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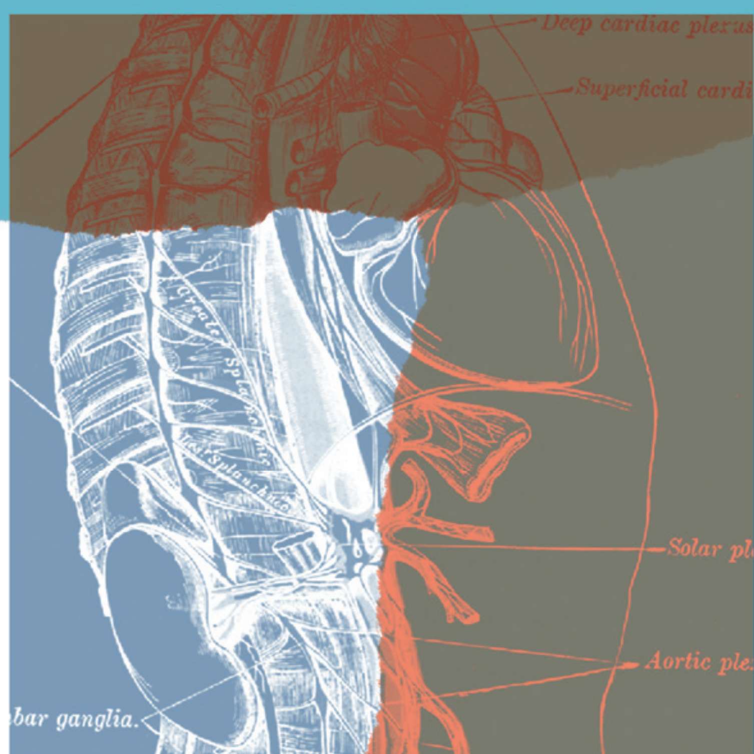

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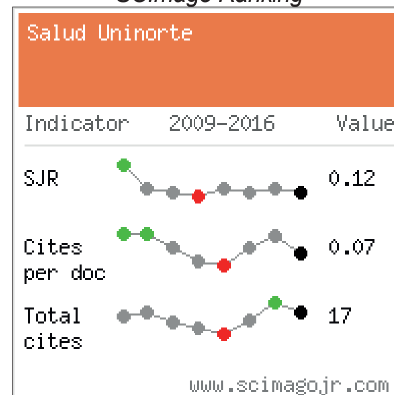

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EDITORIAL
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Pensar en el cuidado de la salud

Think about health care

Sara Huerta-González[1]

Han pasado más de tres décadas desde la propuesta de la Asamblea Mundial de la Salud en la que se planteó como principal meta social alcanzar salud para todos en el año 2000 con sociedades que permitieran a sus ciudadanos gozar de salud para llevar una vida social, económica y productiva. La declaratoria fue relevante en la propuesta, pero sobre todo en los señalamientos que hizo en relación con las limitaciones de los modelos de salud imperantes y centrados en la enfermeda; a partir de esa asamblea se puso en la agenda de las naciones y de la propia Organización Mundial de la Salud el desarrollo de modelos enfocados en los determinantes de salud; de esa propuesta surgió la idea de la Promoción a la salud, en la que la Atención Primaria de Salud (APS) sería la estrategia principal para desarrollar las políticas públicas (1).

Posteriormente, con la Declaración de Alma Ata se refrenda la APS como la política que se debía seguir para alcanzar la meta de salud para todos en el año 2000 y como estrategia principal el fortalecimiento de la promoción a la salud (1). La Carta de Otawa (1-2) refrenda esto y se establece a la promoción a la salud como la práctica dominante, sobre todo en el campo de la salud pública. Sin embargo, en la época actual la salud sigue siendo un reto; a pesar de las iniciativas y de cambios de paradigmas en los modelos de salud sigue teniendo altos costos para las naciones y las sociedades.

Las sociedades actuales enfrentan un doble desafío como consecuencia de los grandes cambios sociales, económicos y demográficos: por un lado, se debe enfrentar los problemas de salud y sus implicaciones de enfermedades infectocontagiosas, mortalidad materna e infantil, etc., algunos de estos se tocan en este número, y por otro lado, los nuevos problemas de salud surgidos por el desarrollo y los cambios acelerados en los perfiles de mortalidad, en el aumento de enfermedades crónicodegenerativas, las enfermedades mentales, la violencia, entre otras.

Es así que uno de los principales retos que enfrentan los países en salud está relacionado con la atención del adulto mayor; en

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todos los países la proporción de personas adultas mayores se incrementa sostenidamente, provocando que en los próximos decenios se alcancen cifras que triplicaran las actuales (3). Por otro lado, a pesar de los esfuerzos en los programas que consideran la lactancia materna como la mayor estrategia para prevenir la morbilidad y mortalidad infantil en los últimos años, la corriente negativa hacia la lactancia materna se ha incrementado. Se sabe que la falta de lactancia natural se asocia con menor riesgo de sufrir cáncer de mama, de ovarios y diabetes en la mujer (4); así mismo, la práctica de la lactancia materna es crucial para la sobrevida de los lactantes y para el desarrollo neuroinmune de los niños con impacto en la economía familiar; esta situación repercute con más fuerza en los países pobres.

De igual modo, la marginación, el cambio ambiental, los movimientos sociales y la crisis económica mundial han reorientado la forma de cuidar la salud y revalorizar los modelos para el cuidado de la salud, en que la prevención ha sido eficaz para los grupos de riesgo, pero no ha sido suficiente para responder a las necesidades. La prevención sigue siendo una respuesta emergente de la gran parte de la población carece y que sigue costando convocar en las instituciones el nivel de salud. Por ello se hace necesario adoptar nuevos paradigmas que respondan a las necesidades de salud y orientan a que la población pase de centrar su atención de la enfermedad a la salud o a la vida; para ello se requiere de esfuerzos coordinados de muchas instancias y actores para alcanzar esta meta en el que médicos, enfermeras y personal del equipo de salud como expertos, en ejercicios interprofesionales con compromiso ético y social enfrenten y atiendan de manera holística y con humanismo a la población, para así detectar oportunamente los riegos, fortalecer el cuidado de la salud, la prevención de enfermedades, la salud en todas las poblaciones en sus distintos ciclos de vida, así como reducir las consecuencias de las enfermedades crónicodegenerativas.

Lo anterior lleva a reflexionar y pensar sobre los límites y alcances del cuidado que otorgan estos expertos que se desarrollan en un sistema de salud individual, curativa, intervencionista y hegemónicamente biologicista. De acuerdo con Waldow (5), el término "cuidado" significa la relación de estar-en-el-mundo, que comprende un compromiso del yo/self consigo mismo, con el otro y con el todo mayor, el cosmos. Este cuidado presenta características compatibles con la filosofía holística; el cuidado humano representa una actitud ética en que seres humanos perciben y reconocen los derechos los unos de los otros, las personas se relacionan con miras a promover el crecimiento y bienestar de los otros y tiene profundas vinculaciones espirituales con la ecología y las prácticas sostenibles.

De acuerdo con Boff (6), el cuidado ha estado presente en todos los seres humanos desde sus orígenes e inicio de la humanidad; lleva a reflexionar en la manera como las personas cuidan, se cuidan y son cuidados, y esto se manifiesta de acuerdo con su contexto histórico, político, económico, social, cultural y espiritual. De esta manera, las relaciones de cuidado se dan de manera cotidiana en la vida del ser humano, en cada acción que realiza y lo impregne de afecto y dedicación para otro ser humano.

El cuidado constituye entonces una práctica social sedimentada en la cultura de las relaciones consigo mismo, con los otros y con el entorno; su abordaje contiene implicaciones

multidimensionales, las cuales no necesariamente se han desarrollado de manera paralela y explícita en la historia de la humanidad; valdría la pena reflexionar en transitar a este nuevo paradigma del cuidado a través del paradigma de lo humano y su esencia. De acuerdo con esto, las tareas del cuidado son necesarias para vivir, para convivir, satisfacer necesidades, sobrevivir, construir bienestar individual, etc. El campo de aplicación del cuidado se ubica en el mundo de lo íntimo, lo privado y lo público; este nuevo paradigma es explicado a través de dimensiones de la existencia humana y con la naturaleza del cuidado y sus modos- de-ser.

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Flexor tendon injuries in children. About a series of cases

Lesiones de los tendones flexores en niños. A propósito de una serie de casos

Enrique Vergara Amador[1], Manuel A. Hernandez Solano[2]

Abstract

Objetive*: to describe the clinical characteristics of a series of pediatric patients with injuries of flexor tendons of the hand and their functional results..*
Materials and methods*: This is a retrospective study of patients with flexor tendon injuries over a two-year period. Variables analyzed were: age, sex, laterality, trauma mechanism, affected area, associated lesions and results with TAM scale.*
Inclusion criteria: age 0-16 years, diagnosis of flexor lesion and minimum follow-up of 10 weeks.
Results*: Twenty-one patients were found, 15 of them had a cutting injury. One case had bilateral involvement. Zone V was the most affected in all cases, followed by zone II. The most frequent associated lesions were collateral nerve and ulnar nerve injuries. Short-term results were good in most patients.*
Conclusions*: A high index of suspicion is necessary for the diagnosis of these lesions; in pediatric patients, surgical exploration is recommended in case of clinical suspicion of tendinous lesion. Primary repair is the gold standard of treatment and the results are good with an adequate follow-up and immobilization protocol.*

Keywords: tendons, tendon injuries, hand injuries, child.

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Resumen

Objetivo: *describir las características clínicas de una serie de pacientes pediátricos con lesiones de tendones flexores de la mano y sus resultados funcionales.*
Materiales y métodos: *es un estudio retrospectivo de pacientes con lesiones de tendones flexores en un periodo de dos años. Variables analizadas fueron: edad, sexo, lateralidad, mecanismo de trauma, zona afectada, lesiones asociadas y resultados con escala TAM. Criterios de inclusión: edad 0 -16 años, diagnóstico de lesión de flexores y seguimiento mínimo de 10 semanas.*
Resultados: *Se encontraron 21 pacientes, 15 de ellos tuvieron lesión por objeto cortante. Un caso tuvo compromiso bilateral. La zona V fue la más afectada en todos los casos, seguida de la zona II. Las lesiones asociadas más frecuentes fueron lesiones de nervios colaterales y del nervio cubital. Los resultados a corto plazo fueron buenos en la mayoría de los pacientes.*
Conclusiones: *Es necesario un alto índice de sospecha para el diagnóstico de estas lesiones; en pacientes pediátricos se recomienda exploración quirúrgica en caso de sospecha clínica de lesión tendinosa. La reparación primaria es el estándar de oro de tratamiento y los resultados son buenos con un esquema de seguimiento e inmovilización adecuado.*

Keywords: tendones, traumatismo de los tendones, traumatismos de la mano, niño.

INTRODUCTION

Flexor tendons injuries in children represent a diagnostic and therapeutic challenge for surgeons. These injuries can go unnoticed and rehabilitation is difficult, but good results are achieved after treatment.

The incidence of these lesions in children has been estimated at 3.6 / 100,000 children per year (1). Flexor zones II and V are the most commonly affected and it is very strange to see these lesions in children younger than two years old, although they have been described in newborns occurring during emergency caesarean deliveries (2). "Buds" or higher incidence peaks have also been observed in holidays times, in which children tend to manipulate sharp instruments (2).

The most common trauma mechanism is caused by cutting glass, followed by sharp object injuries (knives). Associated neurological injuries are commonly found in III and V flexor zones, and they are not frequently associated with finger fractures or extensor tendon injuries (1). These injuries are more common in men than in women, and most commonly affect the right hand (1, 3).

The objective of this study is to describe the clinical features of a series of patients with flexor tendon injuries of the hand and their functional results in short term.

MATERIALS AND METHODS

This is a retrospective study of pediatric patients with flexor tendon injuries of the hand, during a period of two years from April 2015 to April 2017, in the hospital base of the study.

Inclusion criteria were age between 0 and 16 years, with a diagnosis of flexor tendon injury made by a specialist, and a minimum follow-up of 10 weeks.

The variables analyzed were: age, gender, laterality, trauma mechanism, affected flexor

zone, associated injuries and, in short term, the functional outcome were assessed with the Total Active Motion (TAM) scale of the American Society of Surgery of the Hand (ASSH).

The study was approved by the medical ethics committee of the Hospital.

RESULTS

Twenty-two (22) patients were included in the study. The average age was 7.28 years (1-16). Fifteen patients (71.4%) were men. The right limb was affected in twelve cases (52.4%), and there was a case with bilateral involvement. The most common trauma mechanism corresponded to sharp trauma (15 cases, 71.4%), partly produced by broken glasses, glass windows or paintings. The sharp mechanism traumas were caused by knife (13%) in three cases, associated with neglected or aggressive acts. Table 1.

Affected flexor zones

Flexors zones of the hand are the same in adults and children. Figures 1-2. (4).

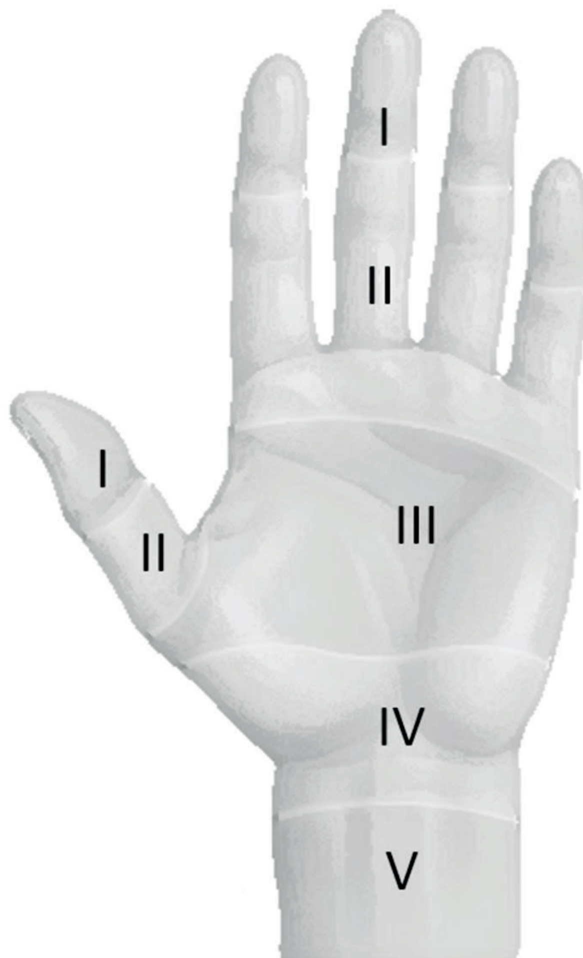
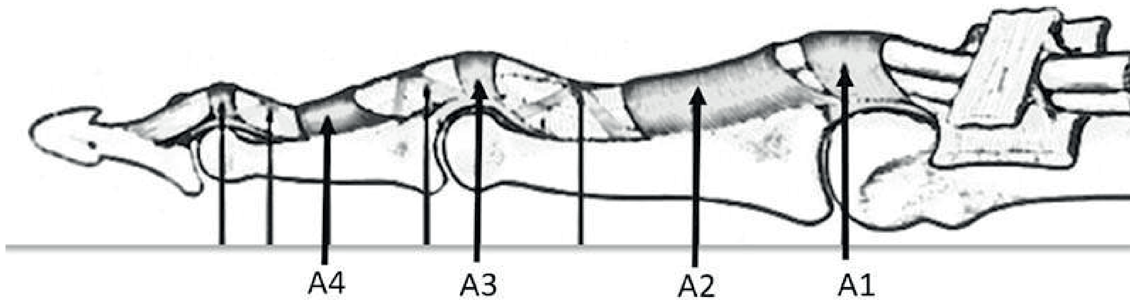


Figure 1. Flexor zones in the hand



Fuente:

Figure 2. Diagram of the tendon sheath of the fingers and pulley system

The most affected flexor zone in this series was the V in eleven cases (52.3%). The biggest of these traumas were produced by a high-energy cutting mechanism, mainly accidentally broken pottery and glass. The zone II was the next most affected with a total of 8 patients (38%). In these there were also accidental injuries for broken glass or ceramic. The lesions in zone III corresponded to 14.2% of the population -three cases-, in zone I and in IV only a case of each (Table 1).

Table 1. Characteristics of patients in the study

Patient	Age	Gender	Mechanism	Affected limb	Flexor zone	Injured flexor tendon (s)
1	7	F	Cutting wound, glass door	Left	V	FCR, partial injury of PL
2	6	M	Cutting wound, ceramics (sink)	Left	V	Digit 3-5: FDS, FDP
3	13	M	Cutting wound (bulb)	Right	III	Digit 3: FDS, FDP
4	3	F	Cutting wound, ceramics (sink)	Left	II-III	Digit 2,3: FDP
5	7	M	Cutting wound, glass	Right	IV	FCU
6	8	M	Cutting wound, glass (door)	Right	V-VI	Digit 2-5: FDS, FDP. FCU, PL
7	4	M	Cutting wound, glass bottle	Right	V	Digit 2-3: FDS. PL, FCR
8	11	M	Cutting wound, glass (picture)	Bilateral	V	Left: digit 3: FDS, digit 4,5: FCU, FDS. Right: partial injury FDS
9	15	M	Cutting wound, glass	Left	V	FCU
10	3	M	Blunt-force wound, iron door	Left	II	FDP
11	1	F	Cutting wound, edge tile	Right	II	FDP
12	8	M	Sharp wound, knife	Right	V	FCU
13	14	M	Sharp wound, knife	Left	V	FCU (90%)

Patient	Age	Gender	Mechanism	Affected limb	Flexor zone	Injured flexor tendon (s)
14	7	M	Cutting wound, glass	Right	I-II	FDP
15	9	F	Blunt-force wound, sinks	Right	II-III	Digit 5: Abductor digiti minimi, FDS
16	13	M	Sharp wound, glass	Right	II	Digit 3: FDS, FDP
17	7	M	Blunt-force, iron, fluorescent tubes	Right	V	Digit 2: FPL, FDS, FDP. PL
18	1	F	Sharp, knife	Left	II	2-4 digits: FDS, FDP
19	5	M	Cutting wound, glass	Right	II	FDS 2nd digit (30%)
20	6	F	Cutting wound, glass	Left	V	FCU, digit 2-4: FDC, FDP
21	5	M	Cutting wound, glass	Left	V	2,3 digit: FCR, FDS, FDP

M: male, F: female. FCR: flexor carpi radialis, PL: palmaris longus, FDS: flexor digitorum superficialis, FCU: flexor carpi ulnaris, FDP: flexor digitorum profundus, FPL flexor pollicis longus.

Injured flexors

There was a total of 65 documented lesions. More Injured tendons were the FDS and FDP. Regarding the FDS, there were 25 tendons injured in total (37%) in 12 patients. FDP was also injured 23 times in 11 patients. In 8 patients both tendons were found injured. Of the remaining patients who took only superficial or deep flexor tendon injury, these lesions were isolated or with other different injuries.

The most frequently injured tendon after previous was the FCU in 7 patients (10%). The other injured tendons PL-four cases-, FCR - three cases-, occurred sporadically. There were five cases of partial lesions (7.4%).

Primary repair of injured tendons was performed during admission. Lesions were repaired fully in 91% of patients. In one patient (case 19) only deep tendons were repaired due to age and the difficult reparation in the affected zone. In another patient (case 15) only muscle ADQ was repaired, leaving the superficial tendon injury unrepaired.

The most commonly used technique was Kessler knot in twelve patients (54%), followed by Adelaide knot in four patients (18%) and double Kessler in 4 cases (18%). Figure 3, 4.

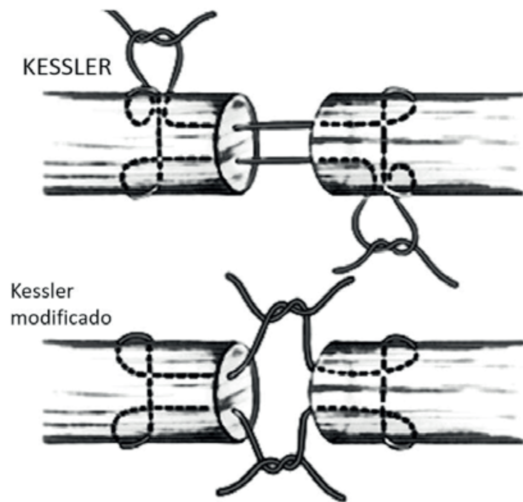
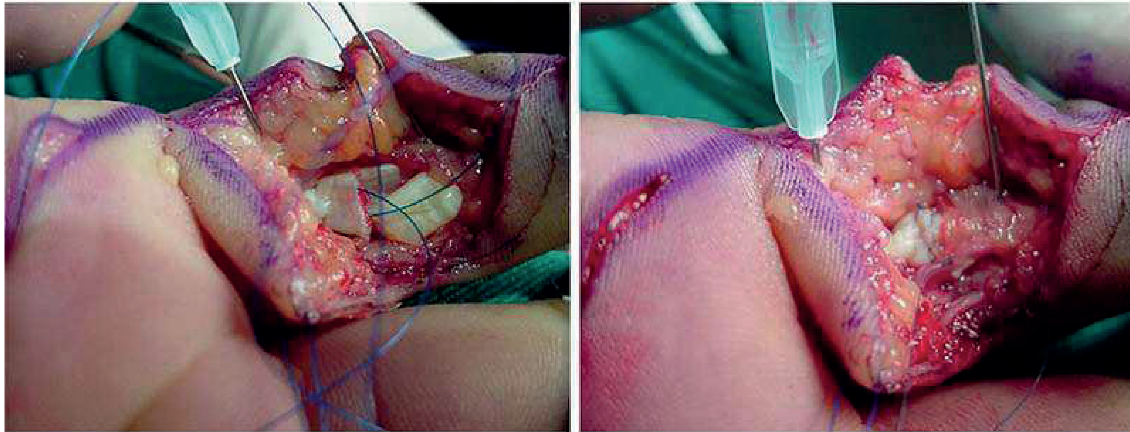


Image above shows the original classic description. Below, a modification is shown, leaving knots at the juncture of the tendons. In this diagram the suture is passed 2 times. It could be done with 4 steps.

Figure 3. Kessler type knot



Fuente:

Figure 4. Design of modified Kessler suture in zone II of finger flexor with epitendinous suture

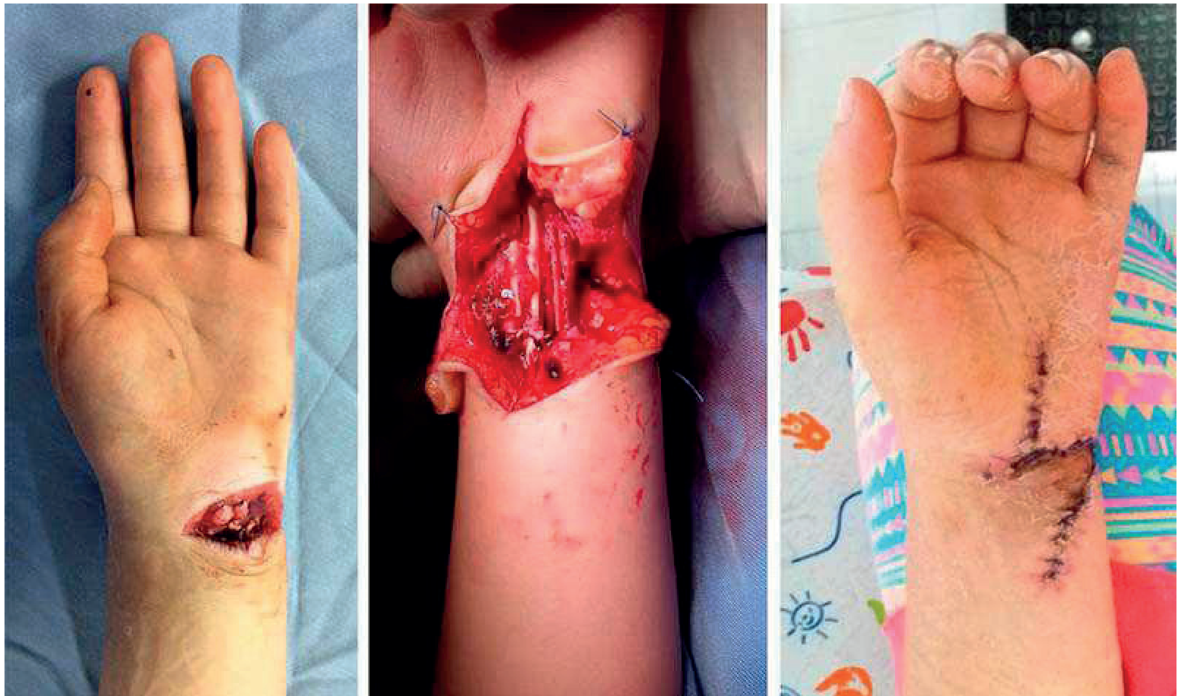
With the remaining patients, in one case (4%) nonabsorbable polypropylene (Prolene) was used to repair a myotendinous injury with simple points (12); in another patient, a crossed suture was used to repair a intrinsic muscle injury of the hand (case 15), and in another a single point was used in a partial tendon injury (case 20). There were two cases (9%) of tendinous reinsertion: one with pull-out through bone tunnels with button (case 14) and another case with suture to the palmar plate (case 19).

Epitendinous continuous suture was used in 7 cases (32%).

The most commonly used suture was Prolene® **in 17 cases (81**%), polydioxanone (PDS) in three (14%) and Vicryl (polyglactin 910) in a case (4%). The size of the suture varied between 4-0 and 5-0, 5-0 being used in patients under 5 years with injuries in zone I-II.

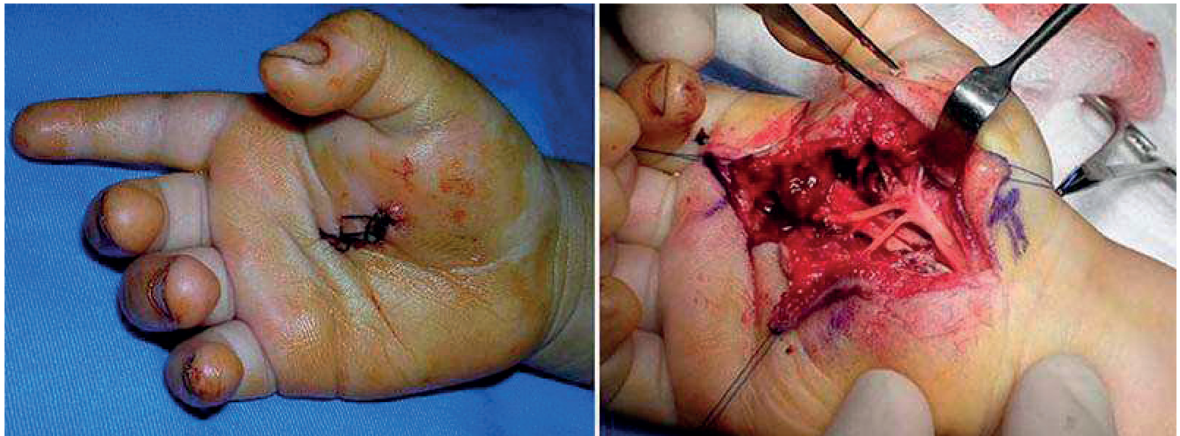
Associated injuries

There were associated injuries in 19 patients (86%), most of them corresponding to nerve injury, followed by vascular lesions. There was a total of 27 nerve injuries, with ulnar nerve injury in 7 cases (26%), being complete in 6 cases (22%) in zones IV and V, and a case with partial injury of 80% in zone V. The median nerve had complete injury in 4 cases, all of them in zone V. There was a case of partial injury to the superficial branch of the radial nerve. The remaining fifteen nerve injuries were partial or complete digital collateral radial (case 9) and ulnar (case 6) injuries in zone I to the zone III. Figure 5, 6.



Center: repair of the artery, nerve and injured flexors. Right: clinical result at 15 days.

Figure 5. Flexor tendon injury in zone V in ulnar border of the wrist with ulnar artery and nerve injury



Right: repair of the flexor tendons in the 2nd finger, showing intact median nerve.

Figure 6. Zone III flexor injuries

Nerve repair was done in all patients with epineural technique using suture size between 7-0 and 9-0. Different types of suture were used: ethilon® **in 20 cases and** Prolene® **in 7 cases. There were vascular injuries** in 7 cases, six of them involving the ulnar artery. In four cases no vascular repair was done because there was found extensive arterial thrombosis and previous ligature of the artery. Arterial repair was performed in two cases with microsurgical techniques using Ethilon 8-0 and vascular Prolene 7-0.

The remaining case presented a digital artery injury that was repaired.

All patients were immobilized with a plaster splint with metacarpophalangeal (MCP) flexion and wrist in a neutral or slightly wrist flexion. One patient with a FPL injury was immobilized with a thumb spica. surgery.

Immobilization time averaged 4.7 weeks for all patients (3-7 weeks). Then physical therapy without immobilization was started. In two cases, children over 12 years old, the splint was continued night-only for 2 weeks more.

After removal of the splint emphasis was placed on improving the flexion and extension movement range with home therapy and physical therapy. No formal rehabilitation protocol was followed.

Functional results

TAM (Total Active Motion) score and the ASSH (American Society of Surgery of the Hand) were used to evaluate the functional outcome of the patients. The score considers the range of active mobility compared to contralateral –uninvolved side-, as a percentage. An excellent result is considered when equivalent to the contralateral, good if greater than 75% of the contralateral, fair between 50 and 75%, poor below 50% and appalling if worse postoperatively.

Only 17 patients were evaluated with the minimum follow-up. The remaining five did not return to control. There was a good result in 14 patients (82.3%). Of the remaining three cases: one had an excellent result, one had a poor one and another an appalling one.

The poor result corresponded to a patient with injury to the fifth finger FDP, with little adherence to the immobilization, and who presented an inability to flexion, with a movement of 43% compared to the contralateral during follow-up at six weeks. He was scheduled for surgical exploration, but did not return to control. The appalling result corresponded to a 7-year old patient with an FDP injury of the second finger of the right hand in zone I. At three months, he had a flexion contracture of 70 degrees of DIP and PIP joint and a hypertrophic scar. Surgical exploration with likely tenolysis or graft tendon was decided, but the patient did not return to control.

DISCUSSION

Flexor tendon injuries in the pediatric population are produced generally by cutting instruments including glass separators used as doors (1, 5). In our series, more cases were produced by broken glasses, and also broken ceramic sink was the cause of injury in three cases. There was no correlation between patient age and the predominant trauma mechanism. For example, in three patients injured by sharp mechanisms, the younger was a one-year old and the oldest was 14 years. Causes in these cases were unintentional or accidental activities.

In general, these patients had the classic signs of flexor tendon injury with loss of biotenodesis in the affected region of the injured finger or hand. The diagnosis of associated injuries was made during the initial assessment, or suspicion as described by some authors (6), or during the surgical procedure.

In a patient with flexor injury in zone II only FDP was repaired. In the rest of the patients, all tendon injuries were repaired. Navali (7) reported that repair in zone II can be performed in both tendons regardless of age because, due to growth and rapid repair, adhesions and contractures are unlikely.

The repair technique used was double or single Kessler in most patients. One case with Adelaide knot was made. No direct relationship was found between the number of steps of the suture and increase of tendon rupture, which is consistent with other studies (7, 8). However, Muradian (9) found an inverse relationship between the type of suture -double or triple-, and increase in rupture incidence.

Other authors recommend simple techniques and the number of strands depends mainly on the axial surface of the tendon subject to repair (10). The epitendinous suture was used in seven cases, out of which three were in the zone V, being its use low respect to the existing literature (1, 5, 10). Four other patients had injuries in zone II; not finding postoperative adherence in any of them. In literature, the use of epitendinous suture is recommended in all flexor tendon repair (5). However, in cases where epitendinous suture was not made, only one rupture occurred, which cannot be attributed to lack of suture and probably was associated with poor adhesion to immobilization and rehabilitation. In other literature reports, the epitendinous suture is used in less than 50% of the population (1, 3, 5). The importance of epitendinous repair in flexor zone 2 is extrapolated from adult injuries.

It is worth highlighting the high number of injuries found in this study. In other case series evaluated, the maximum found was a hundred injuries in 47 patients (5).

Associated lesions in all patients were repaired in the same surgical time. Thrombosed and poor-quality arterial injuries were not repaired. This work considered the associated injuries and they were repaired in most of the cases. In many cases, they go unnoticed and are not repaired (1). In this series we found a case of the A4 pulley repair without complications as rupture or tendinous adherence. Pulley repair is important because of its role in finger flexion biomechanics (11, 12).

There was a good result in most of the patients. Two cases had poor outcomes, one with adherences and fibrosis postoperative and another who abandoned the immobilization. The overall results are consistent with the series published reporting good results in these patients (5, 10).

The postoperative scheme used consisted of initial immobilization with subsequent withdrawal and mobilization therapy, where parents played a very important role. About the scheme used, it is consistent with other authors in immobilization for a minimum of four weeks (6) to avoid activities not supervised that may lead to new tendon rupture.

Loss in follow up is common and lack of an effective and regular physical therapy service in our environment makes it very difficult to establish early-mobilization protocols despite early success reported with these activities

(13). A complete four-week immobilization protocol followed by rehabilitation is the most accepted and supported by the literature for pediatric patients (14).

CONCLUSION

Flexor tendon injuries in children require a high level of diagnostic suspicion. Surgical exploration under anesthesia and primary repair are recommended for a proper approach to these injuries. A non-absorbable and aged-sized suture is necessary for repair, and a 4 to 6 weeks of immobilization must be guaranteed. Rehabilitation can be started after immobilization and parents should be involved in this phase of the follow up. Good results are obtained in most patients.

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Conflict of interests: None to declare.

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ARTÍCULO ORIGINAL/*ORIGINAL ARTICLE*
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Risk factors of burns in children from low-income families and without medical insurance

Factores de riesgo de quemaduras en niños de familias de bajos ingresos y sin seguro médico

Enrique Vergara Amador[1], Manuel A. Hernandez Solano[2]

Abstract

Objective: *To estimate the burn risk in children associated with some elements of family dynamics and the household structure of low-income families without medical insurance.*
Patients and methods. *The participants in this case-control study were matched by age and sex. The population comprised children from low-income families without medical insurance who were treated at the Civil Hospital of Guadalajara "Dr. Juan I. Menchaca" from May 2010 to January 2011. The variables were the socio-demographic characteristics of the child and their caregiver, the agent of burn, and various elements of family dynamics and household structure. To calculate the risk factors, we used Logistic Regression to obtain the Odds Ratio and Confidence Intervals of 95%.*
Results. *The risk factors were not having a caregiver present at the time of burn (OR 13.44, 5.14-35.15), parents treated for depression (OR 15.55, 1.84-131.08), and children who belong to a single parent family (OR 4.29, 1.84-9.98). On the contrary, a child who has three or more siblings reduces burn risk (OR 0.41, 0.18-0.92).*
Conclusions. *The following elements had not been detected as risk factors in low-income families without medical insurance: caregiver absence, depression in parents, and belonging to a single-parent family.*

Keywords: Risk factors, Burns, Children.

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Resumen

Objetivo: *Estimar el riesgo de quemaduras en relación con algunos elementos de la dinámica familiar y la estructura de la casa de las familias de bajos ingresos y sin seguridad social.*
Pacientes y métodos. *Es un estudio de casos y controles pareado por sexo y edad. La población incluida fueron niños de familias de bajos ingresos económicos y sin seguridad social que fueron atendidas en el Hospital Civil de Guadalajara "Dr. Juan I. Menchaca" de mayo de 2010 a enero de 2011. Las variables fueron características sociodemográficas del niño y del cuidador, agente de la quemadura, elementos de la dinámica familiar e infraestructura del hogar. Para la estimación de factores de riesgo se realizó una Regresión Logística para la obtención de Odds Ratio e Intervalos de confianza de 95%.*
Resultados. *Los factores de riesgo fueron no contar con un cuidador presente en el momento de presentada la quemadura (OR 13.44, 5.14-35.15), padres tratados por depresión (OR 15.55, 1.84-131.08) y pertenecer a una familia disfuncional (OR 4.29, 1.84-9.98). Por el contrario, tener tres o más hermanos reduce el riesgo (OR 0.41, 0.18-0.92).*
Conclusiones. *Estos elementos no se habían detectado como factores de riesgo en familias de bajos ingresos y sin seguridad social: ausencia de cuidador, depresión en los padres y disfunción familiar.*

Keywords: Factores de riesgo, Quemaduras, Niños.

BACKGROUND

Burns are the most traumatic injuries that a child can experience.[1] In Mexico, these injuries represent a Public Health Problem owing to the fact that they are among the 20 leading causes of morbidity in populations aged 10-years-old or less.[2] Approximately 36% of these events occur inside the home, with more than 50% of cases involving children under 15 years-of-age, out of which 79% are under 5-years-old.[3] The most vulnerable children belong to low-income families.[1,4-6] Once these events occur, the process of medical treatment, recovery, and rehabilitation is long, and when the injury is severe, the process has physical, psychological, social, economic, and familial impacts on both the children and their families.[7]

In most cases, these events are entirely preventable. In several high-income countries, the prevention of burns in children has resulted in a 50% reduction in mortality.[8] The strategies implemented explain that such results point to three major elements: person, environment, and social conditions; in this sense, a number of modification has been made in the legislation, design, and manufacture of a number of products, such as paraffin and some household chemicals. Likewise, other strategies have been implemented, such as home visits, support to families considered at risk, and the use of security devices.[8] In Mexico, these strategies were established in 2016 by the initiative of the Technical Secretariat of the National Council for the Prevention of Accidents (STCONAPRA). Together with other public institutions, a set of guidelines was constructed that contributes to the reduction of burns in vulnerable groups. The preventive actions were: installation of alarms against fire, the regulation of water temperature at home, the promotion of less flammable bedding and pyjamas, the use of a water sprinkler system on ceilings, among others.[9] All those actions were used in contexts and populations with sufficient income, in contrast to other groups in Mexico that live in vulnerable conditions owing to a lack of economic income and

medical insurance before the occurrence of their children's burns.[8]

In this situation, the analysis of elements in this population is necessary for the development of a design and to select prevention strategies for vulnerable families; specifically, low-income families without medical insurance. Therefore, the aim of this study is to estimate the risk of some elements of family dynamics and household structure in low-income families without medical insurance.

Patients and methods

This case-control study was conducted at the Civil Hospital of Guadalajara "Dr. Juan I. Menchaca" between May 2010 and January 2011. The ratio sample size was 1:1, paired by sex and age. The sample size was calculated with the following variable: depression in parents. We considered a frequency of 11.70% of parents with depression and whose children presented burns versus 1.06% in parents with children with other health conditions or other injuries. With that information, the minimum size sample was 166 people—83 per group, according to the OpenEpi application.[10] The mental status of parents with children injured by burns was a less analyzed variable. Some studies referred that the parents could present symptoms of posttraumatic stress, anxiety, or depression in a lapse of time ranging from one to four weeks after injury; in addition, this situation could also affect the clinical evolution and treatment of children. Further, this situation can also increase with the existence of a foregoing mental disease, such as anxiety or depression.[11-15]

The inclusion criteria for each group were the following: the cases were children of both sexes who were hospitalized in the Medical Care Unit for Children with Burns. The controls were children of both sexes who had attended the Pediatric Emergency Service for another medical cause different to burns. The medical information was obtained from the Clinic Record and from the information provided by the relative responsible for the child present in the moment of injury with prior informed consent and oral acceptance of those responsible for the children, as established by the Regulation of the General Health Law on Subject-Matter of Health Research and in the consideration of this study as minimum-risk research.[16] The investigation was evaluated by the Ethics Committee of Civil Hospital of Guadalajara "Dr. Juan I. Menchaca". The exclusion criteria were children hospitalized by burns and those diagnosed with child abuse or where they presented with an external cause of injury; with these criteria, no persons were excluded from the study. The suspicion of child abuse was defined as having at least one of the following characteristics: incomplete vaccination scheme, lack of birth registration, delay in medical care (> 24 hours), not attending school, and having any concomitant disease and no adherence to treatment.[17,18] It is necessary to mention that none of the suspected cases detected in the study was confirmed after the corresponding legal study.

To collect the information, a collection form was drawn up that contained the following variables: a) sociodemographic data of child: sex, age, schooling, disability, birth place he/she occupies among his/her siblings, number of siblings; b) agent of burn: agent that caused the burn, place of occurrence of the burn; c) sociodemographic data of caregiver: age, schooling, kinship of the caregiver with the child; d) elements of family dynamics

present prior to the occurrence of the burn: present caregiver, schooling of caregiver, parents with anxiety treatment, parents with depression treatment, parents with substance abuse (including tobacco, alcohol, marijuana, or cocaine consumption), parents who consumed an amount of alcoholic beverages, parents with marijuana consumption, parents with cocaine consumption, smoking parents, single-parent family, number of people at home, suspected child abuse; e) elements of the home infrastructure: type of housing, the house has all utilities (i.e., gas, water service, electricity, telephone service, and sewer system), the house has a boiler, the kitchen has a stove, adequate electrical installation (when the electrical installation of the home was made by the company in charge of the supply), adequate storage of liquids (it was evaluated that household chemicals found in the home, which can cause a burn, were stored in containers with an airtight seal and out of reach of children).

The term "single-parent family" was defined as having one of the following criteria: children of divorced or separated parents, children of a single mother, children living with their mother or father and their partner (other than the father or the mother of the children in the study).

The capture of information and statistical analysis was carried out in the SPSS 22.0 software. Statistical analysis consisted of three phases: 1) obtaining frequencies and proportions, in addition to calculating the difference of proportions in the variables of schooling and kinship of the caregiver with the child. 2) calculation of Odds Ratio (OR) and 95% confidence interval to determine the association between the variables related to some elements of family dynamics and some elements of the household structure with the occurrence of burn; likewise, the value of p was estimated and found statistically significant a p smaller than 0.05. 3) Finally, those variables with a p value smaller than 0.25 were selected to introduce them to the logistic regression model. Sex and age variables (matching variables) were included to obtain the adjusted Odds Ratio (ORa) and 95% confidence intervals. As a secondary analysis study those children with burns that occurred inside the home were selected, together with an analysis of the risk factors of burns, in addition to some elements of household infrastructure, for which the frequencies were obtained, percentages, OR, and X^2 to obtain p value. In case of not being able to calculate OR due to any of the cells scoring zero, a Fisher's Exact Test was calculated, taking $p<0.05$ as statistically significant. To evaluate the goodness of fit for the logistic regression model, a Hosmer and Lemeshow test was applied, taking the p value greater than 0.05.

Results

The study groups have similar socio-demographic characteristics, in which a predominance of men can be observed (69.15%). In addition, two-thirds of the population (60.64%) in the study had an age of less than 5-years-old, with their schooling determined according to their age. When the burn occurred, the place he/

she occupied among siblings was the first in the third part (35.10%), and, on average, they had 2 siblings. (Table 1).

Table 1. Sociodemographic characteristics in cases and controls

Characteristic	Cases n (%)	Controls n (%)
Sex		
Men	65 (69.15)	65 (69.15)
Women	29 (30.85)	29 (30.85)
Group of age		
0 to 23 month of age	30 (31.92)	30 (31.92)
2 to 5 years old	27 (28.72)	27 (28.72)
6 to 11 years old	31 (32.98)	31 (32.98)
12 to 15 years old	6 (6.38)	6 (6.38)
Level of education		
Preschool	13 (13.83)	14 (14.89)
Elementary school	31 (32.98)	29 (30.85)
Secondary school	5 (5.32)	6 (6.38)
Not attending school because not having the required age	45 (47.87)	45 (47.87)
Disability in the child		
Yes	5 (5.32)	1 (1.06)
No	89 (94.68)	93 (98.94)
Place that the child occupies among his siblings		
First	33 (35.10)	30 (31.92)
Second	26 (27.66)	27 (28.72)
Third	21 (22.34)	22 (23.40)
Forth	6 (6.38)	9 (9.57)
Fifth or higher	8 (8.51)	6 (6.38)
Number of siblings		
None	15 (15.9)	9 (9.6)
1 to 2	50 (53.2)	44 (46.8)
3 to 5	26 (27.7)	37 (39.4)
6 or more siblings	3 (3.2)	4 (4.2)
Total	**94 (100.0)**	**94 (100.0)**

In this study, the most frequent burn injury in the children was caused by hot liquids (56.38%); among them, the most important

was hot water (35.10%). Mainly, the place where burns predominantly occurred was inside the home (62.8%) (Table 2).

Table 2. Producer agent and the occurrence place of burns

	No.	%
Burns caused by hot liquids	53	56.38
Water	33	35.11
Oil	2	2.13
Milk	1	1.06
Broth	17	18.08
Burns caused by corrosive liquid	1	1.06
Burns caused by flame	34	36.17
Burns caused by electricity	6	6.38
Place of occurrence burns		
Outside of home	35	37.2
Street	20	21.3
Workplace	2	2.1
Other house	11	11.7
Other place	2	2.1
Inside the home	59	62.8
Kitchen	36	38.3
Playground	9	9.6
Bedroom	6	6.5
Bathroom	2	2.1
Living room	4	4.2
Other place in home	2	2.1

Source: Direct

The age of the caregiver was located mainly in the group of 18 to 30 years (46.8%) in the case group of cases, and in the control group, the age range is from 31 to 59 years (52.1%). Schooling differed in both cases: the schooling of the caregiver was primary or inferior in 56.4%, whereas in the controls it was 31.9%, thus presenting a statistically significant difference (p<0.001). Regarding kinship of the caregiver with the child, the parents were responsible for childcare in 78.7% of the cases and 91.5% of the controls. This difference was statically significant (p = 0.01) (Table 3).

Table 3. Sociodemographic characteristics of the Caregiver

Age of caregiver	Casos n (%)	Controles n (%)
Younger than 18-years-old	7 (7.4)	4 (4.3)
18 to 30-years-old	44 (46.8)	41 (43.6)
31 to 59-years-old	39 (41.5)	49 (52.1)
60-years-old or higher	4 (4.3)	0 (0.0)
Schooling of caregiver		
An illiterate person	7 (7.4)	0 (0.0)
Functional illiterate person	6 (6.4)	0 (0.0)
Incomplete elementary school	17 (18.1)	13 (13.8)
Elementary school	23 (24.5)	17 (18.1)
Secondary school	25 (26.6)	39 (41.5)
High school	8 (8.5)	18 (19.1)
Technical degree	7 (7.4)	3 (3.2)
Bachelor's degree	1 (1.1)	4 (4.3)
Kinship of caregiver		
Mother	74 (78.7)	85 (90.4)
Father	0 (0.0)	1 (1.1)
Siblings	5 (5.3)	2 (2.1)
Grandparents	11 (11.7)	6 (6.4)
Other person	4 (4.3)	0 (0.0)
Total	94 (100.0)	94 (100.0)

Source: Direct

The risk factors regarding burns in some of the elements related to the family dynamics of children found were not having a caregiver (OR 8.68, CI 95% 3.78-19.93), parents treated for anxiety (OR 11.07, CI 95% 1.39-88.32), parents treated for depression (OR 12.33, CI 95 1.56-97.51), belonging to a single-parent family

(OR 4.61, CI 95% 2.26-9.43) and that the caregiver was another person or another family member of the child, except his/her mother and/or father (OR 2.91, CI 95% 1.21-6.98) (Table 4).

Table 4. Risk factors of burns in the family dynamics of children

Risk factor	Cases No. (%)	Controls No. (%)	OR	CI 95%	p
Disability of a child					
Yes	5 (5.32)	1 (1.06)	5.22	0.60-45.6	0.09
No	89 (94.68)	93 (98.94)	1.0		
Number of siblings					
>3 siblings	29 (30.85)	41 (43.62)	0.58	0.31-1.05	0.07
<2 siblings	65 (69.15)	53 (56.38)	1.0		
Place that the child occupies among his siblings					
First	33 (35.11)	30 (31.91)	1.15	0.63-2.12	0.64
Other	61 (64.89)	64 (68.09)	1.0		
Caregiver present at the moment of burn					
No	42 (44.68)	8 (8.51)	8.68	3.78-19.93	<0.001
Yes	52 (55.32)	86 (91.49)	1.0		
Level of education of caregiver					
Lower than secondary	78 (82.98)	69 (73.40)	1.77	0.87-3.58	0.11
High school or higher	16 (17.02)	25 (26.60)	1.0		
Kinship of caregiver with the child					
Another person or other relative	20	8	2.91	1.21-6.98	0.01
Mother or father	74	86	1.0		
Parents treated by anxiety					
Yes	10 (10.64)	1 (1.06)	11.07	1.39-88.32	0.005
No	84 (89.36)	93 (98.94)	1.0		
Parents treated by depression					
Yes	11 (11.70)	1 (1.06)	12.33	1.56-97.51	0.002
No	83 (88.30)	93 (98.94)	1.0		
Parents with drug addiction					
Yes	57 (60.64)	63 (67.02)	0.76	0.42-1.38	0.36
No	37 (39.36)	31 (32.98)	1.0		
Parents who drank some amount of alcohol					
Yes	42 (44.68)	44 (46.81)	0.92	0.52-1.63	0.77
No	52 (55.32)	50 (53.19)	1.0		
Parents who consumed marijuana					
Yes	2 (2.13)	1 (1.06)	2.02	0.18-22.68	0.56
No	92 (97.87)	93 (98.94)	1.0		
Parents who consumed cocaine					

Continúa...

Risk factor	Cases No. (%)	Controls No. (%)	OR	CI 95%	p
Yes	0 (0.00)	2 (2.13)	---	---	0.50*
No	94 (100.00)	92 (97.87)			
Smoking parents					
Yes	40 (42.55)	47 (50.00)	0.74	0.42-1.32	0.41
No	54 (57.45)	47 (50.00)	1.0		
Single-parent family					
Yes	40 (42.55)	13 (13.83)	4.61	2.26-9.43	<0.001
No	54 (57.45)	81 (86.17)	1.0		
Suspected child abuse					
Yes	9 (9.6)	0 (0.0)	---	---	0.003*
No	85 (90.4)	94 (100.0)			
Occurred a burn inside the home					
Si	59 (37.2)	0 (0.0)	---	---	<0.001*
No	35 (62.8)	94 (100.0)			

Risk factor	Cases No. (%)	Controls No. (%)	OR	CI 95%	p

f Fisher's Exact Test
irect

With regard to children who did not have a caregiver present at the time of the burn, a total of 50 children shared this characteristic. Their profile was 6.4 years (SD 4.5), the ratio by sex was 4.5:1 with greater affectation in boys (82.0%), one child had a disability (2.0%), and 58.0% had 2 siblings or less.

Statistical significance was found in the adjusted analysis when children had parents treated for depression (OR 15.55, CI 95% 1.84-131.08), were part of a single-parent family (OR 4.29, CI 95% 1.84-9.98) and those that did not have a caregiver at the time of the event (OR 13.44, CI 95% 5.14-35.15) Risk of burn was found to increase regardless of age and sex of the child. A factor that decreased the risk of burn by 59% in this study population was having three or more siblings (Table 5).

Table 5. Risk factors adjusted* of burns in children of low income family and without insurance

Elements of family dynamic	OR adjusted**	CI 95%	p
Parents treated for depression			
Yes	15.55	1.84-131.08	0.01
No	1.0		
Single-parent family			
Yes	4.29	1.84-9.98	0.001
No	1.0		
Number of siblings			
>3 siblings	0.41	0.18-0.92	0.03
<2 siblings	1.0		
Caregiver present at the time of burn			
No	13.44	5.14-35.15	<0.001

Yes	1.0

*Logistic Regression Model
**Information paired by age and sex
Source: Direct

Inside the home, some elements of household infrastructure were found to increase risk in the occurrence of burns, such as: living in a rural area, not having all services at home, not having a water heater or boiler, and not having a stove. It was also found that not having an adequate electrical installation and inadequate storage of fluids were associated with the presence of injury (p<0.001) (Table 6).

Table 6. Risk factors of household structure*

Type of house	Cases No. (%)	Controls No. (%)	OR	CI 95%	p
Rural	10	2	5.82	1.22-27.83	
Urban	49	57	1.0		
House had all services					
No	46	29	3.66	1.64-8.14	
Yes	13	30	1.0		
House had a boiler					
No	42	4	67.94	14.87-310.4	
Yes	17	55	1.0		
Kitchen had a stove					
No	11	2	6.53	1.38-30.92	
Yes	48	57	1.0		
House had adequate electric installation					
No	18	0	----	----	<0.001**
Si	41	59			
House had an adequate store of fluids					
No	30	0	----	----	<0.001**
Si	29	59			

*n=59, only children that the burns occurred inside home were included
**p value in Fisher's Exact Test
Source: Direct

DISCUSSION

Risk factors of burns in children were: parents treated for depression (OR 15.55, CI 95% 1.84131.08), belonging to a single-parent family (OR 4.29, CI 95% 1.84-9.98), not having a caregiver present at the time of injury (OR 13.44, CI 5.14-35.15). Another factor that reduces the risk of burns is having three or more siblings. This factor was found to reduce 59% of the risk of burns.

Regarding the number of siblings, in other studies, it was observed that the existence of siblings was a risk factor of burn,[19,20] especially in children under 5-years-old; however, this aspect was different in this study. This difference could be explained by changes in

family structure, economy, family roles, and not having medical insurance; for example, a single-parent family where the mother needs to go out to work requires support from a person for the care of her children, a situation that could be lightened when medical insurance is available because an affiliated worker to medical insurance has access to kindergarten; likewise, having older siblings could reduce the risk of burns because sometimes they support care or have some skills to identify risks.

With regard to the occurrence of burns, in Lima, Peru, 5.7% of burn cases were reported when children stayed alone at home[21]; instead, 44.68% of the cases occurred in this study. In another aspect, the frequency was 20% higher for mothers that were caregivers of children, which is in contrast to the results shown by Delgado et al.[21]. In the other study, the frequency of other caregivers (meaning a person that was not the mother or the father of the child) was 17% lower than the frequency shown in this study (4.7% vs. 21.3%). The educational level of the caregiver was lower than high school (83% versus 81.6%), which does not indicate any important differences.[22]

In another study,[23] it was reported that the frequency of scalding (17%) was found in the children of mothers with depression. In this study, the specificity of which of the parents were treated for depression was not documented; however, this frequency was lower than reported (11.70%). The parent's abuse of substances was associated with the occurrence of burns, and, in turn, this could produce less supervision and some type of child abuse as it had happened in another context,[24,25] even when, in this study, this variable did not show a statistical association with occurrence of burns in the adjusted analysis.

The main agent that caused burns were hot fluids, as was the case in other cities, such as Lima, Peru[21]; Federal District, Mexico[19,26]; south-central China area[27], and Cape Town, South Africa[28]. The other agent was hot soups (West Texas and Western New Mexico in the United States)[29]. This situation was similar to that shown in the study. Of the elements inside the home, it was found that living in a rural area, not having all services, and not having a boiler or stove in the house increased the risk of the occurrence of burns, and these are associated with low-income in families[7], as was the case in Peru[21], England, Wales, Scotland, and Northern Ireland[23].

Another aspect that attracted attention was that the responsible person was between 12 to 17-years-old in 7.4% of the cases. It was found that this kind of person is limited by age owing to fluctuations in the conductive behavioral aspects of adolescence, which cause insecurity and rebellion, which could prevent them from taking care of others; in addition, this activity is not the responsibility of a teenager[30]. On the other hand, grandparents also participate as caregivers of their grandchildren. In this study, 4.3% of the cases were in the care of elderly. Caring for children was more frequent among grandparents, and it is estimated that of almost 3 million children who stay at home, 61% of them are in the care of their grandparents[31]. Although this issue was not the aim of this study, it is striking because it should be questioned as to whether senior citizens have any interest of taking care of their grandchildren, and if the latter person has the physical and mental capacity to do this activity[32] because these conditions could increase the risk of burns or any other external injury inside the home.

The strengths of this study include the use of a case-control design paired with sex and age that allowed the researchers to establish a more consistent causal association in relation to other epidemiological studies. This study allowed the exploration of a vulnerable population; that is, a population without medical insurance and low-income, which, in our context, is the population with a higher risk of unintentional injuries as burns. The use of multivariate analysis allowed the creation of a model for a calculated statistical significance. The results of this study could be extrapolated for populations with similar characteristics, including Mexico, where approximately 40% of the population has no medical insurance, and affiliation to a health institution with medical insurance is associated to income; therefore, the lower the income a person has, the lower the possibility of having medical service will be[33]. Jalisco is not a state with a high vulnerability index[34]; however, other states of Mexico had a high index of vulnerability, and their risk of causing unintentional injury is higher.

The weaknesses of the study were: not including some other variables of family dynamics, such as parent occupation and the activities performed by the caregiver inside home while being in charge of children, as well as identifying the triggering cause for depression in parents, including the information reported in other studies, such as postpartum depression[23] or unemployment.[23]

The risk factors found in this study could contribute initially to preventing burns in children inside the home, such as verifying where and how fluids are heated at home and the person in charge of caring for children, particularly because these injuries occur mainly in children under 5-years-old. In the same way, it is necessary to plan and implement programs that reduce risk in the vulnerable population, as well as address mental health problems that may exist in parents.

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Acceso a servicios de salud de personas en situación de discapacidad física en Zarzal (Valle del Cauca, Colombia)

Health services accessibility for people with physical disabilities in Zarzal (Valle del Cauca, Colombia)

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Resumen

Objetivo: *Este estudio tuvo como objetivo describir y analizar el acceso a los servicios de salud de las personas en situación de discapacidad física en el municipio de Zarzal (Valle del Cauca, Colombia).*
Materiales y métodos*: Se efectuó un estudio observacional con 56 adultos con diagnóstico de discapacidad física. La encuesta final aplicada se denominó EASS-DISCAPACIDAD FÍSICA, que evalúa perfil sociodemográfico y socioeconómico, acceso a servicios preventivos, acceso a servicios curativos o de rehabilitación, gasto de bolsillo y acceso a la atención específica en discapacidad física.*
Resultados*: Los resultados confirman la desventaja social y económica en la que se encuentra la población en situación de discapacidad. Aun cuando el total de las personas encuestadas se encontraban afiliadas al SGSSS, indicando cobertura, esto no ha garantizado el acceso a servicios de salud integrales y oportunos. Se encontraron problemas en el acceso y continuidad de los servicios de rehabilitación, en especial por retrasos en las autorizaciones por las EPS, demoras en las citas para procedimientos y terapias, y falta de educación para la salud en manejo de la discapacidad física.*
Conclusiones*: Se recomienda aplicar la Encuesta en otros territorios del país, con el fin de visibilizar dicha población y sus necesidades de acceso al sistema de salud. Es necesario que el Ministerio de Salud y Protección Social fortalezca el Sistema Nacional de Discapacidad con el objetivo de establecer prioridades de atención para estas personas.*

Palabras clave: Discapacidad, acceso a los servicios de salud, derecho a la salud.

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Abstract

Objective: *This study aimed to describe and analyze access to health services for people with physical disabilities in the municipality of Zarzal, Valle, Colombia.*
Materials and methods*: An observational study was conducted with 56 adults diagnosed with physical disability. The applied survey was EASS-DISCAPACIDAD FÍSICA that evaluates sociodemographic and socioeconomic profile, access to preventive services, access to curative or rehabilitative services, out-of-pocket expenses and access to personalized care in physical disability.*
Results*: The results confirm the social and economic disadvantage of the population in a situation of disability. Although the total number of people surveyed were affiliated to SGSSS, indicating coverage, it has not guaranteed access to comprehensive and timely health services. Problems were found in the access and continuity of rehabilitation services, especially delays in the authorization of health insurance companies, delays in appointments for procedures and therapies, and lack of health education in the management of physical disability.*
Conclusions*: It is recommended to apply the survey in other territories of the country, in order to make the population more visible and their needs for access to the health care system. It is necessary that the Ministry of Health and Social Protection strengthen the National Disability System with the aim of establishing priorities of care for this population.*

Keywords: Disability, access to health services, right to health.

INTRODUCCIÓN

El aumento en la esperanza de vida ha traído cambios en el perfil demográfico, produciendo un incremento de la discapacidad derivada de la ocurrencia de lesiones afectivas, físicas y psíquicas, producidas por violencia, el conflicto armado y el desplazamiento (1), o bien por meras razones de desgate biológico y funcional de las personas.

La discapacidad se ha definido como el conjunto de limitaciones de la actividad y restricciones para la participación que tienen algunas personas. Refiere a la dificultad para realizar actividades de la vida diaria (2) e incluye restricciones en la estructura y función (3). En particular, la discapacidad física es definida como "la alteración de la capacidad del movimiento, que implica en distinto grado, las funciones de desplazamiento y/o de manipulación, bucofaríngeas o de la respiración, y que limitan a la persona en su desarrollo personal y social" (4). Estos trastornos pueden ser resultado de una etiología variada, pero clasificados de acuerdo con la topografía del trastorno motor, las características del movimiento y el nivel de restricción en el desempeño (4).

La discapacidad en las Américas es un tema de enorme repercusión social y económica, pero del cual se carecen de datos completos (5). El trabajo en políticas o programas relacionados con la discapacidad se basa en datos estimados. No obstante, según el informe de la Organización Mundial de la Salud de 2014 (6), la discapacidad ha sufrido un incremento de más de mil millones de personas. A esto se suma que la incidencia de la discapacidad se encuentra relacionada con determinantes sociales, y se presenta con mayor frecuencia en zonas de bajos ingresos

y bajo nivel educativo (7). Este incremento en la prevalencia de la discapacidad demanda una mayor necesidad de asistencia sanitaria y acceso a servicios de salud, oportunos e integrales, considerando las necesidades.

El acceso a los servicios de salud se entiende como "la disponibilidad, promoción y uso efectivo de servicios preventivos, curativos y de rehabilitación, para responder a las necesidades específicas de la población, en condiciones de garantía suficiente, oportuna y de calidad, del derecho a la salud" (8), (9). En el tema de discapacidad algunos autores han expresado que las principales barreras relacionadas con los servicios son la falta de calidad, calidez e integralidad de la atención, la pobre cobertura, la creencia de que la rehabilitación es un proceso costoso para el asegurador, y barreras en el ambiente hospitalario (10), (11). Otros autores han indicado que los costos en discapacidad no son uniformes para toda la población y que se relacionan con la severidad de la limitación funcional. Los costos directos incluyen el cuidado médico y rehabilitación, intervenciones tempranas, vigilancia de condiciones crónicas y uso de la tecnología. Los costos indirectos están representados por la pérdida laboral, bajos índices de satisfacción y bienestar, apoyos compensatorios del gobierno y la beneficencia pública, y la dependencia que absorbe la familia o el pago de un cuidador (12),(13).

Considerando lo anterior, este estudio tuvo como objetivo describir y analizar el acceso a los servicios de salud de las personas en situación de discapacidad física en el municipio de Zarzal.

MATERIALES Y MÉTODOS

Tipo de estudio. Estudio cuantitativo, con diseño observacional, aprobado por el Comité de Ética de la Investigación de la Facultad de Ciencias de la Salud de la Pontificia Universidad Javeriana seccional Cali.

Contexto, población y muestra. El estudio se desarrolló en Zarzal (Valle del Cauca, Colombia), que[] tiene una población de 43 035 habitantes (14),[] distribuidos en un corregimiento y siete veredas. Cuenta con una empresa social del Estado (ESE) y seis puestos de salud en los niveles 1 y 2 de atención.

De acuerdo con la Secretaría de Bienestar Social, a 2016 la población estaba conformada por 119 personas clasificadas en situación de discapacidad.

Se realizó un muestreo por conveniencia aplicando como criterios de inclusión: tener diagnóstico de discapacidad física, mayores de 18 años, vivir en Zarzal y expresar voluntad para participar en el estudio mediante la firma del consentimiento informado. Los criterios de exclusión fueron estar bajo el efecto del alcohol o sustancias psicoactivas al momento de la encuesta y presencia de otro tipo de discapacidad. La muestra final estuvo conformada por 56 personas.

Técnica de recolección de información. La encuesta utilizada fue una adaptación de la Encuesta de Acceso a Servicios de Salud para Hogares Colombianos (EASS) (8) y de la Encuesta Plan Nacional de Atención para las personas en situación de discapacidad del DANE (14). La encuesta final aplicada y validada por jueces expertos se denominó EASS-DISCAPACIDAD FÍSICA y consta de 76 preguntas cerradas que evalúan perfil sociodemográfico y socioeconómico, acceso

a servicios preventivos, acceso a servicios curativos, gasto de bolsillo y acceso a la atención específica en discapacidad física.

Procedimiento. Después de identificar a los participantes, se les contactó por vía telefónica, se les invitó a participar en el estudio, se programó una visita domiciliaria en la que se explicó el consentimiento informado y se procedió a su firma. Se aplicó EASS-DISCAPACIDAD FÍSICA durante julio y agosto de 2016. El tiempo promedio de aplicación de la encuesta fue 55 minutos.

Análisis de información. Una vez realizada la depuración de la base de datos, se realizó un análisis univariado. La información fue organizada y resumida a través de tablas de frecuencias, cálculo de medidas de tendencia central, variabilidad y dispersión, de acuerdo con el nivel de medición de cada variable. Una interpretación conjunta de los resultados obtenidos constituyó el análisis descriptivo de la información recolectada. La información fue procesada con la herramienta de apoyo SPSS versión 20.

RESULTADOS

Características sociodemográficas. De la muestra final, conformada por 56 personas en situación de discapacidad física (n=56), 59 % fueron mujeres y 41 % hombres. La muestra se concentró en tres estratos socioeconómicos (1, 2 y 3). Todos los encuestados estaban afiliados al Sistema General de Seguridad Social en Salud (SGSSS); el 75 % al régimen subsidiado, el 23,2 % al régimen contributivo y el 1,8 % al régimen especial. Los datos completos sobre la información sociodemográfica se presentan en la tabla 1.

Acceso a servicios preventivos. El 66.1 % de los encuestados acudió al médico en el último año como *medida preventiva*, el 21,4 % asistió al médico y al odontólogo, 1,8 % solo al odontólogo. El 10,7 % no asistió a ninguna consulta preventiva. Del total de la muestra, 73.2 % utilizó más de un medio de transporte para llegar al servicio de salud. Con relación al tiempo empleado para llegar al lugar de la atención de salud la última vez, el 83.9 % tardó menos de una hora y el 14.3 % de una a cuatro horas.

Acceso a servicios curativos o rehabilitación. En relación con el *acceso a servicios de urgencias*, el 62.5% acudió en los últimos seis meses. El 40 % esperó entre 31 minutos y una hora; el 14.3 % esperó entre una y dos horas, mientras 25.7 % espero más de dos horas. El 75 % consideró que le brindaron la atención necesaria; les negaron la prestación del servicio por encontrarse afiliados a una EPS que no tenía convenio con la IPS al 11.1 %.

En cuanto al *acceso a la consulta médica general*, el 82.7 % refirió haber consultado en el último año. Después de la consulta, el 21 % manifestó que tuvo problemas para el tratamiento por falta de dinero para pagar copagos con 19.6 %, porque la EPS no realizó las autorizaciones respectivas 17.4%, y 6.5 % por tramites excesivos para gestionar eventos no POS.

Por su parte, el 67.4 % fue remitido a *médico especialista*; las especialidades con mayor demanda de servicios fueron fisioterapeuta y cirugía con 19.4 %, y médico internista con 16.1 %. Un 45.2 % refirió que fue atendido con consulta con el especialista entre dos a cuatro semanas; a un 29 % no lo habían atendido al momento de la Encuesta, y el 6.5 % tardó de uno a tres meses. Al 20 % la EPS no les entregó medicamentos y al 37.1 % solo algunos de

ellos. A quienes no les entregaron medicamentos, el 71.4 % fue por no estar incluidos en el POS 71.4 %.

En cuanto al *acceso a servicio de hospitalización*, el 10.7 % de las personas lo utilizó. Todos consideraron que la calidad de la atención fue buena y que su necesidad de salud fue resuelta. La información completa sobre los resultados de este módulo se presenta en la tabla 2. La tabla 3 resume la oportunidad de la atención, atención de la necesidad y calidad de la atención valorada por las personas encuestadas.

Gasto de bolsillo en acceso a servicios de salud. El pago de medicamentos, exámenes y procedimientos no autorizados o no entregados por la EPS estuvo entre 2.700 y 30 000 COP. El pago por lentes, audífonos o aparatos ortopédicos fue de $80 000 COP promedio.

Acceso a la atención específica para la discapacidad física. Los participantes reportaron trastornos del movimiento en cuerpo, manos, brazos y piernas con un 42.9 %, en ojos 23.2 % y en sistema nervioso 19.6 %. El 82 % reportó que conocía el origen de su discapacidad: por enfermedad general 45 %, accidentes 27 % y enfermedades genéticas 10.7 %.

El 67.9 % expresó que no había tenido acceso a procedimientos y terapias de rehabilitación en los últimos 6 meses. El 22.9 % lleva de 0 a 1 año sin recibir servicio de rehabilitación, 28.6 % de 2 a 5 años, 17.1 % de 6 a 10 años y 31.4 % más de 10 años. Los motivos: falta de dinero 39.5 %, ya la terminó 23.7 %, no sabe 18.4 %, cree que ya no la necesita 10.5%, no le gusta 5.3 % y porque el centro de salud le queda muy lejos 2.6 %. El tipo de rehabilitación que con mayor frecuencia les ordenaron fue fisioterapia 42.9 %. Y aunque el 60.7 % utiliza ayudas especiales, prótesis o medicamentos permanentes, el 52 % no ha recibido esto por parte de sus EPS.

El 80.4 % no ha tenido continuidad en su proceso de rehabilitación; las principales razones reportadas fueron: retrasos en las autorizaciones por parte de las EPS 41.3 %, demoras en citas para procedimientos y terapias 30.4 %, y falta de personal de salud especializado en la atención de discapacidad 21.7 %. El 51.8 % no ha recibido, al igual que su familia, educación respecto al manejo de la discapacidad física, a pesar de que un 53.6 % manifestó que requiere de manera permanente la ayuda de otra persona.

El 53.6 % consideró que durante el proceso de rehabilitación le han brindado la atención necesaria para su situación de discapacidad física, mientras que el 35.7 % no lo considera así. De manera coherente con esto, la calidad de la atención fue calificada como buena y muy buena por un 51.8 % y como mala y muy mala por un 39.3 %. De estos últimos, el 66.7 % experimentó tramites excesivos y/o dispendiosos, 9.9 % declararon falta de oportunidad, 7.8 % mala atención del personal administrativo, 7.8 % mala atención del personal asistencial y 5.9 % por condiciones deficientes de infraestructura. La información completa se presenta en la tabla 4.

DISCUSIÓN

Los resultados de este estudio se relacionan con la desventaja social que enfrenta la población en situación de discapacidad. Estas condiciones de vida ya han sido reportadas a nivel nacional y en América Latina (5), (12), (15), (16) como altos niveles de exclusión económica (ingresos, trabajo, consumo), de capital humano (salud, educación), de capital

social (control social, antecedentes personales y culturales, compromisos cívicos) y de acceso físico (infraestructura, movilización) (17). La pobreza y el aumento en la carga de enfermedad por enfermedades no transmisibles generan un impacto en el incremento de la discapacidad a expensas de la vulnerabilidad intensificada (12), (18). Estas condiciones enmarcan grandes retos al Estado en general y a los servicios de salud de salud en particular para la atención la discapacidad (19).

Los resultados mostraron que aun cuando el total de las personas encuestadas se encontraban afiliadas al SGSSS, indicando cobertura, esto no ha garantizado el acceso a servicios de salud integrales y oportunos para esta población en Zarzal. Ya otros autores han señalado que en Colombia el aseguramiento se convirtió en un fin en sí mismo, y que estar afiliado al sistema no garantiza el acceso efectivo a los servicios (20). La equidad se transforma en inequidad, injusta y evitable, por falta de reconocimiento a las necesidades específicas de la población. En el país, estas personas están expuestas a barreras sistemáticas, y Zarzal no es la excepción. A las personas con discapacidad física se les vulnera su derecho a la salud con barreras innecesarias, sin considerar que tanto en la Constitución Política de 1991 como en la Política Nacional de Discapacidad e Inclusión Social y en el Plan Decenal de Salud Pública se estipula especial protección para garantizar la atención en salud sin restricciones administrativas ni económicas (21), (22).

Los hallazgos de este estudio confirman que las personas en situación de discapacidad física del municipio de Zarzal se enfrentan a un sistema de salud con un enfoque más curativo que preventivo, toda vez que se exponen a barreras de acceso oportuno, continuo e integral. Todo aquello que no se encuentre en el "paquete" (POS) supone obstáculos para acceder a los servicios. Esto se puede traducir en mayor carga de morbilidad, potenciando el círculo vicioso entre mala salud y pobreza (23-25), lo cual se exacerba cuando se trata de personas en situación de discapacidad física.

En particular, en el acceso a servicios curativos se evidenciaron demoras en la oportunidad de la atención, problemas para llevar a cabo el tratamiento en cuanto a medicamentos, exámenes y procedimientos prescritos, y falta de acceso por falta de dinero debido a eventos no POS. Estudios previos ya habían mostrado que personas con discapacidad visual habían tenido que recurrir a la acción de tutela para evitar la vulneración de derechos fundamentales y acceder a medicamentos o tratamientos que no se encuentran incluidos en el POS (22). Asimismo, el gasto de bolsillo para acceder a los servicios y adquirir los instrumentos esenciales para su proceso de rehabilitación representa una carga económica adicional. La mayoría de las personas entrevistadas en Zarzal no cuentan con recursos económicos suficientes para estos gastos que implica pagar por equipos especiales, servicios de soporte general, tratamientos farmacológicos y no farmacológicos, servicios médicos y de rehabilitación, adaptaciones domésticas y gastos de transporte, entre otros. En este caso, no solo se ven quebrantados la igualdad de bienestar, sino también la igualdad de oportunidades para lograr el bienestar (26).

Respecto al acceso a servicios específicos los hallazgos no son alentadores. En concordancia con estudios anteriores (27), (28), se encontraron problemas en el acceso y continuidad de los servicios de rehabilitación, en especial por retrasos en las autorizaciones por las EPS, demoras en las citas para procedimientos y terapias, y falta de educación para la salud

en manejo de la discapacidad física. Consecuencia de ello, una proporción importante de entrevistados manifestó mala calidad de los servicios específicos a los que se acceden.

En cuanto a limitaciones, es importante tener en cuenta que los resultados de la investigación no se pueden generalizar considerando el muestreo a conveniencia; es recomendable conducir otros estudios con la misma EASS en poblaciones similares, así como de tipo cualitativo para dar mayor cuenta de las barreras de acceso a los servicios que enfrentan las personas en situación de discapacidad física en el municipio. Lo segundo, explorar de manera específica el acceso a los diferentes servicios preventivos, cuyo módulo de la EASS original se redujo luego del pilotaje del instrumento.

Para finalizar, los autores proponemos que se aplique la EASS-DISCAPACIDAD FÍSICA en otros territorios del país, con el fin de visibilizar dicha población y sus necesidades de acceso al SGSSS. Es necesario que el Ministerio de Salud y Protección Social fortalezca el Sistema Nacional de Discapacidad (29) con el objetivo de establecer prioridades de atención para estas personas. De igual manera, elaborar estrategias a nivel municipal en el marco de la Promoción Social, entre las que se destaca la formación de redes sociales territoriales y comunitarias, formación ciudadana, definición y avances en la atención integral a personas en condición de discapacidad.

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Psychosocial triggers or facilitators and burnout syndrome in workers of grocery stores in Guadalajara, Mexico

Desencadenantes o facilitadores psicosociales y síndrome de burnout en trabajadores de tiendas de abarrotes en Guadalajara, México

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Abstract

***Objective**: To analyze the relationship among the triggers and facilitators variables of the influential psychosocial type with Burnout Syndrome in grocery store workers, in Guadalajara, Mexico.*
***Material and methods**: The study was cross-sectional and applied to 321 people working in grocery stores located in the municipality of Guadalajara, Jalisco. A sociodemographic and labor data questionnaire was applied for the evaluation of psychosocial variables and the Maslach Burnout Inventory scale (MBI-HSS) for the presence of Burnout Syndrome. Both descriptive and inferential analysis were included. Under informed consent the respondents accepted their participation voluntarily.*
***Results**: 64.2% of the population presented Burnout Syndrome. Emotional exhaustion was the most affected (59.9%). Several triggers and / or facilitators were associated with more than one burned dimension, specifically with the Emotional exhaustion dimension.*
***Conclusions**: Grocery stores are usually a family business. The people who work in them, depend on them to survive. They are a source of employment, tranquility and protection. Thus, working safely affirms a better life quality and customer service.*

Keywords: triggers, facilitators, Burnout syndrome.

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Resumen

Objetivo: *Analizar la relación entre las variables desencadenantes y facilitadores del tipo psicosocial influyente con el síndrome de Burnout en los trabajadores de las tiendas de abarrotes en Guadalajara, México.*

Material y métodos*: El estudio fue transversal y aplicado a 321 personas que trabajaban en supermercados ubicados en el municipio de Guadalajara, Jalisco. Se aplicó un cuestionario sociodemográfico y de datos laborales para la evaluación de variables psicosociales y la escala de inventario de Maslach Burnout (MBI-HSS) para la presencia de síndrome de Burnout. Se incluyeron análisis tanto descriptivos como inferenciales. Bajo consentimiento informado los encuestados aceptaron su participación voluntariamente.*

Resultados: *64,2% de la población presentó síndrome de Burnout. El agotamiento emocional fue el más afectado (59,9%). Varios disparadores y/o facilitadores se asociaron con más de una dimensión quemada, específicamente con la dimensión de agotamiento emocional.*

Conclusión*: Las tiendas de abarrotes suelen ser una empresa familiar. Las personas que trabajan en ellas dependen de ellos para sobrevivir. Son una fuente de empleo, tranquilidad y protección. Por lo tanto, trabajar con seguridad afirma una mejor calidad de vida y servicio al cliente.*

Palabras clave: Desencadenantes, facilitadores, síndrome de burnout.

INTRODUCTION

The grocery stores, according to the National Statistical Directory of Economic Units (DENUE) of the National Institute of Statistics and Geography (INEGI) in Mexico, belong to the economic sector specifically classified as "retail trade of groceries and food" (1, 2, 3) are the most important units for final consumers, they are classified as microenterprises, representing 95% of the total number of companies in the nation (4). Even from the 2009 Economic Census, 13.9% of the economic activities belonged to the grocery stores, of which 32% are located in Guadalajara (5). In 2015, this city had 7034 grocery stores, with an estimated 1.9 people working per store (6).

In Mexico, the attention and support of a grocery store depends on several activities and / or functions within it such as: seeking the customer's attention and comfort, listening to orders and any other talk, promoting sales, serving suppliers, to mention a few, but they are also exposed to endless risks where the triggers and / or facilitators (any circumstance, condition, event of the working environment that occurs chronically and that alters the worker's health) of stress symptoms may be present. An example of these triggers and / or facilitators are age, sex, marital status, and others of work type such as workload, salary or remuneration, to name a few (7, 8, 9).

It is known that one of the repercussions to health from exposure to psychosocial risk factors is the burnout syndrome (10), understood as the final state of a progression of unsuccessful attempts to manage work stress and as a three-dimensional syndrome develops in those workers who work in contact with people, manifested in three factors or dimensions: physical and / or emotional exhaustion, depersonalization and low personal fulfillment at work, being able to present all three dimensions at once, or two or one (11). This variable has been widely

analyzed in populations of doctors, nurses (12,13), administrative staff, teachers (14), road agents, congress workers (15), housewives (16), police (17), psychologists (18), but not enough studied in workers of grocery stores, and, of the studies already published they appear under the approaches of marketing (19), accounting (20), economics and finance (21) and few with health aspects (10, 22, 23).

Due to the importance that grocery stores and their workers represent to society, the objective of this paper is based on analyzing the relationship between the influencing variables or facilitators of psychosocial type with the burnout syndrome in workers of grocery stores in Guadalajara, Mexico.

MATERIALS AND METHODS

Type of study: The study is cross-sectional.

Study population: The study population were people who worked in grocery stores located in the municipality of Guadalajara, Jalisco, excluding any business that is not qualified as a "grocery store" (3). The stores were selected supported by the Roji Guide (cartographic guide) of Guadalajara (24). Six of the 7 zones in which the city of Guadalajara is divided, excluding the Minerva area because it is a rather commercial and industrial area (25). Sixteen blocks were chosen per zone where the worker considered as the "main worker or responsible for the store" would be surveyed. Because the prevalences of the syndrome fluctuate from 11.4% (26) to 29.3% (27) or 39.4% (28), it was considered a 30% expected prevalence, with an acceptable error of .05 and an index of 95% confidence, resulting in a total sample of 315 subjects, to which a 5 percent non-response rate was added, totaling 331 subjects, of which 10 questionnaires were eliminated because they were answered incompletely, leaving a total of 321 people to survey.

Of this total, 54.5% were men, the rest were women. The minimum age was 12 years with a maximum of 83, an average age of 43.5 years and a standard deviation of 16. Most 57.9% were married. 31.5% had high school studies, 6.9% had a bachelor's degree, and a person with a master's degree. The minimum working age was 1 month (1.2%), the maximum of 40 years (0.9%), with an average of 9.4 years of work. The most worked shift was mixed (72.3%). Weekly work hours reached up to 133 hours with a minimum of 6, and an average of 67 hours of work per week, working 65.1% on 7 days of the week and Monday being the most worked day (100%) (Table 1).

Table 1. Sociodemographic and labor data of people who work in grocery stores in the metropolitan area of Guadalajara, Mexico.

SOCIO-DEMOGRAPHIC AND LABOR DATA	Quantity	%
Sex		
Female	175	54.5
Male	146	45.5
Age		
Minimum (12 years)		0.3
Maximum (83 years)	1	0.3
Average (43.5 years)	1	
Standard deviation (16.1)		

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SOCIO-DEMOGRAPHIC AND LABOR DATA	Quantity	%
Civil status		
Married	186	57.9
Single	90	28.0
Widower	11	3.4
Divorced	12	3.7
Separated	7	2.2
Free Union	15	4.7
Scholarship		
Incomplete primary	16	5.0
Primary	51	15.9
Secondary school	97	30.2
High school	101	31.5
Technical	33	10.2
Bachelor's degree	22	6.9
Master's degree	1	0.3
Labor Old		
Minimum time (1 month)		
Maximum time (40 years)	4	1.2
Average 9.4 years	3	0.9
Standard deviation 9.3		
Workshift		
Morning	73	22.7
Evening	14	4.4
Night	2	0.6
Mixed	232	72.3
Weekly work hours		
Minimum (6 hours)		
Maximum (133 hours)	1	0.3
Average 67 hours	1	0.3
Standard deviation 27.6		
Days of Work at week		
2 days	1	0.3
3 days	1	0.3
4 days	2	0.6
5 days	22	6.9
6 days	86	26.8
7 days	209	65.1
Day of the week when they work		
Monday	321	100
Tuesday	315	98.1
Wednesday	318	99.1
Thursday	318	99.1
Friday	315	98.1
Saturday	292	91.0
Sunday	223	69.5

Source: self made

Evaluation instruments

Two questionnaires were applied: one on sociodemographic and labor data for the evaluation of psychosocial variables, as well as the Maslach Burnout Inventory scale (MBI-HSS) to assess the presence of burnout syndrome.

The scale of assessment of "Maslach Burnout Inventory (MBI)" (29) consists of 22 items distributed in the three dimensions or subscales already mentioned. The scale is Likert-type, where 0 means never and 6 every day. The scores obtained were based on the American norm and Catalan adaptation placing them at low, medium and high levels, where low levels mean no presence of burnout and medium and high levels mean presence. The general prevalence of the Syndrome is acquired with at least one dimension burned. With respect to the psychometric properties of the scale, it has a Cronbach's alpha of .684 and an explained variance of 43.8 (30).

Statistic analyses

They were of two types: descriptive (frequencies, percentages, averages and prevalences) and inferential analysis (with values of association of OR> to one, an Confidence Interval (CI) that did not include the unit and a value of "p" equal or less than 0.05 were included).

Ethical aspects

With informed consent and the necessary information regarding the study, the people surveyed accepted their participation voluntarily. This study is considered risk-free category one, according to the regulations of the General Health Law on Health Research in its Article 17 of the Official Gazette of the Federation in Mexico (31).

RESULTS

In addition to the data already exposed on the study population, extra information was also obtained on the stores where they work as most people say that the store is their own or family (76-82%). 69.5% said to be the main worker, 65.7% are satisfied with the acquired economic gain, 46.1% are stressed to acquire that profit. Almost all (94.7%) say they have another store close to theirs and that this situation stresses them (19.6%). In addition, they were asked if close to their store there was a "convenience" store, 42.1% said yes, but that it was not stressful (10.3%) (Table 2).

Of the 321 participants, 64.2% manifest the burnout syndrome (one or more of a burned dimension). Being placed on the medium and high level is the presence of burnout, the dimension most affected was emotional exhaustion (59.9%) followed by the Low performance at work (31.2%) and then Depersonalization 22.1% (table 3).

Regarding the association data (table 4), working for more than 67 hours a week, not being satisfied with their acquired economic gain, feeling stressed by that gain, having another store close, whether or not it is a convenience store, working a mixed shift and renting the store, was associated with having more than one burnout dimension. As can be seen in the same table, there are several variables that are specifically associated with the dimension of emotional exhaustion and only two with lack of realization and one with depersonalization.

Table 2. Distribution of the population according to data referred to the grocery store.

DATA ON THE STORE	YES		NO	
	Quantity	%	Quantity	%
The store is own	246	76.6	75	23.4
The store is familiar	264	82.2	57	17.8
The store is rented	38	1.8	283	88.2
The store is borrowed	11	3.4	310	96.6
You are the main worker	223	69.5	98	30.5
Satisfaction with your acquired economic gain	211	65.7	110	34.3
It stresses to acquire that economic gain	148	46.1	173	53.9
Another grocery store is close to your store	304	94.7	17	5.3
It stresses that another grocery store is near your store	63	19.6	258	80.4
Close to your store there is a convenience store	135	42.1	186	57.9
It stresses that a convenience store is near your store	33	10.3	288	89.7

Source: self made.

Table 3. Prevalence of burnout syndrome in general and by dimensions

Dimensions of the burnout syndrome	Qualification levels of the MBI					
	Emotional exhaustion		Low Realization		Depersonalization	
	Quantity	%	Quantity	%	Quantity	%
High level	97	30.2	55	17.1	36	11.2
Medium level	73	22.7	45	14.0	35	10.9
Low level	151	47.0	221	68.8	250	77.9
Prevalence of the syndrome in general	64.2% (206 persons)					

Source: self made.

Table 4. Risk factors between the triggering or facilitating variables with the burnout syndrome

VARIABLES	OR > 1	CI* (not including the unit)	p<0.05
More than one dimension burned against:			
Hours worked during the week (more than 67 hours)	2.43	1.47-4.02	0.000
No satisfaction with their acquired economic gain	2.20	1.27-3.82	0.003
Stress for the economic gain gained	1.84	1.12-3.04	0.014
Stress for having another store nearby	5.76	2.39-14.53	0.000
Stress for having a convenience store nearby	3.46	1.21-10.64	0.015
Mixed shift	1.82	1.07-3.12	0.025
Leased store	2.20	1.05-4.62	0.033

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VARIABLES	OR > 1	CI* (not including the unit)	p<0.05
Dimension Emotional exhaustion against:			
Hours worked during the week (more than 67 hours)	2.32	1.44-3.75	0.000
No satisfaction with your acquired economic gain	2.78	1.65-4.69	0.000
Stress for the earned gain	1.80	1.12-2.90	0.012
Stress for having another store nearby	3.96	1.99-7.99	0.000
Be the main worker	1.80	1.08-3.00	0.022
Mixed shift	1.77	1.04-3.01	0.031
Low realization dimension against:			
Stress for having another store nearby	2.88	1.57-5.31	0.000
Dimension of Depersonalization against:			
Hours worked during the week (more than 67 hours)	1.88	1.05-3.37	0.031

Source: self made.
*Confidence Index.

DISCUSSION

According to the data provided by the INEGI (32) and the data collected in this study, grocery stores are an essential part for those who work as well as for other dependents. Coinciding with the data of Abud and González (33) grocery stores are micro and small businesses owned mostly by families, more than 82% of our population says so.

According to Javela, Taquino, Duque and Cruz (34), Chávez, Cruz and Ríos (4) González and Polanco (35) previously working at a grocery store was «more favorable»; currently, the construction of other stores, such as convenience, stores has caused a certain decline in the number of grocery stores, making them less profitable; the growth of these stores has also been demonstrated by the INEGI (32), while those of convenience increased by 84 percent, the grocery stores only grew by 1.5%. These data were corroborated in this study since one of the questions was directed to whether there was a convenience store near its store, to which almost 95% of them answered yes, but that this situation did not worry them or stressed them (20%).

A study conducted in grocery stores in Bogotá (36) had different results, men are the main workers in their stores while in this study women reach the majority (53.1 against 54.5%); In addition, the ages fluctuate between 36 and 50 years in Bogotá against a mere adolescent of 12 years to an older adult, specifically of the fourth age (37), of 83 years. Compared with the same study, the schooling data attracts attention when finding workers with a high level of education, be it undergraduate or master›s degree. 62% say that the place is owned, against 76.6%.

On the other hand, on the revealed prevalences of the Syndrome, it can be seen that 64.2% have at least one of the three burned dimensions, compared to studies as close as possible to that occupation, we can observe prevalences that go from 75% in store workers in commercial centers in Guadalajara (11) to 55% in grocery store workers in a convenience sampling (23). It is agreed that the emotional exhaustion dimension has the highest prevalence (59.9, 41.1 and 62.5%); followed by low performance at work (31.2, 59.9 and 50%) and finally depersonalization (21.1, 22.4 and 32.5%) (11, 23). In the case of the variables with association, Pando (11) agrees with this study when finding an

association between the emotional exhaustion dimension and the work shift. Qualitatively (38) but comparing with our results, it is observed how the workers of the grocery stores do get stressed by having another store near their own, called supermarket or multitasking where the convenience stores fit. People say that this stress is due to the fear, above all, of closing their stores when they can not cope with the competition and all its implications. It does not coincide with Acuña (38) in terms of the satisfaction they feel for having their own business, working for them and not for others, as well as for the income obtained, but in that the work days are really extensive up to twelve daily hours every day of the week as well as Javela, Tarquino, Duque, Cruz (34).

Pando (11) reveals that he found that being single was associated with the psychosocial factor related to worse working conditions, and that with the Burnout Syndrome, the only association found was between the mixed shift and the emotional exhaustion dimension, data corroborated in this work. On the other hand, Aranda et al (23) in their study with a small sample for convenience of grocery workers had already shown matching association data, variables such as working hours a week were associated with emotional exhaustion and with the global burned dimensions, as well as the lack of satisfaction with their acquired economic gain and the stress caused by that acquired gain was associated with emotional exhaustion.

CONCLUSIONS

The little literature published about this working group, called "grocery stores", the "corner store", "neighborhood stores" or "microbusinesses", makes it difficult to analyze and discuss the results obtained; However, the already derived ones are sufficient to manifest the latent concern for improvement in order to achieve a better quality of life.

Among some recommended suggestions, and as Hernandez says (39) "options should be created based on knowledge, innovation and technology, which allow to offer better services, better quality, continue within the market, and compete with other businesses, including convenience stores".

Do not forget that grocery stores are usually a family business, from which the whole family is supported, but that can also be a source of employment, tranquility and protection.

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Epidemiology and prevalence of pulp and periapical pathologies

Epidemiología y prevalencia de patologías de la pulpa y el periápice

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Abstract

Objectives: *to identify the prevalence and epidemiology of endodontic pathologies present in patients who attended the consultation at the School of Dentistry of the University of Cartagena.*
Methods*: cross-sectional study, where endodontic clinical records were taken in 2015, with 630 and 285 clinical records in undergraduate and postgraduate respectively.*
Results*: patients older than 45 years were the ones who attended the most for an endodontic consultation (71.7% in undergraduate and 55.7% in postgraduate). The female sex was the most prevalent (68% in undergraduate and 70.1% in graduate). The most affected dental organs were the upper anterior teeth in the undergraduate program (37.9%) and the lower molars in the postgraduate program (31.22%). The most prevalent etiology was bacterial (55%); and the most frequent diagnosis was asymptomatic irreversible pulpitis in both undergraduate (31.4%) and postgraduate (20%).*
Conclusion*: nowadays most of the treatments performed in the clinics are due to pathological conditions that affect the pulp and the periapical area of the tooth, so it is of great importance for dentists to know the distribution and prevalence of these pathologies.*

Keywords: endodontics, pulp, bacterial, pulpitis. (DeCs-Bireme).

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Resumen

Objetivo*: identificar la prevalencia y epidemiología de las patologías endodónticas presentes en pacientes que acuden a consulta en la Facultad de Odontología de la Universidad de Cartagena.*
Métodos*: estudio de corte transversal, donde se tomaron las historias clínicas de endodoncia en el año 2015; 630 y 285 historias clínicas en pregrado y posgrado respectivamente.*
Resultados*: los pacientes mayores de 45 años fueron los que más acudieron a consulta por endodoncia (71,7 % en pregrado y 55,7 % en posgrado). El sexo femenino fue el que más predominó (68 % en pregrado y 70,1 % en posgrado). Los órganos dentarios más afectados fueron los anterosuperiores en pregrado (37,9 %) y los molares inferiores en posgrado (31,22 %). La etiología más prevalente fue la bacteriana (55 %); y el diagnóstico que más se presentó fue la pulpitis irreversible asintomática tanto en pregrado (31,4 %) como en posgrado (20 %).*
Conclusión*: en la actualidad, gran parte de los tratamientos que se realizan en la clínica son debido a condiciones patológicas que afectan la pulpa y el periápice del diente, por lo que resulta de gran importancia para el odontólogo conocer la distribución y prevalencia de dichas patologías.*

Palabras clave: endodoncia, pulpa, bacteriana, pulpitis.

INTRODUCTION

Pathologies of endodontic origin are the main cause of emergency care in dental practices, due to the painful symptoms that most of these have. Pulpal pathologies are those alterations or injuries caused in the pulp tissue that can advance towards the periapical area of the tooth, through the apical foramen caused by a periapical pathology (1).

The dental pulp is a delicate connective tissue that contains abundant blood vessels, lymphatics, nerve fibers and undifferentiated cells (2), the pulp is responsible for maintaining dentin vitality, conducting its sensitivity and supplying it with substances necessary for its repair. The dentin depends on the pulp tissue for its formation and maintenance, but in turn, it acts as a defense barrier for the pulp (3). Since it is prone to suffer injuries due to the existence of various etiologies for the appearance of endodontic diseases, such as mechanical, thermal, electrical and chemical irritants, traumatic injuries and periodontal problems (4).

Dental emergencies are a problem of high prevalence, recent data from the United States of America suggest that 22% of the general population presented orofacial pain in the last six months. The Chilean population presents a high damage to their oral health and the response to demands for dental treatment is made through emergency dental care. In Cuba, emergency care was concentrated in hospitals, while the majority of cases could be considered as mild, and be attended by primary health care (PHC), a situation that was also described in other countries (3).

Epidemiological studies report that dental caries is the most frequent etiological factor for the appearance of pulp disease, according to the depth and extension of this, anaerobic and Gram negative microorganisms are one of the most important causes that can affect the pulp (5).

In the studies carried out in Colombia, it was found that the National Oral Health Study IV (ENSAB IV) establishes that dental caries is the most prevalent dental disease in Colombians. It is important to keep in mind that people who are currently between the ages of 40 and 50 years are the most analyzed cohort in the four studies conducted in the

country since 1995, due to the high incidence of caries. In this cohort of people, it would be expected to be able to control the progression of the carious process, through preventive actions and risk control, it would be achieved not only having less frequency of dental caries, but also preventing the progression of it, thus controlling pulp and periapical diseases (5).

Studies determined that the largest number of root canal treatments were performed in people aged 36 years old and the most predominant gender were females, because they have more time to attend for treatment, they found that the largest number of patients corresponded to students and housewives. (6)

Many epidemiological studies of this type exist, carried out in other countries such as Cuba (7), Brazil (8) and Peru (6), but in Colombia there is little epidemiological information related to the prevalence of pulpal and periapical pathologies, since only one study exists, which was performed at the Universidad del Valle (5); In addition, there are no statistics in the literature on the epidemiology of endodontic pathologies in the School of Dentistry of the University of Cartagena; which is why the objective of this study is to establish the prevalence of pulp and periapical pathologies presented at the University of Cartagena and to relate these to other variables such as sex, age, etiology and the affected dental organ; which will favor and/or contribute to scientific, social and educational knowledge, as well as epidemiological surveillance according to the results obtained.

MATERIALS AND METHODS

A cross-sectional descriptive observational study was carried out, this type of study was described by Méndez in 1990. The population of the study consisted of patients who attended the School of Dentistry of the University of Cartagena for presenting any endodontic pathology in 2015. In this year 915 endodontic clinical records were filled, 630 corresponded to patients who attended the undergraduate program and 285 attending the postgraduate program. The inclusion criteria included: endodontic clinical records archived in the period between January and December of 2015. Records of non-archived and poorly completed endodontic clinical records were excluded.

A matrix table that contained the variables corresponding to the information collected from the clinical records filled out by the dentistry students of the University of Cartagena was developed. The variables were the following:

Age (less than 20 years, between 20-45 years and over 45 years), sex (female and male), dental organ (upper incisors, lower incisors, upper canines, lower canines, upper premolars, lower premolars, upper molars, lower molars), etiology (bacterial, traumatic, iatrogenic and pre-prosthetic), diagnosis (healthy pulp, reversible pulpitis, symptomatic irreversible pulpitis, asymptomatic irreversible pulpitis, progressive calcifying pulpal degeneration, pulpal necrosis, symptomatic apical periodontitis and asymptomatic apical periodontitis, acute and chronic apical abscess, previously treated tooth and previously initiated therapy).

As for the analysis and interpretation of the information, the data were included and organized in the Excel version for Windows 2007. The frequency tables were made with their respective graph.

According to the resolution 008430 of 1993 of the Ministry of Social Protection of Colombia, this study is considered without risk; therefore no interventions or modification of

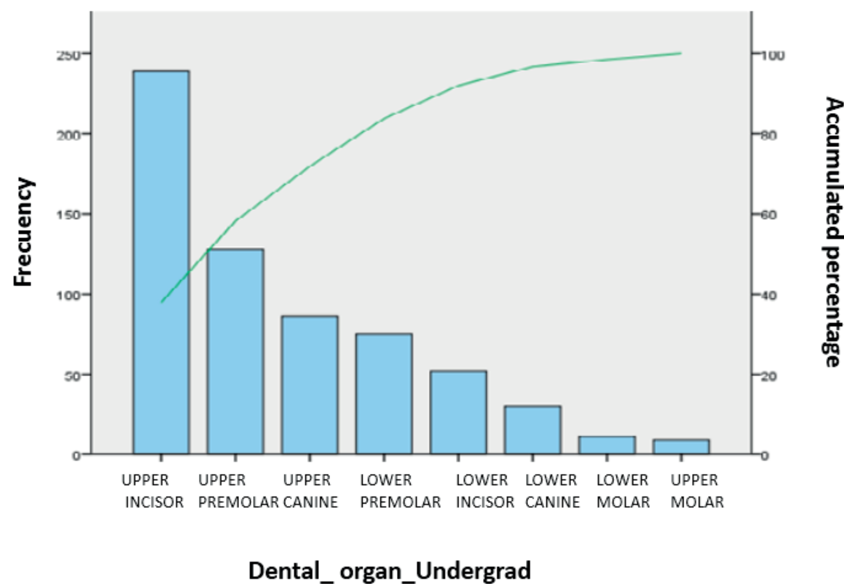
the biological, physiological, psychological or social variables of the clinical records of study were carried out and the collection of data is confidential, so the identity of the patients will not be disclosed in order to protect their rights.

RESULTS

The age range with the highest representation was patients over 45 years of age with 71.7% and 55.7% in both undergraduate and postgraduate programs respectively; followed by the population of 20-45 years with 26.8% in undergraduate and 35.4% in postgraduate, the age range less presented were those under 19 years with a 1.42% in undergraduate and 8.7% in postgraduate.

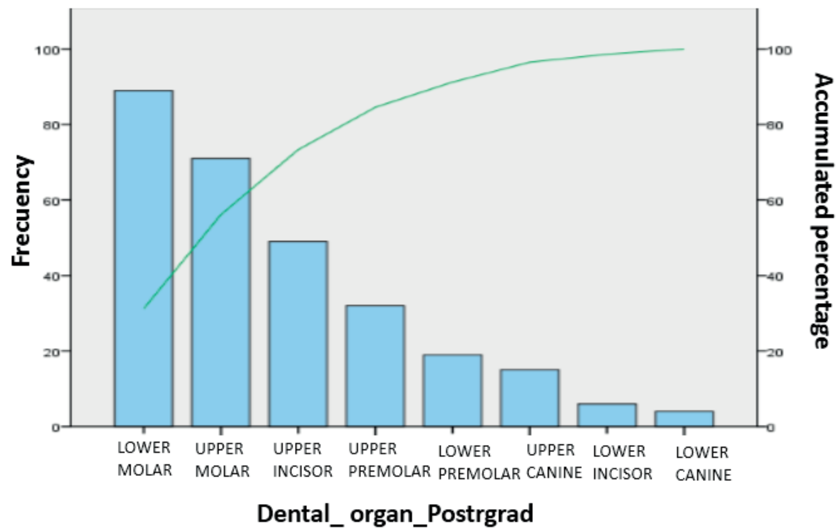
In terms of gender, the predominant sex were females with 68% in undergraduate and 70.1% in postgraduate. The most affected dental organs were the upper anterior and upper premolars with 37.9% and 20.3% respectively in undergraduate; and as for the postgraduate program, the lower molars were the most affected with a 31.2%, followed by the upper molars, with a 24.9% (Figure 1 and 2).

The bacterial etiology prevailed in 54.6%, followed by pre-prosthetics with a 23.9%, while the least prevalent etiologies were traumatic and iatrogenic with a 13.49% and 7.93% respectively in undergraduate; in the postgraduate program it was not possible to determine this variable because in the clinical records this is not specified. The most prevalent endodontic diagnosis was asymptomatic irreversible pulpitis with 31.4% in undergraduate and 20% in postgraduate; followed by healthy pulp with 23% undergraduate; and asymptomatic apical periodontitis with 18.9% in postgraduate (Figure 3 and 4).



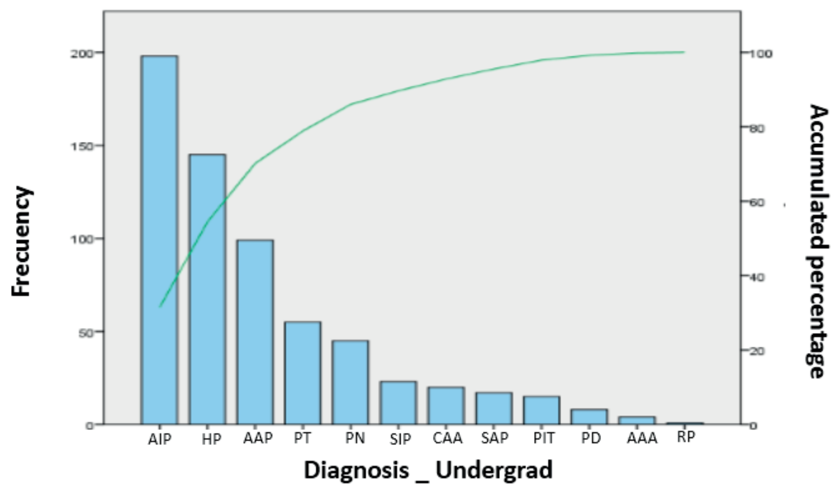
Fuente:

Figure 1. Dental organs affected by an endodontic pathology (undergraduate program)



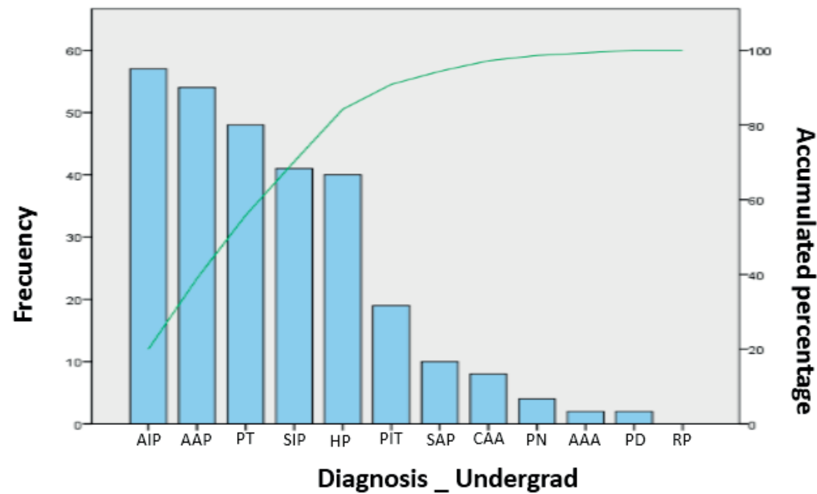
Fuente:

Figure 2. Dental organs affected by an endodontic pathology (postgraduate program)



Endodontic diagnosis:
HP: Healthy Pulp; RP: Reversible Pulpitis; SIP: Symptomatic Irreversible Pulpitis; AIP: Asymptomatic Irreversible Pulpitis; PD: Pulp Degeneration; PN: Pulp Necrosis; SAP: Symptomatic Apical Periodontitis; AAP: Asymptomatic Apical Periodontitis; AAA: Acute Apical Abscess; CAA: Chronic Apical Abscess; PT: previously treated; PIT: Previously Initiated Therapy.

Figure 3. Prevalence of endodontic pathologies (undergraduate)



Endodontic diagnosis:
HP: Healthy Pulp; RP: Reversible Pulpitis; SIP: Symptomatic Irreversible Pulpitis; AIP: Asymptomatic Irreversible Pulpitis; PD: Pulp Degeneration; PN: Pulp Necrosis; SAP: Symptomatic Apical Periodontitis; AAP: Asymptomatic Apical Periodontitis; AAA: Acute Apical Abscess; CAA: Chronic Apical Abscess; PT: previously treated; PIT: Previously Initiated Therapy.

Figure 4. Prevalence of endodontic pathologies (postgraduate)

DISCUSSION

The main limitation presented was the poor completion and lack of important data in the medical records. So we proceeded to ask students not to leave blank spaces in these stories.

The age group mostly found in the study were patients older than 45 years, these results are similar to Gómez and García's (4) in the study *Comportamiento De Las Patologías Pulpares Y Periapicales En Los Pacientes Mayores De 19 Años*, where they determined that the prevalent age was between 46 and 52 years old with a 52.6%. These results are not similar to those reported by Cigales et al (9) and by Gonzáles et al (6) because most of the endodontic treatments were performed in the age ranges between 20-34 years and 23-35 years respectively with a 30.1%.

Regarding gender, the sex that attended the School of Dentistry of the University of Cartagena the most were females on both undergraduate and postgraduate programs. These results coincide with those of various authors, and they can be compared with those obtained by Gaviria et al (5) in an epidemiological study conducted at the School of Dentistry of the Universidad del Valle in 2012, where the female sex had a higher prevalence of pulp lesions with a 61.9%. Likewise, in the study called *Frecuencia De Diagnósticos Y Tratamientos Pulpares Según Indicadores De La Demanda Realizados En Una Clínica Dental Universitaria* (6) where the highest percentage of root canal treatments were found in female patients with

a 66.3%. In the study by Graña *et al* in 2009, the female sex was the most affected with a 60%. On the contrary, results obtained in the study performed by Parejo Madén *et al* (2) in 2014, differ from the present study, since the male sex was the most predominant, with a 69.1%.

The dental organs with a greater prevalence of pulp and/or periapical disease were the upper incisors in the undergraduate program. The obtained results were very similar to those of Gonzáles *et al* (6) in 2005 where the greater percentage of affected teeth were upper incisors with a 50.2%. As for the molars, which were the most affected dental organs in the postgraduate program, it is basically due to the fact that, if endodontic treatment is required in these teeth, they are rarely treated in undergraduate clinics, so in most cases these are sent directly to the endodontics postgraduate. The results obtained by Gaviria *et al* (5) can be compared with those found in this study, since the teeth most affected were the molars in general with 35%; as in the study by Montoro *et al* (11) in 2012 with a percentage of 38.2%.

The most recurrent etiology was bacterial, these results can be compared with the studies carried out by the authors Parejo *et al* (2); and Gómez and García (4) in 2009, where it was determined that the etiological factor that most affected the appearance of pulp and periapical pathologies was dental caries, that is, bacterial etiology with 46.9% and 90.6% respectively.

The most frequent pulp diagnosis in patients who attended the School of Dentistry was the asymptomatic irreversible pulpitis both in undergraduate and postgraduate programs. In the study conducted by Gonzáles *et al* (6) the most prevalent pathology was symptomatic irreversible pulpitis, which differs with the results of the present study, due to the fact that in the School of Dentistry of the University of Cartagena, the majority of patients who come with spontaneous pain, are treated immediately in the emergency clinic. While the second most frequent diagnosis made was that of healthy pulp with 27.4%, keeping a certain similarity with the present study. The second most frequent diagnosis in the postgraduate program was asymptomatic apical periodontitis, which is similar to the results obtained by León *et al* (12) in 2011 in his study called *Frecuencia De Periodontitis Apical En Tratamientos Endodónticos De Pregrado* which showed that the most presented diagnosis was asymptomatic apical periodontitis with a 54.6%. These results differ considerably from the results reported by Viltres and Cuevas (3) in which pulp necrosis predominated in 51 patients (49.51%) which affected an age range of 19-34 years.

CONCLUSIONS

Through the present study it can be concluded that endodontic pathologies majorly affected the female population over 45 years old; the most frequent etiology was bacterial and the most prevalent pulp pathology was asymptomatic irreversible pulpitis, affecting mostly both upper incisors and lower molars.

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Conflict of interests: None to declare.

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Severity factors of Acquired Pneumonia Community in a children's hospital in the Colombian Caribbean

Factores de severidad de Neumonía Adquirida en la Comunidad en un hospital infantil del Caribe colombiano

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Abstract

Objective*: To identify predisposing factors to developing severe pneumonia in hospitalized children diagnosed with community-acquired pneumonia hospitalized in Cartagena's Napoleón Franco Pareja children's Hospital.*
Methods*: Analytical observational cross-sectional study performed in patients under 18 years. Data from surveys and records were analyzed. Univariate and bivariate analysis was performed. The variables are grouped according to the presence or absence of complications and analyzed by ji-square test. We calculated OR of each of the dummy variables to evaluate their association with complications. A P < 0.05 was considered statistically significant for all analyses.*
Results*: 301 patients with severe pneumonia were included. Risk factors related to severity: age less than 3 months (OR: 4.86; CI 95%: 1,5 - 14.3; p = 0.004); exclusive breastfeeding for less than 6 months (CI:95% 7,7- 1,4; p = 0.0019); heart disease (OR: 5.37; CI 95%: 1,28- 19,88, p = 0.010); prematurity (OR: 1.62, CI 95%: 0.93- 6.69, p = 0.034); Incomplete vaccination (OR: 2.32; CI: 95% 1.07 - 5.10; p = 0.015).*
Conclusions*: It was found increased severity risk, statistically significant, in patients less than 6 months breastfeeding, prematurity, heart disease, incomplete vaccination scheme, and positive blood culture with Sp. pneumonia*

Keywords: pneumonía, tachypnea, Streptococcus pneumoniae.

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Resumen

***Objetivo**: Identificar factores predisponentes a desarrollar neumonía severa en niños hospitalizados con diagnóstico de NAC en el Hospital Infantil Napoleón Franco Pareja de Cartagena Colombia.*
***Materiales y métodos**: Estudio observacional transversal analítico en pacientes menores de 18 años hospitalizados con neumonía adquirida en la comunidad. Se analizaron datos obtenidos de encuestas y registros clínicos. Se realizó un análisis descriptivo univariado y bivariado. Las variables se agruparon según la presencia o no de complicación y se analizaron a través de la prueba ji cuadrado. Se realizó el cálculo de OR de cada una de las variables dicotómicas para evaluar su asociación a complicaciones. Una P<0,05 fue considerada como estadísticamente significativa para todos los análisis.*
***Resultados**: Se incluyeron 301 pacientes con neumonía grave. Los factores de riesgo más relacionados con severidad fueron: edad menor de 3 meses (OR: 4,86; IC 95%: 1,5- 14,3; p 0,004); la lactancia materna exclusiva menor a 6 meses (IC 95%: 1,4- 7,7; p 0,0019); cardiopatía (OR: 5,37; IC 95%: 1,28- 19,88; p: 0,010); prematurez (OR: 1,62; IC: 0,93-6,69; p: 0,034); esquema incompleto de vacunación (OR: 2,32; IC 95%: 1,07-5,10: p: 0,015).*
***Conclusiones**: Se encontró aumento de riesgo de severidad en pacientes con lactancia materna menor de 6 meses, prematurez, cardiopatía, esquema de vacunación incompleto, y hemocultivo con Sp. Neumoniae positivo.*

Palabras clave: neumonía, taquipnea, Streptococcus pneumoniae.

INTRODUCTION

Acquired Pneumonia in the Community (CAP) is the leading cause of death in children under 5 years of age in the world, with about 1.2 million cases in 2015 (1). The most vulnerable population is found in the developing countries, especially children under 1 year old, in whom the severe form of this entity prevails, increasing in them the risk of death (2, 3). This is due to socioeconomic conditions, difficulties in access and quality of healthcare services, malnutrition and low vaccination coverage (4, 5).

Every year between 140 and 160 million new CAP's cases are reported, with a lethality of 4% in hospitalized patients and 1% in outpatient (6). According to WHO, each year one of each 20 children under 5 years will have an episode of pneumonia, and of these, one to four of every thousand will require hospitalization (7, 8). In 2010, 120 million episodes of pneumonia were estimated in children under 5 years old, of whom 1.3 died (81% in the first 2 years of life) (1). Streptococcus pneumoniae (Sp) is responsible for 18.3% of these cases (9, 10) CAP was confirmed in children under 3 years old by this germ, in Latin America: a rate of 55 per 100,000 children in Brazil and 76 per 100,000 children in Bogota, Colombia, in 2012 (11).

Risk factors have been described to develop severe pneumonia (12). Among these we find: low birth weight(13, 14), prematurity (15, 16), being younger than 3 months old (17), breastfeeding not exclusive (18), teenager or unlearned mother (19), meeting at daycare centers, overcrowding, malnutrition (20, 21), immunocompromised, presence of congenital heart disease or chronic lung disease (17), exposure to cigarette smoke or biomass (22), incomplete vaccines schedule (23), late medical care (24), and others (15, 24, 25). WHO seeks to reduce the morbidity and

mortality caused by CAP through the identification and dissemination of these factors (12).

There are no studies in our population that determine the vulnerability of some children with CAP to develop complications. The main objective of this study is to identify predisposing risk factors to develop severe pneumonia in hospitalized children diagnosed with community-acquired pneumonia in the Colombian Caribbean.

Methods

An analytical cross-sectional observational study was realized that looked to identify predisposing factors to develop severe pneumonia in hospitalized children diagnosed with CAP in the Napoleón Franco Pareja Children's Hospital (HINFP) between January and December 2014.

Study Subjects

It was included Children younger than 18 years old of both sex with a diagnosis of CAP according to definitions of WHO, British's Chest Society and American Society of Infectious Diseases; who were admitted at emergency service (15-17) and were hospitalized for more than 24 hours. Children admitted to Intensive Care Unit (ICU) from another institution, and patients forwarded to another institution without observable evolution were excluded.

Data collection and statistical analysis

A form was designed that included clinical record's information and the interview with parents and / or caregivers with prior informed consent. Socioeconomic variables (table 1), epidemiological variables (table 2), clinics (signs and symptoms, complications, hospital staying, oxygen therapy, condition at departure, paraclinical record) were included.

Table 1. Socioeconomic Profile of patients with CAP in the Napoleón Franco Pareja Children's Hospital (HINFP) in 2014

Total (n):	301
Age:	
(Half); SD	(2,52); 2,90
[Median]	[1.57]
[Rank]	[.0739726 - 15.21096]
Sex:	
Male n; (%)	159, (52,82%)
Social Security:	
Contributory (%)	6 (1,99 %)
Particular (%)	3 (1%)
Subsidized (%)	286 (95,02 %)
Linked (%)	6 (1,99%)
Socioeconomic:	
Stratum 1 (Low-Low)	236 (78.41%)
Stratum 2 (Low)	50(16.61%)
Stratum 3 (Medium-Low)	15 (4.98%)
Geographic Location (Provenance)	
Urban (%)	257(85,38%)
Rural (%)	44(14,62%)
Condition of overcrowding (%):	109(36,21%)
Maternal age in years:	
(Half); SD	(23.64); 5,79
[Median]	[22]
[Rank]	[15 - 48]
Maternal Education:	
Without education	3 (1%)
Primary	28(9,3%)
High school	223 (74,09%)
Higher	47 (15,61%)

The data were integrated into a spreadsheet for MS Excel 2010™. The statistical package Stata 11 was used to analyze the information. Categorical variables were measured in percentages and continuous variables were measured with central tendency and dispersion's measure. Contingency tables were used as a measure of association between categorical variables, measuring their

statistical significance with the chi-square test and the exact Fisher test for small frequencies. The Relative Risk (RR) of each factor and its confidence interval were calculated. All the statistical tests were contrasted with a level of significance of 5%.

Table 2. Epidemiological profile of patients with CAP hospitalized in HINFP in 2014.

	N	%
Personal history:		
Asthma	104	34,6
Allergies	15	5,0
Diabetes	3	1,0
Down	1	0,3
Sickle cell anemia	11	3,7
Cardiopathy	13	4,3
Prematurity	35	11,6
Hospitalized last month by CAP	11	3,7
Exposure to fumes	63	20,9
Smoke	28	9,3
Exposure to painting	8	2,7
Malnutrition	18	6,0
Others*	38	12,6
Vaccination scheme **		
Full Pentavalent + DPT Vaccination	239	79,4
S. pneumoniae Vaccination	240	79,7
Influenza Vaccination	234	77,7

*1 Case of: Tuberculosis, Cholelithiasis, Cystic Fibrosis, Cleft Lip, Bronchopulmonary Dysplasia, Esophageal Atresia, Ulcerative Colitis, Thalassemia, Myelomeningocele, Osteosarcoma, Esophageal Atresia and S. De Moebius. 2 Cases of: Recurrent Pneumonia, Gastroesophageal Reflux, Cerebral Palsy. 3 Cases of: Tracheostomy and Epilepsy.

** Vaccination scheme verified by card.

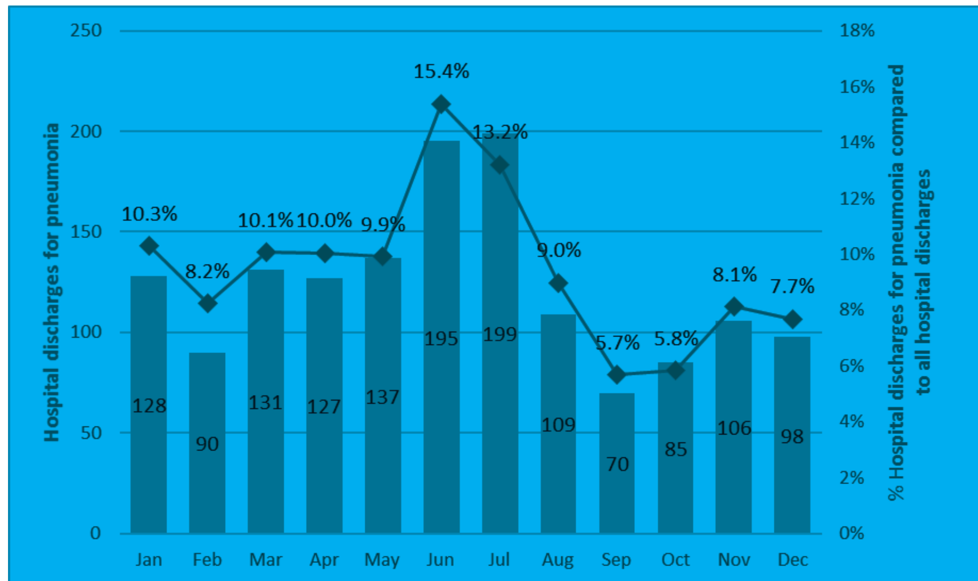
Ethical issues

According to the resolution 008430 of 1993, the then Ministry of Health, the study was categorized safe and approved by the Cartagena University's Medicine faculty's research department.

Results

There were 15,546 discharges at HINFP in 2014; of which 1,475 (9.5%) were diagnosed with pneumonia (Graph 1); Of these, 325 patients with diagnosis of CAP were selected. 301 (20.4%) met the inclusion criteria. The reasons for exclusion were: 8 for incomplete data; 4 did not meet definition of NAC; 1 was over 18 and 11 were under 24 hours.

Tables 1 and 2 summarize the socioeconomic and epidemiological characteristics of the subjects studied. There were no differences regarding sex. The average age in years was 2.5 (SD: 2.9) and the median was 1.5 with IQR (0.07 - 15.2). 85.3% came from urban areas and 78.4% had socioeconomic strata 1. 95% of patients were in a subsidized regime of social security. The median age of the mother was 22 years (IQR: 15 - 48). The most frequent clinical antecedents were asthma, prematurity, exposure to smoke, presence of allergies and heart disease. 79.4% had a complete vaccination scheme for pentavalent and DPT; 79.7% for pneumococcus and 77.7% for influenza.



Fuente:

Graphic 1. Proportion of disbursements by NAC with respect to the total of disbursements in Napoleón Franco Pareja Children's Hospital Foundation in 2014

Clinical profile

50% of the patients consulted on the third day after the onset of symptoms (average of 4.1 days, SD: 3.4). The average stay was 6.0 days (SD: 5.5 and range: 1-56 days). In the general ward, the average stay was 5.0 days (SD: 3.9) and in the ICU it was 9.2 (SD: 5.2). Cough, respiratory distress, rhinorrhea, abdominal pain and vomiting were the most frequent initial symptoms. 69.1% of the patients presented tachypnea and 66.4% of these had chest wall indrawing. Oxygen therapy was required in 138 patients (45.8%); of these, 18.8% required mechanical ventilation. The most used antibiotic schemes were: penicillin (63.8%); ceftriaxone (16.3%); ceftriaxone / clindamycin (5.0%). Two deaths were recorded in the group, in which one had malnutrition and the other sepsis as a complication (Table 3).

Table 3. Clinical profile hospitalized with NAC in HINFP in 2014

	n= 301	%
Signs and symptoms:		
Fever	258	85,7
Cough	245	81,4
Respiratory difficulty	208	69,1
Rhinorrhea	97	32,2
Abdominal pain	27	9,0
Vomit	17	5,7
Tachypnea	208	69,1
Chest wall indrawing	200	66,5
Oxygen Support:		
Oxygen requirement	138	45,9
Mechanic ventilation	26	18,84
Hospitalization room		
General room	267	88,7
ICU	34	11,3
Final Condition		
Alive	299	99
Dead	2	1,0

Patients were classified as presenting severe pneumonia (88.7%) and very severe pneumonia (11.3%). 44 (14,6%) of the patients presented complications; Of these, 7.5% had severe pneumonia and 70.6% had very severe pneumonia, the statistical difference was significant (p = 0.000). The most frequent complication in the group of severe pneumonia was pleural effusion (5.6%) and in the group of very severe pneumonia, sepsis (52.94%). Some patients presented several antecedents (table 4).

Table 4. Frequency of complications in patients with NAC hospitalized at the Napoleón Franco Pareja Children's Hospital in 2014

CAP	TOTAL N=301	CAP Severe N=267 (88,7%)	CAP Very severe N=34 (11,3%)	Pr (Z < z)
Complications	44 (14,6%)	20 (7,5%)	24 (70,6%)	0.000
Pleural effusion	22 (7,3%)	15 (5,6%)	7 (20,6%)	0.001
Sepsis	20 (6,6%)	2 (0,7%)	18 (52,9%)	0.000
Atelectasis	5 (1,6%)	2 (0,7%)	3 (8,8%)	0.000
Empiema	2 (0,6%)	1 (0,4%)	1 (2,9%)	0.041
Pulmonary abscess	1 (0,3%)	0 (0,0%)	1 (2,9%)	0.003
Pneumothorax	1 (0,3%)	0 (0,0%)	1 (2,9%)	0.003
Pulmonary hypertension	1 (0,3%)	0 (0,0%)	1 (2,9%)	0.003

Risk factors of severity

Table 5 shows the risk factors and their association with severe pneumonia. The most related to severity are: age less than 3 months (OR: 4.8, 95% CI: 1.5- 14.3, p 0.004); exclusive breastfeeding less than 6 months (95% CI: 1.4- 7.7, p 0.0019); heart disease (OR: 5.4, 95% CI: 1.3- 19.9, p: 0.010); prematurity (OR: 1.6, CI: 0.9-6.7, p: 0.034); incomplete vaccination scheme (OR: 2.3, 95% CI: 1.1-5.1: p: 0.015). There wasn't any statistically significant difference between sex and severe pneumonia; However, the male sex had a 50% higher risk (OR 1.59, CI: 0.73- 3.59, p: 0.13). History of overcrowding, exposure to smoke or biomass and asthma didn't show differences between patients with severe and very severe pneumonia.

Table 5. Risk factor for severity CAP at Napoleón Franco Pareja Children's Hospital in 2014

Risk factor		CAP Severe		CAP Very severe		Total		Pr(X2)	OR	CI95% Lower	CI95% Upper	P
		n	%	n	%	n	%					
Sex	Male	137	51,5	22	62,9	159	52,82	0,21	1,59	0,73	3,59	0,139
	Female	129	48,5	13	37,1	142	47,18					
Age <= 3 month	Yes	13	4,9	7	20,0	20	6,64	0,00	4,87	1,50	14,36	0,004
	No	253	95,1	28	80,0	281	93,36					
Mother's age <20 years	Yes	64	24,1	9	25,7	73	24,25	0,83	1,09	0,43	2,56	0,487
	No	202	75,9	26	74,3	228	75,75					
Breastfeeding <6 moths	Yes	117	44,0	25	71,4	142	47,18	0,00	3,18	1,40	7,71	0,002
	No	149	56,0	10	28,6	159	52,82					
Mother with no education	Yes	2	0,8	1	2,9	3	1	0,02	3,88	0,06	75,89	0,311
	No	264	99,3	34	97,1	298	99					
Incomplete vaccination	Yes	97	36,5	20	57,1	117	38,87	0,02	2,32	1,07	5,11	0,016
	No	169	63,5	15	42,9	184	61,13					
Overcrowding	Yes	96	36,2	13	37,1	109	36,33	0,92	1,04	0,46	2,27	0,527
	No	169	63,8	22	62,9	191	63,67					
Malnutrition	Yes	14	5,3	4	11,4	18	5,98	0,15	2,32	0,52	8,00	0,143
	No	252	94,7	31	88,6	283	94,02					
Exposure to tobacco	Yes	25	9,4	3	8,6	28	9,3	0,87	0,90	0,17	3,23	0,585
	No	241	90,6	32	91,4	273	90,7					
Exposure to smoke	Yes	52	19,6	11	31,4	63	20,93	0,10	1,89	0,78	4,30	0,084
	No	214	80,5	24	68,6	238	79,07					
Cardiopathy	Yes	8	3,0	5	14,3	13	4,32	0,00	5,38	1,29	19,89	0,010
	No	258	97,0	30	85,7	288	95,68					
Late medical consultation	Yes	86	32,3	10	28,6	96	31,89	0,65	ND			
	No	180	67,7	25	71,4	205	68,11					
Asthma	Yes	94	35,3	10	28,6	104	34,55	0,43	0,73	0,30	1,66	0,277
	No	172	64,7	25	71,4	197	65,45					
Allergies	Yes	15	5,6	0	-	15	4,98	0,15	ND			
	No	251	94,4	35	100,0	286	95,02					
Diabetes	Yes	3	1,1	0	-	3	1	0,53	ND			
	No	263	98,9	35	100,0	298	99					
Down	Yes	1	0,4	0	-	1	0,33	0,72	ND			
	No	265	99,6	35	100,0	300	99,67					
Sickle cell anemia	Yes	10	3,8	1	2,9	11	3,65	0,79	0,75	0,02	5,60	0,627
	No	256	96,2	34	97,1	290	96,35					

Continúa...

Risk factor		CAP Severe		CAP Very severe		Total		Pr(X2)	OR	CI95% Lower	CI95% Upper	P
		n	%	n	%	n	%					
Prematurity	Yes	27	10,2	8	22,9	35	11,63	0,03	2,62	0,93	6,69	0,034
	No	239	89,9	27	77,1	266	88,37					
Hospitalised with CAP	Yes	10	3,8	1	2,9	11	3,65	0,79	0,75	0,02	5,60	0,627
	No	256	96,2	34	97,1	290	96,35					
Exposure to painting	Yes	8	3,0	0	-	8	2,66	0,30	ND			
	No	258	97,0	35	100,0	293	97,34					
Others	Yes	29	10,9	9	25,7	38	12,62	0,01	2,83	1,06	6,98	0,019
	No	237	89,1	26	74,3	263	87,38					

Microbiological profile

5% of the 180 blood cultures performed were positive. The most frequent germ isolated was S. pneumoniae with 5 cases, 4 of them were admitted in ICU: 1 had not vaccination against pneumococcus, 2 received breastfeeding less than 6 months, one had sickle cell anemia and heart disease. Four had a pleural effusion and two presented sepsis as complications too. The virological tests carried out, were positive so: 4.5% for influenza A, 4.4% for influenza B, 14% for H1N1 and 36.5% for RSV (Table 6).

Table 6. CAP microbiological profile at Napoleón Franco Pareja Children's Hospital in 2014

	N=301	%
Blood cultures	180	59,8
Positive	9	5,0
E.coli	1	11,1
Micrococus	1	11,1
S. Aureus	1	11,1
S. Pneumoniae	5	55,5
S. Epidermidis	1	11,1
Viral panel made	44	14,6
Influenza A	44	14,6
Negative	42	95,5
Positive	2	4,6
Influenza B	45	14,9
Negative	43	95,6
Positive	2	4,4
H1N1	50	16,6
Negative	43	86,0
Positive	7	14,0
RSV	52	17,3
Negative	33	63,5
Positive	19	36,5

Continúa...

Discussion

This study analyzes the socioeconomic, epidemiological, clinical characteristics and most frequent complications found in children with severe and very severe CAP in a pediatric hospital, and their relationship with risk factors associated with this clinical evolution.

The WHO and the British Chest Society define CAP as the presence of tachypnea associated with symptoms of fever, cough and chest wall indrawing(26, 27). Tachypnea occurs due to activation of an inflammatory cascade induced by a germ that alters gas exchange

at the alveolocapillary level; When it is not compensated, it evolves to chest retractions, nasal flaring, whining, signs of shock and ventilatory failure with a high risk of death. (28).

Shann, Spooner and Levental's studies showed that the tachypnea and chest wall indrawing as diagnostic signs established by the WHO have high predictive value in children less 2 years old. (29, 30). However, in our study, 30.9% of the children didn't present tachypnea, but radiological findings and complications such as pleural effusion were found in them, which is consistent with other established consensus such as the American Society of Infectious Diseases, which defines CAP as the presence of signs and symptoms of pneumonia that can be confirmed by findings of infiltrates in chest X-rays, in previously healthy children acquired before hospital admission (31).

Only 66.5% of studied children presented chest wall indrawing, that indicates it shouldn't be considered as the only criterion of severity. Other findings such as cyanosis, oxygen therapy, complicated pneumonia or the presence of highly virulent germs such as S. aureus are also included in this concept (27, 31).

Majorities of CAP are managed ambulatorily, but if there is any criterion of severity such as: respiratory distress, oxygen requirement, intolerance to the oral route, cyanosis, chest wall indrawing, to be less than 3 months old is considered hospital treatment. The subjects studied had some of these conditions, because of that, they were classified as severe pneumonia (88.7%).

Patients with CAP who present imminent signs of ventilatory failure, hemodynamic instability, needing for ventilatory and / or inotropic support are classified as very severe pneumonia and require ICU treatment (32). In our study, ten of the patients classified in this category didn't present complications associated with shock or these supports. However, they were at risk of ventilatory failure requiring continuous monitoring, which explains their admission to the ICU (32).

In our study, complications from CAP were presented independently of their severity; the risk of complications in very severe CAP was higher, sepsis and atelectasis were more common in this group. Although the development of empyema in comparison with other complications wasn't as relevant, it was more common in very severe CAP with a statistically significant difference ($p = 0.041$).

Pneumonia cases increase in the rainy season, due to the spread of respiratory pathogens from person to person, and the dryness of mucous membranes is facilitated, which alters their mucociliary function (15). In 2014, pneumonia cases occurred throughout the year, with peaks between June and July and in November, which could be associated with increased rains during these dates.

Although belonging to the male sex is associated with severity (33), In our study there were no differences in relation to sex. Being younger than 3 months or premature, were common factors in these children and coincides with the risk of severity described in the literature.

Breast milk is rich in secretory IgA that prevents the adherence of viruses and bacteria to the respiratory mucosa, so its exclusive consumption during the first 6 months of life is a protective factor (15, 25). In this sample, it was found that not having this condition tripled the risk of severity. When severe malnutrition

occurs, the immune response decreases, facilitating the development of severe CAP (12). In our population, malnutrition doubled the risk of severity (OR 2.32, 95% CI: 0.52-8.00, p: 0.14), including death, evidenced in two cases.

Comorbidities like sickle cell anemia, bronchopulmonary dysplasia, gastroesophageal reflux, asthma, cystic fibrosis, congenital heart disease or immunodeficiency are associated to complications and neuromuscular disease and epilepsy to aspiration pneumonia(34). In our study, heart disease was associated with very severe pneumonia (p 0.010); However, asthma or sickle cell anemia did not increase the risk of admission to the ICU due to very severe pneumonia, it's possible that the presence of other factors that increase this risk may be required.

Active vaccination has been considered a significant resource to reduce morbidity and mortality by CAP (15). Studies describe that immunization against *Haemophilus influenza* and *S pneumoniae* reduced the radiological incidence of CAP by 20%(35). Incomplete vaccination was associated with severe pneumonia in our population.

Environmental contamination and exposure to smoke or biomass, block the mucociliary response of the respiratory tract (15). Overcrowding (12) facilitates nasopharyngeal colonization of germs, this and the late consultation (24) are associated with risk of severity. In our study, there were no differences between severe and very severe CAP when these factors were associated.

It is known that it is difficult to determine the etiological agent of pneumonias in the world (19, 20). Blood cultures are positive in less than 10% of cases (21, 22). In our study, only 5% of the blood cultures were positive. The most frequent isolated germ was S. pneumoniae, which was associated with very severe pneumonia and complications, but not death. Despite the expectation that these cases had a history of incomplete vaccination for pneumococcus, only one met this criterion. This suggests that it is possible that the strain present in these cases isn't covered by the vaccine. New studies should be carried out to establish the pneumococcal subtype in this population and correlate it with those present in the vaccine applied by the EPI.

CONCLUSIONS

CAP is one of the infectious causes with greater morbidity and mortality in our environment. It can be associated to risk factors that predispose to the development of severity. In our study, we found exclusive breastfeeding for under six months since birth, prematurity, heart disease, incomplete vaccination and blood cultures positive for S. pneumoniae increased risk of significant severity. Working on measures that modify these risk factors could reduce complications, hospital staying and death, which in turn would reduce costs. For this reason, the training of health personnel and the vulnerable population is essential.

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Prevalence and risks associated with non-diagnosed arterial hypertension: comparative results in two Colombian cities

Prevalencia y riesgos asociados con la hipertensión arterial no diagnosticada: resultados comparativos en dos ciudades colombianas

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Abstract

Objectives: *To determine the prevalence and factors associated with undiagnosed hypertension in two Colombian cities.*
Methods: *multicentered, descriptive correlational study, with a quantitative approach, non-experimental design, in a population of 2000 inhabitants of Santa Marta and 1000 of Bucaramanga; Blood pressure measurement was performed by using the mercury sphygmomanometer following the technique and procedures recommended by the World Health Organization. Measurements of weight and height were obtained according to the application of worldwide accepted protocols and the identification of the risk factors through an instrument previously validated by experts; bioethical criteria were respected for studies with humans. The statistical analysis was performed by using the PAST software version 3.14.*
Results: *the prevalence of undiagnosed hypertension in Santa Marta was 6.5% and in Bucaramanga 3.4%; the factors associated in the population of Santa Marta were: family history (0.33), tobacco consumption ((0.97), alcohol use (0.20) and physical exercise (0.12) and in Bucaramanga, family history (0.95), tobacco consumption (0.73), alcohol (0.88) and absence of*

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physical exercise (0.78), the reasons for not timely diagnosis, in both populations, were due to the absence of hypertensive signs and symptoms and periodic control of the state of health.
Conclusions*: the prevalence of undiagnosed arterial hypertension was higher in Santa Marta than in Bucaramanga, while the behavior of the risk factors was similar.*

Keywords: Arterial hypertension; Prevalence; Factor; Risk (Source: DeCS Bireme).

Resumen

Objetivo*: Determinar la prevalencia y los factores asociados a la hipertensión no diagnosticada, en dos ciudades colombianas.*
Métodos*: estudio multicéntrico, descriptivo correlacional, con enfoque cuantitativo, diseño no experimental, en una población de 3000 habitantes; la medición de la tensión arterial se realizó mediante el uso del esfigmomanómetro de mercurio siguiendo la técnica y procedimientos recomendados por la Organización Mundial de la Salud, las mediciones de peso, talla y perímetro de cintura se obtuvieron conforme la aplicación de protocolos aceptados mundialmente y la identificación de los factores de riesgos se hizo mediante un instrumento previamente validado por expertos; se respetaron los criterios bioéticos para estudios con humanos. El análisis estadístico se realizó mediante el software PAST versión 3,14.*
Resultados*: la prevalencia de hipertensión arterial no diagnosticada en Santa Marta fue de 6,5 % y en Bucaramanga de 3,4 %; los factores asociados en la población de Santa Marta fueron: antecedentes familiares (0,33), consumo de tabaco ((0,97), uso de alcohol (0,20) y práctica de ejercicio físico (0,12) y en Bucaramanga: antecedentes familiares (0,95), consumo de tabaco (0,73), de alcohol (0,88) y ausencia de ejercicio 2 físico (0,78); los motivos del diagnóstico no oportuno, en ambas poblaciones, se debió a la ausencia de signos y síntomas hipertensivos y de control periódico del estado de salud.*
Conclusiones*: la prevalencia de hipertensión arterial no diagnosticada fue menor en Bucaramanga que en Santa Marta, mientras que el comportamiento de los factores de riesgos fue similar.*

Palabras clave: Hipertensión arterial, Prevalencia, Factor, Riesgo (Fuente: DeCS Bireme).

INTRODUCTION

According to the World Health Organization WHO (1), high blood pressure represents the most important cause of premature death, causing around 9.4 million deaths from heart disease: early detection reduces complications from this cause. Its origin is multifactorial and is related to: race, age, gender, (2-3); obesity (4) salt intake (> 60 mmol / day) (5), alcohol consumption (6), sedentary lifestyle (7), dyslipidemia, (8) smoking (9) and stress (10).

Complications of Arterial Hypertension (HBP) include coronary heart disease, pulmonary infections, and cerebrovascular accidents; (11) the risk factor in men is 34.3% and in women it is 26.5% (12). One in every 3 adults has high blood pressure, causing half of the deaths due to vascular brain injuries and heart disease (13). 11.5% of the population of Magdalena whose ages range from 18 to 69 years, admitted having had HBP and 9.1 % of them said to have been diagnosed as hypertensive; whereas, the death rate from cerebrovascular diseases was 37 per 100,000

inhabitants; which may precede arterial hypertension not opportunely identified, (14).

On the other hand, the National Health Institute (15) reported in 2013 that cardiovascular alterations represented the first cause of death among Colombians; its detection is essential to prevent heart attacks and strokes (16), whose factors are related to the traditional health modelThis happens due to unhealthy eating habits and sedentary lifestyle (17). Its asymptomatic presentation has been recognized as "the silent enemy" (18). Therefore, preventive practices would contribute to the solution of the problem. (19) This study aimed to identify the prevalence and contributing factors of undiagnosed hypertension in two Colombian cities.

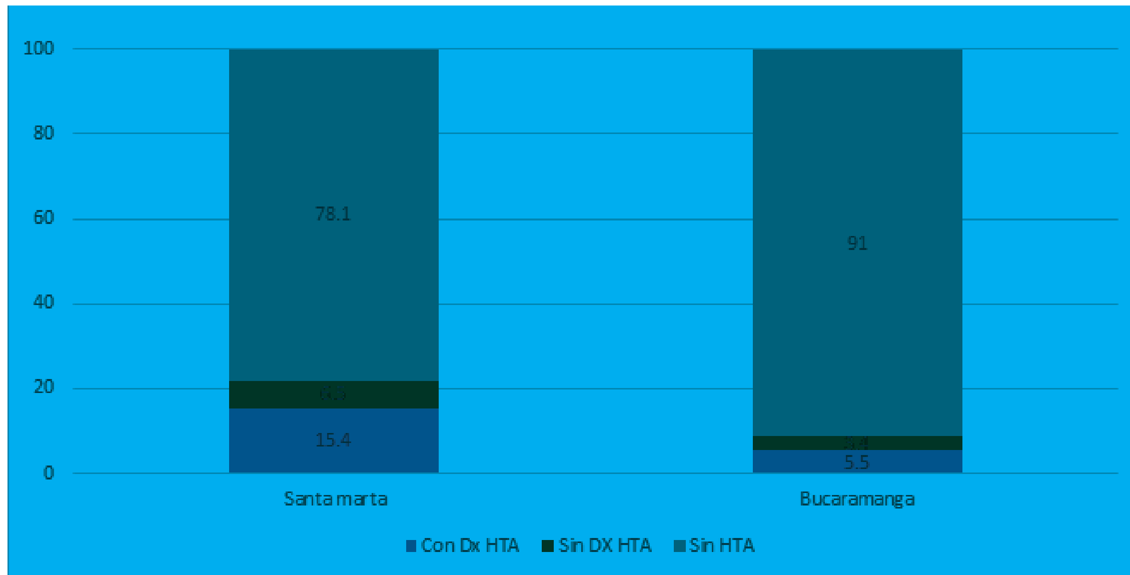
MATERIALS AND METHOD

Multicentric descriptive, transectional, non-experimental descriptive study conducted in two Colombian cities in a population of 3000 adults over 18 years of age, 2000 from Santa Marta and 1000 from Bucaramanga, through intention sampling; Patients previously diagnosed with the disorder were excluded. The blood pressure was measured according to WHO protocol (13) modified, only sitting and standing positions, according to the scale (normal: less than 120-80 mmHg, prehypertension: 120-139 or 80-89 mmHg, Stage 1 hypertension: 140-159 mmHg or 90-99 mmHg, stage 2 greater than or equal to 160 or greater than or equal to 100 mmHg; (13) the body mass index consistent with the WHO assessment scale was obtained (Weight loss: <18.5, normal: 18.5-24.9, overweight> 25, obesity: 25.0-29.9, obesity class I: 30.0-34.9, obesity class 2: 35-39.9 and obesity class 3 :> 40) The sociodemographic information and associated factors (family history of hypertensive disorders, smoker and non-smoker, consumers or non-consumers of alcohol, practice or not of physical exercise), was collected through the application of a survey designed for these purposes, validated by experts and after signing informed consent, bioethical criteria were respected (20) along with the declaration of Helsinki (21). The statistical analysis was carried out using the software Past, version 3.14 (22).

RESULTS

The behavior of the variables of the population per city is the following: in Santa Marta the median age was 35.5 with a lower limit value of 18 and higher than 95 years, the sex 54.85% (1117) female and 44.15% (883) male; whereas, in Bucaramanga, the median age was 32 , with a lower limit of 18 and a higher limit of 91 years; 58% (580) female and 42% (420) male. In both cities, the predominant marital status was single, followed by free union marriage in Santa Marta and married in Bucaramanga. Regarding the socioeconomic stratum in Santa Marta, it was 1 (54.24%) and in Bucaramanga 3 (52.6%). The level of education of the population of Santa Marta was illiteracy and some grade of primary 27.55%; in Bucaramanga, the high school level predominated (21.5%). At the time of the study, 93.45% of the population of Santa Marta and 95.1% of the population in Bucaramanga was found to be affiliated with the social security system.

The frequency of undiagnosed or "silent" hypertension corresponded to 6.5% in Santa Marta and 3.4% in Bucaramanga, with a behavior of 78.1% and 91% of patients without the alteration. The non-diagnostic factor manifested by 100% of the population was the absence of signs and symptoms of arterial hypertension and the absence of controls on their health status. (See figure 1)



Source: Monitoring of blood pressure figures

Graph 1. Distribution of the population according to blood pressure conditions

Non diagnosed Hypertension in Santa Marta, according to gender, corresponded to 66.92% male and 33.08% female; socioeconomic stratum 1 (66.92%), unfinished primary school (18.46%). While in Bucaramanga male gender was (67.64%), socioeconomic stratum 3 (64.70%), complete high school (26.47%).

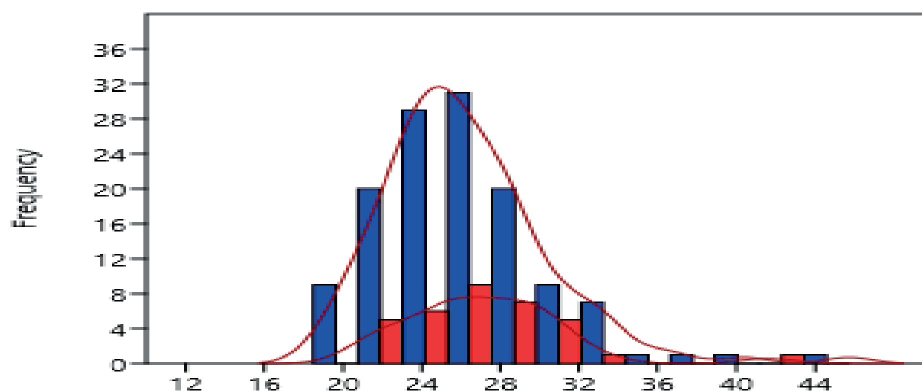
A positive association was found between risk factors and arterial hypertension in Santa Marta: family history (0.33), tobacco consumption ((0.97), alcohol consumption (0.20) and physical exercise (0.12)) and in Bucaramanga: family history (0.95), tobacco consumption (0.73), alcohol (0.88) and absence of physical exercise (0.78) .The correlation between BMI and HTN was positive in Santa Marta and not associated in Bucaramanga, with a Spearman correlation of 0.5, and 0.0 respectively (See table 1)

Table 1. Factors associated with uncontrolled hypertension in both cities

Variables	Santa Marta (Corr.de.Spearman)	Bucaramanga (Corr.de.Spearman)
Fam Ant/Hypertension	0,33	0,95
Tobacco / Hypertension	0,97	0,73
Alcohol/Hypertension	0,20	0,88
Sedentary / Hypertension	0,12	0,78
BMI / weight	0,82	0,65
BMI/per. Abd	0,71	0,48
BMI / Hypertension	0,5	0,0

Source: Statistic analysis

The behavior of the risk according to the body mass index in both groups was concentrated between 18 and 32, with a greater tendency towards the extreme right in the Santa Marta group. (See figure 2)



Source: Trend analysis of the body mass index.

Figure 2. Distribution of body mass index in both cities

DISCUSSION

The prevalence of undiagnosed hypertension was higher in the city of Santa Marta than in Bucaramanga, which may be related to better anthropometric condition, socioeconomic stratification and educational level. However, the prevalence of undiagnosed hypertension is lower compared to the results of Menéndez, who found 37.4% of cases undiagnosed (23). Although the majority of the participants are affiliated to the Social Security System, actions for the early identification of alterations leave aside national regulations (24) (25), as a mechanism to reduce the factors that cause cardiovascular diseases, in addition to the high prevalence of absenteeism from preventive and control programs (26).

The male population presented a higher frequency of undiagnosed hypertension; fact that can be related to cultural characteristics and low assistance to health controls; result that goes in accordance with other studies (27), (28) (23), (29). On the other hand, the representative socioeconomic stratum in Santa Marta coincides with Barceló (30), who found that the less favored classes have a higher prevalence of arterial hypertension, where, in contrast, there was greater coverage of members of the Social Security System; while, in Bucaramanga, the educational level was concordant with Sánchez's study (31). In Santa Marta, there was influence of the body mass index with the abdominal girth, while in Bucaramanga no association was found, contrasting results with Cardona's findings (28). The risk factors

associated with undiagnosed hypertension are similar with that found by García (29).

These results allow proposing strategies aimed at the early diagnosis of hypertensive disorders. It is recommended to follow up on positive cases, as well as to implement care programs and university extension-research actions, in partnership with the health secretaries, so that through screening tests, new cases are monitored.

CONCLUSION

These results allowed toidentify the prevalence of undiagnosed hypertension in two Colombian cities, marked by the non-perception of signs and symptoms; with higher prevalence in Santa Marta than in Bucaramanga. The behavior of the risk factors was similar in both cities.

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Learning style variation in chilean dentistry students from the first to the fifth year

Variación en los estilos de aprendizaje en estudiantes de Odontología de primero a quinto año

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Abstract

Objective: *The aim of this study was to identify the variation of learning styles in dental students from the first to the fifth year at the Universidad San Sebastián, Concepción campus (Chile).*
Method: *A descriptive and transversal study was conducted where The Honey-Alonso learning style questionnaire was given to 535 students. The average scores observed in each course underwent regression curve type studies and the standard deviation of each average over the fitted regression curve was estimated with its corresponding confidence interval and determination coefficient.*
Results: *The active, reflective and pragmatic style presented a fluctuating development as the academic years progressed; with the exception of the theoretical style, which demonstrated a steady increase. All learning style scores increased in the fifth year.*
Conclusion: *Upon reaching the higher levels, there is a development of all learning styles, which means that students adapt to learning through different strategies and have the capacity to adapt to different situations, which facilitate learning. However, we suggest that dentistry, as a clinical career, should promote the active and reflective styles, because they would be the most beneficial in helping students to develop the skills required to successfully face clinical experiences in their practice period, or within the clinical workforce.*

Keywords: Dentistry, Active learning, Teaching profession, University students, Chile.

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Resumen

***Objetivo**: El objetivo de este trabajo fue identificar la variación de los estilos de aprendizaje en estudiantes de primero a quinto año de la carrera de Odontología de la Universidad San Sebastián, sede Concepción (Chile).*
***Método**: Se realizó un estudio descriptivo, transversal en el que se aplicó a 535 estudiantes el cuestionario Honey-Alonso de estilos de aprendizaje. El promedio del puntaje de los estilos de aprendizaje observados en cada curso se sometió a estudios de tipos de curvas de regresión y se estimó, la desviación estándar de cada promedio respecto de la curva de regresión ajustada con su correspondiente intervalo de confianza y el coeficiente de determinación.*
***Resultados**: Se obtuvo que el estilo de aprendizaje activo, reflexivo y pragmático presentó un desarrollo fluctuante a medida que el año académico progresó, la excepción fue el estilo teórico que presentó un aumento constante. Todos los estilos de aprendizaje aumentaron en quinto año.*
***Conclusión**: Al llegar a los cursos superiores existe un desarrollo de todos los estilos de aprendizaje, lo que significa que son capaces de aprender a través de distintas estrategias y presentan una capacidad de adaptación a distintas situaciones lo que facilita su aprendizaje. Sin embargo al ser Odontología una Carrera Clínica se debe potenciar el estilo activo y reflexivo ya que éstos le permitirán desarrollar las competencias requeridas para enfrentar con éxito las experiencias clínicas que les correspondan en su período práctico o ya en su contexto laboral.*

Palabras clave: Clave: Odontología; aprendizaje activo; docencia; estudiante universitario; Chile.

INTRODUCTION

Dentistry students' knowledge acquisition , skills and competencies takes place through the development of curriculum specially designed to be part of the graduation profile of dentists, which must be based on the needs of society in the areas of prevention, diagnosis and treatment of the most prevalent pathologies. Thus, the resolution of pathologies of greater complexities is carried out by professionals who, within the framework of continuing education, have acquired the most relevant competences.

An overview of the current field of dentistry in Latin America shows us that, even in the present situation of globalization, great differences in training programs and in the criteria for curricular equivalence of each country persist. If this aspect were improved, it would facilitate the possibilities of mobility and exchange, both for students and academics, as well as validation of studies and renewal of degrees. This implies the need for these programs to adapt to the professional scenarios of dentistry, not only in Latin America, but also around the world. New guidelines must be generated for convergence in dental education between countries, developing common objectives as well as a coherent and well-structured educational program to ensure uniform, adequate and quality professional education and training.

The quality of the teaching-learning process can be evaluated through criteria that describe the existence of relevant factors in educational institutions, such as the appropriateness of the methods applied and their duration in relation to the proposed objectives. In this area, there should be a variety of pedagogical methods to cover all learning styles appropriate to the specific characteristics of the competencies targeted (1,2,3,4,5).

There is a wide range of authors who, in light of studies in neuroscience and psychology, have addressed the different ways that individuals learn, finding that each person has a specific way of approaching personal knowledge: a style that identifies and characterizes them (6,7,8,9,10,11,12,13,14,15).

Drawing a parallel between education and clinical health fields, every time health professionals receive a patient, they perform a series of interviews and examinations that allow them to obtain the greatest amount of information regarding the patient's health or illness, which leads to a diagnosis, thus establishing the most appropriate treatment with respect to the pathology afflicting the patient. In the academic field, professors deal daily with students, for whom they design different teaching strategies and methodologies, evaluation tools, etc., hoping that their students achieve effective learning. However, a fundamental element has been overlooked, which is the diagnosis of the learning styles of individual students, which for these purposes would correspond to establishing their learning styles. Any learning strategy requires a diagnosis of learning styles before an intervention. This task represents a consistent challenge with regard to the process of approaching and individualizing students, in addition to corresponding training of the teaching staff, so as to be able to correctly understand the results obtained.

To respond to the requirements of facilitating effective learning and to develop self-motivation in students, it is necessary to understand how students learn (16). Loret de Mola (17) suggests that it is necessary to understand why, in the same learning environment, each student acquires knowledge in a different way. At the same time, both López (18) and Rodríguez & Rodríguez (19) propose that learning styles are dynamic and consequently can vary as learners interact with their environment.

Learning is a process that begins with an experiencecharacteristic of the active learning style, followed by reflection on this experience (reflective style), which is then conceptualized and structured, and conclusions are drawn (theoretical style) to finally organize and apply the new information (pragmatic style) (11,19).

With the idea of reaching an accurate and valid diagnosis of students, we used the Honey & Mumford model[6] relating to information processing preference that distinguishes four styles of learning:

- Active learning (based on direct experience)
- Reflective learning (based on observation and data collection)
- Theoretical learning (based on abstract conceptualization and conclusions)
- Pragmatic learning (based on active experimentation and search for practical applications)

This model has been widely used in the literature (7,20,21,22,23,24,25) and has demonstrated high reliability and validity (8,17,26,27).

The impact of scientific advances in health sciences and technological development created a new scenario for dentistry education, which led to the classic or traditional training of dentists in our universities up to the present day, which is now obsolete (28). It is not enough to adapt to an ever-changing and demanding labor market, in which cultural background or prior learning should

be considered in order to generate effective learning (5,28). Understanding how each student addresses the teaching-learning process allows for designing adjustable processes and specific methods oriented towards increasing student learning and the effectiveness of teachers' efforts (8,12).

In the current literature, there are numerous studies that identify learning styles; however, there are no publications relating to learning styles in dentistry students in Latin America. Therefore, the aim of the present study was to identify the variation of learning styles in students from the first to fifth year of the Dentistry program of Universidad San Sebastián, in Santiago, Chile.

MATERIALS AND METHODS

This investigation was a descriptive and cross-sectional study. Learning styles were assessed using the Honey-Alonso Learning Styles Questionnaire (Cuestionario Honey-Alonso de Estilos de Aprendizaje (CHAEA)). It corresponds to an adaptation of the Learning Style Questionnaire (LSQ), validated in Spanish.[8] This questionnaire allows us to identify the learning styles that predominate in each individual and classifies them in four categories: Active, Reflective, Theoretical and Pragmatic learning.

We obtained approval for this study from the Biomedical Research Ethics Committee (*Comité de* ética *de investigación biomédica)* of the Universidad San Sebastián.

The sample was selected for convenience and at random and it was constituted by 490 students from the 1st to 5th year of the Chilean university in 2010 (n = 490), which is equivalent to 90% of the students in that year. Of these, 61% were women and 39% were men. The gender distribution per year was: 20% corresponded to first year students, 25% to second year, 26% to third year, 15% to fourth year and 14% to fifth year. To ensure the maximum audience, the day of application was matched with an activity of mandatory attendance.

Characteristics of the questionnaire and its scale: This questionnaire consisted of 80 items (questions) of dichotomous response, 20 of each learning style randomly distributed, so that the maximum score that could be obtained was 20 points for each type. The absolute score that each subject obtained in each group was 20, and the results indicated the level reached in each of the four styles. The classification of preferences was done according to the score obtained in each style. We used the abbreviated general table of learning style preferences developed by Alonso et al. (8). This scale facilitated the significance of each score and allowed us to know who was in, above and below the average. This way, we obtained accurate data for the students' learning profiles and their preferences in each style.

Statistical analysis

The average scores observed in each learning style was subjected to regression studies in order to determine the type of line that defines the values of each style examined. In addition to the curve type, we estimated the standard deviation ($S_{y.x}$) of each average regarding the adjusted regression curve with its corresponding confidence interval and the unadjusted and adjusted coefficient of determination (R2). The adjustment of the curve was performed by an analysis of variance (ANOVA). The level of significance used in all cases was $\alpha \leq 0.05$. (α by definition is an Type I Error Type)

RESULTS

Once the questionnaires were applied to the students, the predominant learning styles were determined by academic year. In the first year 45% presented a reflective learning style, 21% an active learning, 19% a theoretical and 15% a pragmatic styla. In second year, the predominant learning styles were: 45% reflective, 20% active, 18% theoretical and 17% pragmatic. The predominant learning styles in the third year were: reflective 47%, active 16%, theoretical 21% and pragmatic 16%. In the fourth year, the predominant learning styles were: reflective 41%, active 7%, theoretical 33% and pragmatic 19%. The predominant styles in the fifth year were: reflexive 56%, active 6%, theoretical 21% and pragmatic 17%.

In Table 1, the results of the adjusted curve estimation (Figures 1, 2 3 and 4) of the four learning styles studied are presented with the corresponding standard deviation of the values of y in x. The F values of the variance analysis were not significant (p> 0.05); therefore, the curves have a good fit to the model observed in each of them. In addition, the results of R^2 are presented. It is observed that the styles of active, reflective and pragmatic learning are characterized by cubic curves, with minus signs in some of their coefficients, which reflects that there are moments (academic years) of decrease in the scores of these styles, and that in the fifth year, there is an increase in the respective scores (Figures 1, 2 and 4, respectively). However, the theoretical learning style shows a steady increase in each academic year. In general, the adjusted R^2 values are high in all styles studied, that is, academic years “explain” the performance of observed scores relatively well, except for the pragmatic style, in which the adjusted R^2 value is consistently high (91.6%).

Table 1. Results of the estimation of the curve type in the different learning styles in the courses studied.

Types of styles	Observed curves	S	R 2 (adjusted)
Active*	Y=-54.80+125.3X-53.2X2+6.5X3	10.27	65.8%
Reflective*	Y=-110.0+246.9X-100.8X2+12.25X3	22.11	67.2%
Theoretical**	Y=8.10+9.3X	12.04	55.4%
Pragmatic*	Y=37.80+84.10X-33.82X2+4.083X3	3.70	91.6%

*Cubic curve
**Lineal curve
X=Academic year
Y= Resulting score of learning style in each academic year examined resulting from the estimated curve.

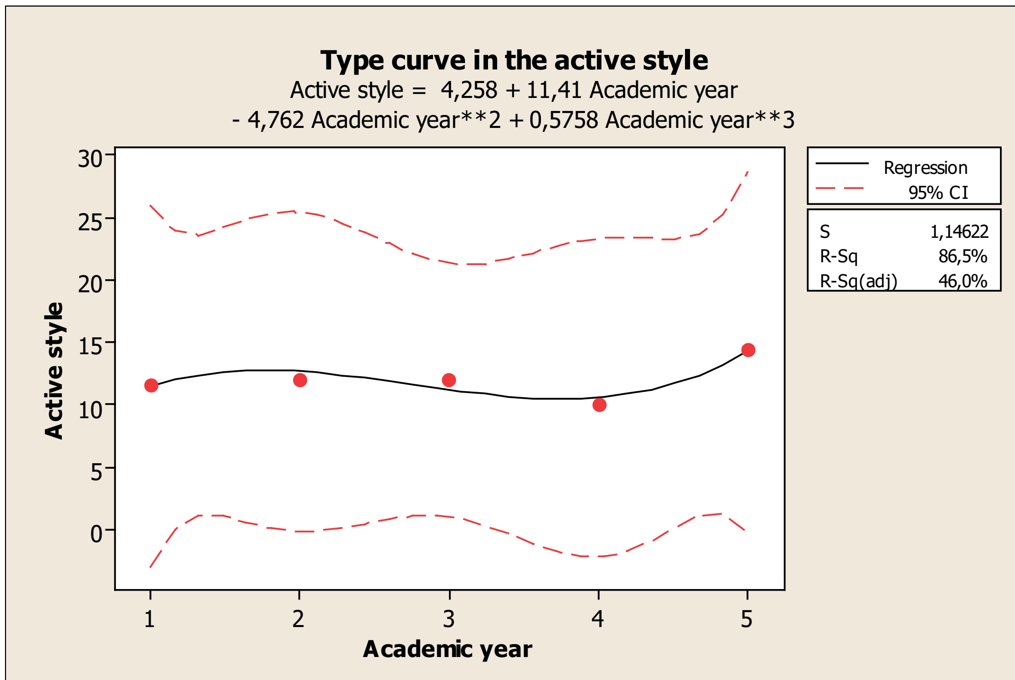

Figure 1.

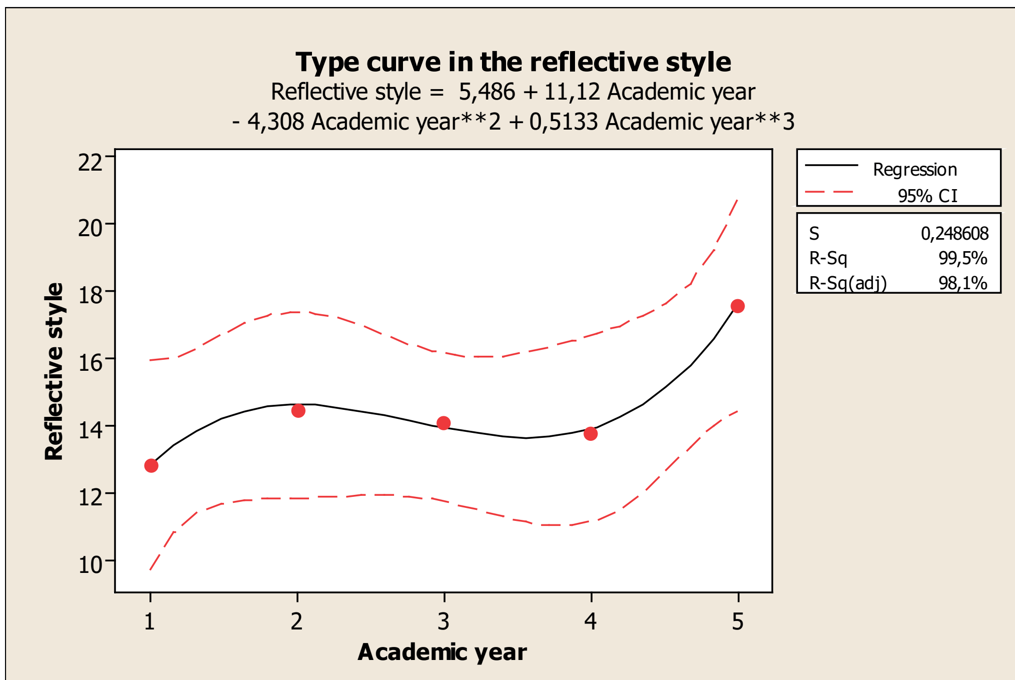

Figure 2.

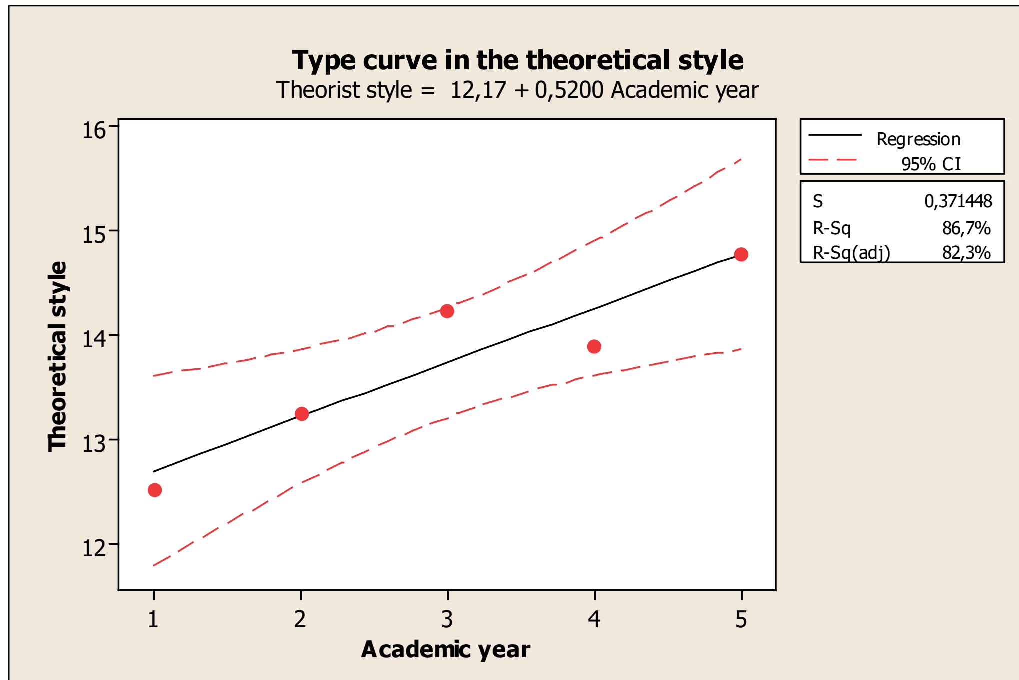

Figure 3.

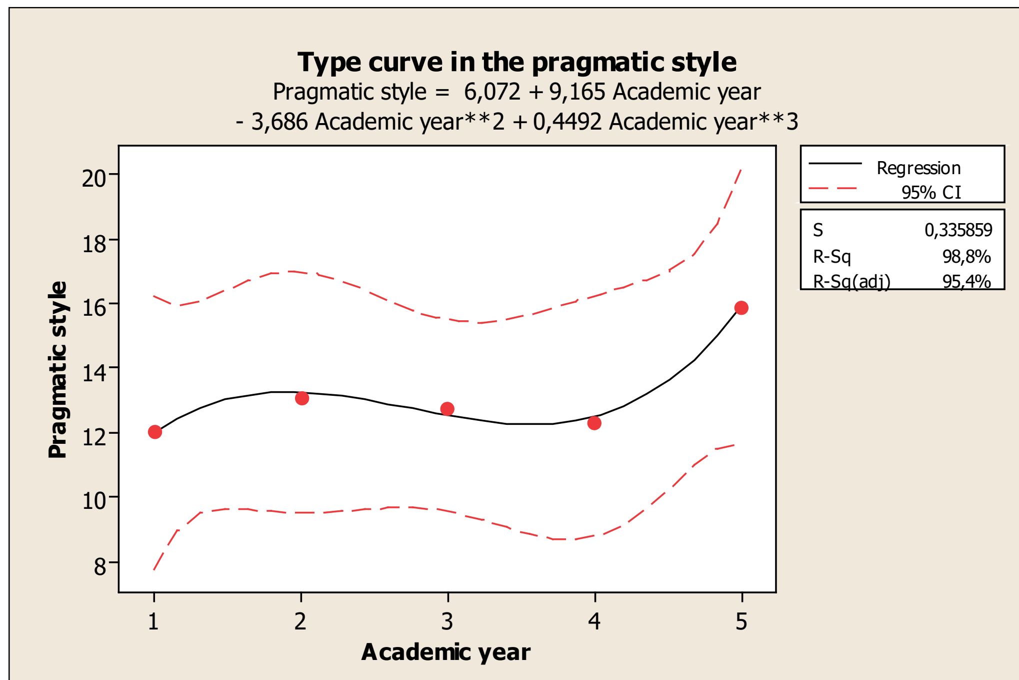

Figure 4.

DISCUSSION

Globalization has generated the need for changes in higher education, since the traditional ways of training professionals are no longer sufficient in meeting international standards. Professionals who graduated under the traditional model are finding it difficult to adapt to a changing field with increased demands of versatility, skills and attitudes.

The classic training of the dentistry professional included the traditional curriculum of a teacher-centered model. This model was derived from the Flexner report, known as the traditional model, and is characterized by an instructional design of content and fragmentation in training that takes place in closed areas from the discipline without any relation between the subjects. Its paradigm is behavioral, centered on the professor and the results. It is limited to what is established in the programs, promotes rote learning and does not consider the needs and the central role of the student in the teaching-learning process. Its structure is based around a plan from the fifth to sixth years statically organized in two well-defined cycles. The first cycle incorporates the basic biomedical content in the initial stage of vocational training, as a requirement for the second cycle, which consists of dental and clinical disciplines, organized by specialties and oriented to the disease. This structure makes the integration between clinical and basic disciplines very difficult. The subjects are semi-annual or annual and, in general terms, compulsory in the completion of the program.

Dentistry is one of the professions that has entered into the cultural and ideological competences; this can be extremely beneficial to dentists, since it can become a crucial element to take advantage of its management. However, it's not enough to think and say that dentists have the relevant competencies. With this new idea it's also necessary to come up with globalizing services that make it possible to promote a more versatile and effective dental care with greater equity, higher quality and with an approach that prioritizes prevention, thereby making the provided services available to a higher number of people. This new perspective of dentistry teaching has generated a hybrid model called Hybrid Curriculum, which uses a combination of different teaching-learning methods in regards to individual characteristics and the sociocultural context of the institution, in addition to addressing student needs throughout the program.

It combines a variety of educational strategies including master classes, learning based on problem-solving and in small groups, case studies, and early introduction to actual and simulated clinical experiences within the educational institution or community services. This approach, therefore, intends to achieve higher quality by including the most important aspects of each method and making them work appropriately. This is crucial in situations when there are no motivated or sufficiently trained professors in relation to the new methods, when there is a lack of appropriate institutional resources, or when there is a lack of access to technology, particularly in countries with large numbers of people living in poverty, professors that are poorly remunerated and governments constantly reducing their contributions to the educational system. Models with traditional methods make it possible to disseminate a larger amount of information to a higher number of students with a reduced availability of means and resources.

The adequacy of applied learning-teaching methods and the duration of these in relation to the proposed objectives make it possible to evaluate the educational process quality. There must be a variety of teaching methods that cover all learning styles lined up with the particular characteristics of competences and the graduation profile targeted (1,2,34,5).

Learning is a process that begins with experience, characteristic of the active learning. Thus, students' development of this style constitutes an important aspect in the beginning of the learning phases and, therefore, to begin the cycle and achieve the final learning result (8). Results obtained in this study (Figure 1) show that the active style is consistently presented from the first to fourth year and increases from the fourth to fifth year, thus favoring the beginning of the learning phase.

There are two aspects that draw attention. Namely, there was a small increase in the third year and a small decrease in the fourth year in active learning style preference. The increase may be related to the transition undergone by the student from theory to practice and the adoption of the dentist role in simulations carried out in pairs. On the other hand, the decrease could be related to the transition from simulated to actual actions performed on patients in a real clinical context causing great uncertainty and stress (29) which seems to hinder reflective capacities, analysis and decisive attitudes required in dental students (28,30,31). For this reason, we infer that active style increase in fifth year is the result of the student developing these abilities and improving his or her manual skills (32).

Reflective style preference (Figure 2) throughout the program showed a decrease in the second year value and an interesting increase in the fifth year which can be explained by the beginning of the program's courses, Integrated Clinic of Adults (Clínica Integrada del Adulto) and Integrated Clinic of Children (Clínica Integrada del Niño) and, as a consequence, patient care. In this stage, the students begin demonstrating hard and soft skills acquired throughout the program, which involve a complex integration process of courses previously taught separately. Students need to go through detailed analysis processes of the compiled data before making decisions and, although it's often under low pressure situations, immediate resolutions are required, which may explain the decrease in this learning style. This aspect makes reflective style development difficult, since, due to its characteristics of passivity, caution and observation, reflective students perform poorly under pressure and feel uncomfortable having responsibility for making decisions, which hinders their development in the clinic (6,8,15) and especially in urgent care. The professor's role should be to promote skill acquisition in order to make students adapt to practicing integrated dentistry by utilizing both theoretical knowledge and practical skills, which should favor reflective style development.[8,15] so it would not obstruct the students' performance in the clinical area.

As the academic year goes by, theoretical style is the only one that shows a steady increase over time with a little fluctuation between the third and fourth year (Figure 3). Due to this style characteristics of dealing with problems directly, progressively and following logical stages, and for being methodical, objective, critical and structured (6,8,33,34); this style helps the students perform clinical and dental processes that incorporate a number of protocols that must be thoroughly applied. However, the theoretical style does not favor students'

development in situations requiring improvisation and creativity, such as in situations of patient care that begin in the fourth year. The increase from the first to third year suggests that method and strategies used by teachers, principally in master classes, promote the teacher-centered model which generates few instances to apply a student-centered learning aspect, which integrates knowledge and a reflective attitude regarding an actual clinical case (32,35). This teaching style prepares them to enter the clinic, which in turn explains the theoretical style decrease in the fourth year. The fifth year increase could be related to the students already understanding the method and having experience with real patients.

The pragmatic learning style shows similar characteristics to the active and reflective ones, having the lowest and highest values in the fourth and fifth year, respectively (Figure 4). For pragmatic students, it is easy to act quickly and face unexpected situations; these students enjoy trying new ideas and techniques and searching for their practical applications (9,35). The lowest pragmatic value being found in the fourth year can be explained due to it being the first year in which the students face actual patient care. Patient care presents a new experience in which they have to apply what have learned, still not being entirely familiar with the dentist role they have to play, making decisions and solving problems by themselves. In these situations, professors only act as a guide, providing supervision and making corrections to the students' decision. On the other hand, the highest value of pragmatic preference being found in the fifth year must be related to the year of experience students already have gained; changing from theory to practice is a situation previously tested in the fourth year. Taking advantage of the characteristics of this style to boost students' learning, theory must be put into practice before the fourth year, forcing students to face situations in which they must relate theory and practice by understanding concepts and applying them in real life (6,8,15).

By analyzing all learning styles, it can be observed that each became more developed in fifth year students, which can be explained by personal development in their learning process throughout the program, and the methodological characteristics inherent to dentist training. Additionally, all learning styles scores decreased in fourth year, which can be explained by the change represented by actual patient care and the stress this induces (29). Patient care is a new experience that many times requires immediate resolutions and demands a high level of relation between theory and practice, oftentimes causing a turning point (15).

The primary method used by professors in courses from the first to the fifth year prior to 2010 was mostly utilizing master classes following a teaching-learning method centered on the teacher. This method is comfortable and familiar for the students, as it is the continuation of the model used in elementary and secondary schools. The aforementioned method predisposes a passive attitude that does not favor innovative, active and divergent thinking (Technical Advisory Committee for the National Dialogue on the Modernization of Chilean Education, 1995). The course in the school program called Basic Clinical Integration Cycle (Ciclo de Integración Básico Clínico) imparted from first to third year constitutes an exception: here, the students become protagonists and take charge of their knowledge; they have to look for the infor-

mation and discuss it with their partners in order to present it in class.

The professors teaching this course often face a difficulty in students' development and implementation of this strategy, however, because the students are not yet prepared for self-sufficient work or familiarized with problem based learning (36,37).

It is in this stage that students tend to first acknowledge their own learning style, which initially is also identified by their teacher; however, their lack of training makes it difficult to teach students about facilitating strategies of the learning process and does not enable them to improve their academic performance through effective and long-term learning achievement (3,34,35,39,40).

According to Salas (11), people generally orally accept the existence of diversity; however, in reality we ignore it systematically. Similarly, Alonso et al. (8) state that professors have maintained a fictitious individualization without a serious application to most educational systems. That can be clearly observed in different educational policies in which methods and teaching approaches are applied to everyone, with no variations, expecting every single listener to understand, value and interpret the message in the same way. Due to this, the study of learning styles becomes particularly important, since its central idea is to address diversity (11) and consider the cultural influence in learning achievement (5).

It is evident that from fourth year on, the curriculum implements the teaching-learning process and requires students to become more active and committed to their own learning. Although there are not many similar studies on dental students, Bitrán et al. (42) state in their research on Medicine students that this stimulation is produced in response to preparation for future professional challenges, which is also consistent with that reported by Engels & De Gara (43), Stratman et al. (44) and Meyari, et al. (45) In contrast, the research applied to dental students in Saudi Arabia by ALQahtani & Al-Gahtani (46) indicates that the assimilative learning style, which is equivalent to the Theoretical-Reflective style, prevails before clinical courses and tends to be divergent, or Active-Reflective, in the following years.

In contrast, Acuña et al. (7) concluded that in health science programs there is a strong preference for the reflective style, which in turn increases in advanced courses, just like what was reported by Canalejas et al. (20).

These results give us the basis to support our hypothesis. Traditional methods are still being utilized that do not enable changes expected in students in a student-centered model. Future studies should reassess learning style development after institutions develop new curriculum designs based on competences and expected performance, where it is likely that the students will show a steady developmental increase in all four learning styles in order to favor, according to Kolb et al. (47), a more effective learning. Bitrán et al. (42) considered this aspect as well; they also suggested that a syllabus can influence students' learning patterns and preferences, relying on the longitudinal study performed by Van der Veken et al. (48). Their study showed that the introduction to an integrated medical curriculum is associated with an increase in self-regulation strategies and vocational orientation of students of medicine, which can be applied to dentistry

students due to their similar curriculum with theoretical, preclinical and clinical courses.

CONCLUSION

The variation of active, reflective and pragmatic learning styles shows a fluctuating development throughout the professional education programs, unlike the theoretical style, which shows a steady upward development. However, all learning style scores increase by the end of the fifth year. Regardless of the learning strategies used, they influence the variation of the learning styles observed. Professors and students can use compatible styles, but often may not be appropriate for contents required for a practical clinical scenario of dentistry (49,50,51). The active, reflective and pragmatic styles must be strengthened in preparation for entering the clinical setting, since these styles provide better tools in dental students' career competences (32). The steady and marked increase of the theoretical style is related to the teaching-learning style reigning during the first five years of the program, which demonstrates the urgent need for a change from the teacher-centered learning model to a student-centered one. This model makes it possible to develop learning styles required for each student stage considering their learning style diversity, thereby favoring the acquisition of effective learning and, in turn, favoring the acquisition of competences required for the professional. These tools enable students to practice an integrated dentistry using both theoretical and practical approaches. Within the problem-solving framework, students must be capable of working together with other professionals from the dental or other heath science fields, utilizing good communication skills and maintaining an open-minded and positive attitude towards new knowledge and technological advances.

Finally, since students were analyzed during a set period of time, it is necessary to conduct research in this area continuously in order to observe students' evolution throughout the program and apply it to other campuses in order to evaluate whether teaching methods being used are effective or not.

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Impact of two therapeutic interventions in patients with non-specific low back pain

Impacto de dos intervenciones terapéuticas en pacientes con dolor lumbar inespecífico

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Abstract

Objective: *To evaluate the impact of two therapeutic interventions in patients with non-specific low back pain.*
Materials and methods: *Prospective study, in which in 20 subjects from both genders assigned through consecutive sampling of the two interventions: Group 1: 10 sessions of conventional physiotherapy treatment (CPT) (Ultrasound, TENS: Transcutaneous Electrical Nervous Stimulation y HWC: Hot Wet Compresses) and Group 2: 10 sessions of Motor Control Exercises (MCE). A numerical Pain Scale (NPS) was applied before and after each intervention.*
Results: *In the first group, it was found a 20% decrease the pain scores after 10 sessions compared with the baseline measurements (before the intervention) (p=0.03). Similarly, in the second group, pain score dimished 42% respect to baseline values at the end of the 10 therapeutic sessions (p = 0.03). When comparing the two interventions, the MCE were more effective than the CPT, even from the first treatment session (p <0.05).*
Discussion: *a significant reduction of pain was found in both groups, although this reduction was significantly in the group treated with MCE.*

Keywords: Physical Therapy Specialty, Low Back Pain, Exercise Movement Techniques, Exercise Therapy.

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Resumen

Objetivo: *Evaluar el impacto de dos intervenciones terapéuticas en pacientes con dolor lumbar inespecífico.*

Materiales y métodos: *Estudio prospectivo, en 20 sujetos de ambos sexos asignados a través de muestreo consecutivo a una de las dos intervenciones: Grupo 1: 10 sesiones de tratamiento de fisioterapia convencional (TFC) (Ultrasonido TENS: eléctrica transcutánea nerviosa Estimulación y CHC: Compresa húmedo-calientes) y Grupo 2: 10 sesiones de ejercicios de control motor (ECM). Se aplicó la Escala numérica del dolor (NPS) antes y después de cada intervención.*

Resultados: *en el primer grupo, se encontró una disminución del 20% de las puntuaciones de dolor después de 10 sesiones en comparación con las mediciones de referencia (antes de la intervención) (p = 0,03). De forma similar, en el segundo grupo, la puntuación del dolor disminuyó un 42% con respecto a los valores basales al final de las 10 sesiones terapéuticas (p = 0,03). Al comparar las dos intervenciones, los ECM fueron más efectivos que el TFC, incluso desde la primera sesión de tratamiento (p <0.05).*

Discusión: *se encontró una reducción significativa del dolor en ambos grupos, aunque esta reducción fue significativamente en el grupo tratado con ECM.*

Palabras clave: Fisioterapia, Dolor lumbar, Técnicas de Ejercicio con Movimientos, Ejercicio terapéutico.

INTRODUCTION

Low back pain (LBP) is the most common musculoskeletal condition that affects the adult population, with a prevalence of up to 84% (1). It is one of the most common conditions that motivate individuals to seek medical attention. Low back pain is associated with loss of work productivity, poor quality of life and high medical expenses, and it is a substantial economic burden for society. (2-4). Low back pain is one of the main causes of work absence causing a considerable cost in societies (5), being the main cause of disability and loss of work in industrialized countries (6). According to the Global Burden of Disease Study, lower back pain ranks first among the leading causes of disability worldwide (7). Lumbar pain is defined as pain between the 12th rib and the lower gluteal fold with or without pain radiating to the leg. Chronic low back pain is usually defined by symptoms that persist for a period of more than 3 months (12 weeks). However, there is no precise definition of this pain in the literature (8).

Current evidence does not provide guidance in selecting an appropriate treatment approach or when specific treatments are warranted. There is no clarity about the best treatments, while many treatments are expensive and of unclear efficacy (9). The poor control of the pattern of activation of the deep muscles and an alteration of the trunk musculature, stability and control of altered vertebral column have been proposed as factors that contribute to the appearance of low back pain and its persistence (10-12). Therefore, treatment protocols that address the control and coordination of the lumbar muscles are believed to be effective in the treatment of Non-specific Lumbar Pain (NLBP) (13).

However, it is important to consider that the pain is produced by the brain after a person's neural signature has been activated

and it concluded that the body is in danger and that action is required (40, 41), that is why that new clinical trials for the treatment of low back pain emphasize non-pharmacological approaches and indicates that drug treatments should be used only when other methods are unsuccessful. The American Medical School recommends treatments that include superficial heat, massage, acupuncture and manual manipulation (14). On the other hand, the prescription of bed rest, which in some cases may be excessive, has been also recommended, the use of therapies with non-ionizing physical modalities (thermal, electromagnetic and mechanical) (15), until surgical interventions, using techniques of advanced image, which as a whole produce high costs for health systems (16), even the direct and indirect costs derived from this musculoskeletal disease exceed those of highly prevalent diseases such as coronary heart disease (17).

For this reason, the objective of this work was to evaluate the impact of two therapeutic interventions in adults with nonspecific lumbar pain.

MATERIALS AND METHODS

A prospective intervention study was carried out before and after the test. Twenty subjects of both genders who presented the medical diagnosis of non-specific lumbar pain were taken by consecutive sampling, } by the specialist in orthopedic and traumatology deriving from a Pain and Spine Center of Cartagena, in the period between June and December of 2016.

Minors, pregnant women and those people with difficulties in understanding the language were excluded, people that had previously performed the therapy.

The written informed consent of each participant was obtained and the research committee approved all the study procedures, in accordance with the Declaration of Helsinki and current Colombian legal regulations. (Resolution 008430 of 1993 of the Ministry of Health).

The participants were randomly assigned to one of the two interventions of the study: Group 1:10 sessions of conventional physiotherapy treatment (CPT) and Group 2: 10 sessions of Motor Control Exercises (MCE). The Numeric Pain Scale (NPS) was applied before and after each intervention.

Through the Shapiro Wilk test, the hypothesis of normal distribution of the data was rejected. An analysis of Mann Whitney U test and rank test with Wilcoxon sign, served to estimate the differences between and intra groups, respectively. The data was tabulated and analyzed in the SPSS V.23 software for Windows.

Clinical and pain assessment

The following data was obtained from each patient: family and personal history; basic anthropometric measurement (weight and height) using standardized technique. The numerical scale of pain (NSP) was introduced by Downie in 1978 (18) and it is one of the most used scales. The patient must assign to his pain a numeric value between two extreme points (0 = Absence of Pain, 10 = Pain of Maximum Intensity). For the application of the scale, patients needed to be able to verbally list the number that defined their level of back pain (19, 20).

Interventions

1.- Conventional physiotherapy treatment (CPT)

Ultrasound (US) Continuous (Ultramax -CEC ®) of 1 MHz - 2 W / cm2 was applied for 15 minutes. After this, Transcutaneous Electrical Nerve Stimulation (TENS), Interferential (Combi 8 Max-Electro Stimulator -CEC ®) 4.000 Hz - 250 µs, for 20 minutes; then, finish with 15 minutes of Wet / Hot Compresses (HWC) (Chattanooga Hydrocollator- HotPac ®) at 60 degrees Celsius.

It is considered that ultrasound (US) can increase local metabolism and blood circulation, improve connective tissue flexibility, and accelerate tissue regeneration, which could reduce pain and stiffness in NLP, while improving mobility (21.22).

The first evidence-based guidelines for the treatment of low back pain did not recommend the use of US in the NLP. However, ultrasound is commonly used in routine clinical practice for musculoskeletal problems, such as back pain (23). Approximately 50% of physiotherapists in the United Kingdom, 65% of physiotherapists in the United States, and 94% of Canadian physiotherapists use the US in their daily practice. In the United States, 55% of primary care physicians recommend US as a form of treatment (24).

Table 1. Application parameters of physical modalities

Modality	Duration	Dosage		Objective
Ultrasound (US) Continuous (Ultramax -CEC ®)	15 min	1 Mhz	2 W/ cm2	Ability to penetrate the deeper layers of tissues and produce vascular changes.
Transcutaneous Electrical Nerve Stimulation (TENS) Interferential (Combi 8 Max-electroestimulador -CEC ®).	20 min	4.000 Hz	250 µs	Ability to penetrate the deeper layers of tissues reducing skin resistance, decreasing pain.
Wet / Warm Compresses (HWC) (Chattanooga Hydrocollator- HotPac ®)	15 min	60°C		Ability to penetrate the superficial and deep layers of tissues and produce vascular changes.

CEC ® Of. Central Córdoba - Argentina: Tel +54-03543- 440011/ 422492/ 422719/ 420986- Of. Buenos Aires-Argentina.

Transcutaneous Electrical Nerve Stimulation (TENS) is a non-invasive therapeutic modality that was implemented more than 30 years ago, together with existing physical agents used in medicine and physiotherapy for the treatment of low back pain. The TENS units stimulate the peripheral nerves by electrodes placed on the surface of the skin; they have well-tolerated intensities and can be self-administered (25-27). For the management of NLP, the CTP, consisted in the use of physical non-ionizing modalities, such as: US and TENS, Wet / Warm compresses (HWC), with the parameters described in table 1, recommended by the medical literature and in rehabilitation (28).

2.- Motor Control Exercises (MCE)

A protocol of motor control exercises was carried out taking into consideration the guide-

lines and fundamentals described by Carolyn Richardson, Paul Hodges, Julie Hides (29, 30) for the activation of the lumbar stabilizing muscles. These exercises were prescribed in a progressive manner and named as follows: Spinal Swing, Abdominal Sink, Palms Down, Elbows Down. Palms down Leg extended, Disturbances.

The etiology of NLBP is complex, and the causes are not clearly known. Research indicates that weakness and loss of motor control of the deep muscles of the trunk, such as deep lumbar (DL) and transverse abdomen (TrA) multiplicity is common in subjects with NLBP (29). Hodges et al., (30) and Ferreira et al., (31) demonstrated that individuals with NLBP are more likely to have a delay in recruitment and insufficient control of TrA.

Table 2. Periodization of the Motor Control Exercises (MCE)

Ejercicio	Dosage	Description	Progression
Spinal Oscillation	5 minutes	Quadruped position and makes repetitive movements towards anterior / posterior avoiding flexion and maximum extension.	Session 1 to 10
Abdominal Sinking	10 seconds/ 10 repetitions/ 3 series.	Supine cubitus, knees in 45 °, sink the abdomen and maintain.	Session 1 to 5
Palms Down	10 seconds/10 repetitions/ 3 series.	Supine cubitus, knees in 45 °, sink the abdomen and maintain with the palms doing inferior pressure.	Session 1 to 10
Elbows Down	10 seconds/10 repetitions/ 3 series.	Supine cubit, knees in 45 °, with its elbows in 90 ° will make inferior pressure.	Session 3 to 10
Palms down Leg outstretched	10 seconds/10 repetitions/ 3 series.	Supine cubit, knee in 45 ° attached to his contralateral and the other fully extended. With the palms he will perform a lower pressure.	Session 3 to 10
Disturbance	10 seconds, 10 repetitions, 3 series	External forces will be applied to the therapist's arm, causing small imbalances. (Palms down-Elbows down).	Session 5 to 10

The MCE performed in patients pretends to maintain postural control in their activities of daily living. At the beginning the exercises are directed to the isometric postural stabilization in a determined area, to progress towards the control of postures, movements of the trunk and extremities in daily activities (32), as described in Table 2 and shown in Fig. 1, 2 and 3.

Figure 1. Motor Control Excersises. Spinal oscillation

Figure 2. Motor Control Excersises. Palms down leg outstretched

Figure 3. Motor Control Excersises. Disturbance

RESULTS

The average age of the participants was 41.8 ± 12.8. In general terms, there were not between-group differences regarding baseline anthropometric variables and the pain scores (Table 3).

Yet, in the first group (n = 10; 7 women and 3 men), a decrease in pain was found after 10 sessions of treatment (20% decrease, compared with the baseline, p = 0.03) (Table 4).

Table 3. Anthropometric and pain results. Baseline. (n = 20)

Variable	Group 1 n=10	Group 2 n=10	Value P
Age	41,8±12,8	38,8±12,8	0.63
Weight	67,8±11,0	66,6±9,1	0.85
Size	1,65±0,07	1,65±0,04	0.73
BMI	24,8±2,9	24,3±3,5	0.57
NSP	8,0±0,81	7,1±1,3	0.16

BMI: Body Mass Index; NSP: Numerical Scale of Pain.
Data presented in Average ± DE. Differences evaluated by analysis of variance.

A similar change was found in the second group (n = 10, 4 women and 6 men), the participants presented significant changes in pain (42% decrease), at the end of the 10 sessions of treatment, compared to the baseline, p = 0.003 (Table 4).

When comparing the two interventions, conventional physiotherapy treatment (CPT) manages to significantly reduce pain according to NPS. However, the Motor Control Exercises (MCE) were more effective, even from the first treatment session, p <0.05 (Table 5).

Table 4. Differences in NPS in the study groups. (n = 20)

Group	Baseline	10 Session	Z	Value p
1	8.0±0.8	6.4±0.9	-2.97	0.03
2	7.1±1.3	4.1±2,1	-2.82	0.00

Data presented in Average ± DE. Differences evaluated with Test of the ranges with Sign of Wilcoxon.

Table 5. Differences between groups in the NPS according to treatment sessions. (n = 20)

Variable	Group 1 (n=10)	Group 2 (n=10)	P. U Mann-Whitney	Value p
10 Session	6.4±0.9	4.1±2.1	18.5	0.01

Data presented in Average ± DE. Differences evaluated by analysis of Mann-Whitney

DISCUSSION

The study executed by Cairns et al., 2006 (33) showed that specific spinal stabilization does not provide additional benefits in terms of physical function, pain, psychological distress and quality of life compared to the conventional physiotherapy group in patients with recurrent LBP and in patients with LBP. Although both groups had clinically significant improvements in function and pain reduction, there were no statistically significant differences between groups. Even so, in general there were a greater percentage of improvements in the group that received conventional physiotherapy than in the specific stabilization group with fewer treatment sessions and in a shorter period of time, even if it was not statistically significant.

In our case, the results of the NPS in the first group showed a significant improvement after 10 sessions of treatment (20% decreases). Our findings coincide with the reports of Durmus et al., in 2010 (34) and Ebadi et al., in 2012 (35), who found a significant reduction of low back pain in the groups that received treatment with electrotherapy and US more than in a program of supervised exercises, respectively. However, the efficacy of these therapeutic modalities in musculoskeletal conditions remains controversial (36). On the other hand, in the second group, treatment with MCE significantly reduced pain in the study population (42% decreases). Data that coincide, with the reports of experimental studies and well designed clinical trials, which have recently demonstrated the usefulness and effectiveness of treatment with MCE in subjects with low back pain (37,38),

achieving changes in the timing of activation and loss of co-contraction and feed-forward mechanisms (3).

In conclusion, it was found in this study that the greatest NLBP reduction occurred in the group of subjects treated with MCE. For its part, we believe it is important to point out that NLBP is not as closely associated with the spinal load and vertebral pathology as previously thought. Rather, chronic low back pain is associated with a complex combination of physical, psychological, lifestyle, cognitive factors, social factors and neuro-physiological factors (changes in the peripheral and central nervous system).

This study shows the same trend as in other studies on MCE in pain reduction, in which they have shown significant changes, so future studies with larger samples and other types of studies are recommended, in order to offer greater evidence about the effectiveness of physiotherapy in the NLBP.

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Aprender a vivir con el dolor crónico en la vejez

Learning to live with chronic pain in old age

Alejandra María Alvarado García[1], Ángela María Salazar Maya[2]

Resumen

Objetivo: *Comprender significados y proceso por el que transita el adulto mayor al vivir con dolor crónico benigno en el envejecimiento.*
Método*: Entrevistas en profundidad a 25 ancianos con dolor crónico benigno. Para el análisis de los datos se utilizó el enfoque de la teoría fundamentada, el muestreo teórico hasta alcanzar la saturación teórica.*
Hallazgos*: Emergieron cuatro categorías: 1) Sintiendo el cuerpo lastimado, 2) La comprensión de las limitaciones, 3) Sobrellevando el dolor, y 4) Vivir con el dolor. La categoría central: "Aprender a vivir con dolor: de la incomprensión a la adaptación". Asimismo, se identificó un proceso común: 1) Descubrimiento del dolor, 2) Experimentar una vida de dolor, 3) Adaptarse a una vida de los cambios, y 4) Reflexión sobre la experiencia. Los significados y etapas del proceso comprenden las estrategias de adaptación que utilizan los adultos mayores para enfrentar sus situaciones dolorosas.*
Conclusiones*: Este estudio propone una conceptualización creativa y significativa: "Aprender a vivir con dolor crónico en la vejez: de la incomprensión a la adaptación". La síntesis del proceso y los significados capturan específicamente la experiencia y aumentan la utilidad de la teoría en la práctica.*

Keywords: Dolor crónico, geriatría, teoría de enfermería, teoría fundamentada (Bireme DeCS).

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Abstract

Objective: *To understand meanings and process that the older adult travels through living with benign chronic pain in aging.*
Method: *In-depth interviews to 25 elderly patients with benign chronic pain, for the analysis of the data was used the grounded theory, with theoretical sampling until reaching theoretical saturation.*
Findings: *Four categories emerged: 1) Feeling the body hurt, 2) Understanding limitations, 3) Overcoming pain, and 4) Living with pain. The central category: "Learning to live with pain: from incomprehension to adaptation". Also, a common process was identified: 1) Discovery of pain, 2) Experiencing a life of pain, 3) Adapting to a life of change, and 4) Reflection on experience. The meanings and stages of the process comprise the coping strategies used by older adults to cope with their painful situations.*
Conclusions: *This study proposes a creative and meaningful conceptualization "Learning to live with chronic pain in old age: from incomprehension to adaptation". The synthesis of process and meanings specifically capture experience and increase the utility of theory in practice.*

Keywords: Chronic Pain; Geriatrics; Nursing Theory; Grounded Theory (Bireme DeCS).

INTRODUCCIÓN

El dolor crónico es común en los adultos mayores y resulta en una morbilidad sustancial. Una muestra reciente y representativa a nivel mundial de adultos mayores que viven en la comunidad encontró que el 67% reportó dolor de intensidad moderada o mayor durante las últimas 4 semanas (1). La prevalencia de dolor no varió significativamente entre los grupos de edad de las personas de 60 a 74 años, 75 a 84 y 85 y mayores. A nivel mundial se ha estimado que 1 de cada 5 adultos sufre de dolor y 1 de cada 10 adultos es diagnosticado con dolor crónico cada año (1).

Sin embargo, la prevalencia del dolor puede aumentar a medida que los adultos mayores se acercan al final de la vida. También los pacientes de mayor edad a menudo tienen dolor en múltiples sitios, agravando el sufrimiento relacionado con el dolor y la discapacidad (1).

El dolor más reportado es el asociado con las articulaciones y la neuralgia, que se producen con frecuencia entre las personas de edad avanzada. A pesar de que el dolor crónico es común, las investigaciones muestran que el 25 % de los individuos que experimentan dolor diario no reciben medicamentos analgésicos, ni tratamientos no farmacológicos. Entre estos pacientes, 21 % eran de 65 a 74 años, el 26 % entre los 75 a 84 años y el 30 % mayores de 84 años (2).

La presencia de dolor se asocia con una peor salud y las personas con dolor pueden experimentar mayor deterioro funcional, caídas, depresión, disminución del apetito, sueño deteriorado y aislamiento social en comparación con las personas que no sufren dolor (3). Además, el impacto multidimensional del dolor puede dejar a los adultos mayores más vulnerables y menos capaces de responder eficazmente a los estresores fisiológicos, contribuyendo, en última instancia, al desarrollo de la fragilidad. Aunque el dolor puede ser manejado adecuadamente en la mayoría de los pacientes ancianos, sigue siendo subtratado (4).

El fenómeno del dolor en el anciano representa una situación humana compleja y requiere del campo de la enfermería una mayor inversión en la investigación y la teoría. Hasta la fecha la literatura no describe o explica la experiencia de vida con dolor crónico en la vejez. Del mismo modo, el dolor puede no ser bien manejado; y no hay evidencia disponible que explore la experiencia del dolor en profundidad. Sin embargo, este estudio tiene como propósito comprender los significados y el proceso por el que transita el adulto mayor al vivir con dolor crónico benigno en el envejecimiento.

MATERIAL Y MÉTODOS

Estudio cualitativo que utilizó la teoría fundamentada, puesto que el fenómeno del dolor crónico en la vejez es un proceso social básico. Las personas comparten experiencias, percepciones, pensamientos y conductas comunes, que son la esencia del fenómeno (5).

Se utilizó las entrevistas en profundidad, la comparación constante y el muestreo teórico, en el análisis de los datos, para identificar códigos, categorías y, por último, la categoría central, utilizando un enfoque sistemático para la recopilación y análisis de datos y para la construcción de conceptos basados en las narrativas de las personas entrevistadas.

Los participantes fueron invitados a contribuir en el estudio por medio de la enfermera que labora en las casas de cuidado de día, se les proporcionó información del estudio y en una reunión posterior se les preguntó si desean ser voluntarios para el estudio.

Los criterios de inclusión fueron: ser mayor de 60 años, presentar dolor crónico con evolución no menor de 6 meses, sin problemas mentales diagnosticados que los limitaran a participar en la entrevista, que puedan firmar el consentimiento informado y ser capaz de expresarse. A continuación, los participantes fueron contactados para obtener el consentimiento informado y establecer la fecha y el lugar para la entrevista.

Los participantes fueron 25: 16 mujeres y 9 hombres; con una edad promedio de 68.52 años, edad mínima de 60 y máxima de 83 años. Su estado civil fue: 56% casados, 20 % solteros, 16 % en unión libre y 8 % viudos. En cuanto al tipo de dolor que refirieron: 36 % dolor articular, el 28 % dolor lumbar, 20 % dolor cervical y el 16 % dolor visceral. Las horas con dolor tiene un promedio de 12.64 horas/día. La intensidad promedio de dolor en la escala es de 7.2. Mínimo de 5 y máximo de 10.

Se realizó entrevistas en profundidad cara a cara por una investigadora, a partir de la pregunta orientadora: ¿Puede describir su experiencia de vivir con dolor crónico? La entrevista a cada participante se realizó en el hogar; en un ambiente de bienestar emocional, físico y afectivo, escuchando, sin juzgar el significado personal de sus propias experiencias. Se le asignaron inicialmente a las entrevistas códigos numéricos para proteger la privacidad de los participantes, y posteriormente un seudónimo para proteger su privacidad y mantener la subjetividad de los participantes. Cada entrevista tuvo una duración entre 30 a 40 minutos al terminarla se le comentó la necesidad de acordar una segunda para aclarar y validar los datos obtenidos. Cada una de ellas fue audiograbada y transcrita textualmente al ordenador por las investigadoras, quienes complementaron con sus notas de campo, las cuales ayudaron a mantener un registro

de los detalles importantes, útiles para el análisis de los datos.

También se realizaron memos basados en las reflexiones, teorías e ideas durante todo el proceso de recolección y análisis de los datos. Los memos ayudaron a construir nuevas ideas y preguntas, lo que permitió identificar los vacíos en la recopilación de datos, y aclarar las relaciones entre los códigos y categorías (6).

El análisis se realizó de forma manual, utilizando herramientas de la teoría fundamentada (7). La codificación se realizó línea por línea, y se elaboraron tablas para agrupar los códigos que originaron las subcategorías y categorías, que se organizaron a través de matrices para consolidar la información.

Las dos investigadoras realizaron los análisis con el fin de aumentar la credibilidad de la interpretación de los datos. Los datos fueron codificados en un proceso de tres etapas: codificación abierta, axial, selectiva, siempre direccionados por el muestreo teórico hasta alcanzar la saturación teórica (7). Posteriormente el proceso social fue identificado por un proceso inductivo, deductivo y validación del mismo. Los conceptos y categorías fueron emergiendo a medida que evolucionó el análisis hasta desarrollar la categoría central o proceso social básico «vivir con el dolor crónico: desde la adversidad a la adaptación.»

Las investigadoras presentaron los resultados a 10 participantes que fueron seleccionados al azar para validar los datos y la experiencia y la validación teórica se comprobó con cada persona que apoyaron el desarrollo de las categorías(8). Además, se realizó un ajuste adicional del esquema teórico después de terminar este proceso de validación.

Este estudio fue clasificado de bajo riesgo, según la Resolución 008430 de 1993 del Ministerio de Salud de Colombia (9), y fue aprobado por el Comité de Ética de la Facultad de Enfermería de la Universidad de Antioquia. Todos los participantes firmaron un consentimiento informado en el momento de la entrevista.

RESULTADOS

Se basaron en las experiencias de los participantes, emergieron cuatro categorías que muestran los significados de la experiencia de la vida con dolor crónico en personas de edad avanzada: Sintiendo el cuerpo lastimado, La comprensión de las limitaciones, Sobrellevando el dolor y Vivir con el dolor. Se identificó un proceso común, que consta de cuatro etapas que reflejan las diferentes fases que el adulto mayor experimenta con dolor crónico benigno: descubrir el dolor, experimentar una vida de dolor, adaptándose a los cambios de vida, reflexionar sobre la experiencia. La categoría central o el proceso social básico se denominó "vivir con el dolor crónico: desde la adversidad a la adaptación", y se convirtió en la categoría central que se fundamentó en los datos.

SIGNIFICADOS

Sintiendo el cuerpo lastimado. Esta categoría la componen las siguientes subcategorías: localizando el dolor, entendiendo el lenguaje del dolor, viviendo con incertidumbre y conociendo las causas. El cuerpo se ha convertido en un aspecto destacado de la vida diaria; se percibe como parte central de su existencia. En él se perciben las limitaciones, incapacidades y otros sentimientos que no pueden interpretarse al principio y es el lugar donde se localizan diferentes dolores: *El dolor en la*

cintura, que a veces me pega en las piernas, llega entre las piernas ... (Luisa).

Los adultos mayores con dolor crónico crean un lenguaje único para descubrir cómo el dolor se manifiesta dentro de sus cuerpos; este lenguaje incluye una serie de metáforas que se puede utilizar para expresar su dolor. *Siento que mis piernas son como algodón ... como si de pronto fueran extranjeras [las piernas]...* (Sofía).

Sus cuerpos están alertas a los factores que contribuyen al dolor e identifican las causas del mismo, por esta razón se vuelven temerosos de realizar actividades que implican un esfuerzo sustancial: *Subiendo y bajando escaleras me parece horrible para mí...* (Sofía). Además, el dolor se irradia a todos los órganos y músculos, lo que intensifica los síntomas y las sensaciones asociadas con un cuerpo lastimado. Cualquier acción ligera se convierte en una amenaza; tienen que ser conscientes del efecto de un esfuerzo y de abstenerse de ejercer un esfuerzo innecesario. El cuerpo se percibe como un instrumento que requiere un cuidado; cualquier riesgo o circunstancia puede causar maltrato del cuerpo que debería ser evitado, ya que cualquier maltrato menor puede activar inmediatamente el dolor.

Además, se vive en incertidumbre, pues unos sienten dolor constante en intensidad y duración, lo que se vuelve abrumador y difícil de manejar; en otros es un dolor cíclico… *el dolor sigue, eso es permanente…* (Clara). Pero también aprenden a conocer lo que lo desencadena y lo evitan, las cuales se convierten en actividades extraordinarias, ya que implican un gran esfuerzo y desencadenan el dolor. Por otro lado, son más conscientes de todos aquellos abusos que deben evitar en la cotidianidad en aras de no disparar el dolor. Dejar de realizar actividades a las que usualmente estaban acostumbrados genera en el adulto mayor sentimientos de frustración frente a su situación. *… ya de pronto con un ejercicio bastante, o un resbalón, o subirme ligero a un bus, o bajarme de un bus, de pronto siento un jalón y ahí me queda el dolor por un tiempo…* (Luis).

La mayoría de los participantes reconocen una fuerte asociación entre el inicio del dolor y su envejecimiento, argumentan que debido a la edad el cuerpo se vuelve vulnerable y, por ende, se van deteriorando sus órganos, lo que finalmente predispone a que el dolor se desencadene. *…Pues yo tengo la conciencia de que los años no vienen solos…* (Andrés).

La comprensión de las limitaciones. Esta categoría la componen las subcategorías: dejando todo por el dolor, incomprendido por la familia, experimentando las decepciones, experimentando el rechazo y emergiendo nuevos sentimientos. Las limitaciones generadas por el dolor impactan todas las dimensiones de la vida de un adulto mayor, incluyendo las dimensiones física, social y psicológica, entre otras: *Siento que este dolor me desactiva en gran medida*... (Sara). El dolor lo inhabilita para las actividades regulares que realizan, con tareas tan simples como tomar el autobús, barrer y subir escaleras, que se convierten en actividades extraordinarias y requieren movimientos pequeños para evitar el dolor. Nuevas sensaciones acerca de estos cambios en la vida diaria son distintos: *¡Estoy tan triste! por esto [el dolor]*... (Gilma). Ellos empiezan a reflexionar sobre los aspectos negativos de dolor y su efecto en sus vidas. El estrés, la ansiedad, la tristeza, la ira, el miedo, la impotencia y la falta de esperanza son causadas por las circunstancias diarias. La depresión que se siente cuando no pueden realizar las actividades diarias, la sensación de impotencia, la ira proviene de ser engañado, el aislamiento por las limitaciones que ellos

experimentan en su vida diaria, el miedo es un síntoma que se intensifica, y la pérdida de la esperanza es sentida por la falta de cura de sus enfermedades los hace considerar que esta experiencia es un obstáculo para la eliminación de las barreras producidas por su dolor. Además, se sienten rechazados: una negativa a su atención, una recriminación o sentirse ignorados cuando manifestaron su dolor, incluso la "crisis", a tal punto que se negaron a atenderlos, precipita la decisión de los participantes de no continuar utilizando los servicios médicos. *… los médicos a uno no le paran muchas bolas [atención]… a veces uno ni va a visitar al médico, porque uno piensa pues para mandarle lo mismo…* (Luisa)

Sobrellevando el dolor. Esta categoría la componen: entendiendo el dolor, interviniendo el dolor, valiéndome de todo para controlar el dolor, buscando distracción, emergiendo nuevos comportamientos y refugiándome en un ser superior. Los adultos mayores al entender que el dolor es parte de sus vidas, la aceptación y las estrategias de adaptación son para hacer frente al difícil proceso de manejarlo…*yo ya aprendí a manejar el dolor y a vivir con el poquito de dolor…* (Luisa). Su objetivo es intervenirlo, para el cual se desarrollan una serie de estrategias creativas con base a prueba y error y compartiendo experiencias con otras personas que experimentan situaciones similares, con el espíritu de la búsqueda de una nueva vía para aliviar su dolor, entre las intervenciones se encuentra: tomar medicamentos, auto-recetarse, uso de agua caliente, quedarse quietos, tomar posturas correctas, caminar y realizar ejercicio, usar los diferentes aditamentos, hacer uso de los remedios caseros entre otros. *…yo siento como paciente que fue la parafina que me quitó el dolor…* (Pilar). Así se busca la adaptación, con una serie de comportamientos de lo que deben hacer para ayudar a que acepte su experiencia. Buscan estrategias, como la distracción, pues…*se dilatan los dolores cuando uno está distraído… y se refugian en un ser superior como camino para aliviar su dolor…a mí me encanta la parte espiritual porque veo que es una parte que lo alivia mucho, lo sostiene, siente uno que todo lo puede…* (Felipe).

Vivir con el dolor. Esta categoría la componen los dividendos del dolor, la percepción del apoyo familiar y la fortaleza en el dolor. Los adultos mayores reconocen que la opción más sensata que tienen es aceptar que el dolor es permanente y las limitaciones serán constantes, aprenden a aceptar su realidad: vivir con el dolor, y transformar sus vidas en una oportunidad para aprender a cuidar de sí mismos y apreciar el valor de sus vidas. Ellos entienden cómo la familia se ha convertido en una fuente de apoyo para sus experiencias: *Hubo un momento en que mi hija me tenía por un brazo, mi marido por otro, y los tres llorábamos porque yo lloraba por el dolor...* (Jorge). Ellos entienden que son los únicos responsables de su estado de salud, para lo cual necesitan cuidarse de todos aquellos factores que pueden predisponer el dolor. Solo alcanzando cambios en sus hábitos cotidianos experimentarán una disminución de su dolor, y así mismo, lograron sentirse más tranquilos. *Aprendí muy tarde como a cuidarme, a valorarme de todo lo que me desencadena el dolor, me demoré, pero aprendí… yo he aprendido a cuidarme un poquito porque digo, el dolor no lo aguanto si no yo...* (Luisa). Tienen fe en sus decisiones y nuevas opciones de tratamiento. Es importante resaltar que los adultos mayores en ocasiones llegan a entender el dolor como un proceso normal del ser humano, el cual se debe recibir con humildad, paciencia y valentía, porque este provee el camino para buscar la felicidad.

… el señor todo lo que nos pone es para nuestro bien…entender que el dolor es parte de la vida y entonces no lo podemos quitar… (María).

Los significados previamente discutidos permitieron la identificación de un proceso común que osciló entre el reconocimiento de las limitaciones por el dolor generado, el desarrollo de las estrategias necesarias para hacer frente a la experiencia con el dolor.

El proceso. Consta de cuatro etapas que reflejan las diferentes fases de un adulto mayor en su experiencia con el dolor crónico benigno: 1) El descubrimiento de dolor, 2) Experimentar una vida de dolor, 3) la adaptación a una vida de los cambios, y 4) al reflexionar sobre la experiencia.

El descubrimiento de dolor. La experiencia de vivir con un dolor crónico benigno provoca que el adulto mayor se sienta sorprendido por la presencia espontánea de una serie de sensaciones molestas en su cuerpo. La necesidad de conocer el diagnóstico hace que este busque ayuda del personal de salud, y el médico tiene un papel importante en este proceso. La necesidad de calmar su dolor hace que los pacientes se sienten abrumados y buscan tratamientos convencionales o no convencionales como una alternativa viable para identificar el diagnóstico y encontrar una solución: *… dicen que es como el nervio ciático que le coge a uno… y ya me descubrieron que ya tengo otra hernia discal…* (Luis).

El dolor ha permanecido con ellos durante meses, años, décadas, ha sido un patrón constante, el cual, como lo refieren, ha llegado para quedarse y alojarse en su ser, en su cuerpo. Por lo general, las crisis de dolores fulminantes y circunstanciales aparecen sin aviso, lo que hace que los adultos mayores sean más conscientes de su situación. Estas crisis implican sistemas de apoyo, como la familia. El sentir el dolor de una manera tan abrupta y fuerte hace que el adulto mayor se refugie en el apoyo brindado por ellos. Esta serie de situaciones han permeado el autorreconocimiento del adulto mayor, lo cual ha hecho que se cuestione sobre los factores que han desencadenado su dolor.

Se vuelven más conscientes y prudentes durante sus actividades diarias con la esperanza de que el dolor va a disminuir. Se abstienen de sus actividades habituales, y esto genera sentimientos de frustración y miedo.

Experimentar una vida de dolor. La experiencia del dolor evoluciona a una siguiente etapa que requiere la comprensión de las limitaciones consecuencia del dolor. Cualquier acción, por pequeña que sea, se convierte en un reto para ellos, deben ser conscientes del esfuerzo que traerá y los efectos de no hacerlas debidamente. El dejar todo aquello que les gusta, todo lo que los hacía sentir felices y cómodos con su vida, hace que surja la necesidad de indagar por alternativas para disminuir su incapacidad y el sentimiento de minusvalía secundario a la presencia de dolor: *si voy a la calle, me voy por el lado de la pared, me voy con la señora o con alguien por el equilibrio, siento que me balanceo, que me voy a caer por la columna, por el peso…* (Luis).

El dolor provoca la búsqueda de recursos, como exámenes, procedimientos y consultas con especialistas, que los hacen sentir en

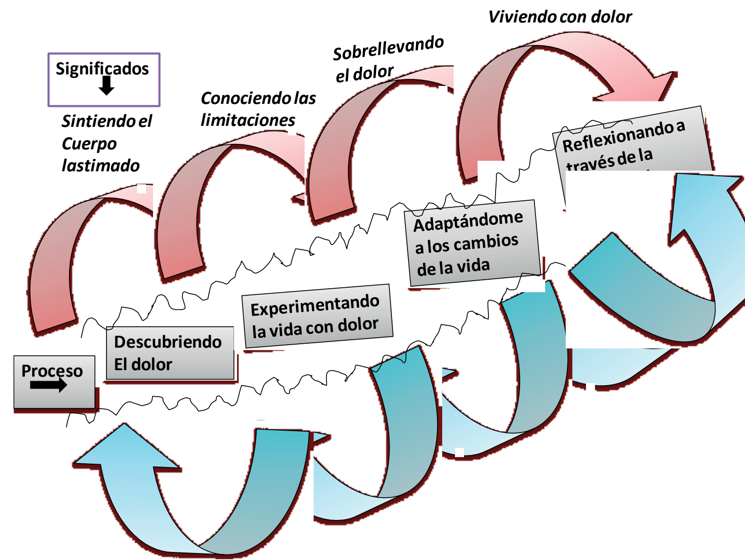
desventaja debido a la terrible experiencia necesaria para buscar una posible cura, pero en ocasiones el sistema de salud no facilita su acceso y… *a veces uno ni va a visitar al médico, porque uno piensa pues para mandarle lo mismo…* (Luisa). Otro aspecto que desencadena sentimientos negativos en los participantes es la poca sensibilidad que tiene el personal médico cuando se trata de explicar el diagnóstico y posibles consecuencias de tratamiento; los describen como fríos, calculadores y deshumanizados, lo que demuestra una vez más la falta de interés por el cuidado del adulto mayor, agudizando así los sentimientos de impotencia, desasosiego, confusión e ira: *… el último médico que me vio, me dijo: 'no, eso ya se llama vejez, eso usted ya se fregó de por vida'…* (Jorge).

Adaptarse a los cambios de la vida. Los adultos mayores entienden que vivir con dolor implica cambios en las actividades diarias; sin embargo, intentan mantener una vida normal y la búsqueda de una manera de aliviar el dolor, que les ofrece esperanza a pesar de sus dolencias. *... Pero entonces tengo que estar listo... para estar contento con el dolor...* (Sofía).

La búsqueda de opciones de manejo del dolor hace que se busquen recursos que sean alcanzables y que puedan incorporarse a la vida cotidiana, como adquirir nuevos hábitos alimenticios, cambiar las actitudes existentes y otros tipos de remedios caseros. Se dan cuenta de la posibilidad de varias alternativas para aliviar el dolor, como el uso de terapias no convencionales y socialmente inaceptables. Creen que el desarrollo de actividades simultáneas y la investigación de diversas alternativas de atención para reducir el dolor pueden generar un resultado positivo. *... Y aprendí a manejar el dolor y vivir con poco dolor...* (Luisa). El resultado es una actitud de confianza, y muchas de estas alternativas son empleadas por los participantes, ya que las perciben como cómodas, viables después de lograr resultados positivos. Tratan de desarrollar una actitud positiva y deciden ignorar su dolor como estrategia para hacerla desaparecer. La presencia de un ser superior les hace sentir seguros.

Reflexionando sobre la experiencia. Están listos para reconocer los aspectos positivos o beneficiosos que el dolor ha introducido en sus vidas y encontrar un nuevo camino que les ayude en su unión con un ser superior que apoya sus experiencias. Se vuelven más receptivos a los demás y desarrollan el deseo de ayudar a las personas que experimentan situaciones similares. Empiezan a poner más esfuerzo en su cuidado con la expectativa de reducir su dolor. Se sienten más fuertes, más tolerantes, fortalecidos en lo personal y se sienten capaces de manejar cualquier nueva adversidad en su vida. *...Creo que el dolor físico es también una gran oportunidad para entender que mi hermano también sufre y puedo ayudarte...* (Mary).

El proceso no es lineal, ni paralelo a todos los adultos mayores, ni en el tiempo es igual en cada etapa, pues algunos de ellos tienen que manejar situaciones problemáticas, como el rechazo de su sistema de salud, la falta de un diagnóstico claro, las crisis de dolor, la falta de apoyo, el aislamiento que hace que retrocedan a una etapa anterior (ver gráfico 1).



Fuente: datos de la investigación.

Gráfico 1. "Aprender a vivir con el dolor: de la adversidad a la adaptación"

DISCUSIÓN

La "Adaptación al dolor crónico en el envejecimiento" (10) consta de un proceso que está compuesto por cuatro fases, las cuales se relacionan entre sí y se representan a través de las estrategias de afrontamiento, las cuales son: descubriendo el dolor, experimentando una vida con dolor, adaptándome a los cambios de la vida y reflexionando a través de la experiencia. El proceso de adaptación se concibe como continuo, el cual varía dependiendo de la etapa del proceso y del significado que le otorgue el adulto mayor con dolor crónico. Vivir con dolor crónico en el envejecimiento ha sido descrito como un trayecto incierto que requiere un ajuste continuo y patrones de respuesta diferentes en cada fase del proceso.

Este estudio proporciona una explicación de lo que los participantes describieron al tener dolor crónico en la vejez, la experiencia es única para cada persona que lo experimenta y manifiestan una variedad de síntomas que afectan la vida diaria de las personas mayores. Las limitaciones son una constante que puede aumentar el nivel de dolor (10).

También las pocas posibilidades proporcionadas por el sistema de salud tienen implicaciones en el tratamiento de cada uno. Los participantes de este estudio describen la experiencia del dolor como "lo peor". Sufren de dolor crónico y describen cambios de comportamientos como la depresión, el estrés y el aislamiento social. Y a través de un lenguaje propio describen diferentes tipos

de dolor. El proceso identificado muestra cómo durante el dolor crónico las personas mayores se mueven a través de las diferentes etapas con el fin de encontrar la adaptación. Al comienzo se sienten frustrados por todas las limitaciones y nuevos sentimientos que surgen con el tiempo. Cuando finalmente encontraron la manera de sobrellevar su dolor, comprenden que el dolor es parte de su vida y que deben tomar el control de esta. Se sienten más fuertes, más tolerantes, reforzados desde lo personal y capaces de manejar cualquier nueva adversidad en su vida.

Los participantes expresan que la intensidad del dolor tiene un gran impacto en la dimensión física de la persona mayor (11), pero otras características incluyen su localización, inicio, duración, frecuencia y patrón (continuo o intermitente); del mismo modo se cumple que el dolor crónico tiene consecuencias emocionales y sociales que puede afectar profundamente su calidad de vida (12). Por lo tanto, la experiencia del dolor crónico en adultos mayores altera profundamente la percepción de los cuerpos y expectativa de vida; esto puede convertirse en un obstáculo en vez de un facilitador, porque el cuerpo se ve como dañado e inútil, en contraste con un cuerpo que alguna vez fue activo y productivo (13). Al comparar los resultados con otros estudios (14-16), también refieren el dolor crónico como inevitable en el proceso normal de envejecimiento.

Igualmente, como lo expresan los participantes, los estados del dolor crónico afectan todas las dimensiones de la vida del individuo: física, psicológicas, social y espiritual; del mismo modo, el dolor crónico interfiere con la capacidad de la persona mayor para realizar actividades de la vida diaria (AVD)(11).

La búsqueda de los servicios de salud por parte de los ancianos es como una solución alternativa a su dolor que provoca un conjunto de expectativas que permean el sufrimiento constante en el momento en que llegan a ellos. Un estudio que investigó los significados de las experiencias de los adultos en sus encuentros con el equipo de la salud encontró un enfoque positivo y una sensación de tranquilidad cuando el personal había entendido la gravedad de la situación (17), pero las personas con dolor crónico son más propensas a ponerse en contacto con el médico en varias ocasiones; y durante estos encuentros reportan una actitud negativa del personal cuando se sienten desatendidos (18).

Por otro lado se afirma, que la aceptación del dolor no incluye todas las experiencias de sufrimiento causado por él, la aceptación no es un acto global de renuncia o abandono; por el contrario, es reconocer la realidad y dejar ir las energías que no funcionan para que los esfuerzos se puedan hacer viables y así se logren los objetivos (19).

Al ir aceptando su situación, el adulto mayor aprende a ser más consciente de toda la realidad de su situación, de sus pensamientos y sentimientos; a su vez, la experiencia transitoria sirve de guía para la acción. Además, los pacientes son capaces de tomar decisiones asertivas acerca de la mejor opción para seguir adelante con la vida, a pesar de la presencia de dolor (20).

De manera similar, otros informan sobre los diferentes recursos para mitigar el dolor; por ejemplo, el ejercicio es un tipo de terapia física que ha sido ampliamente conocida por la función, la movilidad, la aptitud y un cierto grado de reducción del dolor en las personas mayores con dolor crónico y las terapias com-

plementarias refuerzan el efecto analgésico de la medicación, ya sea directamente por sus propiedades analgésicas o por acción indirecta sobre la reducción de la tensión y el estrés, la producción de endorfinas y aumento del flujo sanguíneo (18).

La actitud positiva frente al dolor fue investigada, se exploró el significado de la resiliencia, o la adaptación frente a la adversidad de las personas que viven con el dolor crónico, y reveló que estar con dolor crónico es una experiencia negativa y positiva porque se presenta: a) el reconocimiento de su ser interior, b) el encontrar lo positivo en la vida, c) aceptar el dolor, y d) aprender a aceptar la ayuda; que lleva a concluir que el dolor crónico afecta a todos los aspectos de la vida, y que los adultos mayores utilizan la capacidad de recuperación y reconocen el valor de tener una actitud positiva, aceptando y aprendiendo a vivir con el dolor (21).

Otras estrategias, como el masaje, la terapia de contacto, el uso de accesorios como corsé, férulas, la posición correcta y el agua caliente, entre muchas otras, están involucradas en la reducción del dolor (22).

Además, los pacientes describen la religión y la creencia en Dios como parte de un sistema de apoyo (23), y las personas que enfrentan la enfermedad crónica se sienten conectadas y tienen un sentido de la fe, autoconciencia y esperanza cuando sintieron la proximidad de un ser superior, que potencia su bienestar psicológico y espiritual (24).

Por otro lado, el dolor crónico afecta no solo al individuo sino también su pareja y a otros miembros de la familia. Las familias de las personas con dolor crónico han reportado una sensación de impotencia, angustia emocional y aislamiento y afecta su relación con la persona con dolor crónico (21). Conjuntamente, los pacientes con dolor interpretan el apoyo de su familia como útil o inútil según las interacciones con los miembros de la misma (25).

El adulto mayor, al vivir la experiencia de dolor, pasa por un proceso dinámico que le implica el reconocimiento del mismo, para luego descubrir lo que este ha traído para sus vidas a fin de lograr finalmente adaptarse a la situación. Se puede afirmar entonces que la experiencia de vivir con dolor crónico se fundamenta en el aprender a vivir con dolor partiendo de una incomprensión para alcanzar una adaptación.

CONCLUSIONES

Este estudio propone una conceptualización creativa y significativa: "Aprender a vivir con dolor crónico en la vejez: de la incomprensión a la adaptación". La síntesis del proceso y los significados capturan específicamente la experiencia y aumentan la utilidad de la teoría en la práctica.

La investigación ofrece explicaciones plausibles sobre el significado y proceso por los que pasa el adulto mayor con dolor crónico benigno en la vejez, e invita al desarrollo de estrategias de intervención demostrables. El conocimiento se puede aplicar fácilmente a la práctica si los conceptos están claramente definidos y las relaciones se establecen explícitamente sobre una base conceptual.

La principal hipótesis de la teoría es que las personas, sus percepciones y experiencias son el punto de partida para las intervenciones de enfermería que contribuyen a la adaptación en los adultos mayores que sufren dolor crónico.

Estas categorías permiten a las enfermeras entender cuáles son las principales necesidades que afectan directamente a los adultos mayores que sufren de dolor crónico y las etapas por las que avanza el proceso de adaptación y permite a las enfermeras planificar intervenciones de atención con el interés de promover la adaptación a sus condiciones.

Las contribuciones a la práctica de enfermería. Los significados y procesos identificados por la teoría fundamentada brindan orientación con respecto al cuidado de enfermería de adultos mayores con dolor crónico benigno. Esto permitiría un giro en el cuidado, que asegure que los pacientes con dolor son valorados y tratados adecuadamente, con el objetivo de crear una mejor calidad de vida para el paciente.

Entre los retos futuros de la investigación se debe favorecer las investigaciones en enfermería con diseños cualitativos, puesto que ellos nos permiten direccionar el cuidado más hacia "el ser" de la persona que experimenta una situación particular, permitiendo comprender y redimensionar la realidad de su vivencia.

Es necesario seguir ahondando en el desarrollo y la futura comprobación de la Teorías sustantivas, derivas de la Teoría Fundamentada para implementarlas en la práctica de enfermería, y así lograr avanzar en el cuidado del envejecimiento, desarrollando programas en salud con un esquema conceptual propio.

Esta investigación muestra unos resultados importantes que pueden ser utilizados para la implementación de programas liderados por las instituciones de formación universitaria que fomentarían mayor investigación y un cubrimiento más amplio para el cuidado de los adultos mayores con dolor crónico.

Se sugiere realizar la réplica de este estudio con adultos mayores con dolor crónico benigno en otras poblaciones y contextos.

Entre las limitaciones del estudio se tuvieron en cuenta: situaciones de enfermedad que en etapas avanzadas favorecían la presencia de crisis o la exacerbación de los síntomas y la evidente pérdida de sujetos en la segunda entrevista.

La experiencia de las personas, al ser dinámica y cambiante en el tiempo, puede originar la no recordación de eventos significativos relacionados con su vivencia, lo que hace imposible recordar pequeños detalles que podrían cambiar el significado del fenómeno estudiado. El tipo de estudio, por ser cualitativo, no permite la generalización de los resultados.

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Transferosomas conteniendo ftalocianina de aluminio clorada como alternativa terapéutica en leishmaniasis cutánea: permeabilidad y biodistribución en ratas Wistar

Transferosomes loaded with chloroaluminum phthalocyanine as cutaneous leishmaniasis therapeutic alternative: permeability and biodistribution in Wistar rats

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Resumen

Objetivo: *Evaluar la permeabilidad, retención y biodistribución de los LUD-PcAlCl in vivo.*
Metodología: *Los transferosomas fueron obtenidos mediante rehidratación de película lipídica. Ratas Wistar fueron tratadas tópica e intraperitonealmente con los transferosomas por 5 días. La penetración ex vivo fue determinada mediante el ensayo en celdas de Franz y la retención por el método de la cinta adhesiva. Cinco y treinta días postratamiento se obtuvo la piel y órganos para determinar la retención del compuesto y realizar estudios histopatológicos. La PcAlCl fue extraída con solventes y cuantificada por fluorometría. Los resultados se expresaron en nM PcAlCl/mg órgano.*
Resultados: *La PcAlCl no penetró la piel en los ensayos ex vivo, reteniéndose principalmente en el estrato córneo. Cinco días post-tratamiento tópico la PcAlCl fue retenida en estrato córneo (41,76±0,02), mostrando concentraciones mínimas en bazo (0,09±0,02), epidermis-dermis (0,06±0,17), hígado (0,03±0,02) y pulmón (0,02±0,01 nM). Por vía intraperitoneal se encontró PcAlCl en bazo (0,58±0,4), cerebro (0,07±0,07), corazón (0,07±0,12), pulmón (0,012±0,01) y*

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piel (0,021±0,02 nM). Treinta días postratamiento no se encontró PcAlCl en ningún órgano. Los estudios histopatológicos fueron negativos.
***Conclusión**: La PcAlCl contenida en transferosomas fue retenida principalmente en estrato córneo, mostrando bajas concentraciones en la dermis, sitio donde se aloja el parásito. Se sugiere modificar los componentes vesiculares del sistema para aumentar la permeación del compuesto.*

Palabras clave: transferosomas, liposomas ultradeformables, ratas Wistar, leishmaniasis cutánea, sistemas transdérmicos de liberación, ftalocianina.

Abstract

***Objective:** To assess the UDL-ClAlPc permeability, retention and biodistribution in vivo.*
***Methods**: Transferosomas were obtained by lipid film re-hydration method. Wistar rats were treated topically and intraperitoneally with UDL-ClAlPc for 5 days. Skin and organs were collected five and thirty days after-treatment to determine ClAlPc retention and histopathological studies. The ClAlPc was extracted with solvents and quantified by fluorometry. The results were expressed in nM PcAlCl/mg organ. The permeation was tested ex vivo using Franz-diffusion cells and the retention in stratum corneum and epidermis-dermis by tape stripping.*
***Results**: In the ex vivo experiments ClAlPc-UDL was not able to penetrate rat skin and was retained mainly in the stratum corneum. In rat, five days after topical treatment ClAlPc was retained mainly in the stratum corneum (41.76±0.02) with minimum concentrations in spleen (0.09±0.02), epidermis-dermis (0.06±0.17), liver (0.03±0.02) and lung (0.02±0.01 nM). After intra peritoneal treatment, ClAlPc was found in spleen (0.58±0.4), brain (0.07±0.07), heart (0.07±0.12), lung (0.01±0.012) and skin (0.021±0.02 nM). Thirty days post-treatment ClAlPc was not found in any organ. Histopathological studies were negative.*
***Conclusion**: The ClAlPc contained in transferosomes was retained mainly in the stratum corneum. Low concentration was detected in dermis a place where the parasite survives. This vehicle needs to be improved to increase skin penetration.*

Keywords: transferosomes, liposomes, Wistar rats, cutaneous leishmaniasis, transdermic drug release system, phthalocyanine.

INTRODUCCIÓN

La leishmaniasis es una enfermedad causada por protozoarios flagelados del genero *Leishmania*, los cuales son transmitidos al hombre por la picadura de insectos flebótomos (1-3). El ciclo de vida del parásito alterna entre los promastigotes del vector y los amastigotes que infectan los macrófagos del hospedero mamífero. Exhibe diversas formas clínicas dependiendo de la especie de *Leishmania* y la inmunidad del hospedero que van desde cutáneas, mucocutáneas y viscerales. En Colombia la LC constituye un problema de salud pública, se reporta un promedio anual de 12 380 casos, de los cuales el 98,5 % corresponden a leishmaniasis cutánea (LC), 1,3 % a mucosa y 0,2 % a visceral (1-4).

El tratamiento se basa en el uso de antimoniales pentavalentes (Glucantime®), que cursa con efectos adversos como dolor intenso en el sitio de aplicación, vómito, cefalea, nefrotoxicidad, hepatotoxicidad y alteraciones electrocardiográficas. Como segunda opción se utiliza anfotericina B

(y sus formas liposomales), pentamidina y miltefosina (5).

Los tratamientos tópicos y/o transdérmicos en LC constituyen una opción en casos de lesiones tempranas y no diseminadas.

Se han utilizado tratamientos físicos (termoterapia, electroterapia, terapia fotodinámica, TFD), formulaciones tópicas en forma de cremas, ungüentos que contienen fármacos como la paromomicina y aplicaciones intralesionales de medicamentos (5).

La TFD se basa en la activación de fotosensibilizadores (FS) con una luz específica que en presencia de oxigeno genera especies radicales de oxígeno (ERO), produciendo fotooxidación y destrucción de células y tejidos enfermos (6). Es utilizada en afecciones de la piel como carcinomas basocelulares, queratosis actínicas, enfermedades infecciosas y en leishmaniasis (6).

La PcAlCl es un FS hidrofóbico con alta eficiencia para producir ERO, habilidad de absorber luz visible (640-680 nm) y actividad contra diferentes especies de *Leishmania* (7-8).

La piel es el órgano más extenso del cuerpo con funciones de protección, absorción y permeación. Está formada por la epidermis, que dependiendo del grado de diferenciación se divide en estrato: córneo (EC), lúcido, granuloso, espinoso y basal o germinativo. Inmediatamente debajo se encuentra la dermis, formada por una matriz densa de tejido conectivo, fibras de colágeno y elastina, por fibroblastos, macrófagos, mastocitos, terminaciones nerviosas y capilares sanguíneos. En la dermis se encuentran las glándulas sudoríparas y sebáceas (9). El EC actúa como una barrera formada por corneocitos envueltos en filamentos de queratina y una envoltura cornificada rodeada de lípidos (colesterol, ceramidas y ácidos grasos libres) que previenen la pérdida excesiva de agua y permiten la entrada de medicamentos lipofílicos de bajo peso molecular (10).

Los tratamientos transdérmicos se basan en el uso de sistemas terapéuticos que permiten la difusión del fármaco (aplicado en piel) hacia algunas de las capas internas de la piel, consiguiendo una acción localizada o accediendo al torrente sanguíneo alcanzando actividad sistémica (10-11). Se basan en la utilización de medicamentos incluidos en diversas formas farmacológicas, las cuales aseguran el transporte controlado al tejido diana, garantizando su mecanismo de acción y concentraciones terapéuticas mínimas sin inducir toxicidad y/o reacciones de hipersensibilidad (10-11).

Los fármacos pueden acceder ya sea pasivamente (útil en el caso de fármacos lipofílicos, de bajo peso molecular, dosis bajas) o utilizando potenciadores químicos (agua, solventes, surfactantes, liposomas) y métodos físicos tales como iontoforesis, ultrasonido, electroporación o microagujas (10).

El uso de vesículas lipídicas como sistemas transdérmicos de fármacos es una alternativa. Se han diseñado liposomas, transfersomas, niosomas, etosomas, los cuales presentan baja toxicidad, son biodegradables capaces de encapsular y liberar controladamente moléculas hidrofóbicas y lipofílicas, reduciendo la toxicidad y aumentando la biodisponibilidad de los mismos. Sirven como vehículos del fármaco (atravesando la piel), pueden ser potenciadores de la penetración por su composición e inducir una liberación sostenida en las formulaciones tópica que los contiene (12).

Los liposomas ultradeformables (LUD) o transferosomas son vesículas elásticas compuestos por fosfolípidos, surfactantes (colato de sodio, Tween 80, Span 80) y agua capaz de encapsular fármacos y difundirse a través de la piel intacta (13).

Nosotros diseñamos LUD con una bicapa compuesta de fosfolípidos y colato de sodio (Col-Na) que contiene PcAlCl (14) y miltefosina (15), los cuales mostraron actividad *in vitro* contra *L. (L.) infantum* y *L. (Viannia) panamensis* y *L. (V.) braziliensis.* Continuando con los ensayos preclínicos de este sistema vesicular, el objetivo de este estudio fue determinar la permeabilidad, retención y la biodistribución de PcAlCl en ratas Wistar para valorar la capacidad de estos de penetrar el EC y acumularse en la dermis de la piel de las ratas Wistar.

MATERIALES Y MÉTODOS

Preparación y caracterización de LUD-PcAlCl

Se prepararon siguiendo el protocolo descrito por Hernández et al. 2013 (14). Brevemente, fosfatidilcolina (PL90, Phospholipid, Alemania) y Col-Na (Sigma-Aldrich, St. Louis, MO, USA) en relación 6:1 fueron colocados en una mezcla de metanol: cloroformo (1:1) con una solución de PcAlCl (Sigma). Se rotoevaporaron los solventes y posteriormente la película lipídica fue suspendida en buffer Tris pH 7,2. Para obtener liposomas unilamelares se pasó la preparación a través del extrusor de lípidos. Los liposomas fueron filtrados y guardados a 4°C. El tamaño promedio de partícula, el potencial Z y el índice de polidispersión (PDI) se determinaron utilizando un Zetasizer Nano ZS (Malvern Instruments Ltd. Malvern. Worcestershire. RU). La concentración de PcAlCl se determinó por espectrofluorometría utilizando el fluorómetro LS 55 PerkinElmer, UK (excitación 670 nm emisión 682. nm).

Animales, grupos experimentales y tratamiento

Se utilizaron ratas Wistar hembras (200-250 gramos de peso, 2 meses de edad), obtenidas en el Bioterio de la Universidad Industrial de Santander (UIS), teniendo en cuenta la normativa establecida en la Ley 84 del 27 de diciembre de 1989. Esta investigación fue avalada por el Comité de Ética de la UIS, código CB12006.

En el experimento 1 los animales fueron tratados tópicamente con LUD-PcAlCl (número de animales, n=8) y LUD-vacíos (n=2). En el experimento 2 los animales fueron tratados por vía intraperitoneal (i.p) con LUD-PcAlCl (n=6) y con LUD-vacíos (n=2). Los animales recibieron 100 μL de LUD-PcAlCl (100 μM) o LUD-vacíos aplicados diariamente en una dosis por 5 días. Los animales fueron sacrificados 5 o 30 días después de la última dosis.

Extracción y cuantificación de PcAlCl de piel y otros órganos

Después del sacrificio se extrajeron los órganos: piel, hígado, pulmón, riñón, corazón, cerebro y bazo. La retención de la PcAlCl en el EC se determinó por el método de la cinta-adhesiva (15). Se adhirió un trozo de cinta en la parte central de la piel tratada, aplicando presión durante 30 segundos, posteriormente se retiró la cinta y se colocó en tubos ámbar con el solvente extractor. Este procedimiento se realizó 15 veces. La retención del fármaco en la epidermis más dermis (E+D) se determinó cortando la piel en pequeñas porciones y macerando. La retención en los órganos internos se

determinó pesando 30-50 mg de cada órgano y macerando con pistilo y mortero. La PcAlCl se extrajo incubando con el solvente extractor (etanol: DMSO: ácido acético) bajo agitación constante y posterior centrifugación a 10 000 rpm por 15 min. La concentración de PcAlCl fue determinada en los sobrenadantes por fluorometría.

Pruebas histológicas

Muestras de piel y órganos fueron fijadas con formol taponado al 10 %, procesadas e incluidas en bloques de parafina. Se realizaron cortes histológicos, los cuales fueron coloreados con hematoxilina y eosina. Se observaron microscópicamente y se tomaron registros fotográficos.

Ensayos de difusión

La piel dorsal de las ratas se procesó y almacenó a -20°C. Se utilizaron celdas de Franz siguiendo el protocolo descrito por Rico et al. 2012 (16). En el compartimento donador se colocaron los LUD y en el receptor PBS pH 7,2. Sobre el compartimento receptor se colocó la piel. Las celdas se dejaron a 32°C, con agitación constante por 24 h. Se determinó la concentración de PcAlCl del EC y de la E+D y la del compartimento receptor por fluorometría.

Análisis estadístico

Las diferencias entre los LUDs (vacíos y con PcAlCl) y en la distribución de la PcAlCl después de los tratamientos utilizados fueron determinadas utilizando la prueba de t de Student. Un valor de $P<0,05$ fue considerado estadísticamente significativo.

RESULTADOS

Características fisicoquímicas

Los LUD-PcAlCl mostraron un tamaño de 133,20±3,27 nm, potencial zeta de -36,45±1,23 mV y PDI de 0,15. Los LUD-vacíos fueron estadísticamente más pequeños que los LUD-PcAlCl, mostrando un tamaño de vesícula 110,24±8,32 nm. El potencial zeta fue similar, con un valor de -37,20±8.86 y el PDI fue de 0,15.

Biodistribución de PcAlCl (aplicación vía tópica)

Después de 5 días de finalizar el tratamiento se encontraron concentraciones de PcAlCl en bazo 0,09±0,02, piel (E+D) 0,06±0,02, hígado 0,03±0,02 y pulmón 0,02±0,01 nM/mg de órgano. Después de 30 días se detectaron en bazo 0,04±0,01 e hígado 0,02±0,02 nM /mg (figura 1). En el sitio de la aplicación, la PcAlCl se retuvo en el EC; a los 5 días los valores fueron: cintas 1-5: 26,4±0,01, cintas 6-10: 11,8±0,01 y cintas 11-15: 3,56±0,06 nM PcAlCl/mg. A los 30 días no se encontraron concentraciones de PcAlCl en el sitio de aplicación (figura 1). La aplicación de LUD-vacíos por vía tópica no mostró concentraciones de PcAlCl en los órganos.

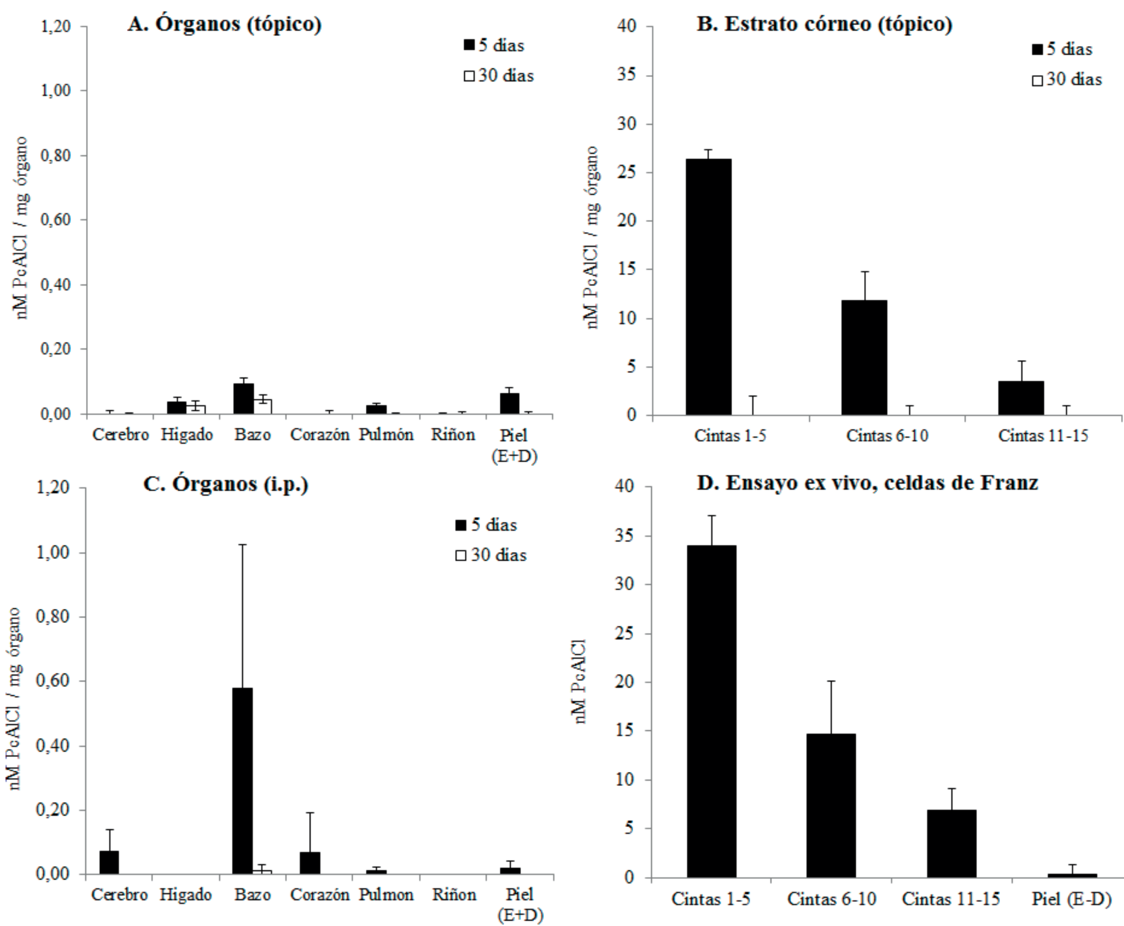
Biodistribución de PcAlCl (aplicación vía i.p)

Después de 5 días los valores de PcAlCl fueron: bazo 0,58 ±0,4, cerebro 0,07±0,07, corazón 0,07±0,12, pulmón 0,012±0,01 y piel 0,021±0,02 nM PcAlCl/mg de órgano. Después de 30 días los valores en bazo fueron 0,01±0,02 nM PcAlCl/mg (figura 1). No se hallaron concentraciones de PcAlCl después de la aplicación i.p de LUD-vacíos.

Entre los dos tratamientos utilizados (tópico e i.p) no se encontraron diferencias estadísticamente significativas en las concentraciones de PcALCl en bazo y pulmón. Sin embargo, concentraciones del compuesto fueron detectadas en el cerebro y corazón de algunos de los animales tratados por vía i.p. Este experimento fue repetido tres veces.

Ensayos de difusión en celdas de Franz

No se detectaron concentraciones de PcAlCl en el compartimiento receptor después de 24 h. La PcAlCl presente en los liposomas se retuvo en el EC con valores de: cintas 1-5: 34,01±0, cintas 6-10: 14,6±5,44, cintas 11-15: 6,9±2,1 nM. En piel (E+D) se encontraron valores de 0,27±0 nM (figura 1).



Las ratas Wistar fueron tratadas con LUD-PcAlCl (100 µM) por 5 días. Los diagramas de barras muestran la retención de PcAlCl 5 o 30 días después del tratamiento tópico en órganos (A) y estrato córneo (B). La retención después del tratamiento intraperitoneal (i.p) se muestra en el Panel C y los resultados de la prueba de permeación en celdas de Franz en el panel D.

Figura 1. Retención en órganos y penetración en piel de la PcAlCl contenida en liposomas ultradeformables(LUD)

Características histopatológicas de piel y órganos

En los cortes de piel se identificó la epidermis compuesta por el epitelio plano estratificado queratinizado. Después del método de las cinta-adhesiva el EC fue removido (figura 2), identificándose en la dermis fibras colágenas y elásticas. En la corteza cerebral se destacaron las células piramidales, también los capilares que conformaban la barrera hematoencefálica; no se apreciaron cambios que sugirieran daño neuronal (figura 3A). En el pulmón se identificaron los bronquios y alveolos con paredes ligeramente gruesas por el aumento del número de linfocitos en su estroma; este hallazgo fue similar en los animales no tratados (figura 3B). El hígado conservó su estructura normal, los hepatocitos en forma de cordones convergieron en la vena centrolobulillar, al igual que las sinusoides (figura 3C). En el corazón se identificaron las fibras musculares cardiacas rodeadas de endomisio (figura 3D). En la corteza renal se reconocieron los corpúsculos renales y a su alrededor los túbulos contorneados (figura 3E). El bazo configurado por la pulpa blanca y la pulpa roja se encontró hipercelular con gran número de hemosiderofagos, igual que en el control (figura 3F).

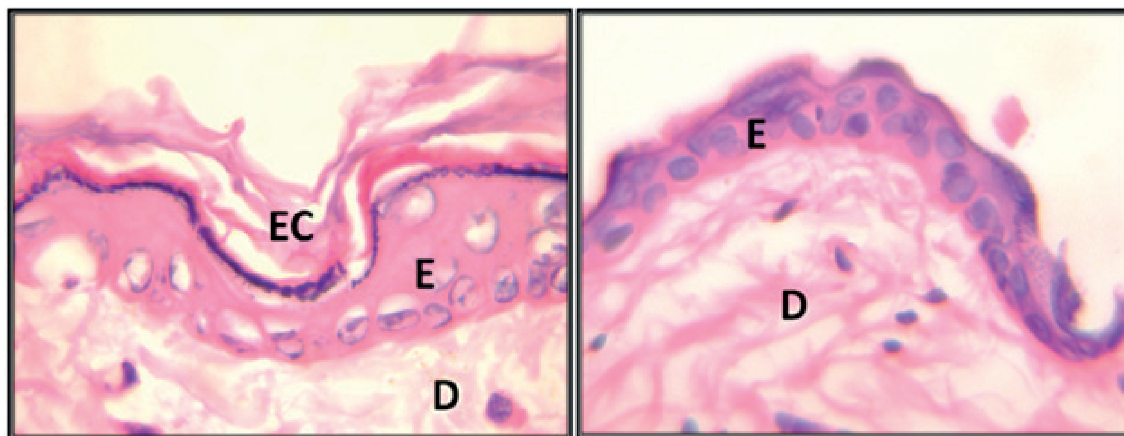


Figura 2. Microfotografía 100X, piel de rata Wistar; piel sana (izquierda) y piel sometida al método de la cinta-adhesiva (derecha). EC: estrato córneo, E: epidermis, D: dermis

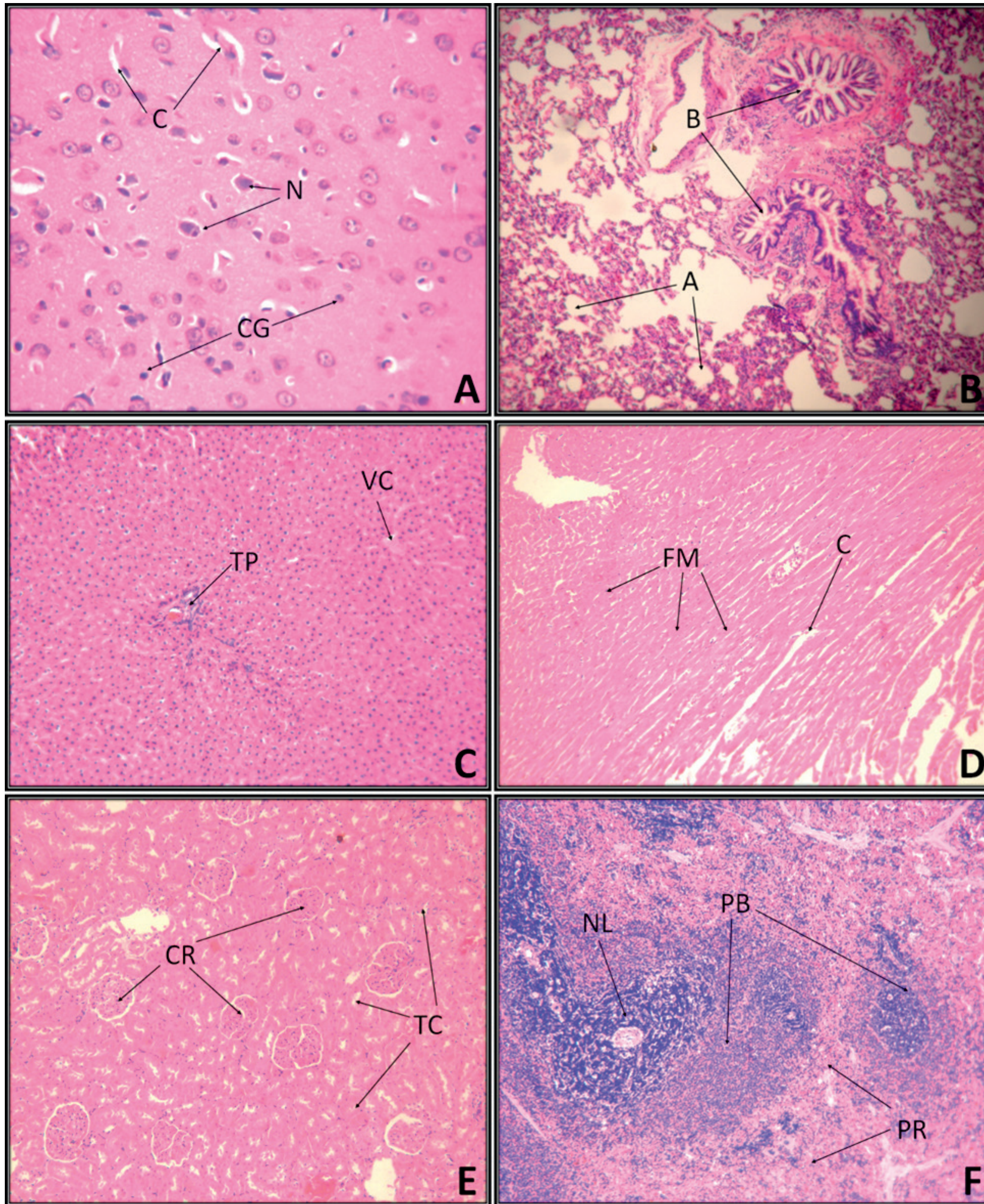


Figura 3. A) Microfotografía 40X, corteza cerebral, N: neurona, CG: célula glial, C: capilar. B) Microfotografía 10X, pulmón, B: bronquíolo, A: alvéolo. C) Microfotografía 10X, hígado, TP: triada portal, VC: vena centrolobulillar. D) Microfotografía 10X, corazón, FM: fibra muscular, C: capilar. E) Microfotografía 10X, corteza renal, CR: corpúsculo renal, TC: túbulos contorneados. F) Microfotografía 10X, bazo, PB: pulpa blanca, PR: pulpa roja, NL: nódulo linfoide.

DISCUSIÓN

Se prepararon transferosomas compuestos por una bicapa lipídica de fosfatidilcolina, Col-Na y PcAlCl, presentando características fisicoquímicas similares a las descritas previamente por Hernández et al. (14). Este tipo de sistema vesicular conformado por lípidos asociados a disolventes orgánicos, *edge activators* (Col-Na) o terpenos ha sido utilizado en tratamientos transdérmicos debido a su capacidad de contener diferentes tipos de compuestos y a su elasticidad y flexibilidad, mejorando la penetración de los compuestos a través de la piel (13), (17),(19). Algunos autores han demostrado su capacidad de penetrar la piel intacta, atravesando la capa lipofílica del EC y luego la hidrofílica de la epidermis (13). Sin embargo, otros no han podido demostrar esta hipótesis, adjudicándoles solo una actividad como potenciadores de la penetración de los compuestos, permaneciendo confinados en el EC (17), (19). En este trabajo la mayor concentración de PcAlCl se encontró en las capas externas de la piel, encontrándose una mínima o nula penetración del compuesto. Diferente a esto, un estudio utilizando LUD similares, pero conteniendo miltefosina (LUD-MIL), mostró la retención de MIL en E+D (776 ng/cm^2) y la penetración (179 ng/cm^2) en piel humana (15). Diferencias intrínsecas en las características de las membranas utilizadas en los ensayos *ex vivo,* al igual que las características fisicoquímicas de los compuestos (MIL versus PcAlCl), podrían justificar estas diferencias. Una formulación tipo nanoemulsión que contenía PcAlCl y ácido oleico-Tween20 como surfactantes también fue evaluada anteriormente por nosotros, encontrándose valores mayores de retención en E+D (8,48 nM) utilizando piel humana (21) y de 62,49 nM/cm^2 en piel de ratas Wistar (16). Liposomas preparados con diferentes proporciones fosfolípidos:Col-Na o que contienen otros surfactantes están siendo diseñados para aumentar la permeación del compuesto a la dermis.

En las ratas Wistar, la aplicación tópica 5 días postratamiento mostró una baja permeación del compuesto en piel acumulándose la mayor parte en EC. Treinta días postratamiento no se encontraron concentraciones de PcAlCl en el sitio de aplicación, lo cual podría deberse en parte a la descamación cíclica de la piel (19). Sin embargo, bajas concentraciones de PcAlCl lograron penetrar la piel, ya que se encontraron concentraciones mínimas del FS en bazo, hígado y pulmón (22). La baja permeación de la PcAlCl y su limitación a EC y E+D podría constituir una ventaja, reduciendo efectos sistémicos; sin embargo, se esperaba una mayor concentración del compuesto en dermis, que es el sitio donde se aloja el macrófago parasitado con *Leishmania*.

Aunque no se pudieron encontrar diferencias en las concentraciones de la PcAlCl en bazo y pulmón después de su aplicación tópica o i.p, esta última vía logró concentraciones detectables del compuesto en órganos como el cerebro y corazón, debido posiblemente a una mejor disponibilidad del compuesto al torrente sanguíneo (22). Dada la fototoxicidad de la PcAlCl, es necesario que este FS se deposite específicamente en los tejidos enfermos y no sistémicamente. Después de 30 días del tratamiento i.p. no se encontraron concentraciones de PcAlCl (con excepción de muy bajas concentraciones en bazo), indicando la excreción del FS.

El estudio histopatológico no reveló cambios estructurales ni sugirió reacciones alérgicas o inflamatorias, como lo son el aumento del calibre vascular y la migración de leucocitos

a la zona. Los resultados en las ratas tratadas con LUD-PcAlCl fueron similares a las tratadas con LUD-vacios.

CONCLUSIÓN

Se requiere perfeccionar el vehículo de PcAlCl, ya que la mayor parte del compuesto se retuvo en EC.

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Niveles de orientación empática en estudiantes de medicina de la Universidad Metropolitana de Barranquilla (Colombia)

Empathy levels in medicine students of Metropolitana University of Barranquilla (Colombia)

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Fecha de recepción: 15 de julio de 2017
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Resumen

Objetivo: *Evaluar el nivel de orientación empática de los estudiantes del Programa de Medicina de la Universidad Metropolitana según género y niveles de enseñanza.*
Materiales y Métodos: *Trabajo de tipo exploratorio con análisis transversal, regido por las normas de Helsinki. La población estuvo formada por los estudiantes de primero a sexto año académico de la carrera de Medicina de la Universidad Metropolitana (Barranquilla, Colombia) (N=2061) de la cual se tomó una muestra (n = 1581) estratificada por año, así: primero: 219; segundo: 324; tercero: 258; cuarto: 278; quinto: 359 y sexto: 143. En el factor Género, la composición muestral fue la siguiente: femenino: 1146 y masculino: 435. La recolección de datos se realizó en julio de 2016. A los participantes se les aplicó la Escala de Empatía Médica de Jefferson (EEMJ) en la versión en español para estudiantes de medicina (versión S), validada en México y Chile. Antes de ser aplicada la EEMJ fue sometida a criterio de jueces (tres académicos de profesión médico) con el objeto de verificar la validez cultural y de contenido. La comprensión de los estudiantes de la escala adaptada culturalmente se realizó mediante una prueba piloto.*
Resultados: *En el factor "Años Académicos" los resultados fueron significativos, no siendo así para el "Género" y la interacción. Se observó que la media disminuyó hasta tercer año, mostrando un leve incremento en cuarto año, bajando en el quinto y aumentando nuevamente en sexto año, siendo el comportamiento semejante en ambos géneros.*

Palabras clave: Empatía, Medicina, Género, Estudiantes.

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Abstract

Objective: *To assess the level of empathy of the students of the medical program of the Metropolitan University according to sex and levels of education.*
Subjects and methods: *Is an exploratory and cross-sectional research. The population included students from first to sixth academic year of Medicine School (n = 1581 N =2061) and was distributed per year: first: 219; second: 324; third: 258; fourth 278; fifth: 359 and sixth: 143. Regarding gender, the sample composition was 435 (male) and female (435) = 1146. Data collection was conducted in July 2016. Participants were administered the Scale of Physician Empathy Jefferson (JSPE) in the Spanish version for medical students (S). Before being applied, the JSPE was subject to the discretion of judges in order to verify cultural and content validity.*
Results: *In "Academic Years", results were significant, not being so for "Gender" and interaction. It was observed that the average decreased until the third year, showing a slight increase in the fourth year, to fall again and increase again in the sixth year. Behavior is similar in both genders and both decline from first to third, showing and a slight increase begins from the fourth year.*

Keywords: Empathy, Medicine, Gender, Students.

INTRODUCTION

La relación entre el profesional de la salud, el médico, y el paciente debe ser comprendida como una interacción dialéctica entre dos personas que tienen intereses personales diferentes (1), es un encuentro humano. Dicha relación contiene, en sí misma, una eminente subjetividad e intersubjetividad que va más allá de la dimensión puramente clínica de un diagnóstico o tratamiento (2,3). Como consecuencia, el factor humano en la atención en salud cobra importancia y, por tanto, la valoración de los profesionales (particularmente del campo de la medicina) sobre sus pacientes no se hace solamente según sus competencias cognitivas y técnicas. De esta manera, se ha planteado, en diversas investigaciones, que para una atención de salud humanizada es necesario que los profesionales del área de la salud sean capaces de desarrollar una comunicación empática con sus pacientes (4-14).

La empatía en la atención de salud puede ser entendida como un atributo cognitivo y del comportamiento que implica la capacidad para comprender cómo las experiencias y los sentimientos del paciente influyen y son influidos por la enfermedad y sus síntomas, y la capacidad de comunicar esa comprensión al paciente (15,16). Constituye uno de los elementos necesarios para desarrollar una habilidad comunicacional básica para las relaciones humanas que se realiza, además, en forma voluntaria (15).

Las investigaciones con profesionales del área de la salud indican que la empatía ha estado relacionada, teórica o empíricamente, con diversos atributos, tales como el comportamiento prosocial, habilidad para recabar la historia clínica, aumento del grado de satisfacción del paciente y del médico, mejores relaciones terapéuticas y buenos resultados clínicos (16- 24). Se ha planteado, bajo métodos de evaluación con diferentes instrumentos de medición de la empatía desarrollados para la población general como para el área médica, que las mujeres presentan mayores niveles de empatía que los hombres (25,26); sin embargo, los resultados empíricos en la medición de los

niveles de este atributo en ambos géneros han resultado contradictorios (27). Por otra parte, se ha propuesto que la empatía es modificable y puede ser desarrollada en forma intencional (25,28), como consecuencia, si esto es así, la “introducción” de la empatía en los procesos de enseñanza-aprendizaje de la formación académica de los estudiantes de ciencias de la salud debiera ser considerada en forma constante durante todo el proceso formativo, todo lo cual implica que las universidades deberían tener un grado de responsabilidad en la formación de este atributo. Por otra parte, la empatía pudiera ser una “variable” que está sometida a la influencia de muchos factores tales como la edad, el género, intencionalidad acerca de la especialidad a seguir en el futuro, curso en que transcurre el estudiante, estructura y clima familiar, personalidad, experiencias empáticas, entorno socio-cultural, escala de valores morales y éticos, entre otros factores; los cuales podrían actuar como “variables” independientes o confundentes (variable de confusión) y, a su vez, podrían contribuir a explicar la variabilidad observada de los niveles de orientación empática encontrada en algunas investigaciones (12,14,15). El objetivo de la presente investigación es medir los niveles de empatía en estudiantes de medicina de la Universidad Metropolitana de Barranquilla.

MATERIAL Y METODOS

Este trabajo es de tipo exploratorio con análisis transversal. La muestra analizada estuvo constituida por los estudiantes de primero a sexto año académico de la carrera de Medicina de la Universidad Metropolitana de Barranquilla (Colombia) (n = 1581 de un N= 2061). La estratificación por año académico fue la siguiente: primero: 219; segundo: 324; tercero: 258; cuarto: 278; quinto: 359 y sexto: 143. En el factor género, la composición muestral fue la siguiente: femenino: 1146 y masculino: 435. La recolección de datos se realizó en julio de 2016. A los participantes se les aplicó la Escala de Empatía Médica de Jefferson (EEMJ) en la versión en español para estudiantes de medicina (versión S), validada en México y Chile (1, 2). Antes de ser aplicada la EEMJ fue sometida a criterio de jueces (tres académicos relevantes de profesión médico) con el objeto de verificar la validez cultural y de contenido (2). La comprensión de los estudiantes de la escala adaptada culturalmente se realizó mediante una prueba piloto, la aplicación de la EEMJ fue anónima y confidencial (operador neutral) siguiendo criterios bioéticos basados en las normas de Helsinski.

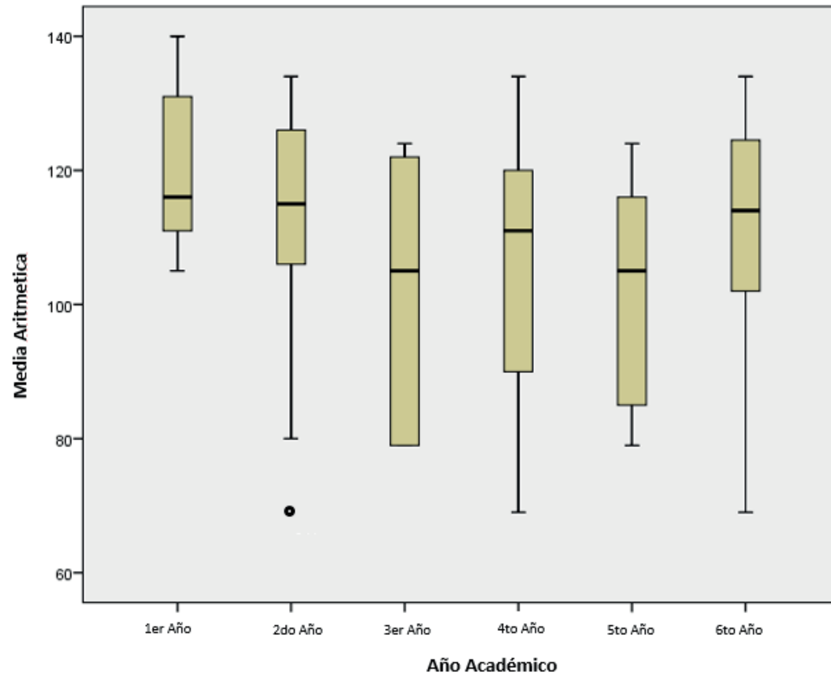
ANALISIS ESTADÍSTICO.

Se estimaron las medias y desviaciones estándar. Se aplicó un análisis de varianza (ANOVA) bifactorial (modelo III), con el objeto de encontrar diferencias de las medias entre los años académicos, entre los géneros y en la interacción de estos dos factores, previa verificación de los supuestos de normalidad (test de Kolmogorov-Smirnov) y de igualdad de varianza (Levene), así como la estimación la confiabilidad interna de los datos mediante el alpha de Cronbach general y el coeficiente de correlación intraclase, y los valores de alfa de Cronbach en la medida que se eliminaban cada uno de los elementos (preguntas), T^2 de Hotelling y prueba de no aditividad de Tukey.

Posteriormente, se empleó la prueba de comparación múltiple de Tukey, con el propósito de determinar el orden jerárquico de las medias. Los datos fueron descritos mediante gráficos de cajas. El nivel de significación utilizado fue de $\alpha \leq 0,05$ y $\beta < 0,20$ en todos los casos y procesados mediante el programa estadístico SPSS 20.0.

RESULTADOS

Los resultados de la estimación de las medias, la desviación estándar y el tamaño de la muestra en el factor "Años Académicos" se muestran en la Figura 1 y la combinación de los niveles de ambos factores, se muestran en la Tabla 1.



Fuente: Fuente: Elaborada por los autores.

Figura 1. Resultados de las medias y desviaciones estándar en cada uno de los años académicos representada en gráfico de cajas (incluye datos atípicos)

Tabla 1. Resultados de la estimación de la media y desviación estándar en cada año académico y en cada género

Año Académico	Genero	Media	Desviación estándar	n
Primer Año	Femenino	120,31	11,361	158
	Masculino	122,38	11,825	61
	Total	120,89	11,502	219
Segundo Año	Femenino	114,64	13,664	200
	Masculino	111,24	15,382	124
	Total	113,34	14,417	324
Tercer Año	Femenino	99,68	18,442	180
	Masculino	102,47	18,425	78
	Total	100,52	18,446	258

Continúa...

Año Académico	Genero	Media	Desviación estándar	n
Cuarto Año	Femenino	106,71	15,132	206
	Masculino	104,87	17,019	72
	Total	106,23	15,632	278
Quinto Año	Femenino	103,63	16,329	282
	Masculino	103,27	16,668	77
	Total	103,55	16,380	359
Sexto Año	Femenino	112,23	15,857	120
	Masculino	105,83	14,990	23
	Total	111,20	15,846	143
Total	Femenino	108,68	16,786	1146
	Masculino	108,48	17,239	435
	Total	108,63	16,907	1581

Fuente: datos tabulados por autores.

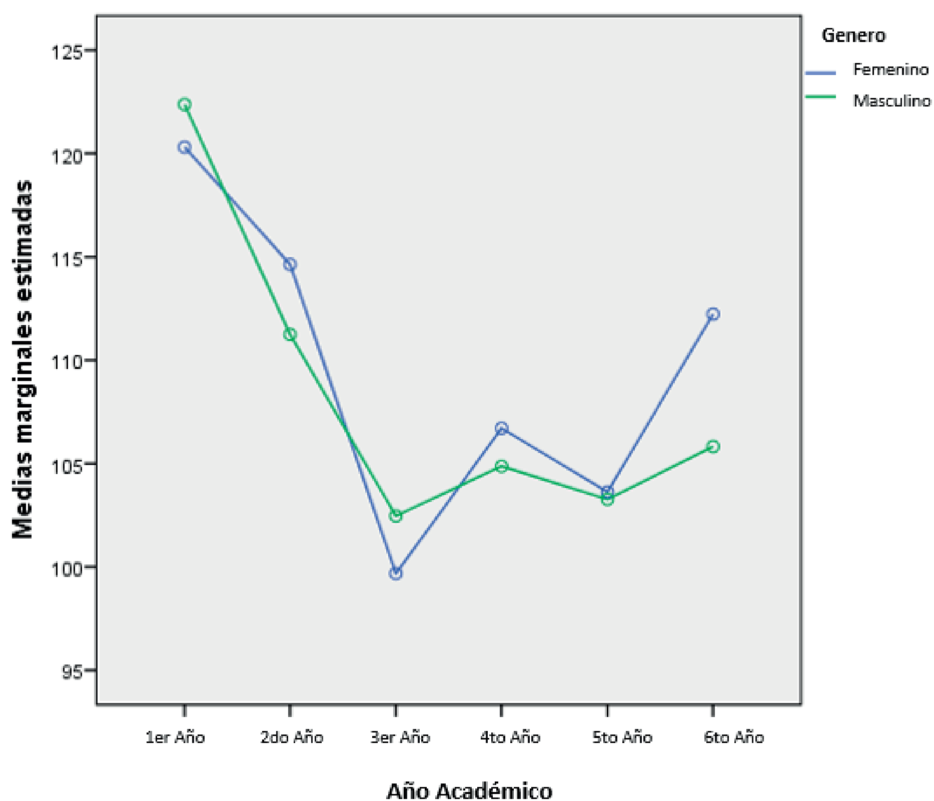
Los resultados del ANOVA fueron significativos (p=0,001) para el factor "Años Académicos", pero no para el "Género" (p=0,224) y la interacción (p=0,098). El valor de eta cuadrado fue de 1,0 para el factor Año Académico, todo lo cual demuestra que la probabilidad de cometer el error de tipo II es igual a 0,0. El otro factor y la interacción tuvieron valores inferiores al valor de la potencia aceptada (0,80). De estos resultados se puede inferir que el tamaño del efecto de las diferencias estadísticas encontradas es alto. El valor del R^2 corregido fue de 0,152; lo cual quiere decir que los factores estudiados explican el 15,2 % de la variación total de la empatía. En la Tabla 2 se observan los resultados de la comparación múltiple de las medias de los Años Académicos. Se encontró que las medias forman cuatro subgrupos con diferencias significativas entre ellas (p<0,05). El primer grupo está constituido por las medias de tercero y quinto año (entre las cuales no existen diferencias significativas (p>0,05). El segundo grupo está formado por las medias de quinto y cuarto año (entre las cuales no existen diferencias significativas (p>0,05), pero, la media de cuarto año si difiere significativamente con respecto a la media de tercer año (p<0,05). El tercer grupo está formado por las medias de sexto y segundo año (entre las cuales no existen diferencias significativas (p>0,05); pero ambas difieren significativamente (p<0,05) de los grupos 1 y 2. Por último, en el cuarto grupo se observa la media del primer año, la cual difiere significativamente (p<0,05) de todos los demás grupos.

En la Figura 2 se muestra la distribución de las medias de los géneros en cada uno de los años académicos. Se observó que el comportamiento es semejante en ambos géneros y ambos decaen de primero a tercero y comienza un leve incremento de los niveles de empatía a partir de cuarto año.

Tabla 2. Resultados de la comparación de las medias observadas en cada año académico

Año Académico	N	Subconjunto			
		1	2	3	4
Tercer Año	258	100,52			
Quinto Año	359	103,55	103,55		
Cuarto Año	278		106,23		
Sexto Año	143			111,20	
Segundo Año	324			113,34	
Primer Año	219				120,89
Sig.		,269	,409	,659	1,000

Fuente: datos tabulados por autores



Fuente: Elaborada por los autores.

Figura 2. Resultados de la representación en una gráfica aritmética simple de los resultados de las medias en cada uno de los años académicos y géneros examinados

ANÁLISIS Y DISCUSIÓN

La investigación realizada en los estudiantes de la Universidad Metropolitana del Programa de Medicina tuvo como objetivo evaluar el nivel de empatía de los estudiantes según género y año de estudio, observándose una diferencia significativa con otros estudios hechos en programas de medicina de universidades latinoamericanas (15-25) donde los estudiantes entran con grandes niveles de empatía y descienden sustancialmente en los años segundo y tercero y después mantienen un comportamiento "in crescendo", mientras que en este trabajo se observó una reducción en el quinto año en comparación con lo observado en el cuarto año. Probablemente esto se deba a factores relacionado con la especificidad de las prácticas formativas, donde los aspectos medico quirúrgicos demandan menos contacto personal con el paciente en comparación con los referidos a la Medicina Interna, Pediatría y Ginecología y obstetricia.

Las prácticas formativas en instituciones hospitalarias con atención de pacientes demandan una mayor formación humanística, además, es mayor la permanencia en los estudios de quienes tienen mayor nivel de empatía, ya que ser empático es una emoción y no cualidad que nace del esfuerzo por comprender la relación asistencial o vinculo del paciente, lo que podría explicar porque se espera que en los últimos años, quinto y sexto el nivel de empatía ascienda.

De esta manera, a medida que el estudiante de medicina comprenda y entienda lo que el paciente siente o piensa, a través de la relación médico–paciente que se instaura en los semestres de clínica y practica hospitalaria, será mejor, en términos empáticos, su atención (28).

Respecto a los semestres de formación, se evidencian diferencias significativas en los extremos del proceso formativo, primero y sexto semestre en comparación con el segundo y tercer año donde se observa un menor nivel de empatía, probablemente ello se deba a la expectativa no colmada frente a lo esperado, explicándose de esa manera los resultados observados, lo que invita a considerar, si se asume que la empatía es enseñable, bien sea desde el currículo oculto, o como parte del currículo oficial, trabajar con los estudiantes su actitud empática desde el inicio de sus actividades formativas, tanto en escenarios de aprendizaje de prácticas formativas, así como en los de actividades teóricas.

En la investigación se destaca que la puntuación obtenida en el primer año no se mantiene en el segundo año y tercer año, mostrando patrones de disminución para los hombres y las mujeres, lo cual, como ya describimos podría guardar relación con el hecho que el estudiante no logre empalmar sus expectativas, contenidas en su imaginario, con lo real de su práctica formativa en el programa, lo que puede promover en él una desmotivación y disminución de sus emociones empáticas frente al ejercicio de las actividades propias de la profesión que estudia.

El estudio demostró que se afecta casi por igual a hombres y mujeres, resultado que difiere de otros estudios que ha mostrado que las mujeres son más empáticas que los hombres, siendo, incluso, en este estudio, en algunos casos mayor el nivel de empatía en los hombres que en las que las mujeres, lo cual puede estar explicados por variables que no fueron objeto de estudio, como, entre otras, la formación del estudiante de medicina durante la educación secundaria y nivel de educación de los padres.

La empatía guarda relación con el comportamiento individual de la calidad humana de cada persona, en este caso de cada estudiante, los cuales construyen su proyecto de vida incidido por su proceso de formación, que para el caso de medicina, demanda, especialmente a partir del cuarto año una íntima relación con el "otro" pretendiendo, tanto desde lo emocional como de lo cognitivo, comprenderlo "poniéndose en sus zapatos", lo que probablemente explique por qué generalmente a partir de ese momento se rompe la llamada "erosión empática", que es más frecuente entre el segundo y tercer año de estudio de medicina (29).

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Cross cultural adaptation of “Florida Patient Acceptance Survey” instrument that measures acceptance of patients of cardiac devices

Adaptación intercultural del instrumento "Encuesta de aceptación de pacientes de Florida" que mide la aceptación de pacientes a dispositivos cardíacos

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Abstract

Objective: *To cross-culturally adapt into the Colombian context the “Florida Patient Acceptance Survey” instrument which measures the acceptance of people implanted with cardiac stimulation devices.*
Materials and methods: *The methodology of translation and back translation has been followed, with the equivalence in cultural semantics to carry out the cross-cultural adaptation of the original version of the instrument Florida Patient Acceptance Survey (FPAS). In the process, experts participated in the areas of: cardiac rhythm disorders, mental health and the validation of health measurement instruments, as well as a professional in linguistics and a professional in statistics.*
Results: *It has been achieved to obtain a Spanish version of the FPAS instrument culturally adapted to the Colombian context, with the necessary adjustments for the understanding of the target population, in order to preserve the semantic and conceptual equivalence of the original version.*
Conclusions: *The Spanish version of the FPAS is semantically and culturally equivalent to its original English version. From the contributions of the experts, adjustments were made, that did not modify the essence of the instrument, after which all the psychometric tests will be performed to carry out the process of validation of the instrument.*

Key words: Cross cultural adaptation, Acceptance, instrument, Artificial Cardiac Stimulation.

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Resumen

Objective: *Adaptar transculturalmente al contexto colombiano el instrumento "Florida Patient Acceptance Survey" que mide la aceptación de las personas implantadas con dispositivos de estimulación cardiaca.*

Materiales y métodos*: Se ha seguido la metodología de traducción y retrotraducción, con equivalencia en semánticas culturales para llevar acabo la adaptación transcultural de la versión original del instrumento Florida Patient Acceptance Survey (FPAS). En el proceso participaron expertos en el área de: alteraciones del ritmo cardiaco, salud mental y validación de instrumentos de salud, así como, un profesional en lingüística y un profesional en estadística.*

Resultados*: Se logra obtener una versión en español del instrumento FPAS adaptada culturalmente al contexto colombiano, con la realización de ajustes necesarios para la comprensión de la población objeto, a fin de conservar la equivalencia semántica y conceptual de la versión original.*

Conclusiones*: La versión en español del FPAS es semántica y culturalmente equivalente a su versión original en inglés. A partir de los aportes de los expertos se realizaron ajustes que no modificaron la esencia del instrumento, posteriormente se realizarán las pruebas psicométricas para llevar a cabo el proceso de validez y fiabilidad.*

Palabras Clave: Adaptación cultural, Aceptación, instrumento, Estimulación Cardíaca Artificial

INTRODUCTION

Technological advances in health, such as cardiac stimulation devices, have allowed to improve the survival rates in people with severe cardiac arrhythmias, making their therapeutic use more frequent (1-5). Despite the positive results in terms of survival, it has been documented that the implanted people have physical, psychological and social difficulties to accept and integrate technology into everyday life (6-10), a fact that does not allow the obtaining of the maximum benefit from the devices in terms of quality of life (11,12).

The "Acceptance" has been a theoretical construct that emerges from the research process and has allowed addressing specifically the issues related to the integration of technology to everyday life. One of the first ones to use the term Acceptance, was Luderitz in 1994, who was interested in the psychological consequences and quality of life issues in the people implanted, defining the Acceptance of the patient as "the perception of the device, the perception of possible discharge, body image changes, changes in lifestyle, perceptions of patients and family members, concerns when returning home, and fear of complications "(13). Later in 1996, Burke, through a qualitative study, was able to identify the acceptance of technology as a central category of the process of living with a cardio-defibrillator, which was defined as "A process characterized by the choice to live with technology, the integration of technology in life, and living life through technology "(14). In 2005 Sears and collaborators defined that "patient acceptance is the psychological accommodation and understanding of the advantages and disadvantages of the device, the recommendation of the device to others, and obtaining benefits in biomedical, psychological functioning and social terms "(15). Likewise, it has been established that Acceptance is an indicator of success

of cardiac stimulation therapy, which is why these difficulties are required to be addressed by health professionals in charge of the care of people with this type of device.

However, the review of the literature shows that currently the specific instruments to assess and address the needs of adaptation in people with cardiac devices are few and there is not a version in Spanish for its use in the Hispanic context, which makes it imperative to have this type of instrument. After the bibliographic inquiries and by virtue of their optimal psychometric values, the Florida Patient Acceptance Survey (FPAS) instrument is chosen, which allows to measure the level of acceptance of the patient to the device, being a specific indicator for people with cardiac stimulation devices. The FPAS consists of 18 items with a Likert-type response scale, assessing four categories or dimensions: return to life, distress related to the device, positive assessment and body image concerns. The scale was developed through a psychometric study in 2005, reporting a Cronbach alpha of 0.83 for the whole scale and for each of the categories or dimensions a Cronbach coefficient between 0.74 to 0.89; Likewise, it demonstrated convergent validity with the SF - 36 quality of life scale and divergent validity with the CES - D and STAI scales (15). The scale has been adapted and validated in Danish population, where it was reported that the validity of the instrument is confirmed for the four factors with a Cronbach alpha of 0.73 to 0.85, so the FPAS proved to be a valid and reliable measure of acceptance to the device in patients with cardiac stimulation devices (16,17).

Taking into account that the Florida Patient Acceptance Survey (FPAS) is a specific measure for people with cardiac devices whose original version was developed in the English language and has not yet been applied in the Spanish-speaking population, it is required to perform the process of transcultural adaptation of the instrument to the Colombian population, and thus have a valid tool that allows addressing the acceptance of the patient of the device of cardiac stimulation to everyday life.

MATERIALS AND METHODS

The translation and bilingual back-translation methodology was used to carry out the process of transcultural adaptation of the FPAS instrument (18,19), which seeks to obtain the semantic equivalence of the original instrument to the version obtained for the Colombian context as observed in figure 1, permission was previously requested from author Samuel Sears for use.

Two Bilingual translators of Spanish mother tongue carried out the translation into Spanish of the instrument independently; each translated version was evaluated jointly by the research team and the translators arriving at a preliminary version of the instrument that was sent to 5 experts for carrying out the content and facial validity.

For the selection of experts, the criteria proposed by Skjong and Wentworht were taken into account: 1) experience in making judgments and making decisions based on evidence or expertise 2) reputation in the community, 3) availability and motivation to participate; and 4) impartiality and inherent qualities such as self-confidence and adaptability (20). The group of experts was made up of: 1 expert nurse in cardiac stimulation devices, 2 nurses with experience in validation of measurement instruments and management of patients with cardiac

rhythm disorders, 1 psychologist nurse specialist in Mental Health and 1 Physician Electrophysiologist.

Once the result of the evaluation was obtained by the experts, the observations by the researchers and the linguist were reviewed one by one in order to achieve the semantic adaptation to the Colombian context. The final version of the instrument was translated back into the English language by a bilingual translator, a version that was sent to the original author who evaluated it and gave his endorsement, to continue with the psychometric process of reliability and validity.

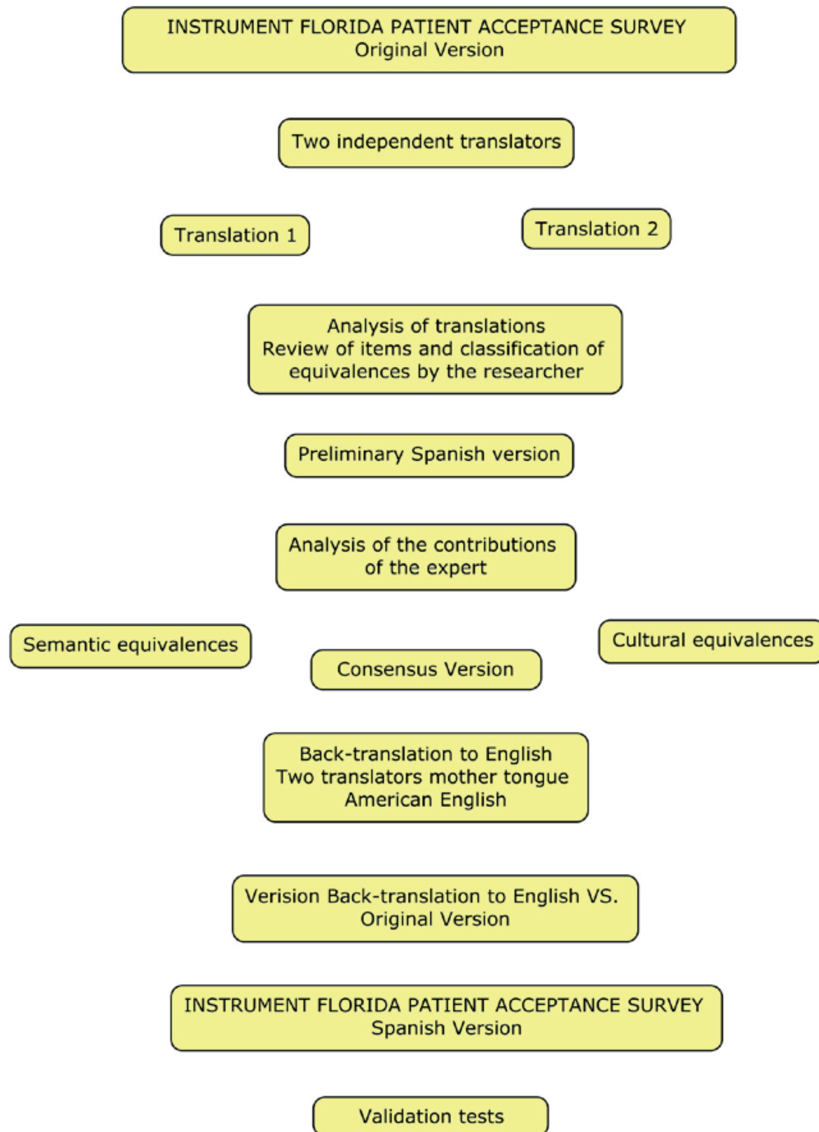

Figura 1. Translation and back-translation process

RESULTS

The FPAS instrument translated into Spanish had some modifications in order to achieve its transcultural adaptation to the Colombian context, considering the observations of the experts, the professional in linguistics and the statistical advice in order to achieve an instrument semantically equivalent to the original. It was taken into account that in the English language a word can have different meanings according to the context of the sentence, when translated literally into the Spanish language it can lose its meaning and affect the sentence that is intended to be evaluated, as is the case of the items 3 and 14 of the original instrument that contained the word "*disfigured*" that when translated into the Spanish language represents "desfigurado", a word that in the Spanish language is frequently associated with the loss of some part of the body, therefore it does not reflect the condition of having a cardiac device in the body. Initially, a search was made of the meaning in English and Spanish of the word, in order to find the appropriate semantic equivalence, later the synonyms were searched in the English language to cover greater possibilities and the suggestions made by the experts were evaluated. All these results were reviewed by the research team and the linguist, making the modifications, as can be seen in table 1.

Table 1. Process semantic equivalence of the item

Original Item	Translated item	Consensual Item	Item Retranslated to English	Final Version of the Item
I avoid my usual activities because I feel disfigured by my device.	Evito hacer mis actividades usuales porque me siento desfigurado por mi dispositivo.	Evito hacer mis actividades usuales porque me siento limitado por mi dispositivo.	I avoid engaging in my day-to-day activities because I feel limited by my device.	Evito hacer mis actividades usuales porque me siento limitado por mi dispositivo.
The positive benefits of this device out-weigh the negatives.	Los beneficios del dispositivo exceden las desventajas.	Tengo claro que el dispositivo ofrece más ventajas que inconvenientes.	It is clear to me that the device offers more advantages than challenges.	Tengo claro que el dispositivo ofrece más ventajas que inconvenientes.
I feel that others see me as disfigured by my device.	Siento que otros me ven desfigurado por mi dispositivo.	Siento que otros me ven diferente físicamente por mi dispositivo.	I feel that others view me differently because of my device.	Siento que otros me ven diferente físicamente por mi dispositivo.

Fuente: Castillo Sierra DM, González Consuegra RV. Intervención De Enfermería Para La Aceptación Del Paciente Al Cardiodesfibrilador Aplicada En El Preimplante.

Similarly, other items to be translated into Spanish, could give an ambiguity to what is being asked, as for example item 10 of the original instrument refers to: "*would you receive the device again*", in this case the word again is open to an ambiguous aspect, since there is no reference in what time or circumstance this situation could be given to be evaluated by the person who diligently proceeds, requiring to be adjusted in the following manner "*if necessary, would you receive the device again*" to give clarity; Another aspect that is relevant

is the context, given that in Colombia the older adult lacks job opportunities, while in the United States, where the instrument was developed, this population still has a productive opportunity, this is how item 6 in its version original translated into Spanish contemplates: "*I have confidence in my ability to return to work, if I wanted to do it*", what made the item exclusive for this population group, with the purpose of making it inclusive in our context was generalized to "*daily activities*", which involves the work aspect.

Finally, as part of the transcultural adaptation of the instrument in the Spanish language, a different ordering of the items was given for two fundamental reasons: the first responds to the observations issued by the experts, who suggested that the first item contemplated in the original instrument "*I get depressed when I think of the device*" has a negative connotation to start an instrument, which can generate an undesirable impact on the person who respomds, and the second reason, is due to the grouping of items by type of response, taking into account that once the items analyzed by the research team and the statistician, the response of certain items are more consistent with a type of frequency, such as the item "*I avoid doing activities that I enjoy by my device*"; It is important to clarify that this ordering of the items in the Spanish version does not alter the score awarded on the Likert scale, but the directionality of the answer for subsequent statistical analyzes.

DISCUSSION

A culturally adapted to the Colombian context Spanish version of the *Florida Patient Acceptance Survey (FPAS)* is obtained as shown in figure 2, despite the modifications made, a semantic equivalent to the original version is maintained, a circumstance that was validated by the original author of the instrument, who told the research team that the essence of the instrument remained to evaluate the acceptance of people to cardiac devices. This article shows the process that was carried out to obtain an adequate translation and adaptation of the instrument, which are the first steps of the process, since as mentioned by Escobar Bravo "*The adaptation of an instrument includes, of course, its translation , its cultural and idiomatic adaptation and the verification of the psychometric characteristics of reliability and validity* "(21); the methodology used for the cultural adaptation of the instrument is the one recommended by experts in the field of validation of measurement instruments (18,19,22), the presented version is coherent with the aspects of a cultural adaptation and will allow obtaining psychometric results similar to those of the original instrument.

It is important to subject the instruments of measurement to cultural adaptation and not only to carry out a mere translation of them, before this, Carvajal mentions "*The way of asking and the language used are sources of bias, but factors are not less so cultural factors that lead to the same question being valid or not in one language or another, or even in different countries that share the same language* "(23), a fact that could be validated through the process of cultural adaptation of the FPAS instrument , where it was evidenced that the English language can have multiple meanings when translated into Spanish and even more so in a specific context such as the Colombian.

Similarly, some authors have described the relevance of carrying out the processes of cultural adaptation of the instruments, not only in terms of semantic equivalence with the original versions, but in terms of decreasing time

and costs in the research processes, allowing the strengthening of existing measures, as well as expanding their use in different populations, making empirical indicators more universal in terms of results in health care, which allows to respond to the multicultural needs of a globalized world, which in many cases, demands immediate responses from different health systems (21,23,24).

Finally, it is important to clarify that the fact of having this version in Spanish culturally adapted to the Colombian context does not mean that the instrument has the same psychometric properties of the original instrument, as mentioned above, this constitutes the first steps of the validation, and a following process will define the psychometric properties of this version of *the Florida Patient Acceptance Survey (FPAS).*

**CUESTIONARIO DE FLORIDA PARA LA ACEPTACIÓN DEL PACIENTE (FPAS)
VERSIÓN EN ESPAÑOL**

Queremos saber qué significa para usted vivir con un dispositivo médico. A continuación, encontrará unas afirmaciones que describen lo que es vivir con un dispositivo médico. Por favor, indique si usted está de acuerdo o en desacuerdo con los enunciados marcando la casilla más apropiada.

	Totalmente en desacuerdo	Un poco en desacuerdo	Ni de acuerdo ni en desacuerdo	Un poco en acuerdo	Totalmente de acuerdo
1. Definitivamente el dispositivo era la mejor opción para mi tratamiento.					
2. Tengo claro que el dispositivo ofrece más ventajas que inconvenientes.					
3. He continuado con mi vida sexual normal después del implante del dispositivo.					
4. En caso de ser necesario recibiría el dispositivo nuevamente.					
5. Tengo los conocimientos suficientes acerca de las precauciones que debo tener por mi dispositivo.					
6. He retomado mi vida por completo después del implante del dispositivo.					
7. Entiendo bien lo que el dispositivo hace por mí.					

Continúa...

	Nunca	Pocas veces	A veces si, a veces no	Muchas veces	Siempre
8. Me deprimo cuando pienso en el dispositivo.					
9. Evito hacer actividades que disfruto por mi dispositivo.					
10. Evito hacer mis actividades usuales porque me siento limitado por mi dispositivo.					
11. Es difícil para mí vivir diariamente sin pensar en el dispositivo.					
12. Tengo confianza en mí habilidad para regresar a mis actividades cotidianas.					
13. Estoy seguro de no sufrir algún daño que comprometa mi vida gracias al dispositivo.					
14. Soy cuidadoso cuando abrazo y beso a mis seres queridos.					
15. Siento que otros me ven diferente físicamente por mi dispositivo.					
16. Siento que ha desmejorado mi apariencia física por el dispositivo.					
17. Me siento limitado para hacer actividades por mi familia como lo hacía antes del dispositivo.					
18. Me preocupa regresar a mis actividades cotidianas.					

Figure **2** .Cultural Adaptation of the Florida Patient Acceptance Survey

CONCLUSIONS

The Spanish version of the instrument "Florida Questionnaire for Patient Acceptance FPAS", is semantically equivalent to the original instrument and adapted to the Colombian context; during the process it underwent minimal modifications that do not alter the essence of the instrument, it is a specific measure to the acceptance of people with cardiac stimulation devices, short and rapid completion in clinical practice and research. In a later phase, psychometric tests will be carried out for the validity and reliability of this version.

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Self-efficacy in physical activity in children, body mass index and physical activity level of their parents

Autoeficacia en la actividad física en niños, índice de masa corporal y nivel de actividad física de sus padres

Sandra Milena Ahumada Satoba[1], Magda Lucía Flórez Flórez[2]

Abstract

Objective: *To determine the relationship between self-efficacy in physical activity in children from 7 to 10 of a school in Bogotá, their body mass index and physical activity levels of parents.*
Method: *Correlative descriptive quantitative study, with a sample of 60 boys and girls between 7 to 10 and 11 months and their biological parents. For the collection of the information, a questionnaire was used to evaluate the self-efficacy towards physical activity in children and the International Physical Activity Questionnaire, long version. The analysis revolved around the correlation between the main variables supported by the Spearman and Gamma correlation coefficient. The explanatory models were based on the multiple regression analysis.*
Results: *The relationship between self-efficacy and children's BMI was negative (Spearman's coefficient of relation - 0.107 and Gamma correlation coefficient of -, 083). The relationship between the body mass index of the children and the physical activity level of their mothers was negative, (Spearman coefficient of relationship of 0.141, and a Gamma correlation coefficient of -, 113). The relationship between the self-efficacy towards the physical activity of the children and the physical activity level of their mothers was negative, (Spearman coefficient of 0.063, and Gamma of -, 160).*
Conclusion: *There is little statistical significance in the relationship between self-efficacy in physical activity in children, their body mass index and physical activity levels of parents.*

Key words: Self-efficacy, Motor activity, Nursing.

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Resumen

***Objective**: Determinar la relación entre la autoeficacia en actividad física en niños de 7 a 10 años de un colegio de Bogotá, su índice de masa corporal y los niveles de actividad física de los padres.*
***Método**: Estudio cuantitativo descriptivo correlacional, con una muestra de 60 niños y niñas entre 7 a 10 años 11 meses y sus padres biológicos. Para la recolección de la información se utilizaron el Cuestionario para evaluar la autoeficacia hacia la actividad física en niños y el Cuestionario Internacional de Actividad Física versión larga. El análisis giró alrededor de la correlación entre las variables principales apoyadas en el coeficiente de correlación Spearman y Gamma. Los modelos explicativos se fundamentaron en el análisis de regresión múltiple.*
***Resultados**: La relación entre la autoeficacia y el IMC de los niños fue negativa (coeficiente de relación de Spearman - 0,107 y coeficiente de correlación Gamma de -,083). La relación entre el índice de masa corporal de los niños y el nivel de actividad física de sus madres fue negativa, (coeficiente de relación de Spearman de 0,141, y un coeficiente de correlación Gamma de -,113). La relación entre la autoeficacia hacia la actividad física de los niños y el nivel de actividad física de sus madres fue negativa, (coeficiente de relación de Spearman 0,063, y Gamma de -,160).*
***Conclusión**: Existe poca significancia estadística en la relación entre la autoeficacia en actividad física en los niños, su índice de masa corporal y los niveles de actividad física de los padres.*
Palabras clave: Autoeficacia, Actividad motora, Enfermería.

INTRODUCTION

The socioeconomic aspect at a global and national level has led to an urbanization environment which has transformed the behavior of the population, even from childhood age and that are largely responsible for chronic non communicable diseases as is the example of excess weight. According to the World Health Organization (WHO) (1), sedentary lifestyle is one of the main causes of cardiovascular disease. The National Survey of Nutritional Situation in Colombia (ENSIN) (2) in 2010 published that 62% of children and teenagers (5-12 years) watch television or play video games for 2 hours or more during the day, a figure that has been increasing year after year, also reported that 13.4% of children and teenagers are overweight and 4.1% suffer obesity, thus concluding that the prevalence of overweight and obesity has increased by 25.9% in the last five years among children and teenagers.

The previously described data suggest that the children affected by overweight and obesity present factors that are definitely preventable, such as lack of physical activity (PA). But for actions taken to be effective with transcendental results when it comes to reducing excess weight in the children population with emphasis on PA, their characteristics should be very well known regarding this phenomenon, and this is where we inquire about of the capacities that they think they have to perform PA and / or in the presence of obstacles that limit it.

At this point it is essential to define physical activity not only as the action, but also how it can become a habit, and this is where it is worth highlighting that the WHO (3) in 2010 published the recommendations of PA where it is stated that all children and young people (5-17 years of age) should carry out daily physical activities in the form of games,

sports, travel, recreational activities, physical education or programmed exercises, in the family context and at school for 60 or more daily minutes.

It is necessary to affirm that there are different studies that reflect a relationship between the habits of PA of the parents and the level of self-efficacy of the children, is the case of the study by Olivares et al. (4), who found that the motivations, barriers, feelings of self-efficacy and self-esteem have a significant influence on physical activity. This study reflects the manifestations of obese children from 8 to 11 years, who report that they would like to have the support of their parents; highlights such as: "I know it's good to do exercises, but I would like my parents go with me to play or ride a bike." Darling and Steinberg (5) report that the practices carried out by parents as caregivers in the first years of life influence the behavior patterns of their children. The habits that people learn from childhood are acquired thanks to the habits of their parents, therefore they are the ones who initiate the education and implementation of PA practices, among others. Likewise, García et al. (6) found in their study that fathers and mothers influence the sedentary behavior of their children.

From this influence of the parents towards their children, a relationship between these behaviors and the self-efficacy in the PA generated in the children is proposed, which in turn is related to their Body Mass Index (BMI), since by having an adequate perception of the ability to perform PA (self-efficacy), more motivating and effective feelings are obtained at the time of initiating and continuing a PA program and therefore more likely to have an adequate weight, which will be reflected in the BMI.

Nursing as a discipline and profession responsible for care, including primary health care, has the task of knowing cognitive behavioral processes, based on the factors that affect the behavior of each child according to his family environment, which entails the acquisition of healthy behaviors, such as the performance of PA as a habit, so that from there, interventions aimed at improving the health condition of the children that will be the teenagers and adults of tomorrow. Based on the above, it is essential to highlight the Self-efficacy theory created by Albert Bandura (7), who studied the human being and his cognitive-behavioral aspect; from it, different research has been released, in the health environment and in the Nursing discipline, in which Bárbara Resnick (8) has concentrated with the objective of describing how the different concepts of the theory are applied to strengthen the motivation to perform PA in the child population and thus form more active and therefore healthier citizens.

Self-efficacy is defined by Resnick (8) as the judgments of a person about their own abilities that influence their actions, since in this case it is vitally important to produce changes in behavior, also affirms that there is a relationship between self-efficacy and specific health behaviors. he concept is the product of diverse sources: own experience, vicarious experience, social persuasion and the physiological and affective state.

The subjects with a high sense of self-efficacy will be involved in activities with a high interest and commitment, investing a great effort in what they do and increasing their effort in the face of difficulties and setbacks. Bandura (9) states that self-efficacy proves to be a factor of great importance in the face

of the motivation to adopt behaviors that promote health or stop harmful behaviors for it. The foregoing suggests that by using this theory, not only would it be possible to determine risk factors, but also that the person would be able to act to eliminate them and create new behaviors called protective factors.

MATERIALS AND METHODS

A correlational descriptive quantitative study was carried out, with a sample consisting of 60 children from 7 to 10 years of age from a school in Bogotá and their biological parents, whose main objective was to determine the correlation between self-efficacy in AF in children, their BMI and physical activity levels of parents. Inclusion criteria were children who were between 7 to 10 years and 11 months old and children who lived with their two parents or one of them and who were between 15 and 69 years of age. The exclusion criteria were given by children who had a cognitive disability and parents who had a physical disability.

To measure the self-efficacy towards PA in children, the Questionnaire to Evaluate the "Self-efficacy towards Physical Activity" was used in children aged 7 to 10 years and 11 months of Aedo and Ávila (10) which consists of 11 questions addressed, with a dichotomous response scale that measures three variables: Search for positive alternatives, Ability to overcome barriers and Expectations of ability. Each variable is classified according to the summation of its items such as: adequate or inadequate, and then the final evaluation of the entire instrument is given taking into account the sum of all variables as follows: two or more variables rated as adequate corresponds to a high self-efficacy and one or fewer variables rated as appropriate corresponds to a low self-efficacy The questionnaire is adapted to the Spanish language, has a high degree of congruence and adequate internal consistency (Construct validity:> 0.70, test-retest reliability: 0.867 and internal consistency: 0.735)

In relation to the measurement of the physical activity of the parents, the "International Physical Activity Questionnaire" (IPAQ) was used in its long version (11), which has 4 domains: PA in free time , domestic activities and in the garden, PA related to work and AP as a means of transportation, in turn interrogates about the three types of AP contained in the four domains, physical activities of vigorous intensity; Moderate intensity and walking PA, to classify the level of PA (low, moderate or high) the unit of measurement of the metabolic rate METs / min / week is used; a MET is the amount of heat emitted by a person in sitting position per square meter of skin and can have different values or multiples (walking: 3.3 MET, riding a bicycle: 6.0 MET, housework within the home: 3.0 MET, tasks in the garden and other activities of moderate intensity: 0.4 MET and vigorous activities 8,0 MET) for physical activities depending on their intensity, the MET / min / week is obtained by multiplying the MET factor assigned to each type of activity for the duration in minutes activity and for the weekly frequency. The IPAQ has a version in Spanish and has been validated at the Colombian level and has a Spearman coefficient of 0.8 and a validity of 0.3.

The Parent´s definition in this study is given according to the inclusion criteria in which one or both of the student's biological parents are taken into account, as in the case of non-biological parents, additional variables such as coexistence time should be analyzed. , from what age they live together, with whom the

boy or girl lived before, among others and this study did not have this scope.

For the interpretation of the IMC, the growth and development standards of WHO adopted in Colombia were taken into account through Resolution 2121 of 2010 of the Ministry of Social Protection (12), for children from 0 to 18 years of age, whose classification is given by the corresponding grid that determines the standard deviation (SD) like this:

- BMI with D.E <-2: Thinness
- BMI with D.E> -2 to <-1: Risk of Thinness
- BMI with D.E> -1 to 1: Adequate
- BMI with D.E> 1 to <2: Overweight
- BMI with D.E> 2: Obesity

In this sense it is important to mention the corrected BMI concept, which emerged with the aim of operationalizing the BMI variable from the interpretation of the same value changes according to the age of the child, therefore it is obtained by dividing the BMI with age; for the respective interpretation is taken into account that the larger the number, the thinner the child is, therefore the smaller the number, the more weight the child has.

The research was endorsed by the Ethics Committee of the National University of Colombia and the ethical criteria described in Resolution 8430 of 1993 of the Ministry of Health, the Helsinki Resolution and in accordance with basic ethical principles were taken into account (respect for the people, beneficence and non-maleficence, autonomy, justice, confidentiality, reciprocity); In addition, there was informed consent and assent by the participants. It should be clarified that there was a minimum risk in its execution.

The data collection was developed in 6 stages. In stage 1, a pilot test was carried out, in stage 2 the selection of the School was made, taking into account that it had primary grades where children were found that fulfilled the inclusion criteria, and where there was not the presence of extracurricular entities that would encourage PA. In stage 3, the children and their parents were selected, who met the inclusion criteria and who, in a previously scheduled meeting of parents, were guided and informed in a clear and simple manner about the investigation, its objectives, justification, procedure to fill out the questionnaires and it was made clear that there were not erroneous answers and they only had to answer truthfully; additionaly , the explanation of the informed consent and assent was made for its later signing by those who accepted the realization of the study, previous authorization on the part of the school, for the programming and coordination. In stage 4, an interview was conducted with the parents who agreed to participate in the study with the aim of filling out the IPAQ Long version. The interview was developed in the school. In stage 5, an individual interview was conducted in a private area of the school to the children who accepted participation in the study and who had the objective of applying the Self-efficacy Questionnaire in PA. Finally, in stage 6, the anthropometric measurement of weight and height was performed in order to determine the BMI of the children. This procedure was carried out in the educational institution and was carried out by the author of the investigation.

The central analysis revolved around the correlation between the main variables supported by the Spearman and Gamma correlation coefficient and the construction of the

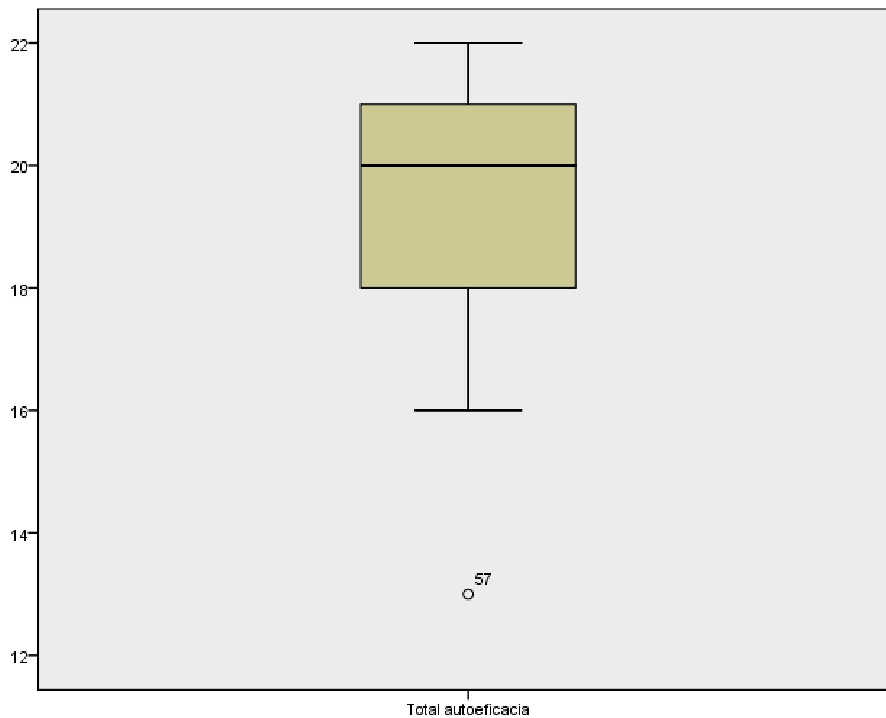
explanatory models based on the multiple regression analysis.

RESULTS

From the data collection, only the responses of children´s mothers were taken into account since the fathers who attended were insufficient to elaborate the data processing and its respective analysis.

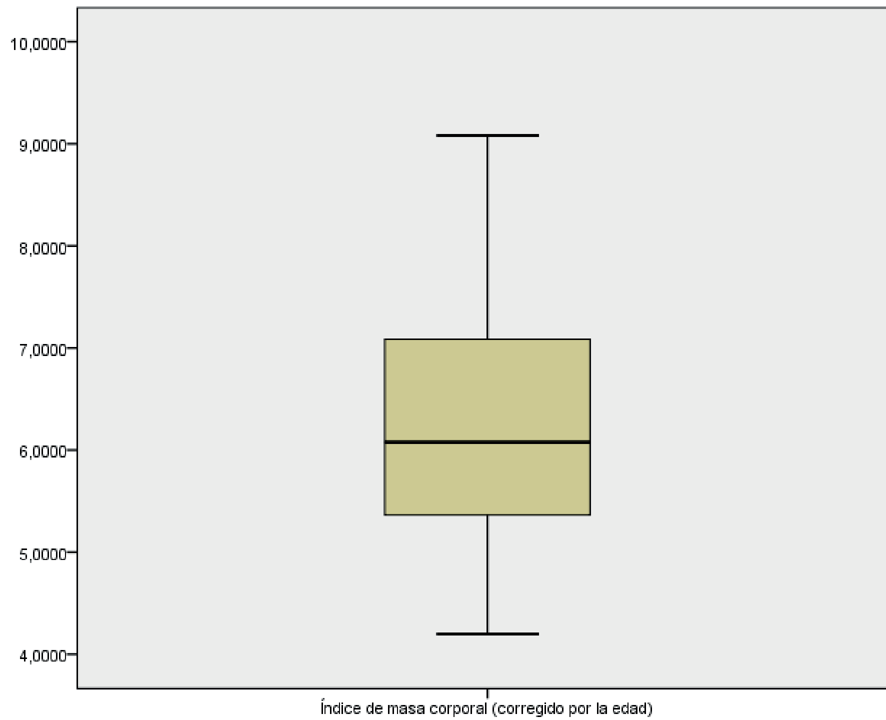
Regarding the level of self-efficacy in PA in children, it was found that it is high, as can be seen in graph No. 1. The Search dimension of positive alternatives, 88.3% of children had it as Adequate. The dimension Ability to overcome barriers, 35% of children had inadequate, while 65% adequate. The dimension of Skill Expectations, 96.6% of children had Adequate.

Regarding the BMI, it can be seen in graph No. 2 that the children were mostly in the classification of Adequate for the age. Table 1 shows the data found according to the BMI classification based on the graphs corresponding to the BMI for Children, Girls from 5 to 18 Years of the WHO Growth Patterns in Colombia (12).



Source: Research database

Graph 1. Level of Self-efficacy in physical activity in boys and girls



Source: Research database

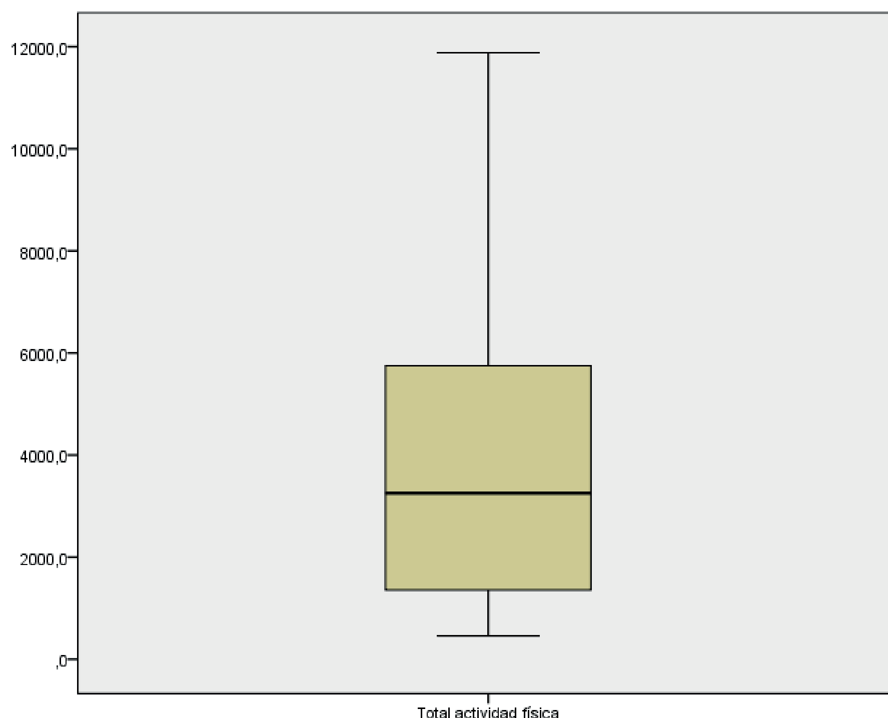
Graph 2. Body Mass Index of boys and girls

Table 1. Classification of Body Mass Index of boys and girls

CLASSIFICATION	GIRLS	BOYS	TOTAL
Thinness risk	0 (0%)	3 (5%)	3 (5%)
Adequate	21 (35%)	17 (28,3%)	38 (63,3%)
Overweight	7 (11,7%)	5 (8,3%)	12 (20%)
Obesity	0 (0%)	7 (11,7%)	7 (11,7%)
TOTAL	28 (46,7%)	32 (53,3%)	60 (100%)

Source: Research database

The findings obtained for the level of PA of the mothers show that it oscillates between 459 and 11884 Multiples of Resting Metabolic Rate (METs), the average was 3747 METs. In the 25th percentile, 1308 METs are located, in 50 there are 3255 and in 75, 5749 METs are located, as can be seen in graph No. 3.



Source: Research database

Graph 3. Total METs Physical Activity of mothers

According to the amount of METs obtained in the 3 types of PA, mothers were found to have values ranging from 0 to 3762 METs; in moderate PA, mothers spend between 0 to 6095 METs and in vigorous PA it was found that mothers spend between 0 to 8400 METs.

In table 2 it can be seen that in relation to the amount of METs obtained in the domain work, mothers spend between 0 to 7000 METs; in the Transport domain they spend between 0 to 4584 METs; in the domain of domestic activities and gardening, they spend between 0 to 5100 METs; and in the domain of sports, recreation and free time, they spend between 0 to 6000 METs.

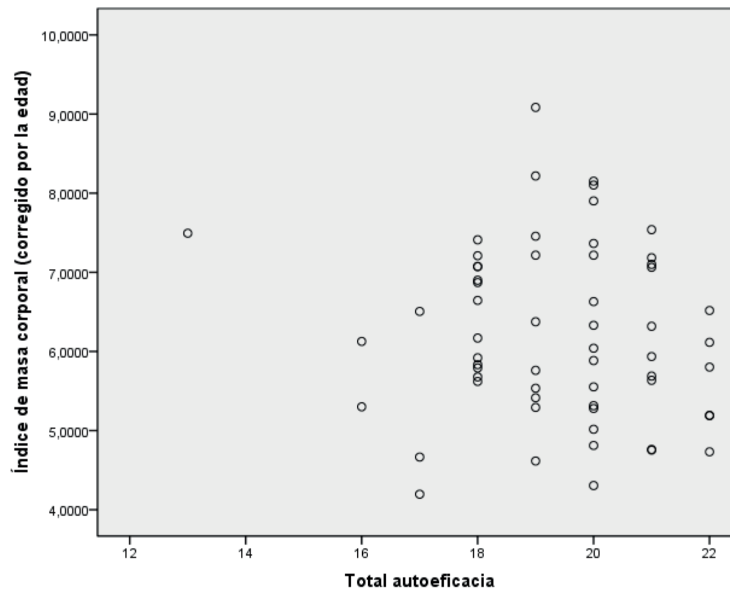
Based on the foregoing and the results found, it is noted that in the activity of Walk, mothers obtained a low level and few women met the requirement in weekly time. According to the domains it was observed that in relation to Work the physical activity is very low (0 to 570 METs.); in terms of transport, physical activity is low (334 METs at 915 METs.); at home and gardening physical activity is low (540 METs at 1890 METs.) and in free time physical activity is very low (0 to 1159 METs.).

Regarding the relationship between Self-efficacy and BMI, it can be seen in figure 4 that there is no statistically significant relationship, finding a coefficient of -0.107 (p = 0.415) and the Gamma correlation coefficient of -, 083.

Table 2. Mothers physical activity level

		Total physical activity	Total walking	Total moderate activities	Total vigorous activities	Total work	Total transport	Total domestic and gardening activities	Total free time
N° Válidos		60	60	60	60	60	60	60	60
N° Perdidos		0	0	0	0	0	0	0	0
Average		3747,03	1026,85	1874,85	845,33	793,90	763,37	1348,51	841,123
Desv. típ.		2506,73	871,242	1396,493	1613,039	1599,1	819,48	1122,47	1323,87
Minimum		459,0	,0	,0	,0	,0	,0	,0	,0
Maximum		11884,0	3762,0	6095,0	8400,0	7000,0	4584,0	5100,0	6000,0
Percentiles	25	1308,75	445,5	630,00	,00	,00	334,12	540,00	,00
	50	3255,00	676,50	1730,00	,00	,00	550,50	890,00	259,50
	75	5749,50	1559,25	2963,75	1140,00	570,00	915,75	1890,00	1159,50

Source: Research database

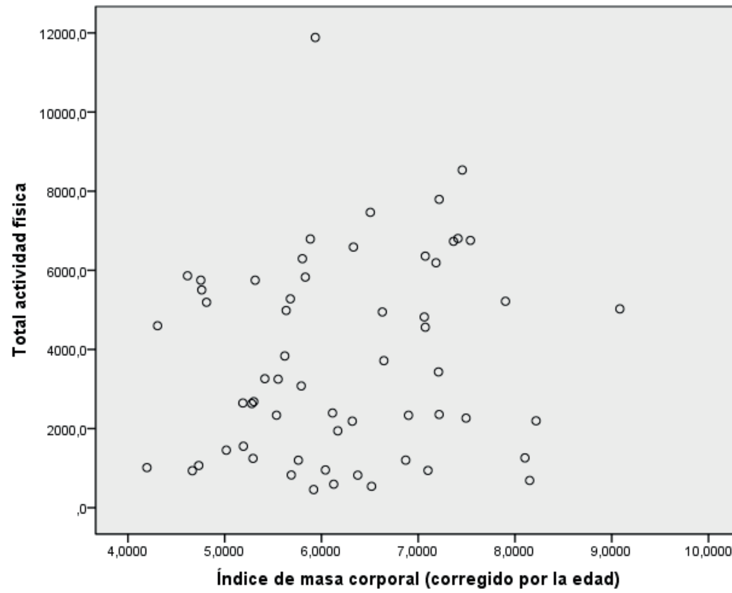


Source: Research database

Graph 4. Relationship Self-efficacy and Body Mass Index of boys and girls

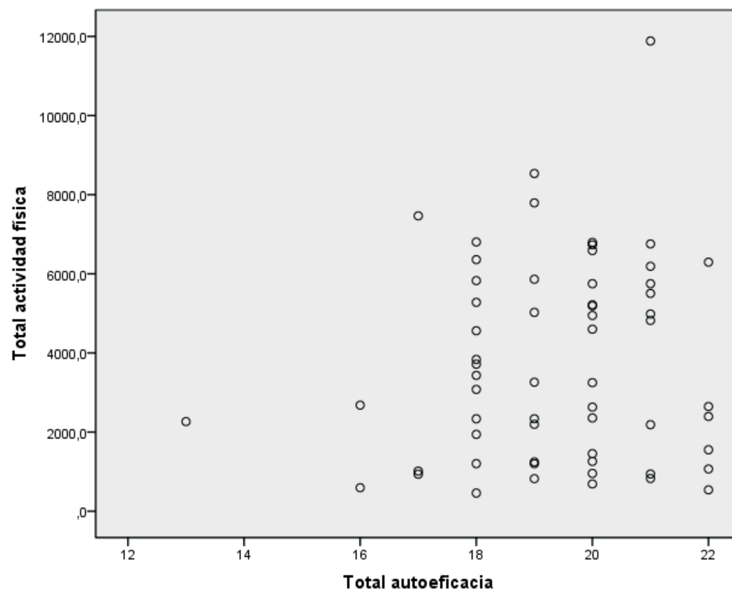
For the relationship between the BMI of the children and the PA level of their mothers, in graph Nº5 it can be seen that there is no relationship, finding a coefficient of relationship of 0.141 (p = 0.282), and the Gamma correlation coefficient of - , 113.

Regarding the relationship between Self-efficacy towards children's AF and their mothers' FA level, in graph 6 it can be seen that there is not relationship, finding a ratio of 0.063 (p = 0.632), and the coefficient of Gamma Correlation -, 160.



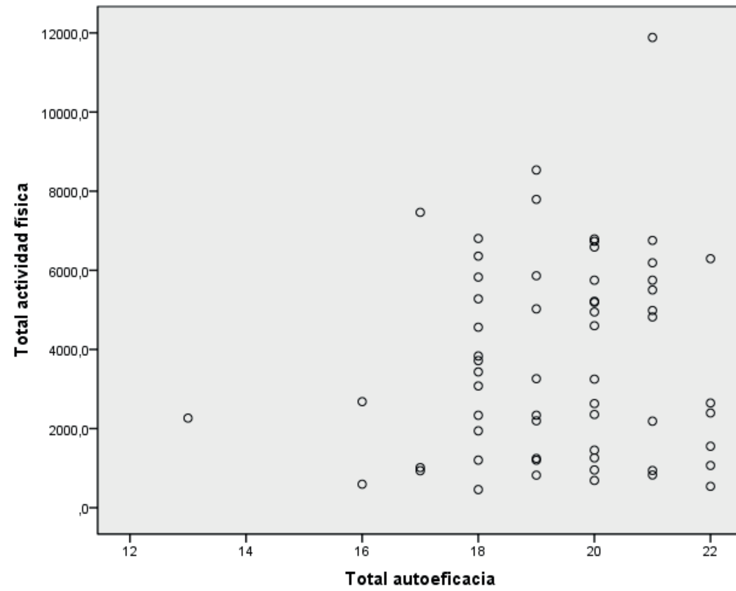
Source: Research database

Graph 5. Relationship Body Mass Index of boys and girls and level of Physical Activity of mothers



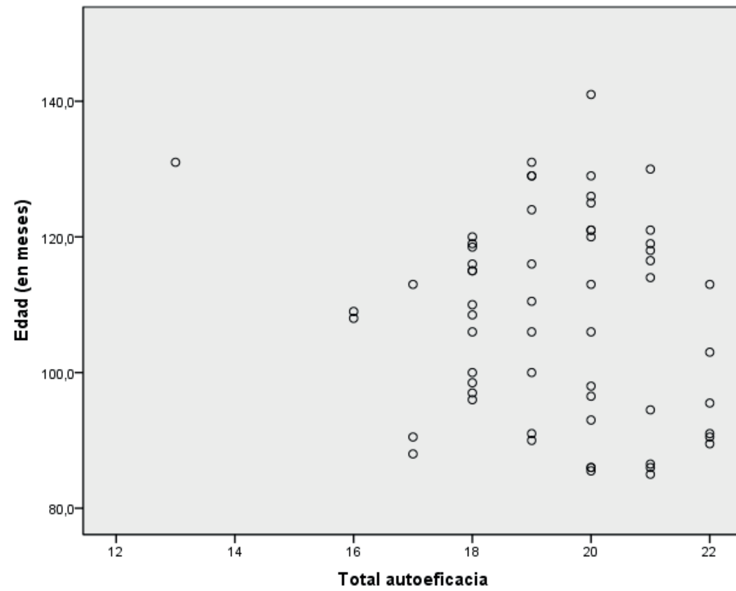
Source: Research database

Graph 6. Self-efficacy relationship in boys and girls and level of physical activity of mothers



Source: Research database

Graph 6. Self-efficacy relationship in boys and girls and level of physical activity of mothers



Source: Research database

Graph 7. Relationship between age and self-efficacy in physical activity of boys and girls

For the relationship between age and Self-efficacy towards children's AF, in graph Nº7 it can be observed that there is not relationship, finding a coefficient of relation of -0.139 (p = 0.288).

DISCUSSION

According to the data found, it can be analyzed that self-efficacy towards AFPA is high in 93.3% of boys and girls, in terms of the dimensions of Search for positive alternatives and Skill expectations is adequate; This means that most children have the capacity to explore possible alternatives for the realization of PA and that they also have sufficient confidence in their abilities to perform it properly. 35% of children have inadequate capacity to overcome barriers, which indicates that a large part of them are not searching for solutions to the obstacles they find to perform PF behavior, a fact that is important to analyze since knowing their cause it could help to identify determining factors and the forms of support to face the difficulties that prevent this activity.

Of the total of 60 children, 63.3% of them have an adequate BMI, of which 35% of the total corresponds to the female gender, 20% of the students are overweight, the female gender corresponds to 11.7% and 8.3% male gender. 11.6% have obesity, predominantly the male gender. In summary, 31.7% of the population is overweight, where children predominate with 20% compared to 11.7% of girls.

Similar results were obtained in the study carried out by Hernández (13), where it indicates that excess weight affects 24.1% of school children: overweight 15.99% and obesity 8.18%. This is where you can see that there is a tendency to increase the figures of overweight and obesity in the different regions of Colombia.

It is important to highlight that the results surpass those described by the ENSIN 2015 (14), in which it was revealed that 24.4% of school children were overweight.

The above reconfirms that overweight and obesity in the child population are increasing and although it is not the majority of the population it is important to face them so that these levels do not continue to increase, starting with identifying risk factors such as low weight that is also found in 5% of children.

Based on the results found, the level of PA of the mothers when performing the summation of all the activities (walking, moderate and vigorous activities), is mostly moderate, reporting a greater percentage of METs between 1308 and 574. In addition, finding that 30 mothers perform 150 minutes per week of PA and more, which indicates that, according to the classification of the IPAQ questionnaire, they perform moderate PA. However, when performing the summation for each domain it was evident that the level of PA was generally low, as can be seen below:

- Work: the physical activity that most mothers perform is very low, since they obtained between 0 to 570 METs.
- Transportation: the physical activity that most mothers perform is low, since they obtained between 334 METs to 915 METs
- House and gardening: most mothers perform between 540 METs at 1890 METs. In this domain the activity carried out is low

- Free time: the physical activity that the mothers perform is very low since they obtained between 0 to 1159 METs.

Taking into account the results described above, in the present study we did not find a statistically significant relationship between self-efficacy towards PA and the BMI of the students since, for the most part, their level of self-efficacy was high; 66.1% of students with high self-efficacy have an adequate BMI.

The results found may be due to the age in which the target population is located, through the interview it was possible to detect that their judgment regarding the ability to perform PA is high, regardless of their BMI, in addition because many of them attend extracurricular sports courses.

However, it is fundamental to analyze that self-efficacy is favoring maintaining an adequate weight for children, this statement can be complemented with the research done by Shauna et al (15), who state that health condition, motor skills and overweight affect self-efficacy to do PA.

According to the results found, there is no relationship between the PA of the mothers and the BMI of their children, although their relationship is negative, it is not statistically significant: this could be due to multiple causes of overweight and obesity such as, for example, Sánchez (16), states that eating habits may be more related to the body composition of children and the effect of growth on body composition.

Although the other risk factors should not be ignored, some modifiable others not. Among them are; Epigenetics: According to Valladares et al (17), the habits of the first 1000 days, Espinoza and Romero (18),the maternal history Valladares et al (17) and Jiménez et al (19), the birth weight Suarez, et al (20), alterations in breastfeeding Saavedra and Dattilo (21), environmental factors that are not generous towards physical activity: Camargo and Tique (22) and the lack of access to health services that do not allow knowing the health status of children and create an obstacle to access education in healthy habits.

In the present study it was also determined that there is no relationship between the PA of the mothers and the self-efficacy in PA of their children. Although it is noteworthy that during the interviews it was possible to identify that many of the PA habits of the mothers are transmitted to their children.

It should be remembered that the theory of self-efficacy has 4 sources, where there is a significant influence of the vicarious experience of other couples, such as the social environment:the School. An example is the study conducted in Mexico by Shamah et al (23) who applied the "Nutrition in movement" strategy, which suggests that interventions to prevent obesity should take into account changes within the school environment, and for greater impact, the inclusion of parents and teachers is recommended.

Through the interviews we could perceive a phenomenon for which a negative statistical analysis was obtained but its relationship is not so significant, this phenomenon is that among the eldest children, their self-efficacy is lower, in this sense Velázquez, et al (24) affirm that the increase in age is always accompanied by a decrease in the Perception of Motor Self-Efficacy. Similarly, Carrasco and Del Barrio (25) affirm that as adolescence approaches, levels of self-efficacy progressively decrease.

CONCLUSIONS AND ACKNOWLEDGMENTS

Resnick (8) has focused his theory of self-efficacy in PA. This being a behavior that must be generated and one of its sources is verbal persuasion, which was essential in the current investigation since parents can persuade their children to perform PA through actions and dialogue; but it has been seen from the perception of children that the fact that parents do not share recreational and sports activities with them, can become a barrier.

The result obtained from the instrument is interesting since it was observed that in general the target population had a high self-efficacy; but it coincides with other studies where it is reflected that the ability to overcome barriers is not adequate in a significant percentage therefore, it is necessary to deepen to know its causes.

With regard to the instrument, it is important to highlight what was referred by Oros, (26) when suggesting the use of a trichotomical instrument, which could influence the large percentage of children with high self-efficacy, this would lead to the modification of the instrument used by Aedo and Avila.

After the statistical analysis, no relationship was observed between these two variables of the study, although its tendency was negative, in the same way self-efficacy had not statistical influence on the BMI of the children but it is important to mention that 31.6% of students is overweight.

From the IPAQ questionnaire the classification of moderate PA of the mothers was obtained, although in this case it is noteworthy that seven participants met the requirements for both high and moderate AFPA, making reading and interpretation difficult, and several participants had to be eliminated, since they exceeded 960 minutes per week of PA and according to the questionnaire should not occur. The majority of METs obtained were in the domain of transportation, home and gardening, but not in free time, in addition to the moderate and vigorous activities, inconsistencies were observed since they did not apply to the target population, such as, for example, the work of gardening; therefore, it is vital that a questionnaire is created for the Colombian population, taking into account the theory to support it, although in some studies they have used pedometers and accelerometers, for which their use is recommended.

For future research it is important to take into account the data of the fathers of the children since, according to Bussey and Bandura (27), they say that according to psychoanalytic psychology, children identify with their mothers but between 3 and 5 years old children identify with their fathers and girls with their mothers, which points to the importance of obtaining data on physical activity behaviors carried out by fathers.

In spite of the little statistical significance with respect to the relationship of the variables, it cannot be denied that the habits and customs of the mothers are transmitted to their children. That is why it is important that these habits are adequate and healthy.

For this reason it is important that nursing be based on care, act on cardiovascular health with emphasis on the promotion of healthy lifestyles, beginning with education to avoid contact with sedentary lifestyle, this by strengthening the protective factors from the

home and from the school environment even reaching the institutional educational project through the formation of intergenerational meetings of PA.

The findings of this research are sufficient to continue encouraging the generation of knowledge and thus continue the path that must be taken to face the challenge of effective interventions of Nursing, based on theories such as self-efficacy and thus know how their sources influence more or less measure in the conduct of AF depending on the age and life cycle of the individual, and in this way help to reduce this problem of great interest that is altering the health and quality of life of children, adolescents and adults. They are the bases for the progress of the world.

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Depression in the elderly: A study in three cities of Colombia

Depresión en el adulto mayor: Un estudio en tres ciudades de Colombia

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Abstract

Objective: *To explore the demographic, health and functional factors associated with depression in the elderly in three cities from Colombia: Medellin, Barranquilla and Pasto.*
Materials and methods*: An analytical cross-sectional study. The study population corresponded to a probabilistic sample of 1514 adult whose age is 60 years or over. A sample was selected by a probabilistic sampling, in two-stage, and conglomerate, according to the geographical and administrative distribution of each city.*
Results*: The results support that the city of Pasto presents the highest number of elderly people with depression; conditions such as low educational level (PR = 4.11), hyperthyroidism / hypothyroidism (PR = 3.43), and dependence on activities of daily living such as using the telephone (PR = 3.80) increase the prevalence of the disease.*
Conclusion*: Depression is present in an important part of the population of older adults and is associated with conditions not only of health but also demographic and functional capacity. It is necessary to address these components from the public health that promotes the prevention of this condition if you want to contribute to the goals of active, satisfactory and healthy aging in Colombia and a better quality of life for this population.*
Keywords: Depression, elderly, health, functional capacity.

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Resumen

Objetivo: *Explorar los factores demográficos, de salud y de funcionalidad asociados con la depresión en los adultos mayores en tres ciudades de Colombia: Medellín, Barranquilla y Pasto.*
Material y métodos: *Estudio analítico transversal. La población del estudio correspondió a una muestra probabilística de 1514 adultos de 60 años y más. La muestra fue seleccionada mediante un muestreo probabilístico, por conglomerado, bietápico, según la distribución geográfica y administrativa de cada ciudad.*
Resultados: *Los resultados muestran que la ciudad de Pasto presenta el mayor número de adultos mayores con depresión; condiciones como el bajo nivel educativo (RP=4,11), el hipertiroidismo/hipotiroidismo (RP=3,43), y la dependencia en actividades básicas de la vida diaria como usar el teléfono (RP=3,80) incrementan la prevalencia de la enfermedad.*
Conclusión: *La depresión está presente en una parte importante de la población de adultos mayores y está asociada a condiciones no solo de salud sino también demográficas y de la capacidad funcional. Se hace necesario el abordaje de estos componentes desde la salud pública que promueva la prevención de esta condición si se quiere contribuir con las metas de envejecimiento activo, satisfactorio y saludable en Colombia y una mejor calidad de vida para esta población.*

Palabras clave: Depresión, adulto mayor, salud, capacidad funcional.

INTRODUCTION

In Colombia, the population of 60 years or more has growth rates higher than that of the total population; In 2005, the number of elderly people was 3,815,453, and 4,473,447 in 2010, with an annual growth rate of 3.18 % in that period, projecting an increase of 3.76 % by 2020. (1).

In developing countries, the health challenges faced by this population include an increase in the prevalence of chronic noncommunicable diseases, as well as a functional and cognitive deterioration that is aggravated by the socioeconomic environment of the country (2).

Depression is the most frequent psychiatric disorder among older adults (3); According to the World Health Organization (WHO) unipolar depression affects 7 % of people over 60 years of age and represents 5.7 % of years lived with disabilities in this population (4). In Colombia, the last mental health study reported that in people over 45 years of age, the prevalence of any depressive disorder was 5 % (5). In a study carried out in the department of Antioquia, the estimated prevalence of risk of depression in the elderly was 26.3 %, with women representing 64.2 % of the population at risk (6).

In the elderly, depression occurs with episodes of crying, sadness and apathy, accompanied by hopelessness, negligence, suicidal ideation, guilt, changes in sleep pattern, alterations in appetite, bowel movements, libido, among others (5,7). This symptomatology affects different dimensions of the older adult, including the physical, functional and social state.

In older adults diagnosed with depression, a high comorbidity has been found with chronic noncommunicable diseases such as diabetes mellitus (8), neoplastic pathology (9), pulmonary disease (10), among others.

In addition, depression affects eating behavior leading to malnutrition in older people (11). In countries such as South Africa, where the prevalence of geriatric malnutrition is high, it has been identified that more than 70 % of those who have this condition also experience depressive symptoms (2).

On the other hand, adults with symptoms of depression have a higher functional deficit (12), even geriatric depression has been negatively correlated with muscle strength, body resistance and flexibility in the lower part of the body, as well as muscle strength of the arm, agility and dynamic balance (13), which would affect the adequate performance in the activities of daily life.

Starting from the above, depression is a disease that decreases the quality of life of the elderly (14) and those who suffer it are unable to take advantage of the resources that surround them, because they lose autonomy due to their mental state. From this point of view, it could be argued that older adults with depression are in a state of vulnerability, understanding this concept as the limitations that a person has to take advantage of the resources generated by the state, the market and / or the community (15).

In Colombia there are no studies comparing depression in the elderly according to the city of residence; An example of this is that in the last National Mental Health Survey, conducted in 2015, a comparison was made of the prevalence of depression according to the regions of Colombia, but an analysis segregated by cities was not carried out (5). The present study aims to explore the demographic, health, and functionality factors associated with depression in older adults in three cities of Colombia: Medellín, Barranquilla and Pasto, in order to provide information to improve the quality of life of this population.

MATERIALS AND METHODS

Type of study

An analytical cross-sectional study was conducted in 2016, from a primary source of information for the search of the factors associated with depression in older adults residents in three cities of Colombia, selected by the number of elderly people and classified as large, medium and small populations: Medellín (391,429), Barranquilla (145,947) and Pasto (42,271) in 2016, according to DANE projections.

Participants

The study population corresponded to a probabilistic sample of 1514 adults 60 year of age and older, living in the urban area of the cities of Medellín (495), Barranquilla (513) and Pasto (506). This study is part of a macro project funded by Colciencias, where the calculation of sample size was made using the formula for finite populations, with a confidence level of 95 %, a sampling error of 5 %, a proportion of good health condition of 50 % and a design effect of 1.0, the sample size being enlarged by 15 % to correct possible information losses. The selection of the sample was carried out by means of a probabilistic sampling, by conglomerate, two-stage, according to the geographical and administrative distribution of each city. The present study on depression took the database of the macro project.

Instruments

A survey was applied to selected older adults, which consisted of questions related to demographic characteristics (age, sex, marital status, educational level, place of residence, etc.), and physical health status (diabetes, heart problems, nutritional, bone health, hypertension, etc.). To evaluate the depression, the Yesavage Geriatric Abbreviated Depression Scale was used, which consists of 15 questions (10 positive and 5 negative) and explores cognitive symptoms of a major depressive episode during the last fifteen days. The scale is widely used given that its completion requires five minutes on average, in addition, it presents an internal consistency and construct reliability in the Colombian population of 0.78 and 0.87, respectively (16).

For the measurement of functional capacity Barthel's instrument was used to evaluate independence in basic activities of daily life such as eating, bathing, dressing and undressing, going up and down stairs and moving around. The instrument shows good interobserver reliability with Kappa indexes between 0.47 and 1.00, and a Cronbach's alpha of 0.86 (17). Finally, the Lawton and Brody Scale was used to evaluate some instrumental activities of daily life such as using the telephone, using public transportation, taking medication, and managing economic matters; This instrument has an inter and intra-observer coefficient of 0.94 (18).

Process

A pilot test was conducted on 20 people over 60 years old living in the urban area of the city of Medellín, with a duration of 8 days, in order to calibrate the instruments to be applied, standardize the pollsters, verify that the questions were correctly elaborated and categorized, and also select the most appropriate techniques for quality control of the information collected. The present study was approved by the Institutional Ethics Committee of the CES University and written informed consent was requested from older adults, following application of the instruments, in accordance with Resolution 8430 of 1993 of the Ministry of Health of Colombia that regulates research on human subjects.

Analysis of data

The Chi-square test was used to evaluate the association between depression and demographic, health, and functional conditions in older adults, assigning a level of significance of 0.05 to reject the null hypothesis. Additionally, with the variables that met the Hosmer Lemeshow criterion of a p-value less than 0.25 in the association test, crude prevalence ratios (PR) were calculated and were taken to an adjusted multivariate model to estimate adjusted prevalence ratios, with 95 % confidence intervals, to determine the strength of the association. The statistical analyzes were carried out through the SPSS program, version 21 (CES University License).

Results

It was found that 83.6 % (1266) of the older adults evaluated did not report having depression, while 12.9 % (196) had symptoms of depression, while in 3.4 % (52) of the sample there was no response to the scale applied. By sex, a statistically significant difference was found between men and women, with a higher proportion of women with symptoms of depression.

When discriminating by city, in the group without depression the highest percentage corresponded to the city of Barranquilla, in contrast to the city of Pasto where the largest sample with depression was located, finding a statistically significant association between the city where the elderly person resides and the presence of depression.

It was found that the economic income in the last month was not associated with depression in the elderly, with the civil status and educational level was found association with the presence of depression. Older adults with depression were the most likely to report that they were unmarried and with a primary level of education (see table 1).

According to health conditions, older adults with depression reported more problems with heart, bone health, hypertension, and hyperthyroidism / hypothyroidism than their peers without depression. While diabetes, nutritional problems, lung disease and the presence of tumors were conditions that were not associated with the presence or absence of depressive symptoms (See table 2).

Table 1. Presence of depression according to the demographic conditions of the older adult of Barranquilla, Medellín and Pasto

Demographic Conditions		Without depressive sympthoms		With depressive sympthoms		X2	P value
		n	%	n	%		
Sex	Men	449	35,47	54	27,55	4,711	0,030*
	Women	817	64,53	142	72,45		
City	Barranquilla	486	38,39	17	8,67	146,671	0,000*
	Medellín	423	33,41	39	19,90		
	Pasto	357	28,20	140	71,43		
Economic Income	Yes	718	56,71	107	54,59	0,311	0,577
	No	548	43,29	89	45,41		
Civil status	Single	610	48,18	115	58,67	7,471	0,006*
	Not single	656	51,82	81	41,33		
Education Level	None	111	8,77	29	14,80	28,344	0,000*
	Primary	651	51,42	126	64,29		
	Secundary	378	29,86	33	16,84		
	Tertiary	126	9,95	8	4,08		

*p value <0,05 statistically significant. Researchers' calculations

Table 2. Presence of depression according to health conditions in the elderly of Barranquilla, Medellín and Pasto

Health conditions		Without depressive sympthoms		With depressive sympthoms		X2	P value
		n	%	n	%		
Heart problems	Yes	49	3,87	17	8,72	9,205	0,002
	No	1217	96,13	178	91,28		
	No	1262	99,68	195	100		
Bone health problems	Yes	42	3,32	16	8,21	10,588	0,001
	No	1224	96,68	179	91,79		
Hypertension	Yes	626	49,45	114	58,46	5,493	0,019
	No	640	50,55	81	41,54		
Hyperthyroidism /hypothyroidism	Yes	59	4,66	28	14,36	28,381	0,000
	No	1207	95,34	167	85,64		
	No	1248	98,58	189	96,92		

*p value <0,05 statistically significant. Researchers' calculations

In the functional conditions, it can be seen that of the basic activities of daily life, independence in the bathroom was the only one that was associated with depression, finding a greater proportion of older adults with depression dependent on this activity, in contrast to the group without depression; however, instrumental activities of daily life such as using the telephone, using public transportation, taking medication and managing economic issues were associated with depression, with a higher proportion of older adults with depression dependent on these activities (see table 3).

Additionally, the prevalence ratio (PR) was calculated as a measure of strength of association, observing that living in the city of Pasto increased the occurrence of depression symptoms up to 4.25 times, while it was confirmed that living in the city of Barranquilla reduced it by 63 %. On the other hand, having no educational level increased more than other demographic variables the association to develop depression in the older adult (PR = 4.11), even in the model adjusted for demographic covariates, morbidity, and functionality, was the variable that most increased the prevalence of depression. Hyperthyroidism / hypothyroidism was the health condition that increased the association (RP = 3.43), while in the instrumental activities it was the dependence to use the telephone (RP = 3.80) (see table 4). Some morbidity variables such as problems in bone health and tumors; and some of functionality such as bathing, going up and down stairs, using public transportation, taking medications and handling economic issues, lost their significance when the association was adjusted for confounding variables.

Table 3. Presence of depression according to the conditions of functionality in the older adult of Barranquilla, Medellín and Pasto

Characteristics	Categories	Without depressive sympthoms		With depressive sympthoms		X2	P value
		n	%	n	%		
Bath	Independent	1249	98,66	189	96,43	5,221	0,022*
	Dependent	17	1,34	3	3,57		
Use the phone	Independent	1034	81,74	106	54,08	75,720	0,000*
	Dependent	231	18,26	90	45,92		
Use public transport	Independent	1048	82,85	145	73,98	8,906	0,003*
	Dependent	217	17,15	51	26,02		
Take the medication	Independent	1147	91,32	155	81,15	19,017	0,000*
	Dependent	109	8,68	36	18,85		
Handling economic matters	Independent	1108	87,73	146	74,87	23,199	0,000*
	Dependent	155	12,27	49	25,13		

*p value <0,05 statistically significant. Researchers' calculations

Table 4. Factors associated with depression in the elderly of Barranquilla, Medellín and Pasto

Characteristics	Categories	PR Crude	IC 95 %	PR Adjusted	IC 95 %
Demographic factors					
City	Barranquilla	0,37	0,21; 0,68	0,37	0,20 - 0,69
	Pasto	4,25	2,90 ; 6,23	4,07	2,64 - 6, 27
	Medellín	1,00	-	1,00	-
Civil status	Single	1,53	1,13 ; 2,07	1,55	1,03 - 2,34
	Not single	1,00	-	1,00	-
Education Level	None	4,11	1,81 ; 9,38	4,71	1,74 - 12,73
	Primary	3,05	1,45 ; 6,39	3,59	1,48 - 8,70
	Secundary	1,37	0,62 ; 3,05	2,20	0,87 - 5,56
	Tertiary	1,00	-	1,00	-
Health factors					
Heart problems	Yes	2,37	1,34 ; 4,21	2,52	1,28 - 4,99
	No	1,00	-	1,00	-
Hyperthyroidism /hypothyroidism	Yes	3,43	2,13 ; 5,53	2,04	1,18 - 3,51
	No	1,00	-	1,00	-
Functionality factors					
Use the phone	Dependent	3,80	2,77 ; 5,20	1,68	1,10 - 2,57
	Independent	1	-	1	-

PR= Prevalence Ratio. Researchers' calculations

DISCUSSION

In the three cities of Colombia where the study was conducted, it was found that demographic factors such as sex, city of residence, marital status and educational level were associated with depression in the elderly.

These results confirm the findings of studies in mental health in the country, in which it has been reported that women show more symptoms of depression than men (5-6); This can be explained by genetic, neuroendocrine, and personality factors, as well as by patterns of socialization and social culture, including the differences between sexes in living conditions and in the distribution of opportunities (19). The results of the present investigation are also in agreement with other studies carried out in older Colombian adults where it has been identified as risk factors for depression being a woman, being widowed or single and having a low educational level (20-21).

Likewise, the National Mental Health Study in Colombia found that the prevalence of depression was higher in the Pacific region, where the city of Pasto is located, in comparison with the central and Atlantic regions, where the cities of Medellín and Barranquilla are located, respectively (5). However, depressive symptoms in elderly residents of the city of Pasto have been explained by the demographic conditions, income level and health status of this population (22), which is related to high poverty rates and social inequality found in the pacific region (23).

On the other hand, health conditions were also associated with depression in the elderly, especially hypertension, hyperthyroidism / hypothyroidism, heart problems, and bone problems. According to Giner et al. (24), the comorbidity between depression and physical illnesses is very frequent and has an important impact on the deterioration of health, even depression can mediate the pharmacological treatment of these diseases.

On a functional level, depression was associated with dependence to bathe, use the telephone, use public transportation, take medication and handle economic issues. In this regard, Kronfly et al. (25) carried out a study with people over 75 years of age and found that depression affected the basic activities of daily life, but not the instrumental activities, therefore, the differences between the studies what is evidence is the influence of the social context on the perception that the older adult has of his state of functionality.

A possible limitation of this study is the introduction of some biases in the measurement of depression as a measure of self-report and not necessarily an established medical diagnosis, which may overestimate its prevalence. However, the use of the Yesavage scale has been widely used and its consistency allows us to consider that the observed values are adjusted to reality. Although the design of the study does not allow the establishment of associations of a causal type because it is not their intention, the associated factors may suggest some conditions that should be considered in preventive interventions with the elderly population. This study excluded rural population, hospitalized and residents in geriatric homes where conditions may be more precarious and may contribute to a greater perception of depressive signs and other factors associated with these conditions in particular so that the findings of this study may limit extrapolation to older adults in these particular conditions.

This study provides relevant information on the mental health of the elderly in Colombia, taking into account that it is a vulnerable population to present mental disorders, due to the physical changes generated by age and social conditions that do not favor adaptation to these changes. This study confirms that depression is a phenomenon associated with multiple modifiable factors that can be intervened in a timely manner, from public health for example and therefore, its understanding is not limited to the findings reported, although these become a precedent for future research on aging in the country.

CONCLUSION

The high prevalence of depression in the elderly, is associated with demographic and health conditions, and globally affects the functionality of the elderly. Faced with this situation, public health actions are needed that promote the prevention of depression in the elderly, including through the establishment of support networks for this population, especially in the city of Pasto where the largest occurrence of the disease was obtained.

The information generated by this research can be useful for public policies that are aimed at active, satisfactory and healthy aging in Colombia and therefore it is necessary to address it from public health that promotes the prevention of this condition if you want to contribute to the goals of active, satisfactory and healthy aging in Colombia and a better quality of life for this population.

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High risk serotypes of the human papillomavirus (HPV) in patients with exofitic lesions in the oral cavity

Serotipos de alto riesgo del virus de papiloma humano (VPH) en pacientes con lesiones exofiticas en la cavidad oral

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Abstract

Objective: *to determine the prevalence of high-risk serotypes of human papillomavirus in verrucous lesions of the oral cavity in a hospital in Cartagena during July 2014 to July 2015.*
Methodology: *an observational, descriptive, prospective study was conducted in 73 patients with verrucous lesions of the oral cavity, in which socio-demographic characteristics, clinical and histopathological diagnosis were determined, and high-risk DNA HPV genotypes 16 and 18 were identified, as well as 12 other high-risk genotypes (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 and 68), by means of the real-time multiplex PCR test. The study complied with legal and ethical standards. The results were analyzed using descriptive statistics with the Stata program v13.2.*
Results: *the prevalence of HPV in the sample studied during the 2014-2015 period was 9.59% (n: 7). In none of the cases positive for HPV in the histopathological study, some high-risk genotype was identified. Serotypes of HPV were more prevalent in patients in the third decade of life (29.5 years, SD ± 10.60), the average age was 62.8 years SD ± 17.74. The population came mainly from the rural area. The most common site was the labial mucosa. A high percentage of participants (87.6%) reported consuming tobacco.*
Conclusion: *in the present study no high-risk HPV genotypes were found in the samples evaluated.*

Key words: human papillomavirus, PCR, virus, oral papilloma.

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Resumen

Objetivo*: determinar la prevalencia de serotipos de alto riesgo del virus del papiloma humano en lesiones verrugosas de la cavidad bucal en un hospital de Cartagena durante el mes de julio de 2014 y julio de 2015.*
Metodología*: se realizó un estudio observacional, descriptivo y prospectivo en 73 pacientes. con lesiones verrugosas de la cavidad bucal, en las que se determinaron las características sociodemográficas, el diagnóstico clínico e histopatológico y se identificaron los genotipos 16 y 18 de alto riesgo de VPH del ADN, así como otros 12 genotipos de alto riesgo (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 y 68), mediante la prueba de PCR multiplex en tiempo real. El estudio cumplió con las normas legales y éticas. Los resultados se analizaron utilizando estadísticas descriptivas con el programa Stata v13.2.*
Resultados*: la prevalencia de VPH en la muestra estudiada durante el período 2014-2015 fue del 9,59% (n: 7). En ninguno de los casos positivos para el VPH en el estudio histopatológico, se identificaron algunos genotipos de alto riesgo. Los serotipos de HPV fueron más prevalentes en pacientes en la tercera década de la vida (29.5 años, SD ± 10.60), la edad promedio fue de 62.8 años SD ± 17.74. La población provenía principalmente del área rural. El sitio más frecuente fue la mucosa labial. Un alto porcentaje de participantes (87.6%) reportó consumir tabaco.*
Conclusión*: en el presente estudio no se encontraron genotipos de VPH de alto riesgo en las muestras evaluadas*

Palabras clave: virus del papiloma humano, PCR, virus, papiloma oral.

INTRODUCTION

In recent years, the diagnosis of exophytic or verrucous lesions of the oral cavity has become important because of its relation to the human papillomavirus and the consequent possibility of malignant transformation. Oral cancer is a malignant neoplasm of aggressive behavior, 90% are of the oral squamous cell carcinoma type. It may be preceded by preexisting lesions called potentially malignant mucosal disorders; it mainly affects people older than 40 years, although diagnoses are reported in patients between 30 and 40 years, with a greater presentation in men (1)

In Colombia, it is the third leading cause of death and oral squamous cell carcinoma occupies the fifth place among all cancers, with a 2:1 man-woman relationship. Approximately 2,000 new cases show up annually, mostly diagnosed in patients older than 60 and rarely in the population under 40 years. It is commonly associated with risk factors such as smoking, genetic predisposition and alcohol consumption; however, there is a growing relationship between the occurrence of oral neoplasm and viral conditions caused by human papillomavirus (HPV), especially subtypes considered to be at high risk, such as: 16, 18 (2, 3)

HPV is 55 nm in diameter, a circular double-stranded DNA nucleus; it belongs to the papillomaviridae family and is capable of producing hyperplastic, papillomatous, and verrucous lesions in both skin and mucosa. This virus has been shown to play an important role in carcinogenesis. The role of high-risk oncogenic HPV is well described in cervical cancer, but not in oral cancer (4, 5)

Human papillomavirus plays an important role in the pathogenesis of squamous cell car-

cinoma of the oral cavity and especially of the oropharynx in patients in whom no risk factors associated with smoking and alcohol are recognized (6,7). Nearly 30% of tumors can be caused by human papillomavirus infection, mainly in the oropharynx (8). In 2013, oncogenic HPV DNA was reported to be detected in approximately 26% of all squamous cell carcinomas of the mouth (9). In 2013, Boscolo et al reported that HPV serotype 16 accounts for approximately 50% of cervical carcinomas and more than 90% of HPV positive oropharyngeal carcinomas (10). It is important to perform a molecular diagnosis in patients with verrucous lesions in the mouth to identify high risk genotypes of the virus and to implement a suitable preventive treatment, avoiding its transformation and progression to oral cancer (11).

The National Cancer Institute of Colombia, reported information about the oral cancer in 2010, which show that lip, oral cavity and pharyngeal cancer accounts for 2.3% (n: 144 cases) of all cases diagnosed that year whose mortality rate is 18.7% in men over 65 years of age and 10.7% in women (12).

Sexual behavior has been reported as a major risk factor associated with the presence of HPV in oral and buccopharyngeal squamous cell carcinomas, with sexual behavior and number of sexual partners being one of the main risk factors (RR 3.1, 95% CI, 1.5-6.5) as well as the practice of orogenital relations (RR 3.4 95% CI 1.3-8.8) (13,14).

Several studies have reported the presence of oral cavity and oropharyngeal tumors associated with HPV in young patients (40 to 60 years of age) compared to patients with HPV negative, who on average are 5 years older (15-17). Regarding the man: woman relationship, some studies report that there is a slight predominance in men (3:1) compared to women in tumors of upper airway pathways.(18, 19)

The methods used for the diagnosis of HPV infection are mainly based on the detection of viral DNA and have been grouped in trials as following: high sensitivity (PCR, 37.1%), moderate sensitivity (Southernblot, 25.2%) and low sensitivity (In situ hybridization or immunohistochemistry, 16.9%).(20, 21)

The objective of the present study was to identify high-risk serotypes of human papilloma virus (vph) in patients with verrucous lesions of the oral cavity.

METHODS

Study design: The researchers conducted an observational, descriptive, prospective, cross-sectional study to determine the prevalence of human papillomavirus serotypes in 73 patients with verrucous lesions in the oral cavity in a population of a hospital in the city of Cartagena in the period of July 2014 to July 2015. The researchers defined for convenience to study all patients who had lesions suggestive of HPV during the mentioned period. For the development of the project, information was obtained from primary sources such as observation, the epidemiological record and the real time PCR result. From secondary sources such as the results of the biopsy (histopathology) and bibliographic sources that allowed the contextualization and discussion of the same. All patients, consciously and in full freedom decided to participate in the research signing the informed consent. From that moment the subject was programmed for the accomplishment of the clinical history and later for the taking of the sample

that will be used for the anatomopathological study and for the PCR. For the anatomopathological, study the samples were fixed in 5% formalin and processed by means of the classic paraffin inclusion technique; They were then stained with hematoxylin-eosin and the lamina was observed under a light field optical microscope, with 10x and 40x magnification to observe the histological changes and degree of cell involvement due to infection by this virus. Histopathological results were reported as changes compatible with HPV infection or HPV negative. Positive samples with changes compatible with HPV infection were stored for molecular study processing following thuis protocol: 1. Sample collection and management: excisional biopsy with free borders stored and transported in Abbott Cervi-Collet Specimen Collection Kit tubes, catalog: 4N73. Each 2.5ml tube contains Guanidin Tiocinate in Tris buffer which inhibits bacterial growth and preserves DNA. 2. Preservation of the sample: the samples were stored in the molecular biology laboratory at -20 °C until the moment of their use. 3. DNA extraction was performed in an automated way in the molecular biology laboratory of IPS Dinámica in Medellín, using the automated equipment Abbott m2000 for Sample Preparation instrument, catalog No. 09K14-090, together with the set of reagents Abbott Sample Preparation System DNA, Catalog No. 06K12-24 employing the principle of microparticles and temperature gradients giving a DNA recovery efficiency greater than 98% from liquid media. 4. Real-time multiplex PCR: performed at the molecular biology laboratory of IPS Dinámica in Medellín where the presence of high-risk HPV DNA was evaluated using the Abbott Real Time High Risk HPV reagent kit catalog No. 2N09-90 With IVD certificate (in vitro diagnostic devices) and sanitary registration INVIMA: 2009RD-0001267. Using the Abbott m2000 6-channel real-time thermal cycler Catalog No: 09K15-090. Multiplex real-time PCR containing 5 primers was performed to amplify the target DNA of HPV. Three forward primers and two reverse primers directed to the conserved L1 region of HPV are employed. This PCR design allows the detection of 14 high-risk HPV genotypes in a single reaction, achieving individual identification of genotypes 16 and 18 and group identification of 12 other high-risk genotypes (31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66 and 68). As internal control of PCR amplification and a correct DNA extraction, the gene of human beta-globin in each of the samples is identified and amplified, plus two analytical controls: one positive and one negative. Legal and bioethical considerations: this study was supported taking into account the legal regulations, according to Article 11 of Resolution 8430 of 1993 of the Ministry of Health and the Helsinki Declaration of 1975, amended in 1983. Descriptive statistics were carried out by reporting frequencies, ratios. For quantitative variables, mean and standard deviation were reported prior to analysis of normal distribution of data using the Shapiro-Wilks test with a Stata software.

RESULTS

In the 73 patients with verrucous lesions suggestive of human papillomavirus infection, the prevalence of HPV was 9.59% (n: 7). To these patients with a positive result for HPV by histopathology, real-time PCR was performed in search of high-risk HPV serotypes, more specific genotyping of 16 and 18, finding that 100% of the cases studied were negative for HPV serotypes of high risk (graph 1). The mean age of the population studied was 62.8 years (SD ± 17.74), a minimum age of 26 years and a maximum age of 91 years. It was evidenced that the greatest number of patients are at ages equal or superior to 60 (graph 2).

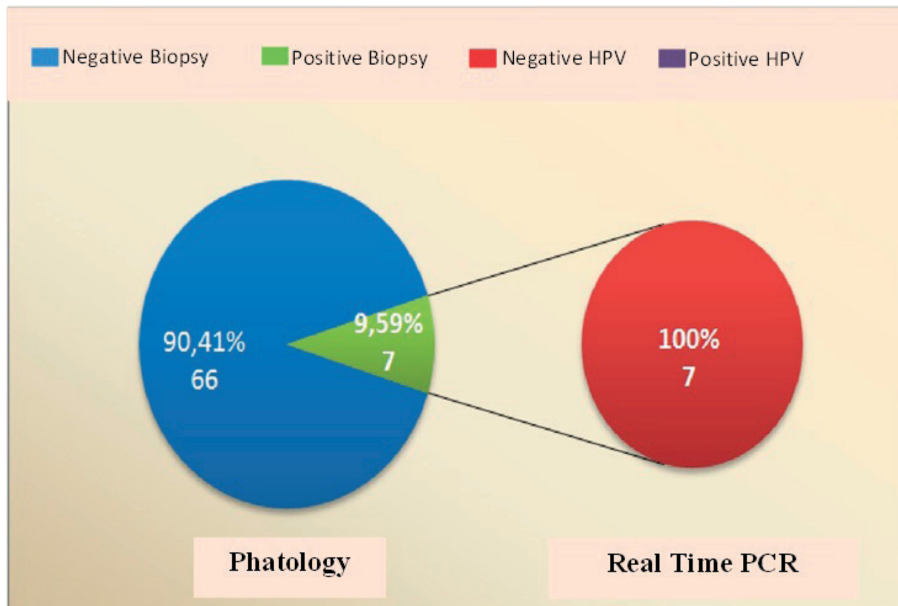

Figure 1. Distribution of the population according to the results of anatomopathological analysis and real-time PCR for the search of high-risk HPV serotypes

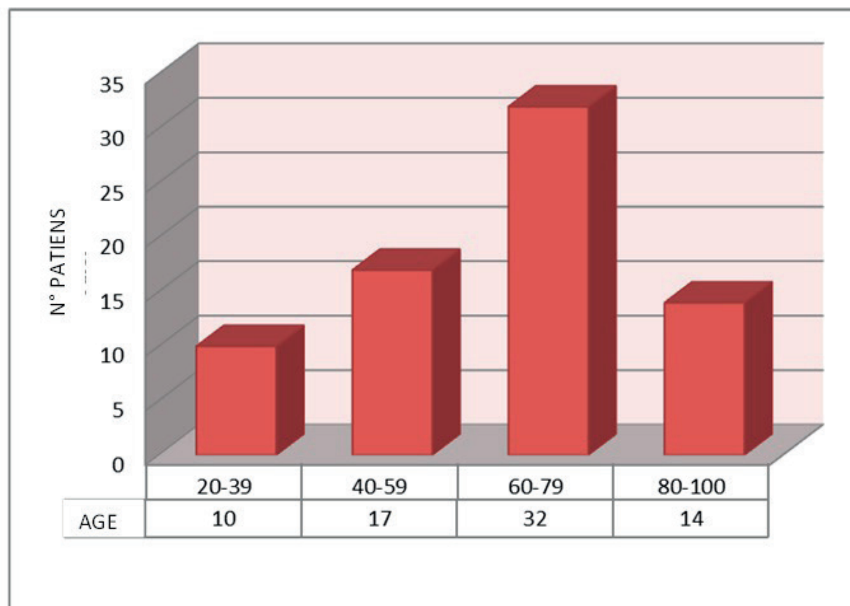

Figure 2. Age intervals of patients attending consultation of maxillofacial surgery at the hospital of Cartagena during the period 2014-2015

As for the sociodemographic variables a predominance of male, free union and rural origin were observed. All of them stated that they were heterosexual, and the majority said they had a habit of smoking; these results can be seen in table 1. It was also possible to observe a higher prevalence of lesions in the labial mucosa, while no lesions were found on the tongue (table 2). The greatest numbers of lesions were located in the labial mucosa, followed by lesions on the hard palate (table 2). Of the 7 biopsy specimens positive for HPV by pathology, 4 (57.1%) presented lesions on buccal mucosa and the other 3 (42.9%) on the labial mucosa.

Table 1. Frequency table of socio-demographic variables and risk factors of patients attending consultation with maxillofacial surgery at the Hospital of Cartagena during the period 2014-2015

VARIABLE		FREQUENCY	PERCENTAGE	ACCUMULATED
GENDER	MALE	50	68,49	68,49
	FEMALE	23	31,51	100
CIVIL STATUS	FREE UNION	62	84,93	84,93
	MARRIED	3	4,11	89,04
	SINGLE	8	10,96	100
ORIGIN	URBAN	23	31,51	31,51
	RURAL	50	68,49	100
RISK FACTORS				
TOBACCO CONSUMPTION	NOT	9	12,33	12,33
	YES	64	87,67	100
CONSUMPTION OF ALCOHOL	NOT	43	58,9	58,9
	YES	30	41,1	100
SEXUAL ORIENTATION	HETEROSEXUAL	72	98,63	98,63
	HOMOSEXUAL	0	0	0
	NOT DEFINED	1	1,37	100

Table 2. Distribution of the population according to the site of presentation of the lesion

PRESENTATION SITE	FRECUENCY	PERCENT	ACCUMULATED
TONGUE	0	0	0
HARD PALATE	15	20,55	20,55
SOFT PALATE	0	0	0
LABIAL MUCOSA	36	49,32	69,87
GUM	9	12,33	82,2
VESTIBULAR MUCOSA	13	17,81	100,0
TOTAL	73	100	

DISCUSSION

HPV is the causative agent of cervix cancer and appears to be involved in the etiology of cancer of the oral cavity, which indicates the execution of studies in non-cancerous lesions, but there is little evidence of molecular tests performed on non-cancerous lesions in which its etiologic factor is the human papillomavirus, and evidence is growing that indicates that in squamous cell carcinoma genotypes of high-risk of this virus are detected, which suggests that lesions that are not cancerous and which are caused by HPV can become cancerous lesions.

The present study reports that the population with verrucous lesions suggestive of HPV infection is very heterogeneous, being present in both men and women. The results of the present study showed that those with HPV positive for biopsy were mostly male. Although in the total population smoking was high (87.67%), in those patients with HPV positive for pathology, this variable was not very representative, since only two (28.6%) had this habit. These results contrast with those reported by Medina et al., which had a greater presence in the female sex and in the smoking habit (60%), assuring that smoking is an important cofactor for infection by this virus. (22)

In 2008, Llamas-Martínez S et al. (23) published a study in which the HPV genome was detected in 23.3% of patients in a control group with healthy mucosa in 45.7% of patients with oral leukoplakia and in 39.4% of oral squamous cell carcinomas. In this study, the researchers found a relationship between serotypes 6, 11, 16 and 31, the first two considered as low risk, and the clinicopathological findings found. These reports demonstrate how HPV genotypes can be detected in healthy oral mucosa or benign lesions. Data explaining the results obtained in the present investigation, where the low prevalence of HPV in vegetative lesions (9.59%) specific for serotypes 16-18 does not allow establishing relationships between clinical findings, histopathological findings and the presence of HPV. The aforementioned authors report a prevalence of HPV in healthy oral mucosa of 23.3%.

Estrada P et al., in 2013 published a descriptive and cross-sectional study of 85 patients with oral lichen planus associated with human papillomavirus. These patients were biopsied to evaluate the main histopathological findings and their relationship with clinical and demographic characteristics. The most relevant results of this study show that conditions predominated in both sexes; the age group of 20 to 29 years was the most affected, whereas the most susceptible anatomical site in the installation of the infection was the buccal mucosa, with a 63.6%, followed in sequence by dorsum and lateral tongue border, with 16.4%. These data differ from our reports, as regards to the sex of presentation of the affections, our study reports preference for the male sex (68.49%), the most frequent location in our study was the hard palate followed by the buccal mucosa with a 17.81%, unlike the Estrada P report, in which the inner cheek was highly affected by lichen planus associated with HPV. In terms of age, differences were also observed, since in the present report the mean age was 62.8 years, Estrada et al. reported a higher incidence at earlier ages (20-29 years).(24)

González M et al., in 2014 published a literature review article to determine how HPV infection affects the prognosis of oropharyn-

geal cancer, the authors report that at least 30% of the cancers in this region are associated with HPV, they confirm that this relationship between malignant oropharyngeal neoplasia and the presence of HPV DNA has increased from 1988 to 2004, by 225% (95% CI: 208% and 242%) and increased from 0.8 cases per 100,000 to 2.6 cases per 100,000, while the ratio of patients with HPV negative oropharyngeal cancer has decreased by 50%, from 2 cases per 100,000 to 1 case per 100,000. The authors report in their literature review that neoplastic pathology associated with positive HPV is more commonly present in men, non-smokers and non-users of alcohol in which the habit of oral sex is a common denominator. The most common oropharyngeal condition that precedes cancer is leukoplakia and the area most prone to disease progression is the tonsils. In the report by González et al., there are data similar to those of our investigation, in what has to do with the most common sex of appearance of HPV-associated lesions, in our study, 68.49% of the population were men. Contrary to the considerations presented by González et al. regarding the cofactor associated with HPV positive patients, in our study the evaluated population, in 87.67% were cigarette consumers and 58.9% alcohol consumers. Our research does not explore whether patients have the habit of oral sex. (25)

CONCLUSIONS

The prevalence of oral HPV in warty lesions in the evaluated population, between July 2014 and July 2015, in the present report was low (9.59%) and the presence of high-grade VHP (16, 18) was not detected. in the samples examined.

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Conflicts of interest: We declare that all authors are aware of the publication rules of the journal and we comply with the requirements therein, including the legal and ethical requirements necessary for the publication of the manuscript, besides that this manuscript has no conflicts of interest that compromise your publication.

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Alteration of the sexual response cycle in women using combined oral contraceptives

Alteración del ciclo de respuesta sexual en mujeres que utilizan anticonceptivos orales combinados

Franklin José Espitia De La Hoz[1], Hoover Orozco Gallego[2]

Abstract

Objective: *To estimate the effect of female sexuality due to the use of the contraceptive combination estradiol valerate / Dienogest against Ethinylestradiol / Drospirenone.*
Material and methods: *A controlled, randomized, unblinded clinical trial was carried out on 174 women, between 18 and 39 years of age, who underwent two hormonal contraceptive options with estradiol valerate / Dienogest and ethinylestradiol / Drospirenone; in a private clinic in Armenia, Quindío, between 2013 and 2017. The female sexual function index (IFSF) was used to analyze the sexual function of the participating women; at the beginning, at six, at eighteen and thirty-six months after the start of the contraceptive.*
Results: *At the end of the study, the contraceptive combination estradiol valerate / Dienogest was a less aggressive therapy in the alteration of the sexual response cycle of the users, while the ethinylestradiol / drospirenone combination significantly affects the desire and excitement with lower scores in the IFSF.*
Conclusions: *The results indicate that the estradiol valerate / Dienogest combination affects the desire, arousal and IFSF score less than the ethinylestradiol / drospirenone combination.*
Key words: Androgens; Contraceptive Agents; Women; Sexuality; Testosterone.

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Resumen

Objectivo: *Estimar la afectación de la sexualidad femenina por el uso de la combinación anticonceptiva Valerato de estradiol/Dienogest frente a Etinilestradiol/Drospirenona.*
Material y métodos*: Se realizó un ensayo clínico controlado, aleatorizado, no cegado en 174 mujeres, entre 18 y 39 años, sometidas a dos opciones de anticoncepción hormonal con Valerato de estradiol/Dienogest y Etinilestradiol/Drospirenona; en una clínica privada de Armenia, Quindío, entre 2013 y 2017. Se utilizó el índice de función sexual femenina (IFSF) para analizar la función sexual de las mujeres participantes; al comienzo, a los seis, a los dieciocho y treinta y seis meses de iniciado el anticonceptivo.*
Resultados*: Al finalizar el estudio resultó la combinación anticonceptiva Valerato de estradiol/Dienogest una terapia menos agresiva en la alteración del ciclo de la respuesta sexual de las usuarias, mientras que la combinación Etinilestradiol/Drospirenona afecta de forma significativa el deseo y la excitación con menores puntajes en el IFSF.*
Conclusiones*: Los resultados indican que la combinación Valerato de estradiol/Dienogest afecta menos el deseo, la excitación y la puntuación del IFSF que la combinación Etinilestradiol/Drospirenona.*

Palabras clave: Andrógenos; Anticonceptivos; Mujeres; Sexualidad; Testosterona.

INTRODUCTION

Sexual health is of fundamental importance to maintain the stability of affective relationships; it is considered as one of the factors that help the appearance, recovery and maintenance of well-being and general good health of the individual (1).

The human sexual response cycle is a four-phase physiological model in response to sexual stimulation. In order of occurrence they are: arousal phase, plateau phase, orgasm phase and resolution phase (2,3)

The female sexual disorders involve a wide multifactorial relationship, and they include four main disorders: orgasmic, sexual arousal, sexual desire and pain (vaginismus and dyspareunia) (4).

The most commonly used questionnaire to evaluate female sexual difficulties is the "Female Sexual Function Index" (IFSF), which includes 19 questions that evaluate the sexual activity of women in the Last four weeks The questions are gathered in six domains: desire (items 1-2), excitement (items 3-6), lubrication (items 7-10), orgasm (items 11-13), satisfaction (items 14-16)) and pain (items 17-19) The score of each domain is multiplied by a factor, and at the end of the arithmetic sum of the domains, the final average is obtained; the higher the score, the better the sexuality. A score below 26.55 means risk of impaired sexual function (5-8).

The sexual response and, in particular, desire, is influenced both by external factors and by internal interactions (memories, perceptions and internal concepts combined with the emotional processing of sensory inputs) (9,10). The use of oral contraceptives has been associated with adverse effects on sexual function, particularly in relation to a possible negative impact on sexual desire (11).

Hormonal contraceptives contain estrogens and progestins or only progestins. They are currently used by more than 100 million women worldwide, with more than 44,000 published scientific studies (12); being the most effective method in terms of planned pregnancy rates. Most commercial preparations contain 20 to 35 µg of ethinylestradiol together with levonorgestrel, norethindrone or a new generation progestin (13).

In combined oral hormonal contraceptives, estrogen decreases the production of dehydroepiandosterone, testosterone and androstenedione through the inhibition of 5-alpha reductase and favors the production of sex hormone-binding globulin (SHBG, in English: [sex hormone-binding globulin]), reducing levels of circulating free testosterone (14,15); Progestogens, on the other hand, have a variable androgenic effect. The result of these mechanisms of action generates a iatrogenic deficit of testosterone, which alters female sexual function (14).

The gestagenic component of combined oral contraceptives is responsible for the inhibition of ovulation, by blocking the preovulatory discharge of LH, while Ethinyl Estradiol (EE) potentiates the antigonadotropic effect of gestagen (16). However, the main novelties in hormonal contraception are the introduction of estradiol valerate (estrogenic component) and drospirenone (progestogen) (17).

The use of modern progestins, and even in low doses, has generated deleterious effects on the sexual health of women, by showing decreased vaginal lubrication (18) and increased vestibular pain (19). In recent investigations, drospirenone and dienogest have reported a positive effect on sexual response as attraction, desire, satisfaction and coital frequency (20,21), perhaps due to the ability to reduce the activity of 5-alpha reductase. In turn, dienogest (a progestogen derived from 19-nortestosterone) has been shown to lack estrogenic, mineral and glucocorticoid effects (22), which increases the likelihood of acceptance among users.

In the case of oral contraceptives, reducing the estrogen dose has, in addition to reducing the risk of thromboembolic disease, reduced side effects such as headache, mastalgia, nausea and vomiting (23), favoring its tolerability and decreasing the negative impact on female sexual function.

In light of all these data of the questionable involvement of combined oral contraceptives in the sexual response cycle of women, we decided to set ourselves the objective of evaluating and estimating the involvement of female sexuality by the use of the contraceptive combination estradiol valerate / Dienogest (E2V / DNG) against Ethinylestradiol / Drospirenone (EE / DRSP).

METHODOLOGY

A controlled, randomized, unblinded clinical trial was carried out on 174 women, between 18 and 39 years of age, who underwent two hormonal contraceptive options with E2V / DNG and EE / DRSP, attended at a private clinic in Armenia, Quindío, between March 2013 and March 2017.

Sample size and type of sampling

The sample size was calculated in a population of 36,000 women, based on a sampling error of 10% and a confidence level of 99%, obtaining a minimum sample size of 165 women.

The randomization method was done in a simple way, the women were divided into two groups, pairs (A) and odd (B), with group A being treated with E2V / DNG, and group B treated with EE / DRSP. After informed consent of the patients, the sexual function was evaluated through the IFSF (5-7), initially, then at 6 months, at 18 months and 36 months until the end of the study.

Each woman was interviewed and asked to fill out the instrument "Sexual Feminine Function Index" (IFSF). Which is a questionnaire consisting of 19 questions, which assess sexual function in the last four weeks. It consists of six domains: desire (items 1-2), excitement (items 3-6), lubrication (items 7-10), orgasm (items 11-13), satisfaction (items 14-16) and pain (items 17- 19). In each question the answer is graded according to the following score: 0). Without sexual activity; one). Hardly ever; two). Less than half the time; 3). Half the time; 4). More than half the time; 5). Usually. The score of each domain is multiplied by a factor, in the end the result is the arithmetic sum of the domains; The higher the score, the better sexuality. According to the authors, a score less than or equal to 26.55 points is considered at risk of sexual dysfunction (6).

The contraceptive tablets were taken orally and without chewing, starting on the first day of the onset of menstruation, one tablet at the same time every day.

The information was tabulated and filed once analyzed in Excel. The statistical analysis of the information was made with the statistical program EPI-INFO® version 3.5.1 for Windows®. Means and standard deviations were used for the continuous numerical variables and proportions for the nominal and ordinal variables. Bivariate analysis was done to relate the differences of the adverse effects between the two groups with the socio-demographic characteristics and other associated factors, as well as to verify the existence of an association between the categorical variables through the χ^2 tests and the exact test. of Fisher, according to the distribution of the variables, with a statistical significance of 5%. The associated factors were evaluated by comparing the two groups by means of the Odds Ratio (OR) and the 95% confidence interval.

The inclusion criteria were: women with need to use an oral hormonal contraceptive method, age between 18 to 39 years of age, with sexual activity in the last three months and presence of regular menstrual cycles.

Exclusion criteria were: women with contraindications to the use of hormonal contraceptives, lactating women, non-compliance with the contraceptive prescription, women who use hallucinogens, chronic diseases and a history of sexual or psychological disorders.

PROCESS

A group of nursing professionals and assistants was organized to collect the information. The group consisted of three nursing assistants, a professional nurse and a general practitioner, all trained in the completion of the IFSF and knowledgeable about the purposes of the investigation. At the same time, the group was led by the main author of the study.

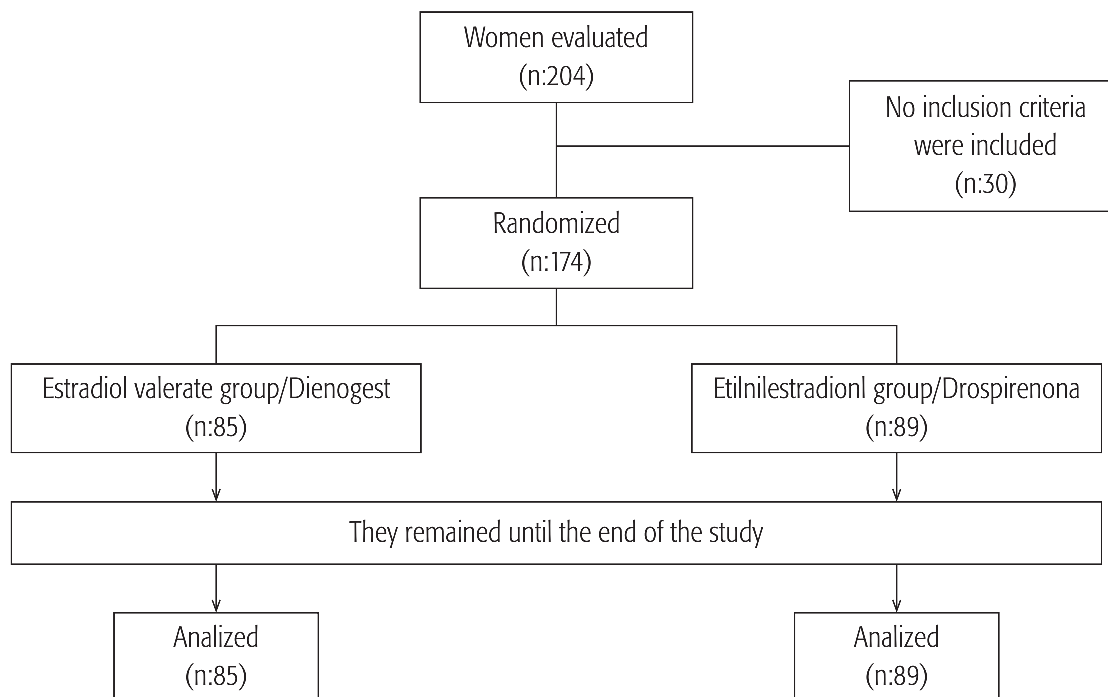
The women who entered the family planning and contraception program were evaluated by the general practitioner and the professional nurse, who determined if they met the eligibility criteria of the study. If the woman met the criteria, she was informed of the objectives of the investigation, as well as the procedures

that would be carried out, and the signature of the informed consent was requested. Once the consent was signed, two nursing assistants delivered the IFSF and taught the completion of each of the patients (individually and in a private setting), in addition to completing the questioning of the other variables of the study. The blood sample was immediately taken to quantify free testosterone and SHBG. The women were followed up at six, twelve, eighteen and thirty-six months, at which time they were asked to fill out the IFSF and were quantified free testosterone and SHBG. All the women were advised by the specialist in sexology, who made the of the possible causes of the alteration of the sexual response cycle.

Information was gathered about the variables: socio-demographic data and obstetric variables related to sexual function, history of rape or sexual abuse, religious condition. In addition, it was questioned weekly coital frequency, masturbation, contraceptive efficacy, undesirable effects of contraceptives, , coital practices, sexual thoughts and fantasies, prevalence of sexual dysfunctions and free testosterone and SHBG titers were quantified.

RESULTS

174 women interested in oral hormonal contraception were studied. Thirty women were excluded, eighteen for not meeting the inclusion criteria and twelve because they left the country. Despite some undesirable effects being present, there was no need to interrupt or discontinue the follow-up over the 36 months (Figure 1).



Source: own resources.

Figura 1. Flow diagram of the phases of the clinical trial

Group A (E2V / DNG) was formed by 85 women and 89 women formed group B (EE / DRSP). The average age of the members of group A was 27 ± 2.7 years, and of group B, 27 ± 2.1 years, with a range that varied from 18 to 39 years of age, no differences being observed between the women of both groups (p = 0.84). The predominant ethnic group was Hispanic in both groups; in group A there were 77.6% of Hispanic women and in group B, Hispanic women made up 75.2%. In group A, 52.9% coexisted in free union and in group B 53.9%. The average BMI was 24.9 ± 5.7 for group A and 24.3 ± 4.8 for group B), without presenting a statistically significant difference (p = 0.852). The socio-demographic characteristics of the women in both groups were similar (Table 1).

No differences were observed between women in group A and group B in relation to schooling (16.2 ± 1.5 years vs. 16.5 ± 1.2 years), urban domicile (84% vs. 83%, p = 0.21) or distribution by coital preference (vaginal: 81/85 vs 84/89, OR: 1.05, CI: 95%: 0.36-3.09, p = 0.87).

56.32% (n = 98/174) of the women reported a coital frequency of two to three times a week; 35.05% (n = 61/174) one or less times a week; 8.62% (n = 15/174) four or more times a week. The average number of times of masturbation per month yielded a median of 2 (between 0 and 6). 16.66% (n = 29/174) of the women reported that they had never masturbated.

A risk of sexual dysfunction was observed, according to the IFSF, in 23.91% of the overall study population (n = 42/174), where the IFSF score was 25.74, reporting the following score per domain: desire: 3.84 ± 1.05, excitation: 3.97 ± 1.03, lubrication: 3.84 ± 1.07, orgasm: 3.97 ± 1.19, satisfaction: 4.37 ± 1.02 and pain: 3.92 ± 1.11

At the end of the study, in the EE / DRSP group 24.71% (n = 22/89) negative effects were reported on sexual function, compared to 9.41% (n = 8/85) reported by the group of E2V / DNG (p <0.01).

The average of the total IFSF at the beginning for group A was 32.4 ± 3.18 and for group B 31.8 ± 3.24 points (p = 0.372). At the beginning of the domain, the average for women in group A was 4.32 ± 0.6 points, and for group B, 4.29 ± 0.3 (p = 0.441) (table 2 and 3).

At six months of follow-up, women in group A showed improvements in the desire domain, while in group B, desire decrease was observed and in the total IFSF score. In group A the average score of the IFSF was 33.6 ± 2.1 points and the desire domain 4.41 ± 0.3 points, for group B the IFSF decreased to 30.9 ± 4.8 points and the desire domain to 4.17 ± 0.6 points, without being statistically significant (p> 0.05) (table 2 and 3).

At eighteen months, a decrease in desire was observed in both groups (group A: 4.31 ± 0.7 and group B: 4.15 ± 0.9), with IFSF scores of 29.7 ± 5.7 in group A and 27.3 ± 4.8 in group B , being statistically significant in relation to the beginning of the study and between groups (p = 0.021) (table 2 and 3).

At thirty-six months there was a persistent decrease in desire in both groups (group A: 4.30 ± 0.8 and group B: 4.13 ± 0.7), with ratings on the IFSF of 29.1 ± 1.2 in group A and 26.7 ± 3.9 in group B (p = 0.243), with similar scores in the IFSF in each group over time, but different from each other, with statistically significant changes (p <0.001) (table 2 and 3).

The average of the arousal domain score before starting the contraceptive was 4.94 ± 1.3 and at thirty-six months of 4.96 ± 0.2 in group A; from 4.83 ± 1.2 at baseline and from 3.42 ± 1.8 at thirty-six months in group B, in this observation, the difference before and after starting the contraceptive was statistically significant (p <0.01). There is no difference in group B, after six months in the alteration of excitation, since it was observed that the decrease in the excitation domain remains constant over time. No statistically significant difference was found at baseline, at 6 (p = 0.672) and 18 (p = 0.462), but at 36 months (p = 0.023) (Table 3).

After six months of follow-up, we found an increase in the values of the average satisfaction domain that showed no significant difference between the two groups, group A 4.59 ± 1.2 points and group B 4.56 ± 1.5 (p = 0.552) (Table 2 and 3).).

Women in both groups registered a similar score in the pain domain at 6 (p = 0.714), 18 (p = 0.603) and 36 months (p = 0.057), with a score lower than 3.7 points (Table 2 and 3).); it also happened for the lubrication domain at 6 (p = 0.402), 18 (p = 0.717) and 36 months (p = 0.546), although with a score higher than 4.1 points (Table 2 and 3).

The percentage of women responding to the search for sexual encounters by the couple was similar between the two groups (OR: 1.08 [0.78-1.8]; p = NS), while the percentage of women who accepted sexual activity for pleasing the couple was significantly lower in group A (OR: 0.9 [0.69-0.96], p = 0.01).

At 36 months a significant superiority of the E2V / DNG combination was observed to maintain the IFSF score above 29.1 in periods after 18 months (OR: 1.05 [1.02-1.17], p = 0.01), while maintenance of satisfaction was similar between groups (OR: 0.96 [0.99-1.05]; p = NS).

In group A, a statistically significant difference of greater sexual desire was identified at 36 months, but lower in relation to the beginning (score 4.32 ± 0.6 vs. 4.30 ± 0.8), compared to group B (4.29 ± 0.7 vs. 4.13 ± 0.7).) (p = 0.03 and OR = 7.2).

When analyzing the two groups, it was found that there were statistically significant differences in the number of weekly sexual encounters: two to four times in group A, compared to one or two times in group B, with a range between 2 and 5, (p = 0.018).

In both groups, the prevalence of vaginal intercourse over the other sexual alternatives (oral or anal sex) did not show statistically significant differences (p = 0.27). The women in group A reported more frequent and easier to achieve orgasms.

The differences between the two groups were not significant in terms of their contraceptive efficacy; however, group B had a significantly higher incidence of mild side effects: headache (p = 0.06, OR: 0.63, 95% CI: 0.39-1.02), weight gain (p = 0.03, OR: 0.57; 95% CI: 0.39-1.05) and breast tenderness (p = 0.24, OR: 0.09, 95% CI: 0.03-0.57).

The group that received EE / DRSP presented significantly greater coital pain (p = 0.035, OR: 0.62, 95% CI: 0.38-1.01).

The percentage of women abused by their partners was similar between groups (OR:

0.93 [0.66-1.8]; p = NS), while that of women empowered with their sexuality was significantly lower in the group of patients who used EE / DRSP (OR: 0.87 [0.81- 0.96]; p = 0.003).

The mean values of free testosterone at baseline remained within the normal reference ranges, and no statistically significant differences were found between the groups, 0.9 ng / mL in group A and 0.8 ng / mL in group B. The serum values of SHBG did not show significant differences (0.06 nmol / L for group A and 0.05 nmol / L for group B); both molecules showed no variations throughout the investigation. It was evidenced that in the E2V / DNG group there was a non-significant increase (3.75%) in the levels of free testosterone, after 6 months of contraceptive initiation, compared to the levels of the onset (p = 0 , 81), which was maintained over time; while in group B, free testosterone showed a slight decrease of 1.38%, while SHBG increased a slight 1.71% compared to 0.67% in group A, without being statistically significant.

DISCUSSION

The IFSF score decreases in both groups after eighteen months of contraceptive therapy (it achieves its greatest decrease at around 36 months). Perhaps this is due to the fact that androgens may have some influence on female sexuality, so the mechanisms underlying their effects remain uncertain (24,25).

The mean of the initial total score of IFSF for the groups was 32.4 ± 3.3 for group A and 31.8 ± 3.6 for group B, without significant differences between groups (p = 0.372). The users of the E2V / DNG combination had higher scores of the IFSF compared to the users of the EE / DRSP combination after thirty-six months of follow-up, showing a statistical difference between the groups (p = 0.001).

In this study it was found that the EE / DRSP combination showed a negative influence on sexual function from the first semester of use, according to the IFSF score ((p <0.01).

Of the six domains of the IFSF, the greatest decreases are observed in desire and arousal. Thus the desire domain shows an average score between 4.17 ± 1.2 (group A) and (group B) 4.01 ± 1.3 at six to descend to 3.84 ± 1.5 and 3.75 ± 1.2 at eighteen months, and 3.54 ± 1.8 and 3.42 ± 1.2 at thirty-six months, respectively; showing a statistically significant difference (p <0.027) at 36 months, favoring the E2V / DNG combination.

In group B the arousal also decreases as shown by the score from 4.83 ± 1.2 at six months to 3.42 ± 1.8 after thirty-six months, while the pain increases as lubrication decreases, a finding similar to that described by other authors (11,26).

Women older than 27 and with more than three children showed a higher risk of presenting difficulties with lubrication and increased pain in group B (OR: 3.6, CI: 2.4-6.6, p <0.0001); whereas nulliparous women (OR: 0.48, CI: 0.27-0.81, p <0.005) and those who did not have a history of episiotomy (OR: 0.57, CI: 0.39-0.99, p <0.04), did not show this type of disorders.

An outstanding fact was the significantly higher incidence of disorders in the sexual cycle of women in group B compared to group A: 24.71% versus 9.41%, showing an OR = 9.3 times more to present sexual difficulties in the group of the combination EE / DRSP (95% CI = 1.2-75.9), with the worst results in sexual

desire, while the E2V / DNG combination showed improvement in sexual desire, at the expense of the dienogest, as reported by others studies (27); In part, it could be due to the fact that dienogest has no affinity for SHBG nor does it displace testosterone (28,29).

At 36 months, the coital frequency remained without significant changes compared to the beginning of the study: 56.32% (n = 98/174) vs 54.59% (n = 95/174) two to three times a week, respectively; 35.05% (n = 61/174) vs 35.63% (n = 62/174) one or less times a week, respectively; 8.62% (n = 15/174) vs 9.77% (n = 17/174) four or more times a week, respectively. However, it was observed that in women users of E2V / DNG contraceptives reported a more frequent weekly sexual activity (62.35% (n = 53/85) two to three times a week), as well as greater frequency and ease to achieve orgasm, they also reported feeling more aroused and ready for intercourse, unlike the users of EE / DRSP, since the latter reported not only a reduction in weekly sexual activity, but a reduction in the frequency of orgasm with worsening of pain during intercourse; which is consistent with other publications (26). While the average number of times of masturbation per month was reported as a median of 3 (between 0 and 7), and the percentage of women who had never masturbated decreased to 12.64% (n = 22/174), without showing significant changes between the two groups.

It has been suggested that androgens do not have a direct effect on sexual arousal, however, their important influence on other aspects of sexual desire, such as thoughts and fantasies, is accepted (30), which was not identified in this study. since in both groups there were no significant differences between the beginning and the end, nor between the two groups.

In both groups a decrease in sexual desire was noted after eighteen months of use of either combination; however, it was observed that despite the greater decrease in the IFSF score in group B with respect to the group A, it is more common to decrease the desire in women of 27 or more years, in multiparas and in those who have a poor relationship, suggesting the influence of non-hormonal factors in the affectation of desire, as described by other studies (31,32).

In this research, the IFSF showed a significant difference between the E2V / DNG combination and the users of the EE / DRSP combination, at the beginning and after the six months of use. The women in group A had higher IFSF scores than those in group B, different from what was documented by other research, where they report that in most women there was no change in desire with the combination EE / DRSP (33) . According to this study, the use of the E2V / DNG combination after six months shows positive effects on female sexuality, with few effects on desire and arousal; highlighting that sexual performance was significantly better.

It has been described that DNG does not have a specific affinity for sex hormone-binding globulin (SHBG) nor for cortisol-binding globulin, so it does not displace testosterone from SHBG and does not increase bioavailable free testosterone (29,34).), which is partially compatible with the findings of this study, which showed a slight increase in free testosterone.

In this investigation -according to the sociodemographic characteristics of this population of women-, the alterations in the cycle of female sexual response, the role of a restrictive sexual morality associated with culture, race

or religion had no influence, unlike what has been described in other studies (35).

The undesirable effects of contraceptives are more frequent in women with a history of sexual disorders (36) and can be increased if a hormonal combination that increases SHBG is initiated; however, in women with the E2V / DNG combination, serum concentrations of SHBG remained within the normal range, without significant changes, in agreement with other investigations (27,37).

The safety profile in the non-alteration of the female sexual response cycle with the use of the E2V / DNG combination, may be influenced not so much by its prolonged regimen, but by the two positive effects that have been highlighted, such as the reduction of the bleeding and the elimination of the premenstrual tension syndrome, facilitating the maintenance of a cyclic sexuality (27).

Unlike other authors (38), in this work we did not find, in either of the two groups, an increase in vestibulodynia associated with the use of combined contraceptives, despite the fact that pain was more frequent in group B.

Analyzing the findings of this study and those found by other authors (39), it can be affirmed that when selecting a hormonal contraceptive, the professional must consider both the woman's clinical history in relation to her sexuality, as well as the adverse effects of these on the cycle of sexual response, due to the simultaneous and intertwined action of a great variety of factors (biological, psychological, social and multidimensional) in the sexual sphere (40) of women.

In this study, when observing the results of free testosterone and SHGB, an absence of association between the alterations of sexual desire and the serum testosterone levels would be confirmed, because, in spite of having serum levels within normal ranges, there was a decrease in sexual desire in both groups, being higher in the EE / DRSP combination. This proves that there is no clear association between the level of androgens and sexual desire, as has been published by other authors (41).

Estimating the effectiveness in the contraceptive efficacy of some hormones, in addition to the easy availability of these drugs, the choice of an adequate product individualizing the user, plays an important role, mainly in older women, multiparous or with a history of episiotomy; since the level of androgens is not the only one, and most likely, not even the most important predictor of female sexual desire (36,39).

Among the weaknesses of this study are the small size of the sample, and that women were not followed beyond 36 months, and were not compared against other molecules derived from progesterone or against placebo; However, even so, the objective of the research was achieved as it was to estimate the affectation of female sexuality by the use of the contraceptive hormonal combination.

On the strengths of this research we can affirm that in a controlled and randomized clinical trial where a good follow-up was done, the validity of the results is not limited, besides having a standardized instrument, translated into Spanish and validated in Colombia. The size of the sample should be highlighted as an additional strength, which facilitated the involvement of women of all ages; therefore, the findings may be generalizable in the general population of women.

CONCLUSION

The results of this research support the theory that the combination EE / DRSP has a greater adverse effect on some aspects of sexual function in women, especially sexual desire and arousal, being clinically important to know when individualizing contraceptive therapy in certain women who already come with affectation of their sexuality.

The metabolic neutrality of E2V and the lack of affinity of dienogest for SHBG make the E2V / DNG combination an option for women of all ages, especially those with disorders of sexual desire.

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Relación entre variables demográficas y prácticas de autocuidado del adulto mayor con diabetes mellitus

Relationship between demographic variables and self-caring practices of the elderly adult with diabetes mellitus

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Resumen

Objectivo: *Determinar la relación entre las variables demográficas y las prácticas de autocuidado del adulto mayor con diabetes mellitus tipo 2.*
Método: *Estudio cuantitativo, descriptivo, correlacional realizado en consultorios del Hospital Tomás La Fora Guadalupe (La Libertad, Perú), con 100 adultos mayores de 60 años y más, quienes cumplieron los criterios de inclusión y aceptaron voluntariamente participar en el estudio. Se midieron las variables demográficas y se utilizó la encuesta de prácticas de autocuidado del adulto mayor con diabetes mellitus tipo 2. Recolectada la información, se hizo un análisis bivariado para determinar la relación entre las variables demográficas y el nivel de prácticas de autocuidado, utilizando como herramienta estadística la prueba chi cuadrado.*
Resultados: *El mayor porcentaje de población se ubicó entre 66-70 años de edad (37 %), mujeres el 55 %; el mayor grado de instrucción fue primaria con 71 %; el mayor tiempo de enfermedad fue de 5 años y más y el 55 % tuvo un nivel de autocuidado bueno. Existe relación significativa entre el grado de instrucción (X2 = 29.118 Valor p= 0.000) y tiempo de enfermedad (X2 =21.596 Valor p= 0.000) con el nivel de prácticas de autocuidado y no hay significancia entre edad y sexo.*
Conclusiones: *Los adultos mayores presentaron buena práctica de autocuidado, pero no lo suficiente para garantizar un buen manejo de su enfermedad, de ahí que para enfermería se convierte en un reto potenciar las capacidades para empoderarlos y ser agentes de su propio cuidado, considerando sobre todo el grado de instrucción y el tiempo de enfermedad.*

Palabras clave: variables demográficas, prácticas de autocuidado, adulto mayor, diabetes mellitus.

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Abstract

Objective: *To determine the relationship between demographic variables and self-care practices of the elderly with type 2 diabetes mellitus.*
Method*: quantitative, descriptive, correlational study carried out in the offices of Tomas La Fora Guadalupe Hospital (La Libertad, Peru), with 100 adults older than 60 years and older, who met the inclusion criteria and voluntarily accepted to participate in the study. The demographic variables were measured and the survey of self-care practices of the elderly with type 2 diabetes mellitus was used. Once the information was collected, a bivariate analysis was carried out to determine the relationship between the demographic variables and the level of self-care practices; using the chi square test as a statistical tool.*
Results*: The highest percentage of the population was between 66-70 years of age (37 %), women 55 %, the highest level of education was primary with 71 %, the longest time of illness was 5 years and more and 55 % had a good level of self-care. There is a significant relationship between the level of instruction (X2 = 29.118 Value p = 0.000) and time of illness (X2 = 21.596 Value p = 0.000) with the level of self-care practices and there is no significance between age and sex.*
Conclusions*: Older adults presented a good practice of self-care, but not enough to guarantee good management of their disease. Therefore, for nursing it becomes a challenge to strengthen the capacities to empower them and be agents of their own care considering above all the degree of instruction and sick time.*

Keywords: demographic variables, self-care practices, Elderly, Diabetes Mellitus.

INTRODUCTION

Estamos viviendo una globalización mundial del envejecimiento y debido al aumento de la esperanza de vida y a la disminución de la tasa de fecundidad, la proporción de personas mayores de 60 años está aumentando más rápidamente que cualquier otro grupo etario. Según la Organización Mundial de la Salud (OMS) entre 2015 y 2050, la proporción de la población mundial con más de 60 años de edad pasará de 900 millones a 2000 millones, que representa un aumento del 12 al 22 % (1).

El envejecimiento es un proceso normal del desarrollo inherente a la vida del ser humano, sin embargo, los cambios son complejos. Para algunos serán difíciles de afrontarlos y para otros reflejan el desarrollo psicológico permanente que explica por qué la vejez puede ser un periodo de bienestar. Sin embargo, hay que reconocer que el envejecer está asociado con la acumulación de una gran variedad de daños moleculares que reducen gradualmente las reservas fisiológicas, disminuyen en general la capacidad intrínseca del individuo y aumentan el riesgo de presentar diabetes mellitus, porque el envejecimiento está indisolublemente vinculado a las enfermedades crónicas (2).

Es este contexto globalizado la salud continúa siendo en este siglo una prioridad en el mundo, porque una buena salud es uno de los tres indicadores del desarrollo sostenible (3). de ahí la importancia del abordaje de las enfermedades no trasmisibles como la diabetes, que está considerada como una epidemia según la Organización Mundial de la Salud (4), y una catástrofe social mundial para la Federación Internacional de Diabetes (5).

La diabetes es uno de los desafíos de salud y desarrollo más importantes del siglo XXI y una de las cuatro enfermedades no transmisibles (ENT) mundiales para intervenir prioritariamente (5). Es una grave enfermedad crónica progresiva caracterizada por la elevación de concentraciones de glucosa en sangre, que es más proclive al envejecer. Según la Federación Internacional de Diabetes, en 2017 en el mundo alrededor de 425 millones de personas adultas tienen diabetes, que representan el 8,8 % y una de cada 2 adultos no han sido diagnosticados (212 millones). Así mismo, aproximadamente 4,0 millones de personas morirán de diabetes, lo que equivale a un fallecimiento cada ocho segundos (6).

La diabetes y sus complicaciones generan grandes pérdidas económicas para las personas y sus familias, para los sistemas de salud y las economías nacionales por los costos y la pérdida de trabajo e ingresos (7).

En el Perú, más de 1 millón de peruanos de 18 años a más padecen de diabetes, con una prevalencia de 5,9 % - 6,9 % y mortalidad de 7,8 % (6,8). Según el informe de la Situación de Salud de la Población Adulta Mayor-2014, el 8,2 % de adultos mayores del Perú fue diagnosticado de diabetes y mayormente en mujeres (8,9 %) que en hombres (7,5 %). En el área urbana, el 10,2 % padece esta enfermedad y 3,3 % en el área rural, y según región, los mayores porcentajes se presentaron en Lima Metropolitana (12,2 %) y en La Libertad 5,8 % (9).

Si no se la controla adecuadamente, la diabetes causa enormes complicaciones devastadoras en el organismo e incrementar el riesgo de muerte prematura. Entre las posibles complicaciones se incluyen: ataques cardíacos, accidentes cerebrovasculares, insuficiencia renal (10 veces más alta en personas con diabetes), cada 30 segundos alguien pierde en el mundo una extremidad inferior, pérdida de visión, que afecta a un tercio, y daños neurológicos potencialmente letales, lo cual aumenta los costes de la atención sanitaria y disminuye la calidad de vida (6,7), de ahí que en el manejo de la diabetes se le da gran importancia al autocuidado del paciente.

El autocuidado es un proceso activo, responsable, flexible y adaptativo que implica que el paciente vigila y responde activamente a las condiciones ambientales y biológicas cambiantes que requieran los diferentes aspectos del tratamiento de la diabetes (10), siendo necesario que el adulto mayor ponga en práctica el autocuidado en nutrición, actividad y ejercicio, cuidado de los pies y la farmacoterapia, vigilando las concentración de glucosa sanguínea y para mantener el control metabólico adecuado y previniendo las complicaciones para una mejor calidad de vida (11,12). Si estas medidas de autocuidado se llevan a cabo podrán prevenir o retrasar las complicaciones de la diabetes, limitar la incapacidad, favorecer la autonomía y disminuir el riesgo de muerte.

Para Orem, el autocuidado es el medio que fomenta al máximo el control de la salud y de la vida, y en su teoría de enfermería sobre autocuidado lo define como "la práctica de actividades que una persona inicia y realiza por su propia voluntad para mantener la vida, la salud y el bienestar" (13). Por lo tanto, el adulto mayor debe convertirse en un elemento participativo. Se hace necesario destacar que el fundamento del autocuidado es un compromiso de asumir la responsabilidad de su propio cuidado, y los profesionales de enfermería se convierten en el recurso indispensable para conseguirlo a través de su rol educador como promotor de

la salud y de la vida abordando los problemas de autocuidado.

Identificar los factores que pueden estar influenciando las prácticas de autocuidado es importante para generar estrategias de un manejo adecuado de la diabetes y evitar o controlar las complicaciones y la muerte prematura en los adultos mayores, especialmente en nuestro país, donde la incidencia y prevalencia van en aumento. En tal sentido, este estudio buscó explorar la relación entre los factores demográficos: edad, sexo, grado de instrucción, tiempo de enfermedad y prácticas de autocuidado de los adultos mayores con diabetes mellitus tipo2, atendidos en consultorios del Hospital Tomás La Fora Guadalupe en La Libertad, Perú.

MATERIAL Y METODO

Estudio descriptivo, transversal, correlacional; realizado en 2010, en 100 adultos mayores de 60 años y más, con diagnóstico de diabetes mellitus tipo 2, atendidos en consultorios del Hospital Tomás La Fora de Guadalupe en La Libertad, Perú.

El estudio fue aprobado por el Comité de Investigación de la Facultad de Enfermería de la Universidad Nacional de Trujillo, y para la toma de la información se firmó consentimiento informado por parte de los participantes, luego de conocer las generalidades y naturaleza del mismo.

Se consideraron los siguientes criterios de inclusión: adultos mayores de 60 años y más, de ambos sexos, cognición normal, con diagnóstico de diabetes mellitus tipo 2 sin complicaciones severas, que aceptaron participar en la investigación.

Para la recolección de la información se utilizó la escala para valorar la práctica de autocuidado en el adulto mayor con diabetes mellitus. La confiabilidad del instrumento se hizo a través del coeficiente del alfa de cronbach =0.799, y la validez fue hecha por juicio de expertos y por la correlación de Peerson r = 0.632 p = 0.001, altamente significativo. Escala diseñada por las autoras basadas en las medidas de autocuidado de la diabetes y conceptos de autocuidado de Dorothea Orem (13) contiene 26 ítems que valoran la práctica de autocuidado del adulto mayor en nutrición, farmacoterapia, ejercicio, higiene y cuidado personal. Esta escala alcanza una puntuación máxima de 52 puntos y una mínima de 0 puntos, con la siguiente escala de niveles: práctica de autocuidado bueno: 27-52 puntos, práctica de autocuidado regular: 14-26 puntos y práctica de autocuidado malo: 0-13 puntos. También se tomó la información de los factores demográficos: sexo, edad, grado de instrucción y tiempo de enfermedad.

La información recolectada se analizó utilizando la estadística descriptiva, y el análisis bivariado para determinar la relación de las variables utilizando la prueba de chi cuadrado. Se estableció significancia estadística con valores de $p < 0.05$.

RESULTADOS

El mayor porcentaje (37 %) de pacientes adultos mayores con diabetes estuvieron en edades de (66 a 70 años). El 55% fue de sexo femenino, el 71 % presentó grado de instrucción primaria y el 59 % tiene más de 5 años de tiempo de enfermedad (tabla 1). Los pacientes con diabetes presentaron un nivel de prácticas de autocuidado bueno (55 %) (tabla 2).

Los factores demográficos, grado de instrucción (X2 = 29.118 Valor p= 0.000) y tiempo de enfermedad (X2 =21.596 Valor p= 0.000) tienen alta significancia estadística con el nivel de prácticas de autocuidado en el adulto mayor con diabetes (tablas 5 y 6). Sin embargo, las variables edad y sexo no fueron significativas (tablas 3 y 4).

Tabla 1. Distribución de frecuencia de 100 adultos mayores con diabetes mellitus según factores demográficos

Edades	nº	%
60 a 65 años	31	31.0
66 a 70 años	37	37.0
71 a más años	32	32.0
Total	100	100.0
Sexo	no	%
Femenino	55	55.0
Masculino	45	45.0
Total	100	100.0
Grado de Instrucción	no	%
Sin instrucción	22	22.0
Primaria	71	71.0
Secundaria	7	7.0
Superior o Técnico	0	0.0
Total	100	100.0
Tiempo de Enfermedad	no	%
Menor de 1 año	6	6.0
De 1 a 5 años	35	35.0
Más de 5 Años	59	59.0
Total	100	100.0

Fuente: Información obtenida de los test

Tabla 2. Distribución de frecuencia de 100 adultos mayores con diabetes mellitus según la práctica de autocuidado

Nivel de Prácticas de Autocuidado	nº	%
Malo	8	8.0
Regular	37	37.0
Bueno	55	55.0
Total	100	100.0

Fuente: Información obtenida de los test

Tabla 3. Distribución de frecuencia de 100 adultos mayores con diabetes mellitus según la práctica de autocuidado y edad

Nivel de Prácticas de Autocuidado	Edad						Total	
	60 a 65 años		66 a 70 años		71 años a más			
	nº	%	nº	%	nº	%	nº	%
Malo	5	16.1	6	16.2	11	34.4	22	22.0
Regular	22	71.0	27	73.0	20	62.5	69	69.0
Bueno	4	12.9	4	10.8	1	3.1	9	9.0
Total	31	100.0	37	100.0	32	100.0	100	100.0

Fuente: Información obtenida del test
Valor Chi-Cuadrado: $X^2 = 4.200$
Valor p= 0.122
No Significativo (No hay relación entre las variables)

Tabla 4. Distribución de frecuencia de 100 adultos mayores con diabetes mellitus según la práctica de autocuidado y sexo

Nivel de Prácticas de Autocuidado	Sexo				Total	
	Femenino		Masculino			
	no	%	no	%	no	%
Malo	14	25.5	8	17.8	22	22.0
Regular	36	65.5	33	73.3	69	69.0
Bueno	5	9.1	4	8.9	9	9.0
Total	55	100.0	45	100.0	100	100.0

Fuente: Información obtenida del test.
Valor Chi-Cuadrado: $X^2 = 0,850$
Valor p= 0.357
No Significativo (No hay relación entre las variables)

DISCUSIÓN

En la tabla 1 se resumen las características de la población en estudio, y se evidencia que la diabetes se presentó mayormente en los adultos mayores de 66 a 70 años, y disminuyó ligeramente a mayor edad dentro de este grupo poblacional. En Perú, según el informe de la Situación de Salud de la Población Adulta Mayor 2014, reporta una prevalencia coincidente por edad, y se observó el mayor porcentaje en los de 75 a 79 años, y disminuyó en los de 80 años y más (9). Al respecto, Rodríguez y cols. (14), refieren que la prevalencia de la diabetes aumenta con la edad, la mitad de estos pacientes corresponden a adultos mayores, y constituye una amenaza en contra del envejecimiento exitoso. Además, en personas mayores de 65 años se calcula que hasta el 20 % tiene diabetes, 50 % intolerancia a la glucosa y en la mitad no se ha diagnosticado constituyendo un gran problema de salud pública.

Se encontró que la mayoría son **de sexo femenino**; estos resultados son similares a nivel mundial y Latinoamérica, donde se viene generando un proceso de feminización del envejecimiento (15-18). La mayor supervivencia de la mujer adulta mayor la coloca en una posición de vulnerabilidad, fragilidad, discapacidad y de riesgo porque vidas más longevas no son necesariamente más saludables. **El mayor grado de instrucción** primaria encontrado podría atribuirse a que una de las mayores desigualdades radica en que las personas mayores pertenecen a una generación en la que el analfabetismo y la baja escolaridad fueron características dominantes a lo largo de su vida, lo cual tuvo como resultado privaciones sociales, económica y ser una limitante para su aprendizaje, autorrealización y trascendencia.

En cuanto al **tiempo de enfermedad**, el 59 % tiene más de 5 años, datos similares encontrados por Haya y Paim (19). El tiempo de evolución de la diabetes y la expectativa de vida activa del paciente resultan de gran importancia para planificar los objetivos terapéutico; caso contrario, a mayor tiempo de enfermedad sin control sufrirán las consecuencias y complicaciones devastadoras e irreversibles, lo cual afecta en grado notable el bienestar y funcionalidad, ya que la diabetes se encuentra entre las 10 principales causas de discapacidad en el mundo y socava la productividad y el desarrollo humanos y las instituciones de salud (5).

La población de adultos mayores cuenta con la proporción más alta de enfermedades crónicas y discapacidades funcionales, siendo la diabetes mellitus una de ellas. Mejorar la calidad de vida se convierte en la principal prioridad, y la educación para el autocontrol no es una opción, es un imperativo (5) por ello el autocuidado se convierte en la mejor estrategia para conseguirlo.

En este estudio se encontró que 55 % de los adultos mayores tienen buenas prácticas de autocuidado (farmacoterapia, alimentación, ejercicio, cuidado de los pies e higiene), siendo insuficiente para el control y mantenimiento de la diabetes, debido a la importancia del autocuidado, que no es parte del tratamiento sino el tratamiento. Diferentes autores han reportado resultados similares, como los de Holguín y Torres (20) y Flores y cols. (21). Estos resultados concuerdan con Krieger-Blake (22), quien refiere que a medida que se envejece, el autocuidado puede volverse más complejo e imposible de realizarlo por los cambios en los órganos de los sentidos, sistema nervioso y funciones cognitivas como la memoria, entre otras. También la desmotivación, depresión, soledad, abandono, estereotipos negativos, pobreza, falta de educación dificultan o impiden la práctica de autocuidado en la vejez.

Al respecto Orem en su teoría de enfermería menciona que “la enfermería tiene como preocupación especial la necesidad del individuo para la acción de autocuidado y su provisión y administración de modo continuo, para sostener la vida y la salud, recuperarse de la enfermedad y adaptarse a sus efectos”. Cuando no se mantiene el autocuidado sobrevendrá la enfermedad, el malestar o la muerte (13). Al respecto existen pruebas fehacientes de que los programas de autocuidado mejoran el estado de salud, las discapacidades. reducen la utilización de los servicios y los costos. La OMS reconoce la necesidad de apoyar los esfuerzos de los pacientes en el autocuidado, y los profesionales de enfermería deben desempeñar una función importante en las intervenciones orientadas a los pacientes al educarlos y facilitar el manejo de la enfermedad (10).

En cuanto al autocuidado en la farmacoterapia para el manejo de la enfermedad, el control de la hiperglucemia, la adherencia al tratamiento y vigilancia son esenciales (14). También Gómez et al. (23) al analizar los beneficios del control glucémico afirman que "las personas ancianas con diabetes tienen mayores tasas de discapacidad, mayor riesgo de cardiopatía isquémica y accidente cerebrovascular y muerte en comparación con individuos sin diabetes". Además, el mal control de la diabetes en ancianos se asocia a un mayor deterioro cognitivo, depresión, inmovilidad, caídas y abatimiento funcional, de ahí la importancia del autocuidado (14).

Referente al autocuidado en la alimentación y la práctica de ejercicio, en este estudio también se encontró que son insuficientes. El objetivo de las intervenciones nutricionales es lograr el mejor control de la glicemia y la reducción de los factores de riesgos de enfermedad cardiovascular sin afectar la calidad de vida, la salud. Esto incluye: balancear el consumo de alimentos, el ejercicio, la insulina y los medicamentos. En general, la American Diabetes Association recomienda que los carbohidratos y las grasas monoinsaturadas juntas proporcionen 60 a 70 % del consume energético (24).

En las investigaciones de Diabetes Prevention Study se comprobó que los mayores de 65 años responden mejor a la dieta y el ejercicio que los jóvenes (14). El ejercicio físico regular tipo resistencia es importante porque favorece una mejor tolerancia de la glucosa, aumenta la fuerza muscular, disminuye la grasa corporal, mejora consumo de oxígeno y el perfil lipídico, mejor circulación sanguínea y la calidad de vida (12,25-27).

En cuanto al autocuidado de los pies, recobra una gran importancia, debido a que implica un riesgo 10 veces mayor de amputación (24). Las personas con diabetes mellitus tienen mayor probabilidad de sufrir problemas en los pies, puede causar daños a los vasos sanguíneos y nervios, y disminuir la capacidad del cuerpo para combatir infecciones. Se considera como medidas de autocuidado la higiene corporal y de los pies (higiene, hidratación, uso apropiado de medias y zapatos, recorte de uñas e inspección rutinaria), que favorecen la seguridad, comodidad y bienestar de la persona y promueven la salud de los pies y previenen amputaciones (25).

Por lo tanto, el autocuidado permite que el paciente adulto mayor con diabetes tome decisiones en el desarrollo de sus propias potencialidades, se siente valioso, independiente, seguro y capaz de contribuir en sus propios cuidados y prevenir complicaciones. Sin embargo, esta práctica, de autocuidado está condicionada muchas veces a factores que pueden determinar su buena práctica como la edad, sexo, nivel de instrucción y tiempo de enfermedad variables consideradas en este estudio.

En este estudio la edad del adulto mayor no evidenció una relación significativa con la práctica de autocuidado. Esto refleja que existe una misma conducta de autocuidado independiente de la edad. Sin embargo, se observa que a mayor edad, menos práctica adecuada de autocuidado. Entre los estudios no coincidentes se puede mencionar el realizado por Salcedo (28) y Flores y cols. (21), quienes encontraron que la edad y el nivel de prácticas de autocuidado tuvieron significancia estadística. La edad es una señal que el paciente es responsable de sí mismo, así como puede indicar una necesidad de asistencia

por vivir en un estado de dependencia en las actividades de la vida diría, que resulta de la enfermedad o tratamiento o de la propia edad (29). También los adultos mayores tienen gran interés en el fomento de su salud y prevenir o manejar su enfermedad, y muchos están dispuestos a adoptar hábitos para su bienestar y se benefician con actividades de autocuidado. Sin embargo, pueden existir otros factores a parte de los cambios de la vejez que limitarían el autocuidado, como desmotivación, otras enfermedades, no tenencia de asistencia, apoyos sociales, entre otros.

La variable sexo, de este estudio no tuvo relación significativa con la práctica de autocuidado. Estos resultados no coinciden con lo encontrado por Armijo y Flores (30), Bernui y Castro (31) y Flores y cols. (21), quienes refieren que el sexo tiene significancia estadística. Se ha atribuido a las mujeres mayor tendencia a cuidar de sí mismas y a buscar atención en su salud. Por otro lado, respecto a los varones, es muy probable que por los diferentes roles y responsabilidades sociales descuiden su apariencia personal, fumen, beban alcohol y estén expuestos a toxinas peligrosas, evidenciándose así una inadecuada práctica de cuidados (17). Si bien es cierto que las mujeres se cuidan más que los varones, los resultados encontrados muestran la no significancia estadística, que podría atribuirse a que la cultura de autocuidado está internalizada sin diferencia de género y que los adultos mayores varones tienen más tiempo para decirse a su cuidado y con mayor motivación.

Según Delgado (32), el grado de instrucción es un factor importante en la práctica de autocuidado, como lo evidencia los resultados. Al respecto Salcedo y cols. (28) demuestran coincidencia con este resultado. Un alto nivel de instrucción permite modificación de conductas, actitudes y hábitos; se espera que a mayor grado de instrucción exista más conocimiento sobre la promoción de la salud, enfermedades y prevención de estas, lo cual permitirá actuar con responsabilidad para informarse, orientarse y guiar sus esfuerzos mediante un proceso de aprendizaje, y obtener capacidad de llevar a cabo acciones adecuadas de autocuidado para el mejoramiento y conservación de su salud y manejo de su enfermedad (33). En cambio, las personas sin grado de instrucción están más expuestas a desarrollar enfermedades y complicaciones, con la posibilidad de que sean seriamente afectadas o morir de estas.

El tiempo de enfermedad influye en el cuidado del paciente con diabetes mellitus. El haber encontrado relación significativa coincide con lo reportado por Pousa Reis (34). También Figueroa y Gamarra (2013) al medir la prevalencia del no control metabólico en pacientes diabéticos tipo 2 encontraron una asociación de no control metabólico con diabetes de más de 10 años de duración: RP 1.35 (IC 95% 1.08-1 (35). Al inicio, cuando recién se ha diagnosticado la diabetes, los pacientes viven un proceso de adaptación al tener que adherirse a un plan de tratamiento de por vida y con las graves consecuencias, debido a lo cual experimentan ansiedad, desesperanza, depresión, miedo lo que dificulta sobrellevar la enfermedad, hasta que finalmente aceptan su enfermedad lo cual garantiza una mejor adaptación, y necesitan tiempo para comprender la trascendencia de la enfermedad y el efecto que ejercerá en su vida (11). Es por ello que a medida que aumente el tiempo de enfermedad, las medidas de autocuidado practicadas serán mejores, porque lograrán adaptarse y aprender a vivir con la enfermedad.

El éxito y el abordaje en afrontar la diabetes hace necesario cuidados compartidos, integrales, coordinados y continuados con el equipo y los servicios de salud, y direccionar los programas hacia la prevención de la diabetes, fortalecer los cuidados para el control y mantenimiento, prevenir las complicaciones y evitar la muerte prematura por falta de autocuidado (12).

En este contexto, para enfermería cobra importancia su rol educador como promotor de salud, innovador y conductor de estrategias para promover la adaptación a la enfermedad y enseñar a sobrellevarla en alianza con los pacientes y sus familias y ayudar al adulto mayor a darse cuenta de que puede aún disfrutar de un estilo de vida saludable. Y aportar al envejecimiento exitoso y con bienestar.

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Mecanismos moleculares de las proteínas de choque térmico (HSPs) implicados en el desarrollo neoplásico

Molecular mechanisms of heat shock proteins (HSPs) involved in neoplasm development

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Resumen

Las proteínas de choque térmico (HSPs) son proteínas inducidas por la mayoría de eventos que generan estrés celular y se expresan en niveles elevados en una amplia gama de tumores, entre los que se incluyen el cáncer de seno, pulmón, próstata, colon, leucemias y estomago, entre otros; esta sobreexpresión está estrechamente asociada generalmente con una resistencia a las terapias establecidas, lo cual genera un mal pronóstico. Las HSPs están involucradas en todas las fases del desarrollo neoplásico, desde la proliferación, la anti-apoptosis hasta en la invasión y metástasis. Entre los mecanismos descritos por los cuales las HSPs incrementan la agresividad tumoral se encuentran la evasión de los estímulos pro-apoptóticos y la respuesta inmune, la pérdida de función de p53, la expresión de proto-oncogenes HER2 y c-Myc, la activación de plasmina y MMP2, entre otros; todos estos eventos cruciales para la tumorogénesis. De esta forma las HSPs se han convertido un objetivo prometedor para el diseño dirigido de fármacos anti-cáncer y estrategias de inmunoterapia.

Palabras clave: Proteínas de choque térmico, cáncer, neoplasia, antitumoral, apoptósis, metástasis.

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Abstract

The heat shock proteins (HSPs) are induced by cells stress and expressed at high levels in a broad range of tumors between including breast, lung, prostate, colon, leukemia and stomach cancer; this overexpression is closely associated with resistance to established therapies instituting a poor prognosis. The HSPs are involved in all cancer stages, from the proliferation, anti-apoptosis, even in invasion and metastasis. Within the mechanisms described by which the HSPs increased tumor aggressiveness and metastasis in some tumor types are evasion of apoptotic stimuli and immune response, loss of p53 function, increased expression of the proto-oncogenes HER2 and c-Myc, activation of plasmin and MMP2, all crucial to tumorigenesis. Thus, the HSPs have become targets for anti-cancer drug design and immunotherapy strategies.

Keywords: Heat shock proteins, cancer, neoplasm growth, antitumor, oncogenesis.

INTRODUCTION

El propósito de esta revisión es describir los mecanismos por los cuales las HSPs participan en el desarrollo neoplásico, ya que los distintos miembros de las familias de HSPs desempeñan un importante papel en el desarrollo tumoral al facilitar el crecimiento autónomo de las células y proporcionar la estabilidad de algunos oncogenes. En el contexto tumoral, las HSPs bloquean vías de muerte celular programada (apoptosis) y promueven la activación de factores que degradan la matriz extracelular. Cabe resaltar que la expresión de las HSPs es bastante heterogénea en los tejidos neoplásicos, y sumado al echo de que no se han desarrollado estudios que evalúen la expresión conjunta de todas las familias de HSPs. Es por ello que conocer el papel de estas proteínas en el desarrollo neoplásico resulta importante, ya que la sobreexpresión de las HSPs en muchos tipos de neoplasias ofrece un espacio para el diseño e implementación de tratamientos que puedan inhibirlas o modificar su expresión. Hasta ahora los ensayos que tienen a las HSPs como objetivo terapéutico han mostrado resultados prometedores para el tratamiento del cáncer basado en la inhibición de estas proteínas.

METODOLOGÍA

Para la realización de este artículo de revisión se hizo una búsqueda de artículos originales y de revisión en las bases de datos de PubMed, Science direct y MEDLINE. Las revistas consultadas fueron PNAS, Cell, Nature, EMBO journal, Oncogene, Cancer Research, BioMedcentral, Nature cell Biology, The Japanese Biochemical Society, Cancer Science, Journal in Medicinal chemistry, Journal of Bioscience, Journal of Biological Chemistry, Journal of Gastronenterology and hepatology, Pathobiology, Clinical cancer research, Journal of neuroscience, Journal of clinical hemathopathology, Oncology, Genes and Development, Chemotherapy, Experimental dermatology, Cancer epidemiology, Molecular Pharmaceutics, Cell stress and chaperones, Journal of Mathematical Biology.

Las palabras clave de búsqueda fueron: proteínas de choque térmico, metástasis y cáncer, HSPs e invasividad tumoral, chaperonas de la tumorogénesis, HSPs y migración celular, proteínas de choque térmico y progresión del cáncer, proteoma de células

tumorales y metastásica, expresión de HSPs en cáncer.

El número de artículos seleccionados fue de 126 (86 artículos originales y 40 de revisión). Se seleccionaron artículos originales a partir del año 2000; para artículos de revisión no se tuvo en cuenta el año. Se revisaron artículos que mostraran evidencia a favor y en contra del papel de las HSPs en cáncer cuyo contenido describiera un rol tanto básico como clínico.

GENERALIDADES DE LAS HSPS

Actualmente el cáncer constituye una de las principales causas de muerte a nivel mundial, superado tan solo por las enfermedades de origen cardiovascular (1); por tanto resulta muy importante comprender las vías moleculares que facilitan el desarrollo de la célula tumoral. Entre estas vías se encuentran las proteínas de choque térmico (HSPs) o "proteínas de estrés", que hacen parte fundamental del funcionamiento celular normal y tumoral. Las HSPs conforman una gran familia de proteínas y se clasifican de en los siguientes grupos de acuerdo con su peso molecular, que varía entre 10 000 a 150 000 Daltons: pequeñas HSPs (Hsp10, Hsp27), Hsp40, Hsp60, Hsp70, Hsp90 y Hsp110 (2). La tabla 1 muestra la clasificación de las familias de las proteínas de choque térmico.

Estas proteínas fueron descubiertas en 1962 y recibieron la denominación de proteínas de choque térmico por el hecho de que se detectaron inicialmente al generar un estrés térmico en Drosophila (3). En su mayor parte las HSPs son expresadas en forma constitutiva en casi todas las células, mientras que algunas de ellas son inducidas ante la presencia de determinadas agresiones, se sobreexpresan en células sometidas a choque térmico, radiaciones, diversos fármacos, infecciones virales, hipoxia, entre otros, y se restablecen cuando el estrés es eliminado (4-6). Su ubicuidad hizo que inicialmente se las agrupara bajo el nombre genérico de ubiquitinas (7). Constituyen una gran familia de proteínas que se encuentran expresadas en todos los organismos, a lo largo de la escala evolutiva, cumpliendo un papel similar en bacterias, levaduras, plantas y células animales (8); por ejemplo, ayudan al correcto plegamiento de los polipéptidos recién formados y en la adquisición de la estructura terciaria de las proteínas, en la translocación y secreción proteica. Igualmente, participan en la reparación de proteínas anormales o en su degradación vía proteasoma. Están relacionadas con el control del ciclo celular participando en algunas vías de señalización y brindan citoprotección en eventos proapoptóticos y de estrés celular (4, 6, 8-14). También están involucradas en la presentación de antígenos mediante la transferencia de péptidos antigénicos a las moléculas clase I del complejo mayor de histocompatibilidad (CMH-I). Algunas HSPs secretadas extracelularmente pueden activar a células presentadoras de antígenos, como macrófagos y células dendríticas (15-20).

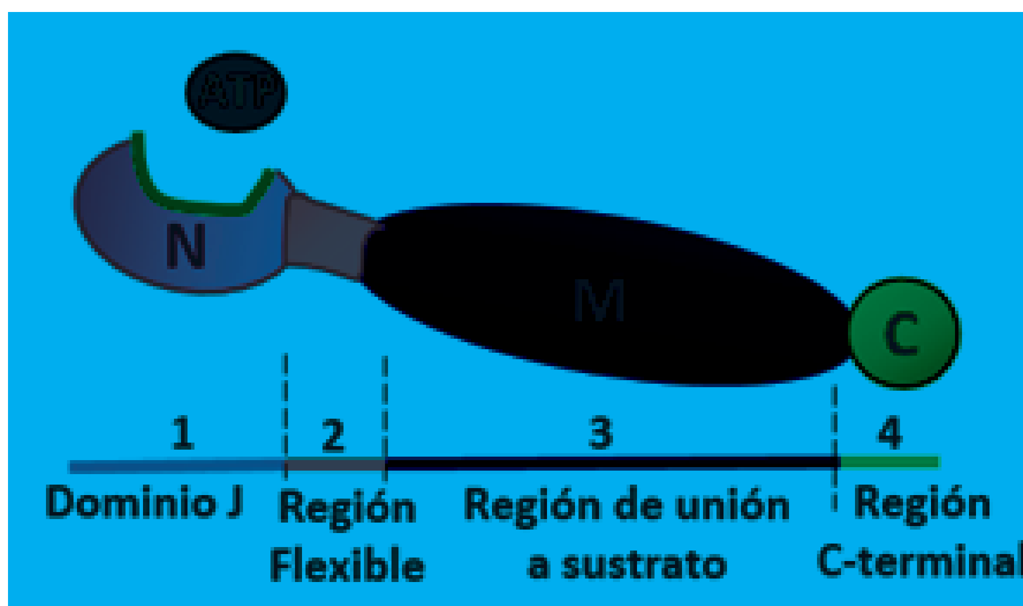
Tabla 1. Clasificación de las familias de las proteínas de choque térmico (HSPs)

Familia	Nombre	Localización celular	Función	Co-chaperona	Referencia
Pequeñas HSPs	p20	Citoplasma	Vaso relajación	Ninguna	(21)
	Hsp22o αB-cristalina	Citoplasma/Núcleo	Estabilización del citoesqueleto		
	Hsp27 (humana)	Citoplasma/Núcleo	Dinámica de la Actina		
Hsp40	Hsp40	Citoplasma	Chaperona	Ninguna	(22)
	Hsp47	Ret. Endoplásmico	Control de síntesis del colágeno		
Hsp60	Hsp58	Mitocondrias	Chaperona	Hsp10	(23, 24)
	Hsp60	Mitocondrias	Chaperona		
Hsp70	Hsc70 (73)	Citoplasma	Chaperona	Hsp40, GrpE, BAG, HSPBP1, Hip, Hop, CHIP	(25, 26)
	Hsc70 (72)	Citoplasma/Núcleo	Chaperona		
	Hsp75	Mitocondria	Chaperona		
	Grp78	Ret. Endoplásmico	Chaperona		
Hsp90	Hsp90α (86)	Citoplasma	Unión a receptores de esteroides	p23, Hop, FKBP51, FKBP52, Cyp40, cdc37	(25-28)
	Hsp90β (84)	Citoplasma	Unión a receptores de esteroides		
	Grp94	Ret. Endoplásmico	Chaperona		
Hsp110	Hsp105	Citoplasma	Chaperona citoprotectora	Ninguna	(29)
	Hs0110	Nucléolo/citoplasma	Chaperona Citoprotectora		

Los números entre paréntesis corresponden a otras denominaciones de las mismas proteínas.
Grp: proteínas relacionadas con glucosa, inducidas por anoxia y deprivación de glucosa.

ESTRUCTURA DE LAS HSPS

La estructura de las HSPs (ver figura 1) está representada por 4 regiones funcionales conservadas: la primera pertenece a un dominio N-terminal (llamado dominio J) característico de la familia de las HSPs, corresponde al sitio de regulación por la actividad del ATP. La segunda porción es una región desordenada rica en Glicina/Fenilalanina, responsable de la flexibilidad de las proteínas, está adyacente al dominio J. La tercer región es un dominio rico en cisteína con repeticiones CXXCXGXG (donde X puede ser cualquier otro aminoácido) de unión al sustrato, está en la región media o central. Por último, la cuarta región corresponde al extremo C-terminal, que permite la dimerización de las HSPs. Estas proteínas se unen a los segmentos hidrofóbicos de los péptidos para poder cumplir su actividad como chaperonas y su unión es dependiente de ATP (10).



Las HSPs tienen 4 regiones funcionales conservadas. En Azul claro dominio N-terminal (llamado dominio J), En azul la región flexible rica en glicina/fenilalanina, en verde la región M de unión al sustrato y en rojo la región N-terminal.
Fuente: Realizada por los autores de la revisión.

Figura 1. Estructura esquemática de las HSPs.

FAMILIA DE LAS HSP PEQUEÑAS

Esta familia presenta un peso molecular entre 15 y 30 KDa, son proteínas ubicuas y altamente conservadas. Se han reportado tres isoformas, aunque su función ha sido poco caracterizada. En general se sobre expresan bajo condiciones de estrés celular y contribuyen a preservar la viabilidad de la célula, manteniendo la conformación nativa de las proteínas citosólicas (30, 31).

Hsp22: también conocida como α- B cristalina o Hspβ-8, es codificada por el gen HSPB8, localizado en el cromosoma 12 (32), y se encuentra en todas células del cuerpo aunque es particularmente abundante en las células nerviosas. Parece interactuar con la Hsp27 (Hspβ-1) en las células nerviosas, ayudando a organizar la red de neurofilamentos de los axones (33).

Hsp27: es producida por el gen HSPBAP1 del cromosoma 3 y fue originalmente denominada Hspβ-1 o proteína de respuesta a estrés srp-27(34). Se expresa en órganos sensibles a estrógenos como el útero, la vagina y piel. Presenta cambios significativos en su localización y expresión durante las diferentes fases del ciclo menstrual (35). Adicionalmente, se encuentra en el cordón umbilical y en menor proporción en la placenta (36). Participa en termotolerancia, proliferación celular, resistencia a drogas, polimerización de actina y como chaperona (37, 38). Se sabe que está involucrada en el transporte del receptor estrogénico desde el citoplasma al núcleo (39).

FAMILIA HSP40

Esta familia es codificada por cerca de 44 genes HSPF1 localizados en los cromosomas 3 y 19 (40, 41). Contribuyen al plegamiento de proteínas y previenen su agregación; actúan como cochaperonas junto a la Hsp70, actividad que es regulada por la hidrólisis del ATP en su sitio activo. Pueden actuar como chaperonas por sí solas y se encuentran localizadas principalmente en el retículo endoplásmico. Esta familia se clasifica en 3 subfamilias de A-C o tipo I, II y III. La subfamilia A está constituida por las proteínas con los cuatro dominios antes mencionados, tiene actividad chaperona autónoma y puede interactuar o no junto con Hsp70. La subfamilia B contiene proteínas que carecen del dominio rico en cisteínas y la subfamilia C tiene solo el dominio J, que no se sitúa necesariamente en el extremo N-terminal; estas dos últimas subfamilias dependen totalmente de la actividad de Hsp70 (22).

FAMILIA DE HSP60

Son una familia de chaperonas mitocondriales codificadas por dos genes HSPD1 localizados en el cromosoma 2 (42). Se encuentran localizadas principalmente en la mitocondria, e incluso se han encontrado en la membrana citoplasmática de algunas células. Son responsables del trasporte y plegamiento de proteínas desde el citoplasma hacia la matriz mitocondrial (25).

FAMILIA DE HSP70

Son codificadas por 13 genes localizados en los cromosomas 1, 5, 6, 9, 14 y 21 (43, 44) y son abundantes en células eucariotas, donde actúan como chaperonas. En cooperación con otras chaperonas, como Hsp40, Hsp90 y Hsp110, se unen a los segmentos hidrofóbicos de los polipéptidos durante la traducción y translocación de los mismos hacia los diferentes compartimentos subcelulares. Se encuentran localizadas en el citoplasma, así como dentro de algunos organelos. Participan en la eliminación de las proteínas dañadas o defectuosas mediante la interacción con el extremo C-terminal de la Hsp70 (Proteína CHIP), que es una E3 ubiquitin ligasa (45).

FAMILIA HSP90

Están codificadas por 17 genes agrupados en 4 clases (HSP90AA, HSP90AB, HSP90B y TRAP, localizados en los cromosomas 1, 3, 4, 6, 11, 12, 13, 15 y 16 (46). Se encuentran en el citoplasma, en la superficie celular, e incluso es excretada extracelularmente, y son unas de las proteínas más abundantes de la célula (47, 48). Se han encontrado más de 100 proteínas que son reguladas por la Hsp90, dentro de las que se incluyen proteínas tales como Akt, Neu/Her-2 (ErbB2), HIF-1α, Bcr-ABl, Raf-1 y p53 mutado (49). Muchas de estas proteínas son importantes mediadores de la transducción de señales y del control del ciclo celular, por ende, la Hsp90 ha sido involucrada como una de las principales HSPs en el desarrollo y progresión tumoral.

EVENTOS ESENCIALES PARA LA PROGRESIÓN TUMORAL

Las neoplasias se forman mediante una serie de pasos en los que la célula normal pasa a ser una célula transformada. Estos pasos implican cambios morfológicos y moleculares que han sido establecidos en los siguientes 6 eventos: 1) Autosuficiencia en las señales de crecimiento, 2) insensibilidad a la inhibición del crecimiento, 3) evasión de la muerte celular programada, 4) potencial replicativo ilimita-

do, 5) angiogénesis sostenida y 6) invasión tisular y metástasis (50). Es importante aclarar que todos estos pasos no se cumplen para los tumores no sólidos.

Los aumentos en la expresión de HSPs parecen estar implicados no solo en la mayoría de estas etapas del desarrollo tumoral, sino también en la adquisición de fenotipos fármacoresistentes, en especial cuando las neoplasias son sometidas a terapias citotóxicas y con esto seleccionan las células resistentes.

MECANISMOS MOLECULARES DE LAS HSP$_S$ QUE FAVORECEN EL DESARROLLO TUMORAL

Adquisición de un fenotipo maligno/ Autosuficiencia en las señales de crecimiento

Las HSPs se han involucrado como proteínas favorecedoras del proceso de transformación celular durante la oncogénesis por sus efectos sobre rutas anabólicas celulares, como la Hsp27 que interactúa con la proteína-quinasa PKD1. En células PC3 (cáncer de próstata), la proteína PKD1 fosforila a Hsp27 en los residuos de serina 82, y este evento se asocia con el trasporte nuclear del receptor de Andrógenos (AR), resultando en un incremento de la actividad transcripcional del AR, lo cual favorecen el crecimiento tumoral (38). En varios ensayos realizados en células Rat-Myc y HeLa se ha encontrado que la Hsp90 es requerida para estabilizar la actividad de HER2, lo cual sugiere que este mecanismo favorece la actividad de las proteínas que se encuentran ubicadas corriente abajo de esta vía, tales como Akt, c-Src, Raf- 1 y cdk4, las cuales juegan un papel en el crecimiento y supervivencia celular. Así mismo, en células Rat se muestra que c-Myc directamente se une a la región proximal del promotor del gen de Hsp90α e induce una sobreexpresión de la Hsp90α, lo cual desencadena transformación celular. Cuando Hsp90 es inducida a través de c-Myc puede controlar la actividad de múltiples rutas envueltas en transformación celular; esto se demuestra al emplear RNA de silenciamiento (siRNA) para la Hsp90α/ Hsp86α, logrando así una reducción de la transformación de las células HeLa y RatMyc, que son positivas para c-Myc (51). Por otro lado, Hsp90 estabiliza la conformación de proteínas oncogénicas que se generan durante la tumorogénesis, tales como v-Src, Bcr-Abl y p53. Esta actividad fue evaluada en células HL-60/Bcr-Abl y células K562, y se demostró que al emplear un inhibidor específico de Hsp90 (geldanamicina o 17- AAG) se induce la degradación vía proteasoma de Brc-Abl, la acumulación citosólica de citocromo C y activación de las caspasas 9 y 3, lo cual desencadena apoptosis (52). Se debe tener en cuenta que las HSPs pueden proteger a las proteínas celulares, evitando que se desnaturalicen o se pliegen incorrectamente durante la oncogénesis, mediante la conformación de complejos heterogéneos entre múltiples chaperonas (Hsp90, Hop, p23, Hsp70 y Hsp40) y las proteínas celulares, incrementando así la eficiencia del chaperoneo de las HSPs sobre las proteínas oncogénicas (26).

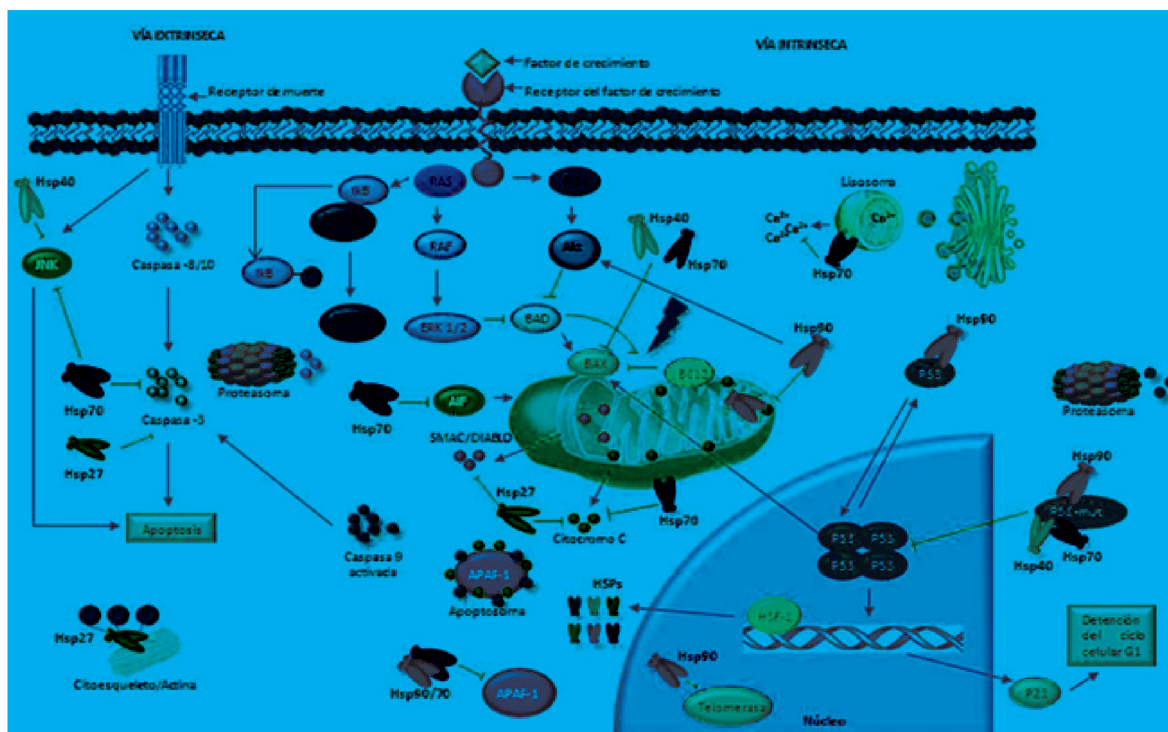
Insensibilidad a la inhibición del crecimiento

Aunque la Hsp70 y Hsp90 se unen a las proteínas supresoras de tumores p53 y Rb10 y se acumulan en células neoplásicas que tienen mutaciones en p53 (53), el rol que desempeñan las HSPs en esta etapa parece no ser tan trascendental. Se conoce que la Hsp72 disminuye la senescencia en células neoplásicas al disminuir la actividad de p53/

p21 y alternativamente bloquea las señales senescentes reguladas por ERK; estos dos mecanismos activan vías oncogénicas a través de PI3K y Ras (54).

Evasión de la muerte celular programada

La respuesta celular de estrés confiere citoprotección a través de la sobreexpresión de diversas HSPs. Se ha encontrado que la Hsp27 interactúa con el factor de inicio de la traducción 4E (eIF4E), disminuyendo la ubiquitinación y degradación proteasomal de este factor; esta interacción protege el proceso de inicio de la síntesis de proteínas para aumentar la supervivencia celular estableciendo un mecanismo antiapoptótico (55). Hsp70 suprime la apoptosis por la asociación directa con Apaf-1, bloqueando el montaje de un apoptosoma funcional, al prevenir el reclutamiento de caspasas en este complejo (56). Igualmente, Hsp70 inhibe la apoptosis al disminuir los niveles de calcio citosólico y estabilizar los lisosomas, previniendo la liberación de catepsina B de los lisosomas, la translocación de Bax y la liberación de citocromo c mitocondrial (57-61). Los anteriores mecanismos fueron demostrados mediante la transfección con cDNA antisentido dirigido contra Hsp70 en células PC3 de cáncer de páncreas, células T Jurkat de leucemia linfoide aguda humana y HT29 de cáncer de colon, líneas celulares que expresan Hsp70 en la membrana del lisosoma. En la línea celular PC3 se incrementó la apoptósis al emplear un oligonucleótido antisentido dirigido contra Hsp70 o al emplear quercetin, un bioflavonoide que disminuye la expresión de Hsp70, lo cual demuestra la importancia de la Hsp70 como proteína antiapoptótica. Por el contrario, al administrar Hsp70 purificada, en la misma línea celular, se inhibe la apoptosis de forma dosis dependiente (62). Al utilizar xenoinjertos de células KATO, de cáncer de estómago que sobreexpresan Hsp105, en un modelo murino de ratones diabéticos no obesos con inmunodeficiencia severa combinada (NOD SCID) y empleando un siRNA dirigido contra Hsp105, se mostró que la supresión de esta proteína induce muerte celular por apoptosis y, que por el contrario, al incrementar la expresión de esta misma proteína la muerte celular disminuye (63), lo cual sugiere que la sobreexpresión de la Hsp105 ofrece una protección ante la apoptosis en células con transformación maligna. La figura 2 resume los diversos mecanismos antiapoptóticos mediados por las HSPs.



En células neoplásicas la respuesta al estrés celular puede conferir citoprotección mediante la sobreexpresión de las HSPs, entre ellas las Hsp90, 70, 40, 27. Por ejemplo Hsp27 estabiliza el citoesqueleto y bloquea a la caspasa 3. El complejo Hsp70/90 suprime la apoptosis por la asociación directa con Apaf-1, bloqueando el montaje de un apoptosoma funcional. Igualmente, Hsp70 y hsp27 inhiben la apoptosis al atenuar los niveles de calcio citosólico y estabilizar los lisosomas, previniendo la liberación de catepsina B de los mismos, la translocación de Bax, SMAC/DIABLO y la liberación de citocromo c mitocondrial. Otro mecanismo antiapoptótico de la Hsp70 se da mediante el bloqueo de AIF y la caspasa 3. El Complejo Hsp90/70/40 bloquea la actividad de P53.

Fuente: Realizada por los autores de la revisión.

Figura 2. Principales mecanismos antiapoptóticos mediados por las HSPs

Evasión de la respuesta inmune

Las células tumorales liberan varios factores que pueden ayudar a la progresión del tumor, contribuyendo directamente al crecimiento neoplásico y/o a la supresión de la inmunidad antitumoral. Se ha demostrado que varios tumores primarios de mama humanos expresan niveles elevados de Hsp27 a nivel intracelular y que adicionalmente estos pacientes tienen altos niveles de Hsp27 en el intersticio y en el plasma al compararlos con los pacientes control (64). Igualmente, se ha descrito que las Hsp27 solubles causan la diferenciación de los monocitos a macrófagos asociados a tumores (TAMs) con fenotipos inmunotolerantes (HLA-DRlow, CD86low, PD-L1high, ILT2high y ILT4high), lo cual crea un estado de anergia ante el tumor. Además, estos TAMs pierden actividad tumoricida, se vuelven extremadamente proangiogénicos (65).

Otro estudio que analizó muestras de cáncer de seno mostró un incremento en la localización nuclear de Hsp90 con una disminución del HLA-1. Esta disociación sugiere un me-

canismo de evasión de la respuesta inmune en células tumorales, porque Hsp90 altera la transferencia de péptidos antigénicos al HLA-1, evadiendo la respuesta antitumoral de los linfocitos T citotóxicos (66).

Potencial replicativo ilimitado

Todas las células somáticas poseen puntos de control que limitan el número de divisiones celulares permitidas, y una vez que las células entran a estos puntos de control se inducen rutas de senescencia. Para escapar de este evento y experimentar un crecimiento ilimitado, las células tumorales deben superar el punto en el cual los telómeros se han acortado lo suficiente en los cromosomas como para evitar futuras divisiones celulares exitosas (67). Las HSPs parecen no ser mediadores importantes en el proceso de proliferación. Sin embargo, Hsp90 junto con la proteína p21, contribuyen al ensamblamiento de la telomerasa, y de esta manera a su activación, lo cual evita un acortamiento del telómero en células no senescentes, y por lo tanto la proliferación celular (68).

Angiogénesis

La Hsp90 interactúa con el factor inducido por hipoxia HIF-1α, el cual se ha asociado con procesos angiogénicos y con el incremento en la radioresistencia en varios tipos de neoplasias, entre los que se encuentran principalmente el cáncer pulmonar, seno y estómago. En células A549 de cáncer de pulmón sometidas a radiación, el mecanismo de la expresión de HIF-1α implica la síntesis de novo de la proteína HIF-1α a través de PI3K/Akt/mTOR y la estabilización de HIF-1α mediante la interacción con Hsp90, que se da exclusivamente en células resistentes a la radiación (69). Al emplear el inhibidor de la Hsp90 17-alylamino-17demethoxygeldamanicina (17AAG) se disminuye la expresión del HIF-1 y la interacción entre estas dos proteínas. Lo anterior lleva a una disminución en la supervivencia celular y disminución de la producción de factores angiogénicos. Al aplicar in vivo 17AAG se disminuye el crecimiento tumoral y la angiogénesis (69). En células de cáncer de páncreas humano HPAF-II y L3.6pl se analizaron cambios en la activación de las vías Erk/Akt/HIF-1 relacionadas con Hsp90, y se mostró que al inhibir la Hsp90 con 17-AAG se disminuye la fosforilación del receptor de crecimiento similar a la insulina tipo β (IGF-IRβ), lo cual conduce a inhibición de la actividad de HIF1α y de STAT3/STAT5, que a su vez conduce a una disminución del factor de crecimiento endotelial vascular (VEGF). Igualmente, empleando 17-AAG en un modelo murino con xenoinjertos de las mismas células tumorales se disminuyó el crecimiento tumoral al reducir la fosforilación de STAT3, y a su vez disminuyó la expresión de IGF-IRβ y la vascularización en el tejido neoplásico (70). Esto mismo se ha confirmado in vivo en modelos murinos para cáncer gástrico (71).

Invasión tisular y metástasis

Existen varios estudios que involucran a las HSPs en la capacidad de migración celular que es un paso importante durante el desarrollo neoplásico y la metástasis. Al emplear como modelo células de cáncer uterino (HeLa) y de seno (MDA-MB231) que han sido tratadas con el factor de crecimiento epidermal (EGF) se descubrió que durante el proceso de migración la Hsp70 se une y regula la localización de la enzima transglutaminasa tisular (tTG) (72). La actividad de la enzima tTG se ha asociado con la formación de un borde de ataque en el tejido neoplásico, en indiferenciación celular y en la estabilización de la matriz extracelular

(73). Al emplear inhibidores de la actividad de Hsp70 se altera la unión de Hsp70 con la tTG y se disminuye la migración celular (72).

La excreción de la Hsp90 es considerado como un factor favorecedor del proceso invasivo y metastásico. Se ha descrito que la Hsp90 puede ser secretada por queratinocitos, células CL1-5 de cáncer pulmonar de células no pequeñas y células MCF-7 de cáncer de seno (74-76). Un modelo que emplea las células de cáncer de colon HCT-8, cultivadas en un medio condicionado por deprivación de suero, mostró un incremento en la secreción de Hsp90α y en la invasión celular (71). Este fenómeno se disminuyó al emplear un anticuerpo anti-Hsp90α, lo cual sugiere que Hsp90α favorece la invasión celular. Igualmente, Hsp90α induce selectivamente la expresión de la integrina αVβ3 mediante la activación de NF-kB. Esta integrina se sobre expresa en el tejido vascular de carcinoma de colon y se ha asociado como factor promotor de la angiogénesis, relacionándose con altos niveles de Hsp90 en el suero de pacientes con cáncer colorrectal (77, 78). Un modelo que emplea células de fibrosarcoma muestra que la Hsp90α (pero no la Hsp90β) secretada a nivel extracelular activa la metaloproteinasa de matriz-2 (MMP-2) y la plasmina, que son moléculas implicadas en la degradación de la matriz extracelular, y al emplear inhibidores de la Hsp90 no permeables a la célula se disminuye la capacidad invasiva y la activación de la MMP-2 y la plasmina (79). También se ha reportado la secreción de la Hsp90 en células de cáncer de colon HCT-8 y su asociación con un incremento en el proceso invasivo ante la deprivación de suero. En este modelo mediante ensayos de ligación por proximidad (*Proximity ligation assay*) se ha demostrado la unión de Hsp90 con varias proteínas, como Neu, que es también conocido como receptor del factor de crecimiento epidérmico humano 2 (HER2), a CD91α, también conocido como receptor α2-macroglobulina (α2MR), al receptor de apolipoproteína E (ApoER) o receptor relacionado con lipoproteínas de baja densidad (LPR), que es un inhibidor de proteasas como tripsina, plasmina, elastasa de neutrófilos y colagenasa de fibroblastos. Estos complejos entre Hsp90, Neu y CD91α inducen las vías de señalización de ERK, PI3K/Akt y NF-kB, p65, que terminan provocando la expresión de la integrina αV, que ha sido asociada con incremento de la invasividad tumoral tanto en ensayos in vitro como in vivo (80).

La localización de la Hsp90 en la membrana plasmática de células PC3 ha sido relacionada con un mayor potencial metastásico, porque al inhibir la actividad de la Hsp90 mediante el uso de anticuerpos específicos se inhibe la asociación entre la integrina β1, la proteína de adhesión focal FAK y c-Src, que son moléculas relacionadas con movilidad y proliferación celular. También se inhibe la fosforilación de FAK y c-Src, lo cual bloquea la activación de la vía integrina β1/FAK/c-Src/ p38/ ATF2/MMP9 y genera una disminución en el porcentaje de migración celular (81). Estos resultados sugieren un mecanismo por el cual la Hsp90 presente en la membrana citoplasmática incrementa el índice metastásico.

IMPORTANCIA CLÍNICA

HSPs como marcadores diagnósticos y pronósticos

Se ha asociado a la sobre expresión de HSPs con un mal pronóstico en una amplia gama de neoplasias en humanos, entre los que sobresalen el cáncer gastico, pulmonar, hepático, endometrio, ovario, seno, osteosarcomas,

leucemia linfoblástica, linfomas, carcinoma prostático y de vejiga (82-89). Aunque los niveles de HSP no proporcionan información a nivel de diagnóstico, los niveles circulantes en sangre de HSPs y de anticuerpos anti-HSPs en pacientes con cáncer pueden ser útiles como marcadores biológicos para establecer el grado de diferenciación, el grado de agresividad y el estado del proceso oncogénico (85, 86, 90-95). Varias HSPs han sido implicadas en el pronóstico de tumores específicos, más notablemente la Hsp27, cuya expresión se asocia con un mal pronóstico en cáncer de seno, gástrico y hepático (96). Así mismo, las Hsp70 y Hsp90 se correlacionan con un mal pronóstico en cáncer de seno, de endometrio, colorrectal, cuello uterino y leucemias (78, 97-99). El incremento en la expresión de las HSPs también puede predecir la respuesta a algunos tratamientos antineoplásicos (69, 100). Por ejemplo, Hsp27 y Hsp70 están implicadas en la resistencia a la quimioterapia en el cáncer de seno y leucemia (101).

Las HSPs como abordaje terapéutico contra el cáncer

La implicación de las HSPs en el proceso oncogénico ha planteado el desarrollo de dos estrategias principales para el tratamiento de neoplasias. La primera se basa en la modificación farmacológica de la expresión de HSPs o de su actividad como chaperonas moleculares (63, 102-111) y la segunda se fundamenta en el uso de las HSPs como vacunas contra el cáncer, explotando su capacidad para actuar como adyuvantes inmunológicos al presentar péptidos tumorales (112-115). Hasta ahora, solo están disponibles para uso clínico algunos inhibidores farmacológicos de Hsp90, como Geldanamicina y su análogo la 17-alilamino-17-deemethoxygeldanamycin (17-AAG), dos fármacos que actualmente se encuentran con ensayos en fase I y II para probar su actividad contra el cáncer (116-118). Lamentablemente, existen pocos reactivos que inhiben selectivamente la Hsp70 citosólica (Quercetin:3,3,4,5,7-Pentahydroxyflavone C15H1007 2H2O; Pifithrin α), sin poder inhibir las demás localizaciones. En cuanto a Hsp27 y Hsp70, los oligonucleótidos antisentido contra estas proteínas han demostrado ser útiles contra el cáncer de vejiga para restablecer la apoptosis y retrasar la progresión tumoral (119-122). Estrategias antisentido también se han empleado en el tratamiento de cáncer de ovario (123). Estas estrategias terapéuticas conducen a la degradación de las proteínas sustrato y a la detención del crecimiento tumoral en G1 o G2 y la activación de la apoptosis (124-126). Se usan estos fármacos asumiendo que las células tumorales, en comparación con sus contrapartes normales, exhiben un fenotipo con una dependencia mayor en la acción citoprotectora de las HSPs.

CONCLUSIONES

Los miembros de las distintas familias de HSPs desempeñan un papel esencial en el desarrollo tumoral al facilitar el crecimiento autónomo al brindar estabilidad de oncogenes sobreexpresados o mutados, lo cual bloquea las vías de muerte celular programada (apoptosis) y promoviendo la activación de factores que degradan la matriz extracelular. La sobreexpresión de las HSPs en muchos tipos de cáncer ofrece un espacio para el diseño e implementación de tratamientos que puedan inhibirlas, coadyuvando al tratamiento antineoplásico. Los ensayos realizados hasta ahora muestran resultados prometedores para el tratamiento del cáncer basado en la inhibición de estas proteínas. Sin embargo, cabe resaltar que la expresión de las HSPs es

bastante heterogénea y no se ha desarrollado un estudio que evalué la expresión conjunta de todas las familias de HSPs para poder establecer cuáles se sobreexpresan o, por el contrario, cuáles disminuyen, por lo tanto se debe evitar la generalización de los resultados obtenidos.

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Importance of nursing care in patients with breast cancer: A narrative review

Importancia de la atención de enfermería en pacientes con cáncer de mama: una revisión narrativa

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Abstract

Objective*: To demonstrate the importance of nursing care in patients with breast cancer.*
Materials and Methods*: Narrative review of the literature, which analyzed 34 studies that were selected from 5 databases, taking into account the recommendations of the report Preferred Reporting Items for Systematic Reviews and Meta-Analyzes (PRISMA) during the search strategy, keeping the Methodological rigor.*
Results*: In addition to the descriptive aspects found in the 34 studies, two major categories were identified that allow to describe the importance of nursing care in patients with breast cancer. The categories are: Aspects valued by nurses and approach to nursing care.*
Conclusion*: The importance of nursing care is evident through the humanized, dignified and palliative treatment that this type of patients require. The literature continues to show the need for nursing care to be comprehensive and strengthened in the light of interdisciplinarity.*

Key words: breast cancer, oncology, nursing, care, palliative care. (Source: MeSH).

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Resumen

Objetivo: *Mostrar la importancia de los cuidados de enfermería en pacientes con cáncer de mama.*
Materiales y métodos: *Revisión narrativa de la literatura, en la que se analizaron 34 estudios que fueron seleccionados de 5 bases de datos, teniendo en cuenta las recomendaciones del informe Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) durante la estrategia de búsqueda, guardando el rigor metodológico correspondiente.*
Resultados: *Adicional a los aspectos descriptivos encontrados en los 34 estudios, se identificaron dos grandes categorías que permiten describir la importancia del cuidado de enfermería en pacientes con cáncer de mama. Las categorías son: Aspectos valorados por los enfermeros y enfoque de los cuidados de enfermería.*
Conclusión: *La importancia del cuidado de enfermería es evidente a través del trato humanizado, digno y paliativo que requiere este tipo de pacientes. La literatura sigue mostrando la necesidad de que los cuidados de enfermería sean integrales y se fortalezcan a la luz de la interdisciplinariedad.*

Palabras clave: cáncer de mama, oncología, enfermería, cuidado, cuidados paliativos. (Fuente: DeCS).

INTRODUCTION

Cancer continues to be one of the leading causes of death in the world (1). It is estimated that its incidence will continue to increase and that 22 million deaths will be recorded in the next two decades (2,3). This indicates that cancer mortality will increase by more than 45% between 2007 and 2030, caused in part by demographic growth and the aging of the population (4). However, its incidence, prevalence and mortality vary in each region and country, and therefore, it is considered a major public health problem worldwide (5).

In 2012 there were about 14 million new cases and 8.2 million deaths related to cancer. The cancers most frequently diagnosed in man were those of lung, prostate, colon and rectum, stomach and liver, in women were breast, colon and rectum, lung, cervix and stomach. More than 60% of the world's new total annual cases occur in Africa, Asia, Central and South America. These regions represent 70% of cancer deaths in the world (6).

The World Health Organization (WHO) reports that the incidence rate of breast cancer increased by 20% between 2008 and 2012, with 1.67 million new cases diagnosed in 2011, which makes it the second type of cancer more common in the world and more frequent among women. The mortality of this type of cancer increased in those 4 years by 14%, with a total of 522.000 deaths in 2012 (7).

A statement issued by the Pan American Health Organization (PAHO) in 2012, revealed that in Latin America and the Caribbean there are 27% of new cases of cancer and 15% of these cases were due to breast cancer. In North America, 30% of new cases and 15% of cancer deaths in women were the result of breast cancer. Taking into account this behavior, it is estimated that by the year 2030 there will be more than 596.000 new cases and more than 142.100 deaths from breast cancer (8).

In Colombia, breast cancer is one of the chronic non-communicable diseases that has

claimed the most lives. The Ministry of Health and Social Protection says that from 1998 to 2013, the number of women who died of this type of cancer increased by 93.37%. This indicates that around 8.686 cases are detected each year; Most of these are registered in Bogota, Medellin, Cali, Barranquilla, Cartagena, Bucaramanga, Santa Marta and the island of San Andrés (9).

In the Department of Atlántico (Colombia), according to statistics from the National Cancer Institute and the Ministry of Health and Social Protection, the cancer incidence rate between 2007 and 2011 was 481 new cases, the estimated prevalence rate was 1.825 cases, and the observed mortality rate of 12.1% of people diagnosed with breast cancer, with a mortality of 41.5% (10).

The American Cancer Society considers that breast cancer originates when the cells of the breast begin to grow uncontrollably. These cells usually form a tumor that can often be seen on an x-ray or can be felt as a lump. The tumor is malignant (cancerous) if the cells can grow by penetrating (invading) the surrounding tissues or spreading (metastasizing) to distant areas of the body (11).

According to Cano *et al*. (12) cancer is cataloged as a disease that affects the person at the physiological, psychological and social level; it brings with it the idea of suffering and death. Thus, when a person is diagnosed with cancer, she goes through a series of changes and situational crises that break her biopsychosocial balance. In response, the person performs adaptive behaviors that allow her to adapt, overcome and regain her balance again.

Currently, an effective cure for breast cancer has not been found, which implies that patients suffering from this type of disease tend to require interdisciplinary and long-term care, commonly known as palliative care. The nursing professional plays an important role in the management of these patients, because nursing care is the epicenter on which the entire care and the discipline responsible for care revolves during the health and illness experiences of the people (13).

Law 911 of 2004 (Code of Ethics of Nursing in Colombia) highlights that the essence of the Nursing profession is the care of health and life, and that this is based on communication and humanized interpersonal relationships between the professional nursing and the human being, family and/or social group, in the different stages of life course, health situation and the environment (14).

This indicates the importance of nursing care in patients with breast cancer, their family and their immediate social environment. For this reason, the present study aimed to show the importance of nursing care in patients with breast cancer in light of the publications reported in the scientific literature.

METHODOLOGY

A narrative review of the literature was developed in order to achieve the stated objective.

Dixon-Woods *et al*. (15) affirm that the narrative approach is characterized by the selection, chronicle and sequential and contingent order of a certain topic or phenomenon. Mays *et al*. (16) state that the purpose of narrative reviews is to summarize, explain and interpret data on a specific topic or question, an aspect that distinguishes it from a systematic review, insofar as it does not emphasize the search, evaluation and intensive criticism of publications through a

rigorous technical protocol, but try to select a certain number of articles, group them according to their results and discuss their approach in light of the methodological characteristics of each to generate general conclusions (17).

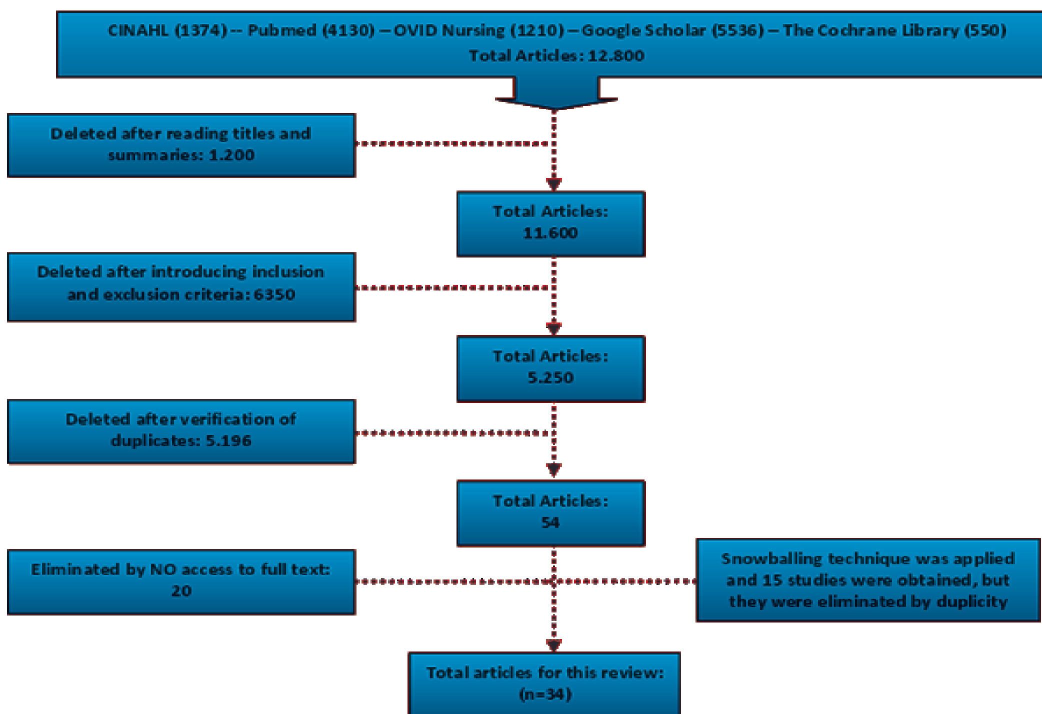
Search strategy

Five databases were reviewed: CINAHL, Pubmed, Ovid nursing, Google Scholar and The Cochrane Library, in the period January - April 2017. The key words used were: "breast cancer", "nursing care", "palliative care" and "oncology" which were combined in English and Spanish taking into account the Boolean operators "AND", "OR" and "NOT" and their different synonyms; truncating the terms with (* y $) to specify the search. The established limits were: clinical cases, research and /or revisions published between 2005 and 2017, in English and/or Spanish, and which would have been developed by nursing at home, in oncology or palliative care units.

Search results

During the literature search, 12,800 works were identified. After the revision of titles and abstracts resulted 11,600, after the application of selection criteria and elimination of duplicates resulted in 54 documents, of which 20 were eliminated for not having access to the full text. Additionally, the snowballing technique was applied and 15 studies were obtained, but they were eliminated in duplicates. Therefore, the total of studies selected for this review was 34 works. (**Fig. 1**)

The information of the 34 studies included in this work was organized chronologically and synthesized, in order to have an amplified panorama for its interpretation. (**Table 2**)



Source: Prepared by the authors, 2017.

Figura 1. PRISMA diagram of the bibliographic search in databases

RESULTS

During the review it was observed that of the 34 selected studies, 1 was carried out in Chile (18), 11 in Spain (19-29), 8 in Mexico (30-37), 6 in Brazil (38-43), 4 in Cuba (44-47), 3 in Colombia (48-50) and 1 in Peru (51).

It was identified that 9 studies used theoretical-conceptual foundations of nursing, such as: the theory of transpersonal care (37) and human care of Jean Watson (50), the theory of the end of life of Ruland and Moore (51), the psychodynamic theory of Hildegard Peplau (30), Swanson's Theory of informed care (49), Saunders total pain theory (46), Henderson's theory of 14 basic needs (21), the Adaptation model by Callista Roy (33), the self-care deficit theory Dorothea Orem (31). Additionally, the use of the natural systems theory of Murray Bowen was found (45), although it is a theoretical construct of Psychology, this author cites it frequently in her studies on palliative care in nursing and quality of family life. (45,52).

The remaining 24 studies did not prove to have been guided by any theoretical-conceptual model of reference. When distributing the studies according to the year of publication, it was found that 8 studies were published between 2005 and 2008 (18-20,30,38,39,44,48), 15 were published between 2010 and 2013 (21- 25,31-34,40-42,45,46,49), and 11 were published between 2014 and 2016 (26-29,35-37,43,47,50,51).

It is important to highlight that in addition to the findings found with respect to the theoretical framework of reference, 7 studies were framed in the use of the nursing process under the approach of the North American Nursing Diagnosis Association (NANDA), the Nursing Outcomes Classification (NOC) and the Nursing Interventions Classification (NIC) (20, 21, 25, 31, 33, 35, 37). Of the 7 studies, 1 combined the standard language with the functional patterns of Marjorie Gordon (20), and 1 with the 10 processes of Watson's care (37). On the other hand, 1 study showed not having used the nursing process and the Nanda-Noc-Nic taxonomy, but took as a reference the Nursing Care Plan for patients with breast cancer, approved by the Junta of Andalucía in Spain (29).

7 studies were oriented under a qualitative research methodology (33, 34, 37, 40, 42, 48, 51), 9 used quantitative methodology (23, 24, 30, 32, 36, 38, 39, 43, 47), 7 were reports of successful experiences and clinical cases (19, 20, 21, 25, 35, 49, 50), 10 were bibliographic reviews (18, 22, 26-29, 31, 41, 44, 46), and only 1 developed a mixed-type quasi-experimental study; that is, it combined quantitative and qualitative methodology concomitantly (45).

Identified Categories

From the critical and exploratory review carried out to the 34 selected studies, using colorimetric technique, two large categories emerged that allowed to identify and describe the importance of nursing care in patients with breast cancer. The categories are: a) Aspects assessed by nurses, and b) Approach to nursing care.

Category 1: Aspects assessed by nurses

A total of 7 subcategories were identified as fundamental aspects valued by nurses during the care experience given to patients with breast cancer, these subcategories are listed in Table 1.

The studies reviewed highlight the important role of nurses in providing social, psycholo-

gical, emotional and family support required by patients who have been diagnosed or have breast cancer, whether in the early, middle or late stages of the disease (18-20,22,28,29,38,48).

Table 1. Subcategories identified in relation to aspects valued by nurses

Category	Subcategories
Aspects assessed by nurses	Social, emotional, family and multidisciplinary support
	Self-care and proactive attitude
	Education in health and for health
	Adaptation, coping and tolerance to stress
	Spiritual well-being and other values
	Quality of life and satisfaction
	Unpleasant symptoms of cancer

Source: Prepared by the authors, 2017.

Below are some descriptive fragments for the identification of subcategories:

> *"**The role of the nurse** is not only related to treatment and cure, but also to establish preventive measures (...), to control the conditions of the patient and **to provide guidance, emotional support**".* (38)

> *"Due to the **broad role that nurses perform**, (...) We provide **advice** and **support** during rehabilitation and reintegration into their daily lives".* (18)

> *"Therefore, in 2002, **a nursing consultation** was created (...), with the aim of providing **post-surgical care and psychological support**, while providing the necessary information in a progressive, personalized and an appropriate environment".* (19)

> *"**Social and emotional support** can help patients learn to cope with psychological stress. This support can reduce levels of depression, anxiety and symptoms related to the disease and treatment".* (28)

Such support can be provided by nursing, psychology, medicine or social work personnel during the pre-surgical and post-surgical phases. However, it is more effective if it is provided in an integral way at an interdisciplinary, even multidisciplinary level (18-20,22,29,38,44,48).

> *"…….the woman who is going to undergo a mastectomy needs a **support network and guidance and interventions** made by a **multidisciplinary team**, with high **participation of nursing staff**, because the preoperative care and how they are performed as well as the necessary orientations play an important role in the recovery"* (38)

> *"It is necessary to give more emphasis to the **multi professional visit** in the preoperative period, since the **entire health team** can contribute to the adaptation of the patientS first and then in their rehabilitation"* (38)

> *"The **multidisciplinary clinical care session** is one of the interventions that can improve the effectiveness of the care provided (…)"* (20)

> *"In our center, Hospital de Palamós (Girona), (...) was formed by a **multidisciplinary team** of gynecologists, radiologists, pathologists and oncologists, (…)"* (19)

> *"On the other hand, a **multi and interdisciplinary team**, enhances the coping activities of patients with the disease".* (29)

Self-care and the proactive attitude of women with breast cancer is an aspect addressed by nursing professionals, because it helps in the process of cancer recovery and improvement of well-being, as well as the reduction of costs and institutional expenses (18,20,30,31).

> *"This process aims to achieve, in short, that women of different ages understand the importance of knowing their breasts; encourage **self-care and a***

> ***proactive attitude*** *regarding the health of their breasts".* (18)

> *"The patient is informed that most of them are transient, vary in intensity according to the individual response, and are given practical recommendations to reduce them, as well as the* ***tools for self-care****".* (18)

> *"An appointment is scheduled at home with the community liaison nurse and the family nurse to assess the knowledge the patient has about her illness and* ***subsequent self-care****, and to monitor the treatment regimen of her previous pathologies.".* (20)

> *".... teaching them* ***how to stay healthy****, can generate a population* ***responsible for self-care*** *that does not depend too much on hospital care and, therefore, leads to lower costs and greater benefits for society and institutions".* (30)

> *"....a nursing care plan, (...) to guarantee quality care, meet present health problems, strengthen the* ***capacity for innate self-care*** *in each of the individuals and achieve early readjustment to society".* (31)

It is important to emphasize that in order to achieve self-care behavior and a proactive attitude, it is necessary that nurses provide information and education to the patient and evaluate each stage of the process (19,23,35).

> *"One of the main objectives of nursing is to* ***provide education and detailed information*** *on all those risk factors; besides* ***stimulating the adoption of healthy habits*** *for the patient and teaching the proper technique of self-exploration of breasts".* (35)

> *"In the consultation (nursing) for post-surgical cures,* ***information tasks, health education*** *and psychological support are performed".* (19)

> *"…..it would be timely and necessary to train nurses specialized in specific care aimed at emotionally supporting and* ***educating*** *women with breast cancer".* (23)

Taking into account that breast cancer involves a set of emotional and psychological affectations in the patient, the nursing professionals see it necessary and pertinent to evaluate the level of coping, stress and degree of adaptation that the patients may acquire (29,33).

> *"………nursing will improve the care and* ***coping of the patient's illness****".* (29)

> *"The nurse plays an important role, can help those suffering from cancer in the* ***process of coping with pain*** *as part of their pathological process and contribute to saving energy to be used in the recovery of the disease".* (29)

> *"…..nurses, can fulfill their objective of promoting the* ***adaptation*** *of the person as a goal of nursing in the four areas, (physical-physiological, self-concept, Role mastery and Independence)".* (33)

Another important aspect identified in the studies is related to the assessment of spiritual well-being and the interpersonal relationships of the patient who experiences the disease (30,31,34,37,49). Therefore, some of the studies reviewed highlight the work of nursing in the approach to the spiritual dimension of the person.

> *"It is important to mention that in the study population everyone feels able to obtain a well-being in depth, giving the guidelines to provide specific* ***nursing intervention*** *for the strengthening of* ***spiritual well-being****".* (30)

> *"For being a pathology that originates physical, psychological and social changes;* ***the nursing staff must be able to meet*** *all these needs in order to help the individual to maintain their independence in the evolutionary process of their illness and in turn, strengthen their* ***biopsychosocial and spiritual health****".* (31)

*"The **Process of Care, based on a theory of nursing**, makes it possible to articulate science and technology with **spirituality and love** for the improvement of the quality of life of women who experience breast cancer".* (49)

*"…..implies that **nurses facilitate spiritual-centered communication** harmoniously during caregiving, (...) ...... Therefore, **integrating spirituality into nursing care** allows society to contribute to the preservation or search for harmony in women who experience breast cancer".* (34)

*"Implementing a **nursing process under this perspective of transpersonal care** allows the development of a conscience of care (...) which facilitates that the woman with breast cancer reaches a remarkable degree of **harmony in her mind, body and spirit**".* (32)

Quality of life and satisfaction of breast cancer patients are two aspects that also emerged in the review of the 34 studies. Achieving quality of life in people with cancer is an unavoidable objective for nursing and the rest of the health team (23,44,49).

*"**……the nursing professional plays a fundamental role in this area (quality of life),** since many objectives are achieved to a great extent with the comprehensive care of the work of the multidisciplinary team".* (44)

*"The **Process of Care,** based on a theory of nursing, makes it possible to articulate science and technology with spirituality and love for the **improvement of the quality of life** of women who experience breast cancer".* (49)

*"**Improving the quality of life** of women with breast cancer **constitutes an independent field** of activity for the **nurse discipline**".* (23)

Most studies are focused on the management and control of unpleasant signs and symptoms derived from breast cancer, as well as the proportion of education to the patient and caregivers about how to control them. Among the clinical manifestations, the most approached are the control and relief of physical signs and symptoms (20,21,22,25-28,33,35,46,50,51), the psychosocial symptoms (21,22,24, 27,28,30,46,50,51), and alterations in the skin (25,26,39).

Category 2: Approach to nursing care

For the identification of the approach, a classification of the studies according to the nursing approach was made to the sick person of breast cancer and the main family caregiver as the immediate context of the affected person. In this sense, it was found that of the 34 studies analyzed, 26 are aimed at people with the health problem (18-28,30,31,33-35,37-39,41-42,44,46,48-50), 3 are aimed at family caregivers (32,45,47), 4 were directed towards the nursing staff (29,36,40,43), and only 1 approached patients, primary caregivers and nursing staff concomitantly (51). It is important to highlight that those studies in which the patient was approached, was done from clinical perspectives. However, it is striking that the approaches of the studies do not include the family.

DISCUSSION

Cancer, and specifically breast cancer, is a process of great emotional impact both for the disease itself and for the physical and emotional consequences that it entails (24). The literature shows that breast cancer is the most common cancer pathology among women worldwide, and is increasing especially in developing countries (23,22,31). That is why early detection, in order to improve prognosis and survival, continues to be the cornerstone of the fight against this type of cancer (23,22).

This has turned professional care into an important social requirement, as well as an ethical imperative for health professionals (20,31); especially, Nursing professionals, who stay longer and establish greater contact with this type of patients (54-57), besides being the most numerous within the health institutions (58,59). This situation makes these professionals have the need to look for new and better mechanisms of approach that allow them to achieve their objective: to take care of health and life (53). In this sense, Argüelles and Fernández (26) affirm that it is important that nursing care be provided with the best possible quality, in order to avoid complications derived from the disease However, to provide quality care, the nursing professional requires extensive knowledge about comprehensive palliative care (36,43).

According to Muñoz-Torres *et al*. (31) the complexity of the physical, psychological and social changes that breast cancer encompasses requires that Nursing personnel have the capacity to meet all these needs in order to help the individual maintain their independence in the evolutionary process of his illness and in turn, strengthen his biopsychosocial and spiritual health.

Olea *et al*. (34) with words of Jean Watson, affirm that the nursing professional must adopt the perspectives of human care to better approach the patient, and Urra *et al*. (60) state that in the care of this type of patients it is fundamental to preserve the human essence and reposition the care within the health systems. This is because the psychological impact that women experience as a result of the diagnosis and treatment of breast cancer is not ephemeral (22).

According to Almeida *et al*. (40) another important aspect that should be strengthened in the practice of palliative care is the therapeutic communication between the nursing professional, patients and the family. This interrelation must be configured in a nursing situation, in which the flow of experiences and shared life allows transforming the meaning of nursing care in the context of the disease.

Some authors affirm that nursing professionals give meaning to their practice in the light of other theoretical contexts and conceptual frameworks that are not nursing (61). However, this review shows that when nursing care is provided under theoretical foundations of reference and systematic methodological frameworks, the results could have a greater impact on the health of patients with breast cancer. In this regard, Hernández (49,50) affirms that the process of care, based on a nursing theory, makes it possible to articulate science and technology, and also allows the integration of the emotional and social dimension with the biological, leading to personal and professional growth in the nurses.

The use of nursing methodology has been a subject on which the effectiveness of care has been demonstrated. Authors such as Ortega *et al*. (35) affirm that the application of the Nursing Care Process allows nurses to provide care in a rational, logical and systematic way. However, these methodologies would have greater impact, if family caregivers and the family in general were included. Ostiguin *et al*. (32) assert that it is necessary to recognize the primary caregiver as an important figure in the health system, by accepting their potential and limitations to assume responsibilities in the care task in the health institution as well as in the home.

Borré-Ortiz *et al.* (62) maintain that the care of the sick person in the home is provided by a primary caregiver or the family, but that in turn, the family requires educational, psychological, spiritual, emotional and social support systems that allow it to maintain its stability, balance and potentiality; confirming what was expressed by Canga *et al*. (63) and Vivar (64) who affirm that it is important that health professionals have a systemic vision of the family and be considered as a unit of care.

In addition to the psychological, emotional and spiritual aspects valued by nurses, this review found a strong tendency towards the care of physical symptoms. This is consistent with what is expressed by Expósito, who affirms that adequate control of symptoms is part of the essence of Palliative Care. (45).

Lafaurie *et al*. (48) recommend that educational processes should be focused on the greater understanding of cancer by women with breast cancer, in addition to guiding them to know self-care strategies that help them to minimize their symptoms and the effects of their treatments. In this same sense, Carvalho (41) proposes that the actions necessary to achieve effective palliative care are related to health education, in which the nurse should encourage the participation of the female user of the health service, encouraging self-care in performing the clinical examination of the breasts ; considering that nursing has a preponderant role in the development of actions with the population, since the focus of their work is humanized care, focused on the prevention of grievances and the promotion of health.

CONCLUSION

Nursing care in patients with breast cancer continues to be a permanent challenge that requires nursing professionals not only to have clinical competencies for the management of symptoms, but also demand competencies for the educational, emotional, family, psychosocial and spiritual approach. Additionally, this approach represents a challenge in the use of disciplinary knowledge to be able to demonstrate the usefulness it has in the improvement of the nursing care process.

On the other hand, the literature continues to demonstrate the importance of the human, dignified and palliative nursing care required by breast cancer patients. Therefore, it is necessary that nursing care be more comprehensive and strengthened in the light of interdisciplinarity. However, it is suggested to continue developing the body of scientific knowledge, increasing research in this field, to improve the quality of care offered to patients diagnosed with breast cancer and, therefore, their quality of life, satisfaction and well-being; both individually and familiar.

Table 2. List of studies included in the review

Nº	YEAR	AUTHORS	TITLE	OBJECTIVE	METHODOLOGY	COUNTRY
1	2005	Silva de Oliveira M, Carvalho AF, Mesquita E, Falcão IC.	Cuidados preoperatorios de mastectomía bajo la óptica de la mujer	Analizar los cuidados de enfermería que más se les realizaron a estas mujeres y verificar su percepción acerca de este período	Estudio descriptivo y exploratorio, con 10 mujeres que se encontraban en la unidad de internación	Brasil
2	2006	Riquelme B, Sepúlveda B Vargas X.	Atención de enfermería en las pacientes con cáncer de mama	Elaborar una reseña de las actividades básicas que realizan las enfermeras en el ámbito de la prevención, educación y cuidados específicos que se brindan a las pacientes sometidas a tratamiento quirúrgico y/o quimioterapia	Reseña narrativa de las actividades que realizan las enfermeras de un Centro Integral de la mama	Chile
3	2007	Romagosa C, Garatea A, Inorizab JM	Cuidados de enfermería a la mujer con patología mamaria: organización de una consulta específica	Presentar la organización, estructura, funciones y actividades más habituales desarrolladas en la consulta de enfermería de patología mamaria desde el año 2002, así como promover la existencia de este tipo de consulta	Reseña de una experiencia exitosa de la implementación de una consulta de enfermería a pacientes con cáncer de mama	España
4	2008	Peinado MC, Cabrerizo MR, Granados AE, Contreras R.	Caso clínico: coordinación en los cuidados de una paciente con cáncer de mama	Mejorar la calidad de vida de pacientes oncológicas en edad avanzada, a través del papel enfermero de los cuidados.	Estudio de caso clínico de paciente con cáncer de mama	España
5	2008	Gallegos-Alvarado M, Hernández DE	Bienestar espiritual en pacientes con cáncer de mama identificado a través de la relación enfermera-paciente	Identificar el bienestar espiritual en pacientes con cáncer de mama, en la fase de orientación a través de la relación enfermera-paciente	Estudio descriptivo y transversal con 125 pacientes en tratamiento quimioterápico ambulatorio	México
6	2008	Pires AM, Araujo R, Cômodo HR	RTOG criteria to evaluate acute skin reaction and its risk factors in patients with breast cancer submitted to radiotherapy	Evaluar y clasificar las reacciones de la piel según los criterios del Radiation Therapy Oncology Group (RTOG) y caracterizar factores que puedan interferir en esas reacciones	Estudio prospectivo, con 86 mujeres con diagnóstico de cáncer de mama	Brasil
7	2008	Figueredo K	Cuidados paliativos: una opción vital para pacientes con cáncer de mama	Realizar una revisión bibliográfica sobre los temas relacionados con el cáncer de mama, la calidad de vida y los cuidados paliativos.	Revisión bibliográfica	Cuba

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Nº	YEAR	AUTHORS	TITLE	OBJECTIVE	METHODOLOGY	COUNTRY
8	2008	Lafaurie MM, Castiblanco DR, González JM, Jiménez DM, Moreno LB, Ramírez LP, Sastoque AG, Tenza JH	Mujeres en tratamiento de cáncer, acogidas por un albergue de apoyo: circunstancias y perspectivas de cuidado de enfermería	Conocer las circunstancias y necesidades de cuidado de enfermería en mujeres con cáncer de mama.	Estudio de tipo cualitativo basado en 13 entrevistas a profundidad de mujeres con cáncer entre los 33 y los 70 años	Colombia
9	2010	Expósito Y	Intervención personalizada a cuidadores primarios de mujeres con cáncer avanzado de mama que reciben Cuidados Paliativos	Diseñar estrategias personalizadas de intervención para cuidadores primarios de mujeres con cáncer de mama en etapa avanzada que reciben cuidados paliativos domiciliarios en el municipio Plaza de la Revolución durante 2008	Métodos mixtos (cualitativos-cuantitativos) y un componente de tipo cuasi-experimental	Cuba
10	2010	Almeida IM, Magalhães RS, Melo I, Carvalho AF.	La comunicación de la enfermera en la asistencia de enfermería a la mujer mastectomizada: un estudio de Grounded Theory	Comprender el proceso de comunicación enfermera/ paciente, con énfasis en la asistencia de enfermería a la mujer mastectomizada	Estudio analítico con abordaje cualitativo, basado en el Interaccionismo Simbólico y la Grounded Theory	Brasil
11	2011	Muñoz F, Moreno E, Peinado MC, Granados AE.	Cuidados de enfermería en paciente con cáncer de mama	Promocionar el principio de autonomía y promover una atención individualizada y continua	Estudio de caso clínico de paciente con cáncer de mama ductal infiltrante	España
12	2011	Vivar CG.	Impacto psicosocial del cáncer de mama en la etapa de larga supervivencia: propuesta de un plan de cuidados integral para supervivientes	Evidenciar el impacto psicosocial del cáncer de mama en la etapa de larga supervivencia y fomentar la reflexión sobre la implantación de un plan de cuidados para supervivientes.	Revisión narrativa de la literatura	España
13	2011	Muñoz-Torres TJ, Rocha-Rodríguez R, Méndez-Berna MY	Plan cuidado enfermero estandarizado en paciente con cáncer de mama.	Reflejar la aplicabilidad y construcción del PLACE estandarizado teniendo como única base el conocimiento teórico de la atención que se debe brindar a una paciente con cáncer de mama	Reseña de una experiencia práctica sobre la construcción del instrumento PLACE para la atención de pacientes con cáncer de mama	México
14	2011	Hernández L.	Navegación de pacientes con cáncer de mama: estrategia basada en la Teoría de los cuidados.	Implementar estrategias de cuidado mediante el diseño y aplicación de un Programa de Atención Integral a Mujeres con cáncer mamario (AIMMA)	Reseña de una experiencia exitosa sobre la implementación de un programa en una Institución de Salud del Valle del Cauca	Colombia

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Nº	YEAR	AUTHORS	TITLE	OBJECTIVE	METHODOLOGY	COUNTRY
15	2011	Ostiguín-Meléndez RM, Rivas-Herrera JC, Vallejo-Allende M, Crespo-Knopfler S, Alvarado S.	Habilidades del cuidador primario de mujeres mastectomizadas	Describir las habilidades del cuidador primario (CP) en términos de conocimiento, valor y paciencia del de mujeres mastectomizadas	Estudio descriptivo de tipo transversal en una muestra de 100 cuidadores primarios del Instituto Nacional de Cancerología de la Ciudad de México	México
16	2011	Carvalho AF, Lavinas MC, Barreto T, Galvão CM.	El pronóstico de cáncer de mama en el embarazo: evidencias para la atención de enfermería	Analizar las evidencias disponibles en la literatura sobre el pronóstico del cáncer de mama durante el embarazo.	Revisión integradora de la literatura sobre pronóstico de cáncer de mama en el embarazo	Brasil
17	2012	Gallegos M, Rodríguez A, Murillo E, Esquivel E, Alvarado MA	Propuesta de cuidado de enfermería domiciliario en personas mastectomizadas: adaptación - afrontamiento	Diseñar un programa de cuidado de enfermería que promueva estrategias de afrontamiento favoreciendo la adaptación y disminución de complicaciones postoperatorias.	Estudio descriptivo, observacional, Proyectivo y transversal	México
18	2012	Olea CV, Berumen LV, Zavala IC.	Modelo de cuidado de enfermería para la mujer con cáncer de mama a través de la integración de la dimensión Espiritual.	Identificar qué es lo que realiza enfermería en la práctica para el cuidado de la mujer con cáncer de mama que acude a un servicio de quimioterapia ambulatoria.	Investigación cualitativa mediante observación participante y diarios de campo	México
19	2012	Pereira AB, Da Costa Lindolpho M, Pinto A	La asistencia de la enfermera en la visión de mujeres mastectomizadas	Identificar las expectativas de las mujeres que se sometieron a la mastectomía en relación al cuidado de la enfermera y cómo estas mujeres percibían la asistencia que les fue prestada.	Investigación cualitativa, descriptiva mediante estudio de caso con 9 mujeres de un grupo de apoyo a mujeres mastectomizadas.	Brasil
20	2012	Ruiz P, Almansa MP.	Calidad de vida en mujeres que conviven 4 o más años con cáncer de mama, desde una perspectiva enfermera.	Evaluar la Calidad de Vida de un grupo de mujeres cuyo diagnóstico de cáncer de mama sea superior o igual a 4 años.	Estudio observacional, transversal y analítico con 24 mujeres que sufren cáncer de mama diagnosticadas hace 4 o más años	España
21	2012	Rizo AC, Gasca E, Molina M, Díaz NV.	Enfoque bioético en los cuidados paliativos en pacientes con cáncer de mama avanzado.	Contribuir a elevar el nivel de información en profesionales de la atención primaria de salud acerca del enfoque bioético en los cuidados paliativos en pacientes con cáncer de mama avanzado	Revisión documental de 77 trabajos publicados entre 2008 y 2011	Cuba

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Nº	YEAR	AUTHORS	TITLE	OBJECTIVE	METHODOLOGY	COUNTRY
22	2012	Brana-Marcos B, Carrera-Martínez D, De la Villa M, Avanzas S, Gracia-Corbato, M, Vegas-Pardavila E.	Factores sociodemográficos y satisfacción con la atención recibida en mujeres con cáncer de mama. Estudio multicéntrico.	Evaluar el grado de satisfacción de las mujeres con cáncer de mama en los Servicios de Oncología Médica de nuestra comunidad y analizar la influencia de los factores sociodemográficos y clínicos en su satisfacción.	Estudio multicéntrico y transversal mediante encuesta de satisfacción, anónima y voluntaria a 225 mujeres diagnosticadas de cáncer de mama.	España
23	2013	Tejerina ME	Plan de cuidados: mujer de 78 años con cáncer de mama en tratamiento con quimioterapia.	Facilitar la identificación del estado de salud de la paciente y sus problemas reales o potenciales, estableciendo un plan destinado a cubrir las necesidades prioritarias, y proporcionando las intervenciones de enfermería pertinentes.	Estudio de caso clínico bajo el abordaje del proceso de atención de enfermería (PAE).	España
24	2014	Ortega RM, Tristan A, Aguilera P, Pérez ME, Fang MA.	Cuidado de enfermería en paciente postoperada de mastectomía: estudio de caso.	Identificar dominios y clases afectadas en paciente postoperada de mastectomía	Estudio de caso en paciente femenina de 47 años de edad diagnosticada con cáncer de mama izquierda.	México
25	2014	Carrillo D, Olvera JL.	Conocimiento del personal de enfermería sobre los cuidados a la mujer postoperada de mastectomía	Describir el conocimiento del personal de enfermería sobre los cuidados postoperatorios a la mujer con mastectomía.	Estudio transversal y descriptivo con 200 enfermeras y enfermeros de oncología.	México
26	2014	Argüelles L, Fernández T.	Atención de Enfermería a Pacientes con Cáncer de Mama y en riesgo de desarrollar Linfedema.	Actualizar los conocimientos del personal de Enfermería de Atención Primaria sobre prevención y tratamiento del linfedema secundario a cáncer de mama	Revisión bibliográfica	España
27	2014	Zavala-Pérez IC, Hernández-Corrales MD, Olea-Gutiérrez CV, Valle-Solís MO.	Cuidado de enfermería transpersonal con base en la teoría del caring a una mujer con cáncer de mama.	Implementar un proceso de enfermería transpersonal con base en los 10 procesos de cuidado del caring a una mujer con cáncer de mama.	Estudio cualitativo de tipo fenomenológico	México
28	2015	Dornelles CM, Santos PS, Brinckmann C, Goldim JR, Ashton P.	Conocimiento del cáncer de mama y cáncer de mama hereditario en el personal de enfermería de un hospital público.	Evaluar los conocimientos del personal de enfermería involucrado en el cuidado de los pacientes de oncología de un hospital universitario público, en relación con el cáncer de mama y el cáncer de mama hereditario.	Estudio descriptivo de corte transversal con 154 enfermeros/as.	Brasil

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Nº	YEAR	AUTHORS	TITLE	OBJECTIVE	METHODOLOGY	COUNTRY
29	2015	Sánchez F.	El yoga como un instrumento de enfermería en los cuidados al paciente oncológico con ansiedad.	Buscar evidencia científica de las llamadas Terapias Alternativas y Complementarias (TAC) para su posible introducción, con las mayores garantías de calidad y seguridad en los planes de cuidados de los pacientes con cáncer, así como la eficacia del yoga para disminuir la ansiedad en pacientes con cáncer.	Revisión Bibliográfica realizada entre los meses de marzo y abril de 2014.	España
30	2015	Vento FE, Expósito MY, Vázquez RL	Características sociodemográficas de cuidadores primarios de mujeres con cáncer de mama y clínicas de las pacientes que atendían.	Describir las características socio-demográficas de los cuidadores primarios de mujeres con cáncer de mama avanzado y algunas características clínicas de las pacientes que atendían.	Estudio descriptivo en una muestra de 72 cuidadores primarios de mujeres con cáncer de mama avanzado.	Cuba
31	2015	Capllonch V.	Cuidados de enfermería en pacientes con cáncer de mama sometidas a radioterapia.	Conocer la importancia de la incorporación de una consulta de Enfermería en los Servicios de Oncología Radioterápica	Revisión de tema y reflexión sobre los cuidados de enfermería.	España
32	2015	Leal C, Jiménez MS.	Afrontamiento del cáncer de mama. Papel de enfermería en el campo de la psicología.	Conocer qué intervenciones enfermeras se llevan a cabo en los estudios de intervenciones psicológicas relacionadas con el afrontamiento del cáncer de mama.	Revisión bibliográfica entre los meses de Enero y Marzo de 2014.	España
33	2015	Oblitas CP, Pérez SE, Gonzales DB	Actitudes de las enfermeras en el cuidado al paciente con cáncer en etapa terminal atendido en un hospital de Chiclayo	Describir y comprender las actitudes de las enfermeras en el cuidado al paciente adulto con cáncer en etapa terminal atendido en los servicios de Medicina y Ginecología de un hospital de Chiclayo en enero del 2015.	Estudio de Caso con enfoque cualitativo, siendo los informantes 10 enfermeras, 11 pacientes y 7 familiares cuidadores.	Perú
34	2016	Hernández L.	La mujer con cáncer de mama: una experiencia desde la perspectiva del cuidado humano.	Ofrecer un cuidado holístico a mujeres con cáncer de mama, ajustado a las condiciones individuales de cada paciente.	Reseña de una experiencia exitosa sobre la implementación de un programa de Atención Integral a las Mujeres con Cáncer de Mama.	Colombia

Source: Prepared by the authors, 2017

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Antibiotic Resistance: Origins, evolution and healthcare-associated infections

Resistencia a antibióticos: Origen, evolución e infecciones asociadas a la atención en salud

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Abstract

The increased incidences of Healthcare-associated Infections (HAI) caused by multidrug-resistant bacteria, have led to an enlarged number of morbidity and mortality cases. Besides, other factors that are affected are patients, families and institutions providing health services. Therefore, the permanent study of the subject is necessary to identify possible strategies that contribute to the reduction of the issue. A critical review of the literature based on the origin of antibiotics, the evolution of their respective resistance, and the impact on public health from a historical and current perspective was developed. The search of the literature was carried out in the bibliographic databases: Pubmed, Web of Science, Scopus, SciELO, The Cochrane Library and Lilacs. The reviewed literature showed, from the historical viewpoint, the discovery of antibiotics to the last-generation antibiotics. The rapid coevolution of genes for antibiotics resistance and its subsequent spread to hundreds of species of microorganisms by Horizontal Transfer gene (HTG) was also reviewed. It is also discussed how the expansion in antimicrobial resistance (AMR) generates a series of factors that increase health-care associated infections care (HAI) and their impact on public health. The development of antibiotics from the discovery to recent changes in the behavior and response of the microorganisms with the generation of AMR shortly after, is one of the most fantastic examples of the evolution that exists in nature.

Key words: Microbial Drug Resistance, Bacterial Genes, Infection, Horizontal Gene Transfer, History.

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Resumen

El aumento en la incidencia de infecciones asociadas a la atención en salud causada por microorganismos multiresistentes a antibióticos, han incrementado la morbilidad, mortalidad y otros factores que afectan a paciente, familias e instituciones prestadoras de servicios de salud; por lo que se ha hecho necesario el estudio permanente del tema, para identificar posibles estrategias que contribuyan a disminuir la situación. Se realizó una revisión de la literatura sobre el origen de los antibióticos, la evolución de su respectiva resistencia, el impacto en la salud pública; desde una perspectiva histórica y actual. La búsqueda de la literatura se realizó en las bases de datos bibliográficas: Pubmed, Web of Science, Scopus, SciELO, The Cochrane Library y Lilacs. El análisis de la literatura mostró desde el punto de vista histórico, el descubrimiento de los antibióticos hasta los últimos antibióticos de última generación, y la rápida coevolución de los genes de resistencia a los antibióticos y su posterior diseminación a cientos de especies de microorganismos mediante la Transferencia Horizontal de Genes (THG). También es discutido como el incremento de la resistencia a los antibióticos (RAM) genera una serie de factores que potencian las infecciones asocia de las a los cuidados de la salud (IACS) y su impacto en la salud pública. La historia desde el descubrimiento, los cambios en el comportamiento de uso de los antibióticos y la respuesta de los microorganismos con la generación de la RAM poco tiempo después, es uno de los ejemplos más fantásticos de coevolución que existe en la naturaleza.

Keywords: Resistencia microbiana a los medicamentos, genes bacterianos, infección, Transferencia horizontal de genes, Historia.

INTRODUCTION

Since the beginning of the antibiotics era, the resistance to these substances has described, during several decades; antimicrobial resistance (AMR) has been an increasing menace for the effective treatment of a wide range of infections caused by bacteria, parasites, virus and fungi. AMR produces a reduced efficacy of antibacterials, antiparasitics, antivirals and antifungals; turning difficult the treatment of patients who have got this kind of microorganisms (1). The origin, evolution and resistance mechanisms have appeared during the last 60 years; at the beginning, the problem was solved with the synthesis of new substances which were capable to control bacteria with AMR, then other medicaments appeared such as aminoglycosides, macrolides, glycopeptides, among others (2). During the first world congress about antibiotics resistance, the World Health Organization (WHO)) exposed that the so called "killer bacteria" are a worldwide menace, with a great ability to mutate; even avoiding broad-spectrum antibiotics, in the same way the data of 114 countries previously analyzed and it was also exposed that AMR is currently present worldwide and at every social level (3). The alarming increase of AMR is, without a doubt, one of the biggest problems of current public health, since these compounds are one of the main tools to control and treat bacterial infections, in human medicine as well as in veterinary.

Recent studies estimated the economical effects of ARM, for example; the annual cost for health system in USA is estimated from 21 to 34 billion dollars, accompanied by more than 8 million days in hospital (4); in Europe, it is estimated a cost around €1.600-6.000 per year in patients with resistance to third-generation cephalosporines (5); a study made in 12 European countries (Belgium, France, Germany, Italy, Netherlands,

Poland, Slovakia, Slovenia, Spain, Sweden and the United Kingdom) evaluated the costs of medical attention and the resistance to multiple medicines finding that this amounted to € 727.4 135 (£ 589 856) (6); the costs in Singapore are around USD$ 8638.58 in multiresistant infections (7); in Spain, the average economical cost per admission of patients who have got strains resistant to multiple medicines is higher than the ones with non-resistant strains with €15.265 compared to €4.933 for the others (8); in South Africa, the average cost of a successful tuberculosis treatment in patients resistant to rifampicin was USD $8359 (9). Therefore, the objective of this study was to make a critical review of the literature about the evolution of AMR, from different perspectives: Historical, molecular, mechanisms and its impact in public health.

METHODOLOGY

A thorough review about the origin and impact of antibiotics and their endurance regarding the infections associated with health assistance worldwide was made with a historical and current perspective. This review is the result of the execution of the research project entitled: "Molecular typing of resistance genes in gram-negative bacilli associated to infections in a health service provider institution in Boyacá". For the identification of the studies, the bibliographic databases consulted were; Pubmed; Web of Science; Scopus; SciELO; The Cochrane Library and Lilacs. It was set a deadline for publications from 2010 to 2017. They were considered original researches or review articles, available in English or Spanish. Key words validated in Descriptors in Health Sciences were also used, which included microbial resistance to drugs, bacterial genes, infection, horizontal gene transfer and history.

RESULTS

Evolution of AMR

Since the emergence of humankind, the use of natural resources ha sbeen sought for its benefit, as an adaptive strategy to different environments.Several natural products were used by observation or intuition, in order to improve their health and welfare, mainly, facing the presence of pathogenic agents.Once these resources were considered exhausted and measured by advances in science, they resorted to chemical synthesis (10).

AMR has been described since the beginning of the 30s. After the use of penicillin in World War I, the first resistant bacteria emerged; in 1945, Fleming postulated the potential risks associated to the use of antibiotics; he showed that the use of a large and prolonged scale can select resistant bacteria, observing in his laboratory that bacteria sensitive to penicillin multiply in the presence of increasing concentrations of the antibiotic (11). During the 40s, the first report of penicillin resistance by strains of *Escherichia coli* (*E. coli*) and *Staphylococcus sp* was reported (12). In 1947, resistance to streptomycin among patients with tuberculosis was detected, where 80% of them relapsed within three months due to the formation of resistant bacilli (13). In the years 1952 and 1957, resistance to tetracycline and chloramphenicol was reported and in the decade of the 60s, β-lactamases producing strains, such as TEM and SHV of wide spectrum (detected in gram-negative bacilli) were discovered (14) (15).

Extended-spectrum β-lactamases (ESBLs) are phenotypically resistant to penicillins and cephalosporins; they were registered for the first time in *E. coli* in 1964 (16). Later, in

the 80s, antibiotics such as aminoglycosides (including vancomycin) were detected from resistant strains of *Enterococcus*; a short time later, it was found resistance to ampicillin in different species and the list kept growing (17). At the end of the 70s, bacteria resistant to ampicillin and cephalosporins were reported (12). In 1980, it was estimated that between 3-5% of *Streptococcus pneumoniae* (*S. pneumoniae*) was resistant to penicillin; but in 1998, 34% of these bacteria increased their resistance to this antibiotic. In the same decade, resistance to vancomycin and erythromycin was observed (13). Subsequently, in 1999 the multiresistance of gram-negative bacteria was described. For the period from 2002 to 2009, an increase in strains of *E. coli* resistant to broad-spectrum cephalosporins was observed, which is present in most of European countries. In 2008, a new enzyme called "New Delhi Metallobetalactamase" was observed, which confers resistance to all beta-lactam antibiotics, except aztreonam; showing a global alert against AMR to several non-beta-lactam antibiotics (18), leaving a few therapeutic options for the treatment of patients infected with these bacteria. After this report, the presence of this type of resistance was identified in 2010 in Canada, in 2011 in the United States and Guatemala; in 2012 in Uruguay, Paraguay and Colombia (19).

AMR is one of the most spectacular and documented natural event in microbial evolution, from the origin and application of antibiotics, passing through a few years in order to make that the different phenotypes arise; twelve years after the origin and application of penicillin, the first resistance mechanism was detected (20). This is how it is observed that, in a few years, bacteria can increase the speed of AMR generation. For example, in ten years after having resistant strains to penicillin and methicillin, resistance to chloramphenicol emerged, and in four years to streptomycin. Therefore, AMR is a growing public health problem, seen barely some years after the discovery of penicillin (21). That is why, a question arises from the emergence of AMR: What is or what are the mechanisms involved in this fast production of AMR?

Origin of AMR

Throughout the five decades that followed the synthesis and the indiscriminate use of antibiotics in people, animals and agriculture; a selective process unprecedented in the history of evolution has been observed, due to the fact that it has been an unregulated practice that lacks control and supervision (22); but this selection, considered by many researchers as artificial, has many components to consider in this review; in addition to the selective effect, the high rate of mutations in bacteria, the formation of bacterial communities and the horizontal transfer of genes, are important factors in the generation of AMR (23). There are several examples in the literature of spontaneous mutations in bacteria; some researchers consider that the evolution of resistance, through the acquisition of spontaneous mutations is particularly relevant for certain drugs, such as quinolones and rifamycins, for which the high-level resistance can result from a point mutation (22, 24). For example, in *Salmonella typhimurium* (*S. typhimuriun*), with a point mutation in the *henC* gene, the resistance of the bacteria to protamine increases, but with a cost in the reduction in bacterial growth (25); similar results were described in *Salmonella enterica*, where mutations in the tRNA-isoleucine gene confer resistance to mupirocin but with a reduction in growth (26). Other authors consider that AMR can evolve through the accumulation of multiple

sequential mutations and not by single point mutations (27); this mechanism would be responsible of the high levels of AMR that currently present many of the microorganism species, pathogenic species(28). These results, have shown that microorganisms that have a strong selective pressure (high concentrations of antibiotics), have RAM in a short period; similar to the one presented currently, especially in treatments against infections in humans (29).

It is presumed that there exist around 20 thousand resistant genes, predicted through the analysis of DNA sequences of different bacterial genomes however, they are functionally expressed in just some of them (28); many of them are originated by unique or consecutive punctual mutations, or also by gen duplications. But, what is the reason for these genes to be distributed in other strains or bacterial species presented in different environments? The answer to this question can be found in studies of comparative genomics. The identification of the sequences of bacterial genes in eukaryotic genomes, as the presence and genomics of pathogenicity islands presented in *E.coli*, found in other animal pathogenic, in human genome and some plant species; they confirm the theory of horizontal gene transfer (30). Horizontal gene transfer (HGT) has been considered as the mechanism responsible of the dissemination of antimicrobial resistance genes through different bacterial species (31). Actually, the genes that present resistance to certain antibiotics in non-related phylogenetically bacteria, demonstrate to have identical nucleotide sequences, including Gram positive and negative bacteria; it emerged at the beginning of the decade of 1990; it was a way to explain the phylogenetic incongruence using different gene trees. This process can also occur among the domains in all the possible directions, from bacteria to archaea, bringing new data about the rise of the genomic era, which has permitted the comparison of genes among different species (32). The interchange of genetic material in HGT among genomes is carried in different ways, acquiring a great relevance in the prokaryotic evolution due to the resistance to antibiotics that contribute to the inclusion of new mechanisms by bacteria (33, 34).

HGT is a phenomenon which takes place in and within the three domains of life (Fig. 1). The acquisition of genes by bacteria has got accelerated by the increase of adaptive and selective pressure needs, specifically the use of antibiotics in infections control in medicine, veterinary, agriculture and animal nutrition (35); the mark of the transference corresponds to the existence of a gene or genic sequence in the phylogenetic tree of the organism and to the observation of the same genic disposition in the donor and receptor bacterial population (31, 36).

With the recent increase of the studies in metagenomics, in which resistance to antibiotics has been identified in different ecosystems (37), for example; in human micro biome which generated complete genome sequences of several hundreds of human microbes, it has confirmed this HGT theory. Liu *et al*, detected a total of 13.514 genes coming from HGT identified in 308 human microbes in different parts of the body (including intestine, mouth, skin, etc.), with an average of 43,9 HGT per microbe THG (30). Besides this finding, researchers discuss the possibility of THG among the micro biome and the cells of our body; and how this event can be related to human health due to the fact that the total number of microbial cells hosted by the human body is 10 times greater than the number of human

cells in the body (100 times the number of genes in the human genome); The theory of HGT between the microbiome and the cells of our body is more than supported, but this behavior is not exclusive of the human microbiome (38).

The acquisition of genes by bacteria is accelerated, increasing the need of adaptation and selective pressure, specifically, by the use of antibiotics to control infections in human medicine, veterinary medicine and agriculture. Therefore, being in permanent contact with diverse environments, farm or domestic animals, plants, insects, among others HGT could be present even more frequently than it is commonly thought (31, 39)

Among the most probable mechanisms of HGT are conjugation, transformation and transduction; in which mobiñe genetic molecules take part such as plasmids, bacteriophages, transposons, integrons and gene cassettes that have genes with functions for their own transfer and / or bacterial resistance (40). In chat 1 examples can be found of mobile genetic elements that transfer resistance genes.

One of the most common and known mechanism is the conjugation by means of plasmid transfer, taking resistance genes; in Gram-negative bacteria, resistance genes are found as a part of small mobile genetic elements or "cassettes", integrated in greater elements (integrons) (41). Integrons are structures of interest because they are found in the bacterial chromosome structure presented in the cassettes of genes related to resistance; it has been observed that more than a cassette can be inserted in the same integron to generate molds that contribute to the spreading of the multiple resistance (42). Resistance genes spreading is higher when these are part of mobile genetic cassettes, which permit them to be transferred by several mechanisms (43). There exists enough scientific evidence of the high rate of HGT among gram-negative and positive bacteria, generated mainly by conjugation.

Cassettes can codify several compounds that generate resistance for a huge range of antibiotics including ß-lactam, aminoglycosides, trimethroprim, amphenicol, sulfonamide, tetracyclines, rifampicin, erytromycin and quinolones (44).Therefore, integrons and cassettes that bring multiple ARM are, currently, the most studied genic elements by researchers in order to explain the origin of ARM and its impact in public health.

AMR in health-care associated infections

During more than 60 years, antibiotics have been considered as the panacea to cure infections, with enormous benefits for human health. The development of the resistance to this important class of medicaments, and the consequent loss of its efficacy as an antimicrobial therapy, represents a serious health menace. Despite the efforts of hospitals to improve the caring process and health of the patient, infections still occur with a higher frequency; it has been complex to determine the world range exactly; it is estimated that every year billions of patients get affected (45). Health-care associated infections (HAI) are defined as any infectious process, general or localized, that occurs due to the stay or attendance to a health center and appears during or after the discharge more than 48 hours after the entry. They include blood infections, affected area by a surgery, skin and soft tissue, pneumonia, and urinary tract infections which are the most common (46). Therefore, HAI, besides entailing an adverse

effect for the patient, are also an indicator of the caring quality. The rise and reemergence of HAI, caused by ARM microorganisms, has as a consequence the increase of morbidity and mortality in hospitals around the world (47, 48). They are associated to economic effects in institutions, in health systems and therefore in economical ranges for the countries (49-51).

In the American continent, a prevalence of HAI is present which varies from 4.5% in the United States, to 14% in Brazil (52). Other studies in several countries of America reveal a wide variation in the incidence of resistance in common bacterial pathogens, as an example, the resistance to third generation cephalosporines observed in *E. coli*, varying from 0% in the case of Brazil to 50% in Peru; in comparison with the world reports where they are found in 26.8% (53).

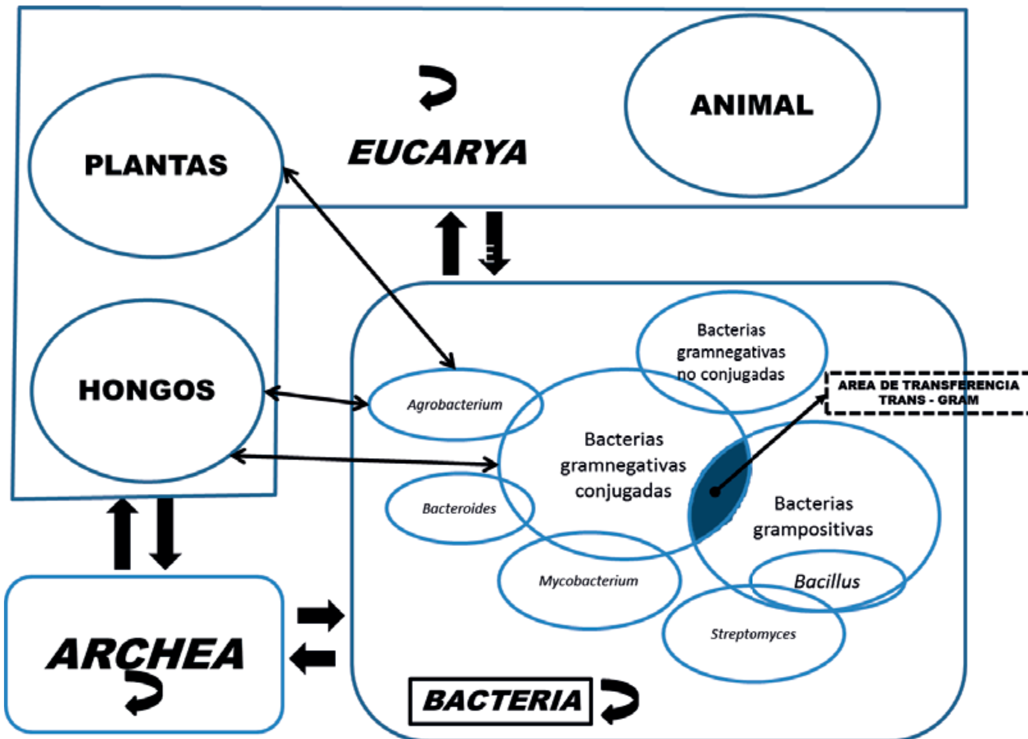
The increase of the resistance has become one of the most important aspects in the world and this is why, the antimicrobial resistance was declared as a public health problem by the World Health Organization in 1999; it is related to the excessive and indiscriminate use of antibiotics in the community and hospitals, as a decisive factor in the origin of the rise of resistant pathogens nowadays (3).Therefore, it is necessary to promote strategies of control of AMR through the exact identification of the microorganism and its resistance phenotype, besides the opportune information of these results to the service of infectious disease treatment in the hospital, in order to avoid the proliferation of multiresistant strains that produce new HAI (46).

CONCLUSIONS

The history of the discovery and usage of antibiotics and their corresponding ARM generation a short time later, is one of the most fantastic examples of coevolution that exist in nature. One of the decisive factors in this case is the indiscriminate use of antibiotics at different levels: In human, animal and environmental medicine. The last mentioned, can emerge when the antibiotics that were not consumed are thrown, taking the risk of generating resistant bacteria in the environment.

On the other hand, the rise of resistance genes can have several origins: (a) Punctual mutations, (b) Consecutive mutations of high frequency and, (c) genic duplications. Besides, microorganisms are held to strong selective pressures, due to the indiscriminate use of antibiotics which cause multiresistant strains. In the same way, these ARM microorganisms are able to transfer their resistant genic pool to other strains or sensitive species to antibiotics by different HGT mechanisms as transduction, transformation and conjugation. HGT can be presented in different auspicious environments as health attention centers where different types of infections are treated and their different origins increasing the HGT potential. The increase of HAI is originated for multiple factors, most of them, avoidable. Unfortunately, in many HGT cases, infections are originated by multiresistant microorganisms, even to last generation antibiotics, increasing the morbidity and mortality around the world.

In a consistent way with the alarms of the WHO, the studies related to ARM must be increased as well the respective restrictions of antibiotics usage, mainly in developing countries as the ones of South-America.



Las HSPs tienen 4 regiones funcionales conservadas. En Azul claro dominio N-terminal (llamado dominio J), En azul la región flexible rica en glicina/fenilalanina, en verde la región M de unión al sustrato y en rojo la región N-terminal.
Fuente: Realizada por los autores de la revisión.

Figure 1. Evolution of antibiotics synthesis

Chart 1. Examples of mobile genic elements that transfer resistance genes

Donor bacterium	Receptive bacterium	Vector (genetic element) / genes	Resistance phenotype
Klebsiella pneumoniae, Eschericha coli, Enteroacter cloacae	Eschericha coli	Plasmids R6K, RP4, R1 y pUA21 / BLEEs tipo SHV-2 y SHV-5 (54, 55).	Cephalosporins
Escherichia coli MKD13	Klebsiella pneumoniae	Plasmids pNU147 / blaTEN-1 (56).	ß-lactam, gentamicin, kanamycin, tetraciclyne and chloranphenicol
Ancestral	Pseudomonas aeruginosa	Integron In0 - plasmid pVS1 / sul 1 (57).	Sulfonamide
Ancestral	Acinetobacter baumannii biotype 9	intl1 - intl2 (Tn7, Tn21)/ sul1 (50).	ß-lactam, sulfonamides, trimethoprim, tetraciclyne, chloranphenicol, and aminoglycosides

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ARTÍCULO DE REVISIÓN/*REVIEW ARTICLE*
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Evidence for nursing care in children in healthy environments

Evidencia para el cuidado de enfermeria en niños en ambientes saludables

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Abstract

The health of Children is influenced by environmental conditions of hygiene in Child Day Care Centers where children spend much of their time. Promoting healthy environments in these places is a work in interdisciplinary health education. The objective is to present a review of literature on the environmental conditions of hygiene and food safety as fundamental care issues and promoting the health of children, which was developed through searching articles in different databases. Four action lines were characterized for addressing strategies and interventions of promotion and health care in early childhood. Finally, in this review the relevant evidence regarding the conditions of environmental hygiene and food safety were documented to address strategies and interventions to promote healthy environments in child care centers.

Key words: Child Day Care Centers, Food Safety, Food Hygiene, Sanitation, Hygiene, Environmental Health.

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Resumen

La salud infantil está influenciada por las condiciones de higiene de los lugares de atención donde los niños pasan gran parte del tiempo. La promoción de ambientes saludables en estos lugares, constituye un trabajo interdisciplinario de educación en salud. El objetivo es presentar una revisión de literatura que permita identificar las lineas de acción para la promoción de las condiciones de higiene y de la inocuidad de los alimentos como temas fundamentales para el cuidado de la salud de los niños. Como resultado, se caracterizaron cuatro líneas de acción para el direccionamiento de estrategias e intervenciones de promoción y el cuidado de la salud en la primera infancia. Finalmente, se documentaron las evidencias relevantes acerca de las condiciones de higiene y de inocuidad alimentaria, para direccionar estrategias e intervenciones de promoción de ambientes saludables en los centros de cuidado infantil.

Palabras clave: Centros de Cuidado Diurno para Niños, Inocuidad de los Alimentos, Higiene Alimentaria, Higiene Personal, Salud Ambiental.

INTRODUCTION

Within the framework of early childhood policies, the World Health Organization (WHO) recommends mobilizing strategies for the promotion of healthy environments and the health care of children in order to mitigate the more than three million deaths of children. under five years of age in the world due to causes associated with the environment (1). These strategies should be directed towards the characterization of environments susceptible to contamination particularly where food is handled (kitchens and dining rooms). Kitchens are considered as critical points where potentially pathogenic microorganisms can be introduced from the people who handle them, from food that is not safe from its preparation, obtaining or storage, or from contaminated water, posing a risk to the health of the consumers (2). Child care providers are expected to apply standardized hand washing and safe food handling procedures, such as those established by the WHO through the five-key manual for food safety (3, 4).

Health care and the promotion of healthy environments in early childhood care places are considered relevant issues in Public Health worldwide. The objective of this article is to present a synthesis of the literature that allows the identification of the lines of action for the promotion of hygiene conditions and the safety of food as key issues for the health care of children.

METHOD

An interdisciplinary group of expert researchers was formed in the subject that allowed the development of a protocol to conduct a systematic narrative review based on the Egger and Smith methodology (5), which establishes seven phases:

1. Construction of a search question - PICOT question (Population, Intervention, Comparison, Results and Study type)
2. Determination of inclusion criteria for article eligibility

3. Access and location of studies in databases
4. Selection of studies
5. Evaluation of the quality of the studies
6. Extraction and synthesis of relevant data
7. Potential analysis and presentation of results

1. Construction of the search PICOT question. The systematic literature review was conducted based on the PICOT question: What are the lines of action for the promotion of hygienic conditions and the safety of food for the health care of children?

From the components of the PICOT question, the search terms MeSH, Thesaurus All Fields and SubHeadings were obtained: Preschool child care, environment condition, food safety.

2. Criteria for the selection of articles. For inclusion in the sample, the following criteria were taken into account:

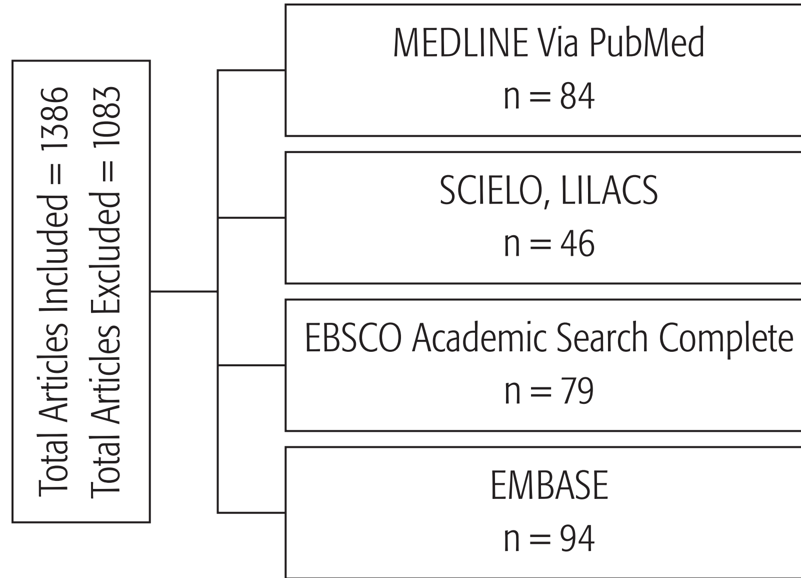
- Controlled clinical trials, association studies and observational studies published in English, Portuguese or Spanish.
- Studies carried out in places of attention in early childhood.
- Studies analyzed as having high methodological quality following the revision procedure included in the SIGN Methodological Guide (Scottish Intercollegiate Network), which is part of the guidelines of the Ministry of Health and Social Protection of Colombia. Individually, the relevant findings of the analysis were recorded in the synthesis table proposed by Melnyk et al. (6)

3. Search strategy and location of studies in databases. A bibliographic search was performed in different access databases of the National System of Libraries of the National University of Colombia and the University of La Salle. The main databases consulted were: Medline, Pubmed, Embase, LILACS, ScienceDirect, Web of Science, SciELO, Scopus and Redalyc, with a search window from 2010 to 2016. With the Analyze search results tool available in Scopus, the trend of the reports in terms of authors, institutional affiliation, country and area of knowledge

Table 1. Search strategy

MeSH Terms EMTREE Terms	Preschool child care, enviroment condition, food safety.
Records retrieved using combinations of search terms	Preschool child care (100236) Enviroment condition (175903) Food safety (37421) 1 OR 2 OR 3 (311489)
Limits	
Type of studies Date[2010 to 2018]	Reviews (1) Trials (10) Descriptives (17)

4. Selection of studies. Studies that met the inclusion criteria were included in the search to document the environmental conditions of hygiene and food safety. Figure 1 shows the process of selecting and organizing the studies.



Source: Prepared by authors.

Figure 1. Process of selection and organization of articles included in the analysis

5. Evaluation of the quality of the studies. In the review protocol it was established that the most useful tool to consider the relevance of the studies was the one proposed by the CASP Program (Critical Appraisal Skills Program) which consists of the application of 38 questions as minimum criteria for the quality of the studies (7). By agreement in the group of experts, the studies that responded to a percentile of methodological quality greater than 80% obtained in the evaluation of quality checklists of the studies were included in the synthesis.

6. Extraction of the relevant data. The relevant study data were extracted with the SIGN tool (8) as reference.

7. Analysis and presentation of results. Once the evidence was synthesized, four lines of action were structured as an innovative result for the generation of future intervention proposals in the promotion of healthy habits in early childhood.

The ethical principles of the research were fulfilled, for which the UGI-221-2001 endorsement of the Ethics Committee of the Faculty of Nursing of the National University of Colombia was included, as part of the research project contract 363 financed by Colciencias, the National University of Colombia Bogota headquarters and the University of La Salle.

RESULTS

The results of the qualitative systematic review were synthesized in the table of evidence synthesis based on four lines of action identified as follows:

Lines of action:

i. Hand washing as a key to healthy habits;

ii. Promotion of healthy environments in the environment and aeration in early childhood care settings;

iii. Promotion of healthy environments for water management in early childhood care centers and;

iv. Promotion of healthy environments for food handling.

Regarding the type of study, meta-analysis or systematic integrative studies were not found. The clinical trials that met the inclusion criteria were analyzed and included in the narrative discussion to argue each line of action constructed. It was not possible to present quantitative results due to the heterogeneity of the data and the different methodological approaches. Due to the quality of the studies found and the need to explore the topic in a comprehensive manner, descriptive observational studies were included.

Studies Included	Topic
Zomer et al. 2013. Randomized Clinical Trial (9).	Hand washing as a key to healthy habits
Hand washing as a key to healthy habits	
Willmott et al. 2016. Systematic Review (10).	
Choi et al. 2013. Randomized Clinical Trial (11).	
Hersey et al, 2013. Observational Study (12).	Promotion of healthy environments in the environment and aeration in early childhood care settings
Alkon et al. 2009. Nonrandomized Clinical Trial. (13)	
Correa et al. 2012. Randomized Clinical Trial (14).	
Cosby et al. 2008. Nonrandomized Clinical Trial (15).	
Dlugosz et al. 2011. Preexperimental Study (16).	
Ortega, 2007. Descriptive Study (17).	
Alkon et al. 2011. Descriptive Study (18).	Promotion of healthy environments for water management in early childhood care centers.
Joventino et al. 2011. Descriptive Study (19).	
Pineda et al. 2013. Descriptive Study (20).	
Prussin et al. 2016. Preexperimental Study (21).	
Serra 2014. Systematic Review (22).	
Jeonghoon et al. 2015. Randomized Clinical Trial (23).	
Lander et al. 2012. Descriptive Study (23).	Promotion of healthy environments for food handling
Mattioli et al. 2014. Randomized Clinical Trial (24).	
Castro et al. 2015. Randomized Clinical Trial (25)	
Giraldo- Gómez et al. 2005. Randomized Clinical Trial (26).	

Source: Prepared by authors.

Graph 1. Type of study

With the tool Analyze search results available in Scopus, the tendency of increase of the reports was observed from the year 2011, this according to the growing need to carry out primary studies of educational intervention to improve health in early childhood. In the methodological critique of the studies, it was found that the intervention studies (clinical trials) did not control all the biases mainly with the random allocation of the participants and in the blinding of the intervention. In this way, observational studies, although their level of evidence is lower in the evaluation of methodological quality, obtained a better evaluation by the group of experts. Therefore, it was decided to perform a systematic narrative review in order to take advantage of the descriptive results from the primary studies that, when applying the checklists, obtained a percentile higher than 80% and that, according to experts, contributed to the construction of the presented synthesis.

DISCUSSION

The four lines of action structured based on the analysis of the results are useful to present the relevant evidence that can serve as a support for the promotion and care of health in early childhood. It is proposed that these lines of action be accepted as strategies for the implementation of educational and health promotion interventions in community and institutional settings not only in the research setting but also to direct nursing care in the first level of attention to health.

The line of action in hand washing; it is the first strategy to be linked in the promotion of healthy environments since it is the most cost-effective practice that children and their caregivers can apply to prevent the spread of diseases in early childhood care settings. The Zomer study in 36 child care centers showed that the educational intervention in hand washing is effective to improve compliance with the guidelines on hygiene and the reduction of up to 25% of gastrointestinal infections and 15% of respiratory diseases for the benefit of the children who attend care centers during a period of 8 months with respect to the control group (9). In contrast, the lack of knowledge and interest of caregivers, has become the main challenge and obstacle to overcome in the effective implementation of the universal technique of handwashing, so more educational interventions are required within the population and linking a greater number of participants. In the systematic review of Willmott et al, 18 studies were included, which could not be meta-analyzed due to the heterogeneity of the effect of the interventions. They report that the design and results of the studies were of low quality, which prevented the meta-analysis from being carried out. This review recommends controlling the risk of bias in future trials (10).

The results of individual studies suggest that interventions in hand washing protocols and healthy habits can reduce children's absenteeism, incidence and symptoms of respiratory infection. (10, 11). All healthcare actors, professionals, caregivers and families, are expected to adhere to the hand-washing procedure routinely, as well as the people who are responsible for the preparation and handling of food in the care centers and schools. . Choi, in an evaluation to 64 educators about the adherence to the hand washing protocol found that the experimental group showed significantly higher scores after the test of knowledge and preventive behaviors than those of the control group t test ($p < 0.001$) (12 -14). That is why including hand washing in educational processes is the key to signi-

ficantly reduce the prevalence of communicable diseases (15). Institutional strategies should be implemented for the provision of soap, disposable towels and / or antibacterial gel, as well as the adequate supply of water and the necessary infrastructure to facilitate the procedure, since the lack of inputs may mean an impediment to the realization of this procedure as evidenced in the study by Correa et al, who found hygiene deficiencies in 17% of the 34 institutions evaluated for lack of such inputs. Regression analysis showed that after the follow-up visit the intervention centers significantly improved their safety and hygiene practices in emergency preparedness and handwashing compared to the control group centers (16, 17). In summary, although the habit of handwashing is the key strategy for children's health due to its cost-effectiveness compared to the high cost of care for preventable infectious diseases, it is necessary to conduct a greater number of intervention studies with high methodological rigor to demonstrate the effect of the benefit of such interventions.

Promotion of healthy environments in the environment and aeration in early childhood care settings; it is constituted in a line of contribution for the control of the microorganisms that are in the surfaces and that alter the safety of the foods, is necessary that the team that work in the places of attention in early childhood fulfill adequate procedures of cleaning and disinfection, using a chemical agent such as sodium hypochlorite, as in the Alkon study, in which cleaning and disinfection policies were implemented in 38 childcare schools where an increase in compliance standards was shown based on these policies (18) ; however, it is necessary to take into account the concentration and the minimum time of action recommended to achieve the desired objective, as well as to clean the surfaces of organic waste first, to achieve a good disinfection (19). It has been reported that the use of hypochlorite to wash the household reduces the presence of E. coli and S. enteriditis in sponges up to the limit of non-detection at 24 hours (12, 13). The cleaning and disinfection of elements and the environment is recommended in all the guides, as well as the continuous ventilation of the floors and tables routinely (20-22).

Another strategy is to comply with national and international infrastructure guidelines of child care centers, since lack of ventilation and infrastructure problems in homes represent a risk for the transmission of pathogens. Therefore, adequate air flow, as well as temperature, humidity and air speed in child care centers, can reduce the risk of bacterial structure formation (23-25).

Promotion of healthy environments for water management in early childhood care settings; The isolation of Gram-negative bacteria, parasites and fecal coliforms is the main indicator of water contamination, being the surfaces of the bathroom and the kitchen the main places of contamination by these bacteria. Additionally, the counting of faecal coliforms on surfaces in contact with hands inside homes indicates a potential risk of dispersion of faecal pathogens (25, 26). Studies conducted by Tedesco et al, show that water is the main means of transmitting intestinal parasites; however, these studies do not consider intervention elements in the community, which should be determinant in controlling the presence of these contaminants in the water. (27-29).

Finally, continuing education based on communication with direct caregivers about the proper management of water has shown

positive results in reducing diarrheal diseases caused by contaminated water consumption (30-34).

Promotion of healthy environments for food handling; this line of action refers to the conditions for the maintenance of food safety, specifically in kitchens and surfaces that are in contact with hands and food consumed by children.

The quality of food is a determinant for children's health, because by their physical and chemical characteristics foods have the ideal conditions for the growth of microorganisms that can alter their quality and therefore their harmlessness, either from any link of the production chain or through those who manipulate them (35-43).

The manipulators are the main responsible for the prevention and control of food contamination, contributing to food safety, with the responsibility of ensuring that their health status, personal hygiene and the processes they perform are appropriate, as well as the use of protective clothing, head covering, mask and appropriate footwear, washing their hands according to the protocol of hand washing and at the indicated times (44). Caregivers and people who have direct contact with food and food preparation areas still lack knowledge and safe practices about universal measures for the proper handling of food and utensils. (45-47)

In short, programs of direct educational intervention with caregivers and people who handle food, through awareness and positive reinforcement of cleaning and disinfection routines, should be continuous strategies to strengthen healthy habits, knowledge and routine safe practices. in the decrease of the proportion of microorganisms present in the food preparation sites and in the food and in this way guaranteeing the health care of the children (48-50).

CONCLUSIONS

The lines of action described above constitute a novel contribution for health professionals who wish to implement proposals for a comprehensive approach in the promotion of healthy habits in early childhood care settings.

Health education as a continuous and structured process can positively influence the decrease of communicable diseases in care centers, mainly in gastrointestinal diseases caused by transmitted bacteria and parasites, commonly by contaminated water. In addition, the active participation of caregivers and parents, in an effort of inclusion and teamwork, can be useful for good habits, not only in care centers, but in the homes of children.

Sensitization and inclusion interventions are required of the people who handle the food, educating about the accomplishment of cleaning routines, disinfection as well as compliance with standard protection measures (hat, gloves, masks) and adherence to the universal hand washing protocol.

It is recommended to advance in the performance of controlled clinical trials of high methodological quality that perform a systematic control of biases and with large samples that represent a greater scientific evidence to show the impact and safety of intervening in the four lines of action described above, since the lack of studies with these characteristics limits the performance of systematic quantitative reviews and meta-analysis.

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Nurses, do they perceive emotional labor?

Enfermeras, ¿perciben el trabajo emocional?

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Abstract

The objective of this article is to reflect on the impact of emotional labor on care delivery to answer the question: How is emotional labor manifested in nursing professionals?. This bibliographical research was carried out on different data bases to develop the reflection and it was divided into three sections. Emotional labor was found to be present in nursing performance and, if professionals are not qualified or prepared to tackle this psychosocial risk, they may suffer from alterations in their health, such as saturation or exhaustion. Additionally, this may indirectly impact users and therefore affect the quality of the delivered care. Hence, it is an important topic for an optimal professional development either for the labor satisfaction or the suitable functioning of health organizations. Emotional labor is a complex construct, especially for health workers, and it may become a negative aspect for workers, users receiving care, and healthcare institutions, more precisely, in their accreditation processes.

Key words: Nursing; Occupational hazards; Emotions; Emotional intelligence (Source: DeCS).

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Resumen

El objetivo del manuscrito es reflexionar sobre el impacto del trabajo emocional en la prestación de cuidados para responder a la pregunta: ¿Cómo se manifiesta el trabajo emocional en los profesionales de enfermería?. Se realizó una investigación bibliográfica sobre diferentes bases de datos para desarrollar la reflexión y dividirla en tres secciones. Se encontró que el trabajo emocional está presente en el desempeño de la enfermería y si no están calificados o preparados para enfrentar este riesgo psicosocial, pueden sufrir alteraciones en su salud, como la saturación o el agotamiento. Para agregar, esto puede impactar indirectamente a los usuarios y, por lo tanto, afectar la calidad de la atención brindada. Por lo tanto, es un tema importante para un desarrollo profesional óptimo, ya sea para la satisfacción laboral o el adecuado funcionamiento de las organizaciones de salud. Se puede llegar a la conclusión que el trabajo emocional es una construcción compleja, especialmente para los trabajadores de salud, y puede convertirse en un aspecto negativo para los trabajadores, usuarios que reciben atención en instituciones de salud, más precisamente, en sus procesos de acreditación.

Palabras clave: Enfermería; Riesgos laborales; Emociones Inteligencia emocional.

INTRODUCTION

Nursing is science and art: As a science, it comprises the inherent knowledge that makes this profession an area of expertise. As an art, it incorporates the essence of caring in a sensitive way and the creativity to achieve the established goals as well as helping the users receive care.

In general, these users are in vulnerability conditions, which demands nursing professionals to look after their needs. This may expose them to intense emotions and extreme situations such as death, violence, emergencies, among others, in addition to their role responsibilities. These professionals may be affected psychologically by such aspects and this may trigger the feeling of emotional labor (1). This may be perceived as something positive or negative, so it is a psycho-social aspect that may become a risk if it is not detected and treated on time. Additionally, it is a priority to establish limits so that emotional labor does not affect the quality of performance or the health of the worker.

Emotional labor is a construct that has only been developed in the last few decades, therefore its influence on nursing professionals has been studied in an incipient way (1-3). Thus, this article is conceived with the aim of reflecting on the effect of emotional labor on care delivery in order to respond to the question: How is emotional labor manifested in nursing professionals?

CONSTRUCTING EMOTIONAL LABOR

Some definitions of psychology are given with the purpose of understanding the functioning and concept of emotional labor. Experts point out that emotions and motivations are the two psychological processes in charge of the adaptation to both the internal and external environment demands. Both processes affect the rest of areas related to human functions such as attention, memory, thought, learning and behavior (4). Thus, understanding both processes, it can be said that nursing professionals, when performing their profession, confront both internal and external demands. The internal demands are related to their individual characteristics, which are pre-stablished by their own family and training; and the external

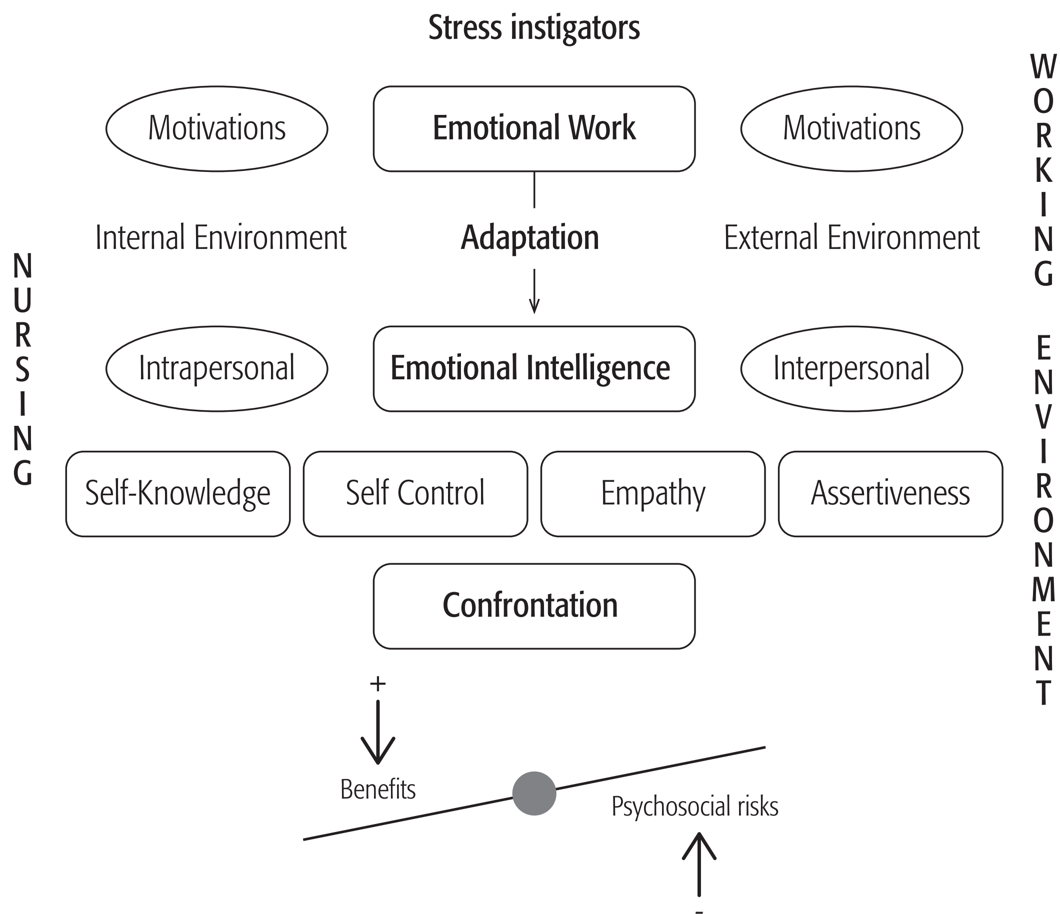
demands are directly related to their working environment. Both generate a reaction to these stimuli; which is to care for each person with a unique treatment.

Defining another important term, emotional intelligence is the intelligence composed by intrapersonal intelligence (which refers to one's own knowledge) and interpersonal intelligence (referring to one's capability to read and understand other people's moods and motivations). Together, they determine the capability of managing one's life at a satisfactory level and give an account of the high or low competence to be aware of feelings such as enthusiasm, perseverance, impulse control, empathy and motivation (4). Therefore, it is postulated that nurses should have an adequate development of emotional intelligence, more specifically in terms of interpersonal intelligence, by the time they begin their education. This is a crucial aspect because empathy is a necessary skill for every nurse and knowing how to confront users' varied emotions is a challenge. Hence, reinforcing interpersonal intelligence is of great priority during training and so, providing tools for its development. Some experts postulate that developing emotional intelligence boosts a positive status related to work, and this has an impact on the quality of the assistance and on the health of the population receiving attention (5). Emotional health implies that there should be a responsible management of moods, emotions and their own and other people's feelings, recognizing and orienting them by taking into consideration values that are divided into four basic components: self-knowledge, self-control, empathy and assertiveness (4). Analyzing this definition, nurses have the responsibility to be healthy emotionally so that they can deliver holistic care of good quality. Thus, in the nursing profession, carrying out the technique to an impeccable standard is not enough to cover the great range of functions to be completed, perhaps, it is more important to deliver a humanized care related to an adequate emotional health (6). If the components of emotional intelligence are put into practice, it can be noted that each one plays a significant role in care delivery no matter which environment or place wher nurses perform their profession: Firstly, self-knowledge, which helps to recognize the reason for studying or picking a career in this profession, what inspires their behaviors, which are their values and believes, among other aspects; secondly, self-control, that should be present in every circumstance due to the hard situations which nurses may be exposed to such as conflicts with colleagues, with other professionals or collaborators and even with users; thirdly, empathy is another relevant aspect that many experts have described as an inherent element to this profession. If a nurse does not develop empathy, she or he cannot deliver a comprehensive care (7); and finally, assertiveness, which ensures a proper charge for users and better decision-making, considering the nurses' own physical and mental health when maintaining a balance between their personal and professional life.

As it is made evident, emotional labor is a multidimensional construct which refers to expressing desirable emotions in an organizational environment which affect interactions with users and could have a negative impact on workers (8). Another author points out that emotional labor corresponds to psychological processes and to behaviors, conscious or automatic, which are derived from existing organizational norms about emotion expression, emotional experience or both. They also regulate interactions im-

plicated in the performance of the position, facilitating the achievement of organizational goals related to emotion expression that, at the same time, are associated to the achievement of other symbolic or significant operational goals of a higher order (2). Thus, when referring to a nurses' job, it is clear that emotional labor is involved because there is a constant interaction with other human beings. In such scenario, emotions are constantly flowing, certain behaviors are desired only by the fact of being a nurse, and these emotions should be managed in response to what is desired from this profession and not always from their real expression (8).

Therefore, emotional labor is present in nursing, and in contrast with other professions, the interaction with third parties is not simple as there are users which are often in state of physical or mental vulnerability (9), and in general, these relations occur in places out of their usual environment, influenced by numerous factors. When nurses play their role, all of this makes them perceive higher levels of emotional labor, so it may become a negative aspect. Hence, for nursing, it is of a great priority to study the relationship between emotional labor and care.



Source: Own Elaboration

Figure 1. Constructing Emotional Labor in Nursing

EMOTIONAL LABOR AND ROLE RESPONSIBILITIES

It is well known that the development of this profession offers a cornucopia of possibilities, which is a positive aspect in today's working environment. Nonetheless, all these possibilities may be considered emotional labor triggers. For instance, in pediatric care, the focus and relevance of emotions is perhaps more significant since it is work in which one human being is absolutely dependent on another and affective bonds are a fundamental part in the care. Authors explain that the death of a child may be a situation experienced in different ways, due to bonds generated during care, and this may cause the learning of life skills (10). These stressful experiences are manifested in feelings that affect perception, cognition and behavior. As a result, occasionally, there may be responses, counter-responses and evasions, such as indifference, that prevent nurses from suffering and that may cause fatigue and exhaustion (11). Another work scenario in which emotional labor may be perceived is in the oncology department, where death is witnessed on a regular basis. Authors indicate that, in this department, training and preparation for confronting death is relevant for avoiding professional exhaustion (12).

For that reason, one of the factors that influence the perception of emotional labor is the working environment, and when it is healthy, it favors the improvement of emotions management. In that sense, experts point out that a good working environment helps the management of emotional demands and promotes the workers' welfare and loyalty (13). Therefore, employers should be in charge of encouraging and supporting healthy working environments and collaborating to the bettermentimprovement of job satisfaction and organizational performance.

As the presence of emotional labor is observed in nursing professionals, the relevance of providing future nurses with tools for boosting their performance and avoiding emotional labor is suggested. One of the proposals is that, during their education, they be trained to identify and control their emotions with the aim to strengthen their emotional intelligence and that with such tools, they will be able to do their professional tasks, putting in practice their best abilities. On one hand, experts highlight the fact that emotional skills should be taught using innovative methods, out of the formal classroom environment and in small groups, to carry out reflective teaching which is focused on the patient (14). On the other hand, the results of studies about emotional labor and emotional intelligence, and their relationship with work welfare and stress, also reaffirm the idea that emotional intelligence education should be included in nursing curricula. This may help in the mitigation of serious consequences attributed to high levels of emotional labor (15), which may have harmful effects.

EMOTIONAL LABOR CONSEQUENCES FOR NURSES

As previously mentioned, emotional labor may have effects on nurses' health. There are certain emotional and cognitive aspects related to the apparition of emotional imbalance and chronical stress that should be taken into account so that they are prevented in the future. Experts highlight the fact that, when a high emotional intelligence is perceived, the worker experiences less psychological demands when facing situations like death, excessive demands, stress, etc. In addition to

this, having emotional clearance and higher skills to repair and differentiate their moods, allows nurses to generate higher levels of self-realization (16). These results clarify that the personal variables on how to manage emotions and a good development of emotional intelligence trigger positive and protective effects for these workers.

Another consequence of emotional labor is labor dissatisfaction. Researchers proposed to prove the relation between the emotional intelligence perceived and job satisfaction by carrying out a study. One of the most relevant results in such study established that the element "emotional repair" is related to job satisfaction. Its definition is understood as the individual skills to manage negative emotions by substituting them when they are felt, for other emotions that make professionals feel better (17). So, it was proved evident that when emotional labor is confronted in a positive way, it is beneficial for workers and so, emotional repair is the key for emotional management.

Depressive symptoms are another consequence of emotional labor. Some experts detected that the more emotional labor is perceived, the more depressive symptoms are present, which in turn, affects the patients' safety and the quality of attention received (18). Consequently, the negative effects of emotional labor are varied, including professional exhaustion (19), depression (18), job discharge (20), among others, and in this respect, interventions become highly significant.

HOW TO CONFRONT EMOTIONAL LABOR

One of the strategies to face this labor problem would be to assure the efficient practice of the management of human resources by implementing high performance work systems (21). This means creating nursing teams with diverse capabilities, which can be strengthened and enhanced, and in turn, will mitigate the negative effects of emotional labor.

It is essential to create support programs for nursing professionals with the aim to reduce professional exhaustion and, therefore, improve job satisfaction (20). For instance, both individual and organizational strategies exist with the purpose of confronting emotional labor. When it comes to individual strategies, one thing to be mentioned is the spontaneous regulation process, which is manifested in the situations in which individual emotional experiences and expressions match organizational requirements. This way, individuals do not make additional efforts to regulate their emotional expression (2,22-23). Another strategy to be stated is deep action, in which, individuals employ different methods to generate emotional experiences compatible with emotional expressions according to pre-stablished norms. Additionally, the last individual strategy to be mentioned is superficial action, in which case, individuals reproduce emotional expressions without experiencing a concomitant emotion (24). This strategy may lead to emotional dissonance. On the other hand, in terms of organizational strategies, there are three that can be noted. First, institutions can carry out training related to emotional expression, especially in relation to the interactions with customers or users (2, 24). Secondly, organizations may carry out direct and indirect control strategies to supervise emotional labor patterns, as they are performed in the case of other work-related behavior aspects. This way, organizations monitor the compliance of expression norms by individuals under the supervision of superiors

or by the utilization of real or simulation users and customers. To add, as a third point, the values and significance encasing organizational culture and socialization are fundamental elements which can define diverse situations and the relation that each individual has with them. Hence, organizational culture conditions the evaluation that individuals make of their working environment, therefore affecting their emotional experience (2, 25).

When analyzing these methods for confronting emotional labor, on one hand, individual learning should start from the professional education process, including curricular activities, emotions management and methods for facing future work demands. On the other hand, organizations should see emotional labor as an aspect to be considered during the beginning of the recruiting process, as well as including it in programs of constant training. Therefore, this will ensure an organizational culture which encourages team work and expression of emotions.

FINAL CONSIDERATIONS

It is known that emotional labor is a complex construct and it could become a negative aspect, for the worker, for the patients receiving care as well as for the companies. So, it becomes relevant to take the necessary actions to prevent it; improving the quality of the healthcare system and the performance and management of the organization.

Responding to the question "How is emotional labor manifested in nursing professionals?". Firstly, the theoretical evidence demonstrates that emotional labor is inherent to the nursing profession, but this construct is scarcely approached as a subject during formation, and it is only visualized by nursing professionals once they begin their career. In such scenario, they find themselves confronted by challenges when carrying out tasks such as care delivery and responding to appropriate demands according to organizational considerations.

The empirical evidence shows that emotional labor is present in the working environment, but there are factors which have an influence both on individual and organizational aspects: for instance, the level of emotional intelligence, social support, place of performance, types of users, physical and psychological demands of the position, working environment, among others.

In order to tackle this problem, it is proposed that more qualitative research is carried out, applying diverse scales to measure emotional labor in all different nursing areas of expertise. This way, professionals have solid foundations to confront psycho-social risks and identify in a clearer way all factors and variables comprised. Nursing is a profession that involves interactions and relationships with other people, so managing emotional labor is of great importance to improve the care delivered to users and the nurses' occupational health.

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Eosinophilic granulomatosis with polyangiitis: a challenge for differential diagnosis

Granulomatosis eosinofílica con poliangitis: un desafío para el diagnóstico diferencial

Elías Forero Illera[1], Jorge Lechuga Ortiz[2]

Abstract

Eosinophilic granulomatosis with polyangiitis (EGPA), previously known as Churg-Strauss syndrome, is a rare small and medium vessels vasculitis, consisting of asthma, migratory pulmonary infiltrates and eosinophilia. Its low occurrence makes it difficult to achieve an early diagnosis, and hence a directed treatment in order to control it and avoid complications. We report a 31 year-old man with refractary asthma, who developed arthritis and multiplex mononeuritis. Before EGPA´s diagnosis, he had just received asthma treatment (steroids, bronchodilators, antileukotriene and omalizumab); but once EGPA is confirmed and correct treatment was started, there was a remarkable clinical improvement.

Key words: Churg Strauss, Vasculitis, Allergic granulomatosis, Antineutrophil cytoplasmic antibody.

Resumen

La granulomatosis eosinofílica con poliangitis (EGPA), anteriormente conocida como síndrome de Churg-Strauss, es una vasculitis poco frecuente de vasos pequeños y medianos, que consiste en asma, infiltrados pulmonares migratorios y eosinofilia. Su baja aparición dificulta el diagnóstico precoz y, por lo tanto, un tratamiento dirigido para controlarlo y evitar complicaciones. Presentamos a un hombre de 31 años con asma refractaria, que desarrolló artritis y mononeuritis múltiple. Antes del diagnóstico de EGPA, acababa de recibir tratamiento para el asma (esteroides, broncodilatadores, antileucotrienos y omalizumab); pero una vez que se confirmó la EGPA y se inició el tratamiento correcto, hubo una mejoría clínica notable.

Palabras clave: Churg Strauss, vasculitis, granulomatosis alérgica, anticuerpo citoplasmático antineutrófilo.

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INTRODUCTION

In aggressive and rare diseases, a rapid diagnosis and therefore, a directed treatment improves substantially the prognosis of patients. EGPA requires for its diagnosis a high clinical suspicion, because the majority of cases can mimic diseases like asthma for several years. It is important to remark key points that allow medical doctors to have EGPA in mind, in order to achieve a timely treatment and prevent the progression of the disease that could be fatal.

CLINICAL CASE

A 31 year-old man was directed to the Rheumatologist for 4 months of swollen and tender joints in hands, elbows, shoulders and ankles; in addition to 30 minutes morning stiffness. He had also had frontal headache and hands paresthesias for 2 months.

The patient had a history of asthma, with poor response to treatment since he was 9 years old. He received prednisone, beclometasone, salbutamol, ipratropium bromide until 22 years of age, time when he started to use salmeterol/fluticasone plus montelukast, because of the uncontrolled asthma. Once the disease got worse in symptoms in spite of the described treatment, omalizumab was started.

Relevant exams showed: positive rheumatoid factor (100 UI/dL [reference<30 UI/dL); Blood eosinophils count: 7.830/mm^3 (representing 34% of total white blood cells); Erythrocyte sedimentation rate: 78 mm/hour (reference <30 mm/hour); and C-reactive protein: 12 mg/L (reference <3 mg/L). Antinuclear antibodies and extractable nuclear antigens antibodies were negative. C3 and C4 fractions were normal. Initially, the patient received a diagnosis of Rheumatoid arthritis (RA), and underwent therapy with methotrexate 15 mg per-week plus prednisone 5 mg/day without improvement.

For assurance reasons, the patient arrived to our center after 6 months of RA diagnosis. By that time, physical examination showed: normal respiratory sounds; hypothenar eminence atrophy in left hand with decreased muscular strength of flexors and extensors (Figure 1); left forearm and hand dysethesias; and synovitis in elbows, wrists, and 2nd/3rd/4th metacarpophalangeal joints.

In summary, it is a case of a patient with uncontrolled asthma since childhood, arthritis, peripheral neuropathy, eosinophilia, positive rheumatoid factor and elevated acute phase reactants. Therefore, we asked for neurology consultation and some complementary studies.

An electromyogram test & nerve conduction study of upper extremities showed sensitive and motor neuropathy, with predominance of axonal involvement, more severe in the left ulnar nerve, basically related to multiple mononeuropathy. Magnetic resonance of the brain was normal, however it demonstrated pansinusitis. Chest tomography showed peribronchial enlargement, cylindrical bronchiectasis and subpleural emphysema (Figure 2).

6 months later, the patient developed purpuric skin lesions in feet, compatible with vasculitis (Figure 3). This last finding in addition to uncontrolled asthma, pansinusitis, eosinophilia and multiple mononeuropathy led to think about EGPA diagnosis. Antineutrophil cytoplasmic antibodies were weakly positives (ANCA-P titers 1:40). It was not possible to take specific antibodies (anti-proteinase 3 and anti-myeloperoxidase), and patient rejected a skin biopsy. In spite of low ANCA-P titers, ba-

sed on the context of clinical case, the antibodies were taken into account for EGPA diagnosis, highlighting that they are positive just in 40-60% of cases and they are not specific for EGPA. Omalizumab was suspended. It was ordered prednisone 50 mg/day plus cyclophosphamide 600 mg/m^2/month (6 doses).

Once the treatment started, patient improves arthritis, skin lesions, asthma symptoms and acute phase reactants. When clinical, radiological and para-clinical improvement was achieved, prednisone was lowered progressively 10 mg/week until 10 mg/day dose. Patient finished the 6 doses of cyclophosphamide successfully; and nowadays, he continues in medical control, without reactivation of EGPA, and persisting only with blood eosinophilia.

DISCUSSION

Churg-Sttrauss syndrome, since 2012 EGPA (1), is a medium and small vessels vasculitis, ANCA positive, with prevalence rate of 6,8 (IC95%: 1,8-17,3) per million-patients/year, and incidence of 0-14 cases per million-patients/year in asthmatic groups (2-4). In Colombia, there are cases reported in Cali, Bogotá, Medellín and Huila (5-8); but any in the Caribbean Coast. EGPA diagnostic criteria are listed in Table 1. EGPA affects mainly lungs and skin, but also kidney, heart, gastrointestinal tract and nervous system.

EGPA has 3 phases, not always distinguishable (9-12):

a) Prodromic: usually at 20-30 year-old, with allergic manifestations (rhinitis, dermatitis, asthma [present in 90% of EGPA]).

b) Eosinophilic: often after 30´s, with elevated eosinophils in blood (Eo>10% of total blood cells, or Eo count>500/mm^3) and organs like lungs. Eosinophilia may persist, even with disease control.

c) Vasculitic: appears after 8 to 10 years of symptoms onset. Here, 40% of patients debut with transitory pulmonary infiltrates (because of pulmonary vasculitis), asthma and eosinophilia. In this phase the mortality increases, due to necrotizing granulomatous vasculitis of multiple organs; and also leads to beginning of fever, arthritis, anorexia and weight loss.

Although bronchiectasis is more related to infections (tubeculosis, fungi), inflammatory pneumonitis, immunodeficiencies or systemic diseases (lupus, RA); in EGPA it is not known if bronchiectasis is produced by the disease or the immunosuppresion of its treatment. (13-14)

Regularly, it is difficult to achieve an adequate control in asthma related to EGPA. Asthma severity increases with the onset of the vasculitic phase, which suggests EGPA could be present. Corticosteroid for asthma can delay the beginning of vasculitic phase, which may suddenly appear with the decreasing or the suspension of corticosteroids.(15). There are data suggesting that EGPA could be an adverse effect of antileukotrienes, especially 3-12 months after its onset; however, there is not a proved causal relationship. This could be more related to the use of antileukotrienes for uncontrolled asthma (moment when is it possible to think in EGPA diagnosis) or with reducing of corticosteroids dose when antileukotrienes are started (which can precipitate the vasculitic phase onset). (16-18)

This clinical case shows the evolution of a male with asthma since childhood, with

EGPA diagnosis after 22 years. Difficult-to-treat asthma, pansinusitis, eosinophilia, pulmonary infiltrates, multiple mononeuropathy and cutaneous vasculitis in conjunction were the key points of EGPA diagnosis. Seropositive arthritis in EGPA is especially interesting, because it is not described in the review that was made for the case discussion.

EGPA should be suspected in late-onset or difficult-to-treat asthma, eosinophilia and neuropathy, remembering that the vasculitic phase may be delayed with corticosteroids for asthma; and may be facilitated after corticosteroids suspension or reduction. Early diagnosis leads to timely initiation of treatment that prevents progression to more severe stages.

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Diverticulitis del ciego. Reporte de caso en un paciente joven

Diverticulitis of the cecum. Case Report on a Young Patient

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Abstract

La diverticulitis del ciego es una causa rara de abdomen agudo. En esta ocasión se presenta el caso de una paciente de 20 años de edad quien ingresa con signos y síntomas de apendicitis aguda; durante el procedimiento quirúrgico se evidencia diverticulitis en ciego y se realiza hemicolectomía derecha más íleo transversoanastomosis, evolucionando adecuadamente y con egreso hospitalario satisfactorio. Este es el primer caso conocido en un paciente de esa edad. A pesar de ser una patología infrecuente, es importante tenerla en cuenta como diagnóstico diferencial de apendicitis aguda, y además el cirujano debe estar preparado para aplicar los diversos tratamientos que existen para la resolución de los cuadros.

Key words: Diverticulitis, abdomen agudo, apendicitis, diverticulitis cecal, enfermedad cecal.

Resumen

Diverticulitis of the cecum is a rare cause of acute abdomen. We present the case of a 20-year-old female who was admitted with signs and symptoms consistent with acute appendicitis. However, cecal diverticulitis is evidenced intra-operatively and a right colectomy is performed followed by an ileo-colic anastomosis. The patient recovered well and was discharged home on post-operative day five. This is the first known case in a patient of this age. Although rare, it is important to include cecal diverticulitis as a differential diagnosis in such scenarios as well as understand the many surgical techniques available for its management.

Keywords: Diverticulitis, abdomen, acute, appendicitis, cecum, diverticulitis, cecal, diseases.

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INTRODUCTION

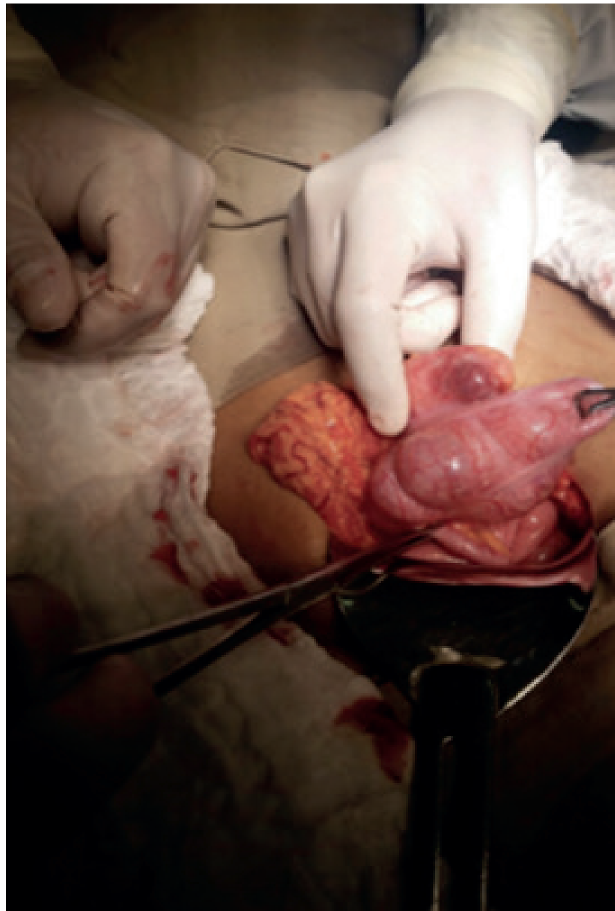
La enfermedad diverticular del ciego es una patología de muy baja frecuencia; en países occidentales representa el 1 a 2 % de los casos de diverticulosis colónica (1); la edad promedio de presentación en varias series está entre 40 a 59 años (2,3,4), sin embargo, hay algunos pacientes muy jóvenes (5,6,7); la mayor parte de ellos son asintomáticos, pero ocasionalmente ocurre diverticulitis manifestada con dolor en fosa iliaca derecha, que sumado a la juventud de los pacientes y a la relación 150:1 a favor de la apendicitis aguda (8), favorece un diagnóstico erróneo.

Se presenta un caso de dolor en fosa iliaca derecha en una mujer joven que ingresó a quirófano con diagnóstico de apendicitis aguda complicada pero con hallazgo intraoperatorio de formación diverticular y posterior diagnóstico histológico de diverticulitis cecal.

PRESENTACIÓN DEL CASO

Paciente de sexo femenino, 20 años de edad, quien consultó por dolor de 56 horas de evolución en fosa iliaca derecha, comienzo insidioso, intensidad creciente, nauseas, vómitos y fiebre no cuantificada; sin datos de importancia en la historia familiar y personal. Al examen físico: presión arterial 115/65 mmHg, frecuencia cardiaca 98 latidos/min, frecuencia respiratoria 18 ciclos/min, temperatura 37,5 ºC, dolor a la palpación abdominal en fosa iliaca derecha con signos de irritación peritoneal y sensación de masa profunda. Hemoglobina, 13 mg/dl; leucocitos de 17 300/microlitro; neutrófilos, 87%. Una ecografía abdominal reportó líquido libre en Fondo de Saco de Douglas lado derecho. Se diagnosticó apendicitis aguda complicada, con alta probabilidad de plastrón apendicular, y se inició procedimiento quirúrgico mediante incisión mediana infraumbilical, con hallazgo en fosa iliaca derecha de unos 50 cc de líquido seroso de reacción peritoneal; apéndice con aspecto normal y longitud de 7 cm; en el borde antimesentérico del ciego se evidenció formación diverticular con diámetro de 3 cm, friable y con despulimiento de la serosa (figura).

Debido a los signos de preruptura evidenciados en el ciego y la imposibilidad de diferenciar macroscópicamente entre enfermedad benigna y maligna, se realizó hemicolectomía derecha más ileo-transversoanastomosis. El paciente toleró el procedimiento y recibió alta médica al séptimo día. Los hallazgos patológicos microscópicos fueron: colon derecho con formación diverticular cecal y proceso inflamatorio agudo y crónico mediado por linfocitos y polimorfonucleares que se extiende hasta la serosa, acompañado de depósitos de fibrina y microabscesos. Estudio negativo para granulomas y cambios malignos.



Fuente: Registro Clínico.

Figura 1. Pieza quirúrgica. Se observa el divertículo con signos de inflamación

DISCUSIÓN

Los divertículos cecales son reportados en la literatura como poco frecuentes, su prevalencia es mayor en países orientales (6). Fueron reportados por primera vez en 1912 por Potier (9); generalmente son asintomáticos, pero pueden complicarse con inflamación, hemorragia o inclusive perforación (10), imitando clínicamente los casos de apendicitis aguda, por lo que su diagnóstico es predominantemente intraoperatorio.

La diverticulitis colónica derecha, y en particular la cecal, es raramente reportada en Latinoamérica (11, 12), y mucho menos en Colombia; hecho asociado probablemente a factores genéticos, ambientales y culturales; sin embargo, con base en el actual caso es pertinente sospecharla cuando hay dolor en hemiabdomen derecho que sugiere patología quirúrgica, con diagnósticos diferenciales, tales como apendicitis aguda, patología biliar y hepática. El diagnóstico preoperatorio es importante porque el tratamiento no es necesariamente quirúrgico.

Una ayuda útil para confirmar o descartarla es la tomografía axial computarizada multicorte (13), cuyos hallazgos son:

1. El divertículo es visto como evaginación de la pared colónica derecha con diferentes grados de engrosamiento de su pared; su inflamación es evidenciada mediante cambios en la pared del colon y estructuras adyacentes, tales como turbidez o aumento de la atenuación de la grasa peridiverticular (13).

2. Engrosamiento excéntrico o circunferencial de la pared colónica, con pequeñas colecciones organizadas, sugestivas de abscesos pericolónicos producto de microperforaciones de los divertículos o extensión del proceso inflamatorio; el neumoperitoneo en un hallazgo raro pero posible (13).

3. Una inflamación marcada de la pared colónica podría impresionar patología neoplásica, sin embargo, la presencia de halo y preservación de las capas de la pared orientan a diverticulitis (13).

La TAC es, entonces, un estudio complementario útil para confirmar o descartar diverticulitis cecal y además obtener información sobre complicaciones de esta patología, permite ofrecer el tratamiento idóneo (médico o quirúrgico) al paciente. En el caso de diagnóstico preoperatorio, utilizar antibióticos de amplio espectro es una buena opción (14). Sin embargo, en el caso expuesto existía clara indicación quirúrgica, debido a los datos clínicos, lo cual confirma la primacía de los signos y síntomas en la toma de decisión para el tratamiento, más aun si no se cuenta con las ayudas imagenológicas recomendadas; pero el cirujano debe estar preparado para enfrentar situaciones de diverticulitis cecales cuando el diagnóstico preoperatorio es de apendicitis aguda (15). Cuando el diagnóstico es intraoperatorio, el tratamiento quirúrgico específico depende de otras características que acompañen el cuadro, así: se ha reportado la realización de apendicectomía más tratamiento antibiótico, pero por el riesgo de pasar por alto casos de carcinomas inflamatorios, esta opción se recomienda para pacientes en poblaciones con baja probabilidad de patología maligna; la diverticulectomía simple más apendicectomía es otra opción, sin embargo, alguno estudios recomiendan resección amplia para evitar recaídas sintomáticas de los pacientes; y en los casos en los que no es posible excluir macroscópicamente la patología maligna, la indicación es hemicolectomía derecha con márgenes de resección(10).

CONCLUSIÓN

La diverticulitis cecal es una causa poco frecuente de dolor en fosa iliaca derecha, que imita la apendicitis aguda. Suele presentarse después de los 40 años de edad, pero cada vez hay más reportes en pacientes más jóvenes. El cirujano general debe considerarla en el diagnóstico diferencial en los casos de sospecha de apendicitis aguda y familiarizarse con sus diferentes posibilidades terapéuticas. En casos de diagnóstico clínico dudoso, está indicada la laparotomía exploratoria, y si existen dificultades para establecer macroscópicamente la benignidad, se debe realizar hemicolectomía derecha. Se debe sospechar preoperatoriamente y usar como ayuda la TAC.

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Inventario de Violencia y Acoso Psicológico en el Trabajo (IVAPT) en Colombia: el peligroso *Little Jiffy*

Inventario de Violencia y Acoso Psicológico en el Trabajo (IVAPT) in Colombia: the dangerous *Little Jiffy*

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Sr. Editor.

El acoso psicológico es un riesgo psicosocial emergente (1) con consecuencias a nivel personal e institucional (baja productividad, altas tasas de absentismos, pérdidas económicas, etc.), que requiere de políticas preventivas y de intervención para su abordaje, siendo el primer paso, explorar la magnitud del problema en términos de prevalencia a través de instrumentos de medición que cuenten con adecuadas propiedades psicométricas que respalden la validez de las inferencias en base a sus puntajes. En ese sentido, consideramos encomiable el aporte de Pando et al., al obtener evidencias de validez del *Inventario de Violencia y Acoso Psicológico en el Trabajo* (IVAPT) en Colombia (2), no obstante, hay serias limitaciones metodológicas que llevan a cuestionar sus conclusiones, siendo la principal, la utilización del método *Little Jiffy*.

El "pack" conocido como *Little Jiffy*, fue propuesto originalmente hace poco más de 50 años (3) y consiste en tres procedimientos: *análisis de componentes principales* (ACP) para la extracción de componentes, la *regla de Kaiser* (RK; Valores Eigen > 1) (3) para determinar el número de componentes a extraer; y la *rotación varimax* (RV) para definir la estructura más simple. De acuerdo con la literatura especializada, esta combinación es la menos recomendada [4] debido a las limitaciones

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propias de cada procedimiento en el marco del estudio psicométrico de un instrumento de evaluación.

En principio, el ACP no es un método de análisis factorial propiamente dicho, sino de reducción de variables (4,5)y toma en cuenta la varianza verdadera y la varianza del error, lo que lleva a sobreestimar las cargas factoriales (5,6)y sesgar la interpretación adecuada del constructo evaluado. Cabe mencionar que existen otras opciones que podrían emplearse dependiendo de la situación, como el método de *Mínimos cuadrados ordinarios* o de *Máxima verosimilitud* (5,6) En cuanto a la RK, existe evidencia que tiende a sobre-estimar el número de factores/ componentes que deben retenerse (5), y por tal motivo es considerado como un método analítico no fiable (6). Otros métodos más precisos en comparación a la RK, como el *Análisis Paralelo* (6, 7) y el *Minimum Average Partial* [8], cuentan con evidencia favorable y son más precisos para determinar el número de factores/componentes a extraer. Finalmente, respecto al uso de RV, ésta estuvo basado en el supuesto de que producía soluciones factorialmente más simples e interpretables, además de fijar la independencia de factores; pero estudios recientes indican que son las soluciones producto de *rotaciones oblicuas* las que ofrecen estructuras más simples (9, 10).

Según la evidencia mostrada, resultan al menos cuestionables las cifras de prevalencia presentadas por Pando et al., ya que se sustentan en un instrumento con evidencias de validez obtenidas a través de procedimientos que fueron superados y que actualmente no son recomendados en la metodología psicológica para el desarrollo y adaptación de instrumentos. Es recomendable que se pueda efectuar un re-análisis de los datos presentados, y verificar la divergencia entre el enfoque Little Jiffy y el análisis factorial propiamente dicho.

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Inventario de Violencia y Acoso Psicológico en el Trabajo (IVAPT) para Colombia

Inventory of Violence and Psychological Harassment in the Workplace (IVAPT) for Colombia

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Estimado Editor:

En respuesta al generoso cuestionamiento que aparece en su prestigiada revista, hacemos llegar a usted algunas líneas. Para nosotros, la violencia y el acoso psicológico en el trabajo son realidades que provocan condiciones psicosociales negativas y destructivas en trabajadores en todo el mundo hace largo tiempo. Dichas prácticas provocan efectos a diferentes niveles, que lesionan a los trabajadores que las sufren, a sus familias y, por supuesto, a la sociedad en la que conviven. Hemos trabajado largamente en identificar, describir este fenómeno y, en suma, dimensionarlo en la población hispanoamericana.

Este fenómeno social es, por supuesto, una construcción para la psicología, lo cual nos permite explicar y dimensionarla. Como sabemos, el avance de las ciencias del comportamiento está asentado en el concepto de constructo, debido principalmente a que los constructos sirven para resumir, organizar y facilitar la interpretación y el análisis de datos mediante diferentes métodos, entre ellos el análisis factorial y de componentes, que son considerados métodos muy similares que facilitan la transición del tratamiento de un gran número de variables observadas a un número menor de variables latentes, o, en su defecto, la comprensión de los factores subyacentes (1, 2).

El ACP es un método de análisis que busca generar cargas factoriales, al reducirlas mediante ecuaciones lineales que le permiten calcular las posiciones de los valores en un espacio determinado mediante la identificación de componentes principales que sirven para verificar la distancia de los vectores.

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El uso del método de componentes principales, y en particular el conocido como Little Jiffy, fue desarrollado no a partir de los resultados de un "software", sino como producto del análisis del problema matemático de los factores utilizando, entre otros, el principio de simplicidad: Si es posible dos métodos o soluciones, hay que usar siempre el más simple (3).

Después de millones de pruebas del método de rotaciones oblicuas y el análisis de matrices de correlación aparece el método que se usa actualmente basado en los componentes principales. El uso de las rotaciones de tipo ortogonal obedece principalmente a la cantidad de factores que se pueden retener, sin perjudicar el constructo en condiciones especiales (3).

Si bien este método ha recibido recientemente críticas similares y al parecer literales a las que aparecen hoy, los argumentos son similares a los que el propio Kaiser (2) ya había apuntado en el tratado original de este método y que redundan en aspectos relativos al proceso (extracción, rotación, tamaño de la muestra, etc.) y ningún estudio indica que los datos son cuestionables (1-4). Decimos que estudios de simulación recientes, han examinado y empíricamente demostrado que, efectivamente, pudiera haber efectos de la extracción excesiva o insuficiente de componentes y factores, y han llegado a la conclusión de que la subextracción sería un problema serio en todas las situaciones que se estudiaron, pero que la sobre extracción es un problema que aumenta siempre que disminuye el tamaño de la muestra. También distintos autores enfatizan que los investigadores deberían emplear la mayor cantidad de métodos para determinar el correcto número de factores o componentes para minimizar tales problemas. Con esto queremos evidenciar que otros estudios indican que la extracción y la rotación son variables que se deben pero también lo son el tamaño de la muestra, y en ningún momento se hace referencia a un método en particular, sino a considerar lo que se consideraría adecuado para mejorar los resultados (1, 2, 4).

Por otra parte, el análisis de factores o componentes se ha convertido en una parte estándar del desarrollo de medidas y es uno de los procedimientos estadísticos más empleados en las ciencias del comportamiento; como se sabe, el principal problema del análisis factorial es determinar los componentes de varianza de la varianza total de un factor común, como evidencian en su estudio comparativo Izquierdo Alfaro, Olea Díaz y Abad (5).

El método conocido como Little Jiffy es útil no solo por estar extendido en su uso, también al tratarse de poblaciones de un tamaño mayor y constructos en donde el tamaño del azar podría ser elevado, la retención de factores de acuerdo con la extracción que realiza este método no ofreció errores, como sugiere el mismo Kaiser (3): "así que bombardeé a todos mis amigos algebraicos alrededor del mundo con él, y tampoco pudieron demostrarlo".

Los argumentos basados en sugerir revisiones cuidadosas no ofrecen mayores evidencias de que la herramienta, como mencionan, haya generado fallas, ni mencionan por qué la población estaría en condiciones especiales diferentes de las de cualquier prueba que se haya realizado del método, sino simplemente acuden a la cita de la publicación (6, 7), quienes afirman que efectivamente al usar un método distinto en un "software" determinado es posible encontrar mejores resultados.

El ACP es un método de análisis que busca generar cargas factoriales, al reducirlas mediante ecuaciones lineales que le permiten calcular las posiciones de los valores en un espacio determinado mediante la identificación de componentes principales que sirven para verificar la distancia de los vectores.

Como ya se mencionó, los datos ofrecidos en la validación se sustentan en un instrumento con evidencias de validez obtenidas a través del método más comúnmente usado por las ciencias del comportamiento (5) y que redunda en las soluciones sencillas y urgentes que necesita la evaluación de la violencia en el trabajo, tema central y común a nuestros trabajadores hispanoamericanos.

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