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Journal of Health Sciences

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Presentation of Content

As the first article we present, *Depression as an important factor in memory impairment in the elderly*, by Hernández-García, Ruth Indira, Ontiveros-Vargas, Angel Adrián, Santiesteban-Contreras, María Tereza and Vázquez-Ríos, Elda Raquel, with adscription in the FaPyTCH, UJED, as the second article we present, *Self-care capacity and Quality of life in the elderly in the South of Veracruz*, by González-De la Cruz, Patricia, Lara-Hernández, Janeth, Jiménez-Zúñiga, Esther and Santiago-Mijangos, Alma Delia, with adscription in the Universidad Veracruzana, as third article we present, *Emotions in Mayan pregnant women: barriers to care and proposals to reduce them*, by Rodríguez-Angulo, Elsa María, Ojeda-Rodríguez, Ricardo, Santana-Carvajal, Andrés and Caballero Canul, Ricardo, with assignment at the Autonomous University of Yucatán, as next article we present, *Hardiness and coping strategies in retired national selected athletes during the Covid -19 pandemic* by Ponce-Carbajal, Nancy, Ramírez-Nava, Ruben, Durazo-Terán, Luis, A. and De La Cruz-Ortega, Manuel F, with adscription in the Universidad Autónoma de Nuevo León and Universidad Estatal de Sonora, as next article we present, *Retrograde percutaneous closure of patent ductus arteriosus experience at the 20 de Noviembre National Medical Center*, by Fokine, Anna, Salgado, Antonio and García, Humberto, with adscription in the Hospital Materno Infantil, Instituto de Seguridad Social del Estado de México y Municipios ISSEMyM and National Medical Center 20 de Noviembre, as next article we present, *Inhibition of dental plaque after application of a dental Varnish* by Moreno-Marín, Flora, Roesch-Ramos, Laura, González-Muñoz, Itzel and Mora-Sánchez, Aura Leonora, with adscription in the Universidad Veracruzana, Región Veracruz, as last article we present, *Pharmacotherapeutic follow-up in geriatric hypertensive patients in the State of Campeche [Mexico]* by Mex-Álvarez, Rafael Manuel de Jesús, Guillen-Morales, María Magali, Chan-Martínez, Roger Enrique and Montero-Xiu, Tania Noeli, with adscription in the Universidad Autónoma de Campeche.

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Depression as an important factor in memory impairment in the elderly

La depresión como factor importante en la alteración de la memoria en el adulto mayor

Hernández-García, Ruth Indira * ^a, Ontiveros-Vargas, Angel Adrián ^b, Santiesteban-Contreras, María Tereza ^c and Vázquez-Ríos, Elda Raquel ^d

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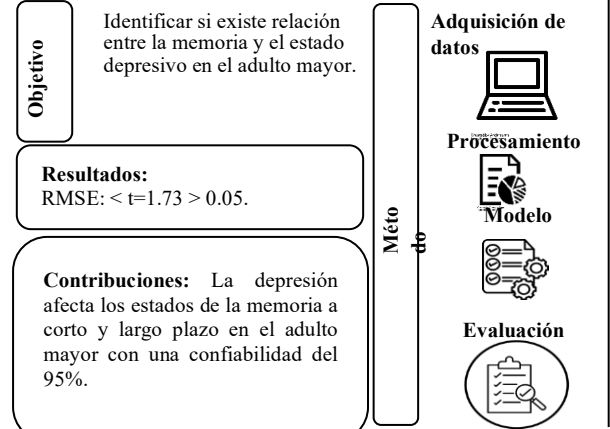
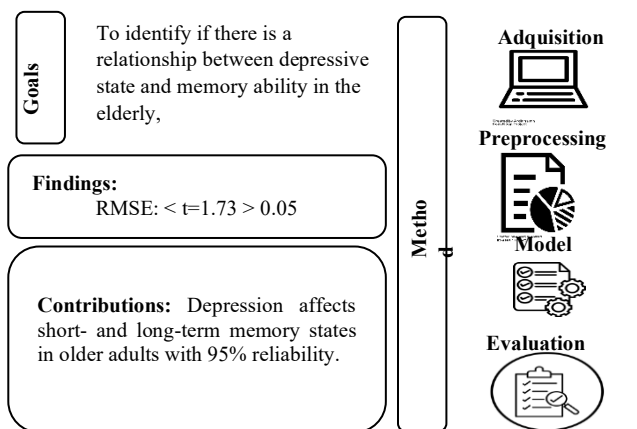
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Abstract

Depression negatively affects memory ability in older adults. This article addresses the correlation between depression and memory in the elderly, evaluated by the Beck Test and the Mini-Mental Test. Methodology: non-experimental, exploratory, observational research. Contribution: In a sample of 19 participants, the results show that 79% of the participants have a level of depression, which 30% of the study population requires intervention by a psychologist and 45% by a psychiatrist. Depression affects the memory status of older adults, with a $t=1.73$ to 95% reliability

Resumen

La depresión afecta negativamente la habilidad para la memoria en el adulto mayor. En el presente artículo se aborda la correlación que existe entre la depresión y la memoria en el adulto mayor evaluados mediante en Test de Beck y el Test Mini.Mental. Metodología: investigación de tipo no experimental, exploratorio, observación. Contribución: en una muestra integrada por 19 participantes, los resultados muestran que el 79% de los participantes se encuentran con un nivel de depresión, el cual el 30% de la población de estudio requiere de la intervención por un psicólogo y el 45% por un psiquiatra. La depresión afecta el estado de memoria de los adultos mayores, con una $t=1.73$ al 95% de confiabilidad



Depression, Older Adult, Memory

Depresión, Adulto Mayor, Memoria

Area: Promotion of frontier research and basic science in all fields of knowledge

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Introduction

The affective or emotional component of the daily life of the older adult, often deprived of the warmth and support of the family group or a minimum of positive social interactions, confers different meanings to the gradual reduction of various biological, cognitive or sensory functions and, with it, a greater vulnerability to various agents or pathogenic factors. [Tello, 2020]

There are elements to take into account that determine the maintenance of cognition in the elderly patient such as; pathologies of the patient, social support, mood and the presence of geriatric syndromes such as frailty and osteopenia. [Zambrano-Calozuma & Estrada-Cherre, 2020]

With aging, there is the consequence of a degenerative process at the organic level, due to the accumulation of molecular errors, including in the brain. Dr. María Sagrario Manzano, a neurology specialist in Madrid at the Infanta Cristina Hospital, mentions that in the aging brain only certain areas involved in executive functions and memory are affected. Throughout this process, neurons decrease in size and others die [Riojas, 2021]

Memory and attention are higher brain functions that, under normal conditions, allow human beings to perform appropriately in personal and social life. To a large extent we are what we remember, and in doing so we can guide and inform our present and future behavior [Zanín, Gil, & De Bortoli, 2004].

Since these functions are of utmost importance for our life, the question arises whether mood influences the alteration of these functions, hence the objective of this research which is to know the processes of attention and memory and their relationship with mood in the elderly through the application of the following tests: Hamilton test, Beck test and mini-mental screening test.

Justification

It is known that memory and attention are main aspects of executive functions; with the passage of time the quality of life and health of people is affected by a decline in their functionality, which leads to consequences at social, mental and physical levels. [Riojas, 2021]

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Age-related memory problems are a cognitive alteration considered normal, they are mild forgetfulness. It has been suggested as a normal stage in the elderly. This event is known as Age-Related Memory Impairment [ARMD], but this cognitive alteration is not considered a disease. [Sosa Sosa, 2016]

Carbajal [2007] explains that in our country most of the older adults who consult for memory loss do not have cognitive disorders, what they present are these subjective memory losses, where they believe they present a decrease of some cognitive function but in reality this loss is not made known after the corresponding tests have been performed. This subjective loss is strongly related to anxieties, fears of developing dementia, relationship conflicts and attention problems of older adults. [Sosa Sosa, 2016].

According to the above mentioned and seeing the importance of attention and memory in daily life, it was considered important to conduct this research in order to verify the impact that the mood of older adults may have in relation to the loss or deterioration of attention and memory.

Based on the above, the interest of this research is to investigate attention and memory in older adults and their relationship with mood.

Problem

Depression is a common illness worldwide, with an estimated 3.8% of the population affected, including 5.0% among adults and 5.7% among adults over 60 years of age. Approximately 280 million people worldwide have depression. Depression can become a serious health condition. It can cause the affected person to suffer greatly and function poorly at work, at school and in the family. In the worst cases, depression can lead to suicide. More than 700 000 people die due to suicide every year [OMS, 2021].

According to the World Health Organization [WHO] dementia and depression affect approximately 5% and 7% of the world's elderly population, respectively. Anxiety disorders affect 3.8% of the older population. [OMS, 2021].

Older people with depressive symptoms have poorer functioning compared to those with chronic medical conditions such as lung disease, hypertension or diabetes. [WHO, 2017].

Hypothesis

Ho: “Attention and memory processes are unrelated to mood states in the older adult.”

Hi: “Attention and memory processes are related to mood states in the older adult.”

Objectives

General objective: to identify if there is a relationship between depressive state and memory ability in the elderly,

Specific objectives

- To investigate the Beck test total score for depressive mood in the older adult.
- To know the total score of the memory subsection of the Mini Mental Test.

Theoretical framework

Background

Memory

Memory is a neurocognitive function that allows recording, encoding, consolidating, retaining, storing, retrieving and recalling previously stored information. While learning is the capacity to acquire new information, memory is the capacity to retain the information learned [Portellano, 2005]. Basically, we can establish two main memory modalities according to the time elapsed for its storage: short-term memory and long-term memory. [Portellano, 2005].

Short-term memory [STM]

It is the process of initial retention of information for a short period of time ranging from a few fractions of a second to several minutes, although some authors place the time limit of short-term memory at 30 seconds. Before any perceptual processing of information can take place, it is necessary that a sensory encoding of the stimuli to be memorized takes place, so that within short-term memory there are several modalities: sensory memory, immediate memory and working memory. [Portellano, 2005]. 2410-3551.

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Long-term memory [LTM]

Is the ability to retain information for longer periods of time or permanently. LTM also refers to the ability to recall information after an interval of time in which the subject has focused his attention on another task [Portellano, 2005].

Older adult

In Mexico, older adult is considered a person who is over 60 years old and refers to the stage that adds up all the experiences of life and goes through most of the family, professional and social goals. But it also marks the beginning of a stage where people present conditions of physical, social and economic vulnerability. [GOB, 2017]

Aging involves a series of physical, psychological and social changes related to changes in all organs, including the brain. With the passage of time, a series of cognitive modifications begins involving memory, language, perception and attention. These cognitive changes constitute one of the central factors of the late stages of life. [Ardila & Rosselli, 2007]

Individuals between 55 and 74 years of age are considered senile young, senile old those over 75, and senile older those over 85 years of age. [Ardila & Rosselli, 2007]

Depression

Depression is a common illness worldwide, affecting an estimated 3.8% of the population, including 5% of adults and 5.7% of adults over 60 years of age. Globally, approximately 280 million people have depression [WHO, 2017].

Depression is a common mental health disorder. It is characterized by persistent sadness and a lack of interest or pleasure in activities that were previously rewarding and enjoyable. In addition, it can disrupt sleep and appetite, and is often accompanied by fatigue and poor concentration.

Depression is a major cause of disability worldwide, and has a significant impact on the burden of disease. The effects of depression can be prolonged or recurrent, and can dramatically impair a person's ability to function and live a rewarding life. [WHO, 2017]

Ortiz-Vargas, Angel Adrián, Santiesteban-Contreras, María Tereza and Vázquez-Ríos, Elda Raquel. [2025]. Depression as an important factor in memory impairment in the elderly. Journal of Health Sciences. 12[31]1-8: e11231108. <https://doi.org/10.35429/JOHS.2025.12.31.1.1.8>

Depression in older adults is a common pathology, which is associated with comorbidities, excessive use of health resources, suicide and mortality. It is generally underdiagnosed and undertreated. Within it, two types are distinguished: 1] Early-onset depression that begins before the age of 60 years, and occurs in older adults as recurrent or chronic depression and 2] Late-onset depression that starts after the age of 60 years and would be associated with more changes at the neurological level and dementia. [Bruning, 2019].

In people over 65 years of age, depression affects quality of life; depressed older adults generally have more anxiety, somatic complaints, poor prognosis and high mortality. Contrary to popular belief, depression is not a natural part of aging and can often be reversed with prompt and appropriate treatment. However, if left untreated, depression can accelerate physical, cognitive and social decline [Tenesaca Camacho, 2021].

The Beck Depression Inventory, second edition [BDI-IA]

The Beck Depression Scale is one of the instruments frequently used to assess depressive symptoms [Beck, 2009]. The Beck Depression Inventory, second edition [BDI-IA] is a self-report instrument composed of 21 items, whose purpose is to measure the severity of depression in adults and adolescents aged 13 years and older.

This version of the BDI was developed to assess symptoms corresponding to the diagnostic criteria for descriptive depressive disorders in the Diagnostic and Statistical Manual of Mental Disorders Fourth Edition [DSM-IV, 2013] of the American Psychiatric Association [Beck, 2009].

The Beck Inventory meets the psychometric requirements for its valid use in our environment. In terms of factorial composition, construct validity, discriminant validity and internal consistency, they corroborated the adequate psychometric properties of the BDI-IA, which endorse it as a sufficiently valid and reliable instrument for the measurement of depressive symptoms in the Mexican population, which also supports the cross-cultural validity of the instrument [Beck, 2009]; [Holsen, 2012].

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The cut-off scores proposed by Beck et al. [1996] were found to be appropriate for discriminating the different degrees of depression.

Level of depression
<=9 Normal
10-15 Slightly depressed
16-24 Moderately depressed
25-62 Severely depressed

Table 1 Total scores for the interpretation of the Beck Test inventory results.

Mini Mental Screening Test

The Mini-Mental State Examination [MMSE] is a written test commonly used as part of the process when considering a diagnosis of dementia, with a maximum score of 30, with lower scores indicating more severe cognitive problems.

It is one of the most widely used tools worldwide for its brevity and easy application it has 10 areas of assessment: spatiotemporal orientation, three-word register, attention fixation, memory, verbal nomination, repetition and comprehension, reading, writing and visuospatial construction, The cut-off point established for the MMSE defines "normal" cognitive function and is generally set at 24, although theoretically it could be anywhere between 1 and 30 [Llamuca Quinaloa, Macías Guamangate, Miranda Caisaluisa, & Tapia Cerda, 2020].

It is mandatory when starting the test to begin by collecting the patient's data, as well as their degree of schooling and work they did before retirement [year in which they started school and year of completion, approximately]. This will also help to create a degree of trust with the patient and facilitate their collaboration.

If we analyze the MMSE, we see that it consists of 5 sections: [1°] Orientation, [2°] Fixation, [3°] Calculation and attention, [4°]

Memory and [5°] Language and praxis. When carrying it out, we should not interrupt it, especially the sequence of fixation, calculation and attention and memory.

Hernández-García, Ruth Indira, Ontiveros-Vargas, Angel Adrián, Santiesteban-Contreras, María Tereza and Vázquez-Ríos, Elda Raquel. [2025]. Depression as an important factor in memory impairment in the elderly. Journal of Health Sciences. 12[31]1-8: e11231108. <https://doi.org/10.35429/JOHS.2025.12.31.1.1.8>

Between the 1st and 2nd, and between the 4th and 5th we can make a brief pause if the patient gets tired or is very nervous, trying to reassure him and tell him that it is not an exam.

Range Level of cognitive impairment

< 24 Probable cognitive impairment

> 24 No cognitive impairment

With all this we will have reached the end of the test and we will have to make the correction for age and cultural level. After reviewing the MMSE we reach the following agreement [See Table 2].

Schooling refers to the age of completion of studies, not to the number of years of schooling. Broadly speaking, the first group includes those who have not completed primary school, the second group includes those who have completed primary school and those who have completed high school, and the third group includes those who have completed high school or a degree.

Patients with depression and anxiety usually score low on this type of test due to impaired attention and concentration, without being indicative of MCI or dementia [the response of "I don't know, I don't know" to simple orientation or calculation questions is characteristic, and they end up performing if we insist that they pay attention and make an effort.

Research methodology

The present study is exploratory, non-experimental, observational and cross-sectional, with a descriptive statistical analysis.

The complex variable of depression was analyzed for its relationship with neurocognitive functions by means of Mini Mental. In addition, the following variables were considered: age, gender and school grade.

For the statistical analysis of the population studied, measures of central tendency and dispersion were used.

Procedure

The participants were patients attending a geriatric center called "taking care of those who gave us life" in the city of Durango.

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Data collection was carried out during the month of February 2021, culminating at the end of February of the same year.

Informed consent was obtained after signing the informed consent in accordance with the official Mexican standards 004-ssa3-2012 on the clinical record and 040-ssa2-2004 on information, and the instruments for data collection and interpretation of the results were applied.

The following tests were used for the study: "Beck test" and "mini mental screening test"

The identification of the signalistic variables and academic performance [gender, age and school average] was obtained through the application of a clinical survey. Statistical analysis of the information obtained was performed using Excel software.

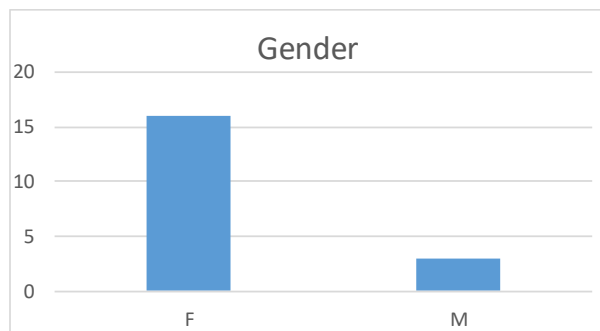
The inclusion criterion was limited to all those patients in the group who agreed to be part of the sample and signed the informed consent corresponding to the Mexican official standards [NOM-004-SSA3-2012 for the clinical record and NOM-040-SSA2-2004 on information] prior to their participation in the evaluation.

Elimination criteria were discarded for participants who left any of the evaluation tests unfinished, previous neurodegenerative diseases and non-attendance at evaluations, as well as patients who wished to withdraw from the study.

According to these criteria, out of a total of 20 patients, 1 were eliminated, leaving a total of 19 valid cases for the investigation.

Results

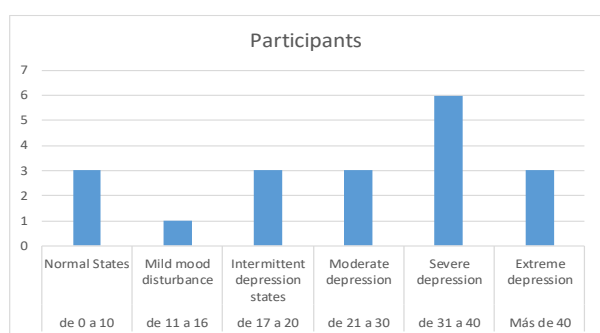
The sample studied was made up of 19 participants, who attend the "Geronto-geriatric Center: taking care of those who gave us life", of which 8 correspond to individuals of the female gender and 2 of the male gender [See graph 1].

Box 1**Figure 1**

Gender of the sample

The mean age of the participants was 78.3 years, with the minimum being 55 years and the maximum being 88 years, with a mode of 71 years and a mean of 82.5, the standard deviation was 10.57. The reliability of the results obtained in the evaluation of the Beck Depression Test was with a Chronbach's alpha of .90 [excellent reliability].

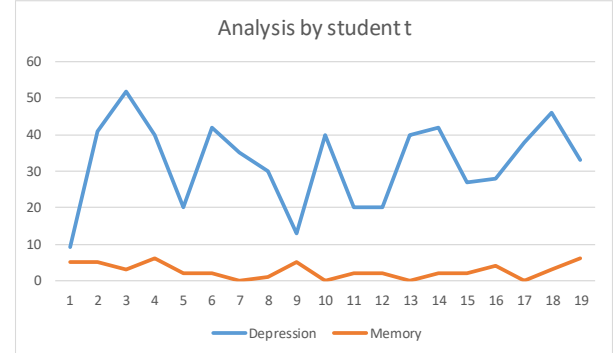
Regarding the results obtained from the evaluation of depression using the Beck Test, it was found that only 3 participants [21%] did not show any level of depression, while 16 participants [79%] showed a high degree of depression [See graph 2].

Box 2**Figure 2**

Beck Test Results

The reliability of the results obtained from the Mini-Mental Test was with Chronbach's alpha of .66 [very reliable].

Regarding the correlational analysis, the research hypothesis is accepted since, based on the results, depression affects the memory status of older adults, with a $t=1.73$ to 95% reliability. [See graph 3].

Box 3**Figure 3**

Correlation between memory and depression in the elderly

In the following correlational analysis by Pearson between depression and mini-mental, a moderate positive significance level was found with an $r = .40$, with $p = 0.05$ with a reliability of 95%, which refers to the fact that, in a moderate positive way, the higher the level of depression, the greater the cognitive impairment or the greater the prevalence of mild dementia.

It is essential to emphasize that the results obtained in this population cannot be extrapolated, because it is a small sample from a single site. Comparisons with other institutes would be necessary to assess the state of cognitive functions more broadly and accurately.

Conclusion

The affective or emotional component of the daily life of the older adult, often deprived of the warmth and support of the family group or a minimum of positive social interactions, confers different meanings to the gradual reduction of various biological, cognitive or sensory functions and, with it, a greater vulnerability to various agents or pathogenic factors. [Tello, 2020]

It is known that memory and attention are main aspects of executive functions; with the passage of time the quality of life and health of people is affected by a decline in their functionality, which leads to consequences at social, mental and physical levels. [Riojas, 2021]

Age-related memory problems are a cognitive alteration considered normal, they are mild forgetfulness. It has been suggested as a normal stage in the elderly. This event is known as Age-Related Memory Impairment [ARMD].

[Sosa Sosa, 2016] Indira, Ontiveros-Vargas, Angel Adrián, Santiesteban-Contreras, María Tereza and Vázquez-Ríos, Elda Raquel. [2025]. Depression as an important factor in memory impairment in the elderly. Journal of Health Sciences. 12[31]1-8: e11231108. <https://doi.org/10.35429/JOHS.2025.12.31.1.1.8>

In the present study, after analyzing the results of the correlation between memory and depression, it is found that 79% of the population is depressed from 78 years of age [mean study], with a correlation $t = 1.73$ and with a $p = 0.05$.

Therefore, it is recommended that as a preventive measure, cognitive stimulation workshops be carried out or implemented, complemented by mental health professionals to prevent these cognitive-behavioral alterations.

In the case of the limitations of this research, it is recommended to expand the sample by including a larger number of participants from different rehabilitation centers.

Additionally, it is suggested to increase the participation of professionals in human communication therapy during the rehabilitation steps of this addiction. In this way, along with the behavioral work, a therapeutic plan focusing on neurocognitive processes in adults could be evaluated and structured.

Declarations

Conflict of interest

Hernández García, Ruth Indira.

Ontiveros Vargas, Angel Adrián.

Santiesteban Contreras, María Tereza.

Vázquez Ríos, Elda Raquel.

We declare that we have no conflicts of interest, either competitive or financial. In addition, we have no interest in personal relationships that could have influenced the article.

In addition, we declare that we have no conflict of interest with the publisher, the members of the editorial and arbitration board or committee.

Authors' Contribution

Hernández-García, Ruth Indira: Contributed to the project idea, research method and technique. He supported the design of the field instrument. He carried out the data analysis and systematisation of results, as well as writing the article.

Ontiveros-Vargas, Angel Adrián: Carried out the systematisation of the background for the state of the art. She supported the design of the field instrument. She also contributed to the writing of the article.

Santiesteban-Contreras, María Tereza: contributed to the research design, the type of research, the approach, the method and the writing of the article.

Vázquez-Ríos, Elda Raquel: He supported the design of the field instrument.

Availability of data and materials

The data obtained were previously authorized by the geriatric center called "taking care of those who gave us life" in the city of Durango, as well as from the participants in this research by means of informed consent.

Funding

The research did not receive any funding.

Abbreviations

APA	American Psychiatric Association
BDI-IA	The Beck Depression Inventory, second edition
DSM-V	Diagnostic and statistical manual of mental disorders
MMSE	The Mini-Mental State Examination
NOM	Mexican Official Standards
NEUROPSI	Neuropsychological Assessment
LTM	Long-term memory
SDA	Alcohol Dependence Syndrome
STM	Short-term memory
WHO	World Health Organization

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Self-care capacity and Quality of life in the elderly in the South of Veracruz





Capacidad de autocuidado y Calidad de vida en el adulto mayor del Sur de Veracruz

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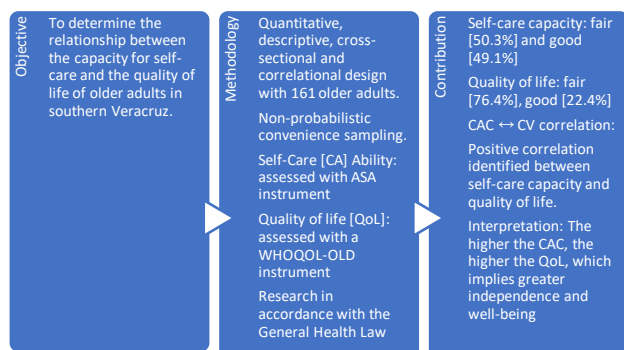
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Abstract

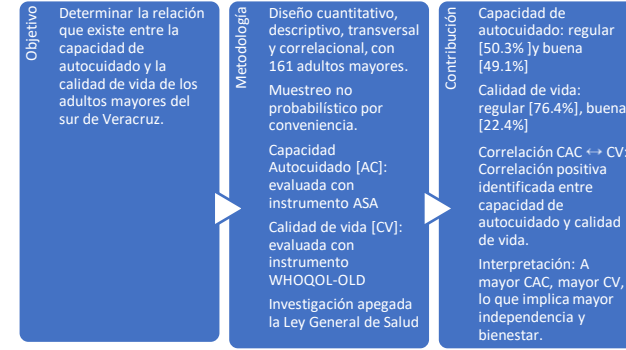
Aging is an irreversible process associated with the accumulation of molecular damage that reduces physiological reserves. Biological, psychosocial factors, and individual experiences influence perceptions of quality of life. This study aimed to determine the association between self-care capacity [SCC] and quality of life [QOL] in older adults [OA]. The study was descriptive, cross-sectional, and correlational. The study included a sample of 161 older adults from southeastern Veracruz, selected by snowball sampling. The ASA and WHOQOL-OLD instruments were used, with analysis using SPSS. The average age was 69.6 years; 76.4% had some pathology. QOL was rated as fair [76.4%] and good [22.4%]; SCC as fair [50.3%] and good [49.1%]. A positive correlation was identified between SCC and QOL. It is concluded that a higher level of self-care promotes a better quality of life, greater independence, and well-being in older adults.



Quality of life, self-care, older adults

Resumen

El envejecimiento es un proceso irreversible asociado a la acumulación de daños moleculares que reducen las reservas fisiológicas. Factores biológicos, psicosociales y experiencias individuales influyen en la percepción de la calidad de vida. Este estudio tuvo como objetivo determinar la asociación entre la capacidad de autocuidado [CAC] y la calidad de vida [CV] en adultos mayores [AM]. De tipo descriptivo, transversal y correlacional con una muestra de 161 AM del sureste de Veracruz, seleccionados por muestreo bola de nieve. Se utilizaron los instrumentos ASA y WHOQOL-OLD, con análisis en SPSS. La edad promedio fue de 69.6 años; el 76.4% tenía alguna patología. La CV fue calificada como regular [76.4%] y buena [22.4%]; la CAC, como regular [50.3%] y buena [49.1%]. Se identificó correlación positiva entre CAC y CV. Se concluye que un mayor nivel de autocuidado favorece una mejor calidad de vida, mayor independencia y bienestar en el AM.



Calidad de vida, autocuidado, adulto mayor

Area: Advocacy and attention to national problems

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Introduction

Population ageing is linked to a country's economic development. According to the Economic Commission for Latin America and the Caribbean [ECLAC], a population is considered moderately aged when older adults make up 10% or more of the total population. Similarly, the World Health Organisation [WHO, 2022] estimates that between 2000 and 2050, the global population over the age of 60 will increase from 11% to 22%.

In Latin America and the Caribbean, the transition is faster, as in 2020 more than 8% of the population was aged 65 or over, and this percentage is estimated to double by 2050.

In Mexico, the 2022 National Occupation and Employment Survey [ENOEN] estimated that there were 17,958,707 older adults [OA] aged 60 or over, equivalent to 14% of the total population. By age, 56% are between 60 and 69 years old, 30% are between 70 and 79 years old, and 14% are 80 years old and above. In terms of gender, the percentage is slightly higher for men aged 60 to 69 and for women aged 80 and over [National Institute of Statistics and Geography [INEGI], 2022].

At the national level, in 2020, the National Population and Housing Census reported that the adult population aged 60 and over amounted to 15.1 million people [equivalent to 12% of the total population], with the main states being: State of Mexico [1.9 million], Mexico City [1.5 million] and Veracruz [1.3 million] [Kánter Coronel, 2021].

Ageing is a universal and irreversible process, biologically caused by the accumulation of various molecular damages that gradually reduce an individual's physiological reserves.

The combination of biological and psychosocial factors, such as acquired experiences, will determine a positive or negative outlook for the rest of their life. Improving health remains the global priority for this century and is one of the three indicators of sustainable development. That is why it is urgent to take the right approach to self-care and quality of life in the adult population [Martínez et al., 2021; Leitón et al., 2018].

A determining factor in quality of life is self-care, which is defined by the WHO as the ability of individuals, families and communities to promote health, prevent disease, maintain health and cope with illness and disability with or without the support of a healthcare provider. Adults acquiring self-care habits translates into healthy ageing and improved well-being [National Institute of Older Persons [INAPAM], 2022].

Self-care is a fundamental practice carried out by nurses, yet alarmingly, there is a tendency for staff to neglect it, limiting themselves to following the treatment prescribed by medical staff and failing to implement interventions that promote the patient's interest in recovering and caring for their health [Macias et al., 2020].

Regarding the concept of self-care, Dorothea Elizabeth Orem established in 1969 that it is the sum of actions performed that generate exchanges of contributions and benefits for the improvement and maturation of the people who perform them. This theory reiterates that self-care is a human activity intentionally performed by individuals or caregivers on their behalf, with the aim of maintaining life, health and, therefore, well-being [Araújo et al., 2022].

The ageing population poses a challenge for the health systems of different countries: today, the priority is not to improve longevity, but to improve health and well-being. In this sense, specialists from various fields use the term quality of life to refer to an individual's perception of their life, within their cultural context and in relation to their expectations and interests. The WHO, in turn, establishes that quality of life is a subjective and individual perception linked to one's life experiences [Martínez et al., 2016].

Living longer does not mean living better, which is why health professionals need to pay special attention to this age group in order to ensure their well-being. Studies on quality of life in old age reveal that psychological, physiological and social well-being are key factors. It is vital that older adults pay attention to their health behaviour, taking positive measures towards their condition and needs to improve their health and prolong their life, as these variables guarantee healthy ageing.

To correctly understand ageing and its implications for people's lives, it is also essential to address the concept of 'quality of life' which, according to Cáceres-Manrique et al., encompasses different dimensions such as physical health, environmental conditions, personal satisfaction and economic well-being.

The WHO also adds that quality of life will depend not only on one's perception of their context, but also on their level of dependence and beliefs [Martínez et al., 2021]. In the case of older adults, it is hoped that health-related quality of life will be constructed in a favourable way, recognising and experiencing old age as a stage of continuation in a life process and not as a phase of functional decline and social isolation. Older adults experience changes in their mental, social and physical abilities, which can alter their quality of life and their perception of it [WHO, 2022].

The definition of QoL depends on the authors, and Hickey [1999] comments that it is an individual concept because each person perceives it differently due to influences such as personal experiences and expectations. For Cummis, it is a 'universal construct, defined objectively and subjectively, where the objective domains are cultural measures of well-being and the subjective domains refer to personal satisfaction in different dimensions' [Fernández and Rojo, 2005].

The QOL of older adults is defined as their personal perception of life within their cultural context and the values in which they live.

This perception is related to their goals, expectations, and interests, and is also linked to the satisfaction of basic needs such as income and the quantity and quality of goods at their disposal. Unfortunately, fewer and fewer older adults have an income that allows them a decent standard of living, which puts their survival at risk [Molano and González, 2020; Queirolo et al., 2020].

Assessing QoL in older adults is a challenge for the health systems of countries facing population ageing. The rapid increase in the number of people over the age of 60 calls for urgent adjustments to social, political, economic and legal programmes, which must be modified in order to meet the needs of this population group [Martínez et al., 2016].

It has been shown that quality of life in older adults is related to physical and psychological health. Previous research shows that perceived health and cognitive functioning influence the perception of quality of life. In addition, there is a positive relationship between quality of life, well-being and life satisfaction.

A positive perception of quality of life influences behaviour, the will to live and successful ageing.¹⁴ Furthermore, recent studies have revealed the close relationship between self-care and quality of life, such as rest, sleep, personal development and physical well-being [Alisa et al., 2022; Loredó et al., 2016].

Population ageing is a phenomenon of great relevance in this century with serious health, economic and social repercussions. As the older adult population is more vulnerable to the processes of the life cycle, such as the onset of disease and changes in family, emotional and economic dynamics that affect self-care capacity and quality of life, it is imperative to address both variables by conducting studies that investigate the association between quality of life and self-care in older adults.

Objectives

To determine the relationship between self-care capacity and quality of life among older adults in southern Veracruz.

Methodology

Design and population

A quantitative, descriptive, cross-sectional and correlational design was used. The target population consisted of 161 older adults from the south-eastern region of Veracruz. Between May, June and July 2023, non-probabilistic convenience sampling was used, including adults over 60 years of age of both sexes who agreed to participate voluntarily with informed consent, ensuring anonymity. Approval was previously requested from the

Ethics and Research Committee of the Faculty of Nursing at the University of Veracruz, Minatitlán Campus. Once the request was approved by the study subjects, the instruments were applied, and finally, the participants were thanked [Sampieri et al., 2006].

Data collection

Data collection was carried out using a questionnaire divided into sections to determine the characteristics of the study subjects, covering sociodemographic data, labour participation and comorbidities. Quality of life was measured using the WHOQOL-OLD questionnaire, translated and adapted by the World Health Organization [WHO, 2006], which consists of 33 items that assess six dimensions: sensory capacity, autonomy, past, present and future activities, social participation, death and dying, and intimacy [Gutiérrez et al., 2023].

Self-care capacity was assessed using the Appraisal of Self-care Agency Scale using the modification adapted in Colombia [Manrique & Velandia, 2009], consisting of 24 items that assess the frequency with which self-care activities are performed [Díaz de León et al., 2023].

This research complied with the regulations of the General Health Law on Health Research of 2014, Chapters I and II, including Articles 13, 16, 21, and 22; the Declaration of Helsinki in sections 24, 25, and 26 referring to confidentiality, privacy, and informed consent [Chamber of Deputies of the Honourable Congress of the Union, 2014; World Medical Association, 2014].

Data analysis

Data processing was performed using the Statistical Package for the Social Sciences [SPSS] version 25 for Windows, which provided descriptive statistics such as frequencies, percentages, and measures of central tendency and standard deviation.

The Kolmogorov-Smirnov goodness-of-fit test was performed to corroborate the type of data distribution, obtaining a $p=.200$ for quality of life and $p=.070$ for self-care abilities, thus determining the use of Pearson's Rho parametric tests.

Results

Box 1

Table 1

Données sociodémographiques

Age		
Minimum	59	Media 69.60
Maximum	96	
Sex	f	%
Female	106	65.8
Male	55	34.2
Marital Status		
Single	11	6.8
Married	80	49.7
Widowed	55	34.2
Unmarried	6	3.7
Separated	9	5.6
Level of education		
Basic	116	72.1
Higher	29	18
No education	16	9.9
Accompaniment		
With Accompaniment	144	89.4
Unaccompanied	17	10.6

In this research, the sample consisted of 161 older adults with an average age of 69.6 years; they were female [65.8%], married [49.7%], widowed [34.2%]; most of them had basic education, only 18% had a university degree.

Half of the older adults lived accompanied by their partners or their children; it is worth mentioning that 10.6% lived alone.

Box 2

Table 2

Health status.

Comorbidities	f	%
No disease	38	23.6
Hypertension	40	24.8
Diabetes and hypertension	28	17.4
Diabetes	18	11.2
Oncological	10	6.2
Musculoskeletal diseases	6	3.7
Ophthalmological diseases	4	2.5
Endocrine Enf.	5	3.1
Cardiocirculatory diseases	5	3.1
Neurological disease	2	1.2
Others [vertigo]	5	3.1
Nutritional status		
Normal	49	30.4
Overweight	62	38.5
Obese	50	31.1

Own elaboration

Of the most frequently reported diseases, hypertension and type II diabetes and cancer were found, only 23.6% reported being healthy. Regarding nutritional status, a large part of the sample [69.6%] had latent risk factors as they were overweight and obese.

Box 3

Table 3

Quality of life and self-care capacity rating.

Level	Variable			
	Quality of life		AC capacity	
	f	%	f	%
Poor	27	16.8	7	4.3
Fair	90	55.9	108	67.1
Good	44	27.3	46	28.6

With regard to the study variables, it is observed that in both the level of "regular" QoL [55.9%] and QALY [67.1%] predominates, followed by "good", however, it is observed that a minority has a "bad" quality of life, but in the QALY it maintains a perception of "regular" to "good".

Box 4

Table 4

Pearson correlation.

	Promotion of functioning and personal development	Personal interaction	Activity and rest	Social interaction	Food consumption	Score CA Capacity
Autonomy	r .588** p.000	.453** .000	.208** .008	.261** .001	.299** .000	.553** .000
Past, present and future activities	r .525** p.000	.442** .000	.168* .034	.345** .000	.372** .000	.541** .000
Sensory Capacity	r .344** p.000	.244** .002	.053 .501	.170* .031	.142 .073	.293** .000
Social participation	r .580** p.000	.425** .000	.267** .001	.328** .000	.318** .000	.563** .000
Death and agony	r -.140 p.077	-.022 .778	-.283* .000	.025 .751	-.199* .011	-.138 .080
Intimacy	r .362** p.000	.238** .002	.178* .024	.297** .000	.235** .003	.358** .000
Score CV	r .580** p.000	.463** .000	.150 .057	.385** .000	.299** .000	.564** .000

*p<0.05, **p<0.01

Own elaboration based on results obtained using SPSS v.25.

Pearson's Rho correlation showed an overall score between the WHOQOL-OLD and ASA instruments of $r=0.564$, $p=.000$, which is positive with a strong correlation. By dimensions, the significant correlation of the self-care capacity scale was identified as 'promotion of functioning and personal development' with the dimensions of quality of life: "autonomy" [$r=0.588$, $p=.000$], 'past, present and future activities' [$r=0.525$, $p=.000$], 'social participation' [$r=0.542$, $p=.000$], sensory capacity [$r=0.344$, $p=.000$] and 'intimacy' [$r=0.336$, $p=.000$].

It was observed that older adults had the decision-making capacity to carry out their self-care and activities of daily living by themselves, integrating positively into this stage of life. With regard to the Quality of Life dimension, negative correlations were identified in 'death and dying' [$r=-1.40$, $p=.751$]; that is, older adults, being mostly independent, do not perceive a state of imminent death. Meanwhile, in the rest of the dimensions, physical well-being and the ability to perform daily activities were identified, as well as maintaining social and participatory relationships within society.

Discussion

This research was conducted on 161 older adults in southern Veracruz to determine the association between self-care ability and quality of life. With regard to the descriptive characteristics of the population, the following findings were obtained: with regard to age, an average age of 69 years was reported, with a predominance of females [65.8%] and married individuals [49.7%], which is consistent with Villarreal, Pérez, and Usta [2022], where 71.1% of participants belonged to the 60-69 age group, 63% were women, and 36% were married. On the other hand, it differs from the findings reported by de Alisa, Cano, and Maldonado in 2022, where 56.9% of the population were men with an average age of 70.89 years.

With regard to the variables Self-Care Capacity [67.1%] and Quality of Life [55.9%], they showed a 'fair' perception, similar results to those of Villarreal, Pérez, and Usta [2022], who reported a 'fair' level in QOL [56%] and SCC [45%]; they coincide with data found by Alisa et al. [2022], where 43.1% obtained a partially adequate level of self-care, and differs from the Quality of Life variable, where 44.4% reported it as 'poor'.

González-De la Cruz, Patricia, Lara-Hernández, Janeth, Jiménez-Zúñiga, Esther and Santiago-Mijangos, Alma Delia. [2025]. Self-care capacity and Quality of life in the elderly in the South of Veracruz. Journal of Health Sciences. 12[31]1-8: e21231108. <https://doi.org/10.35429/JOHS.2025.12.31.2.1.8>

By dimension, we agree with the same authors in having strong significant correlations in the dimension of quality of life with promotion of functioning and personal development [.580**], while Alisa et al. reported personal development [.225 *].

However, we differ with the results of the dimension with the highest correlation, which for this study is promotion of functioning and personal development with: autonomy, past, present and future activities, sensory capacity, social participation and intimacy, all dimensions with $p < 0.05$, and for Alisa et al., rest and sleep with: emotional well-being, interpersonal relationships, personal development, physical well-being, self-determination and social inclusion [$p < 0.05$].

Conclusion

The research yielded relevant data by exploring the group of older adults and investigating the relationship between the level of self-care and their quality of life. When searching for scientific evidence, little literature was found that addresses these two variables in different populations and conditions; therefore, these variables need to be studied together in this population group.

Promoting self-care and healthy habits in the young population guarantees the quality of life of older adults, with nursing professionals playing a leading role in this task by promoting health in the young population and, of course, in those who reach 60 years of age and above. It is necessary to strengthen and promote, through education and interventions, the tools necessary for older adults to cope with and experience successful ageing.

Although the results show that older adults have a good level of independence, they also reflect the need to ensure their protection so that this status is maintained as far as possible, especially because this stage of life makes them susceptible to losing their health status in the face of any change in their daily habits and activities.

Finally, the two study variables showed that older adults had a lower proportion of quality of life [16%] and self-care actions [4.3%] in a “poor” classification, which indicates that they do not take adequate care of themselves and there is a deficit in self-care.

Declarations

Conflict of interest

None of the authors had a conflict of interest for this research.

Author contribution

González-De la Cruz, Patricia: Contributed to the conceptualisation of the study, writing of the original draft, statistical analysis, and final editing of the manuscript.

Lara-Hernández, Janeth: Participated in data collection and systematisation, literature review, and preparation of tables and figures.

Jiménez-Zúñiga, Esther: Collaborated in the general supervision of the project, validation of results, and critical correction of intellectual content.

Santiago-Mijangos, Alma: Contributed to the methodological design, formulation of objectives, and final review of the manuscript for publication.

All authors approved the final version of the manuscript and are responsible for its content.

Availability of data and materials

The articles analysed in this research can be found in the Web of Science, Scopus, and Google Scholar databases.

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Abbreviations

AM	Older Adult
ASA	Assessment Scale for Self-Care Ability
CAC	Self-Care Ability
ECLAC	Economic Commission for Latin America and the Caribbean
QoL	Quality of Life
ENOEN	National Occupation and Employment Survey, New Edition
INAPAM	National Institute for Older Adults

Article

INEGI	National Institute of Statistics and Geography
WHO	World Health Organisation
SPSS	Statistical Package for the Social Sciences
WHOQOL-OLD	Questionnaire on the quality of life of older adults

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Background

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

Emotions in Mayan pregnant women: barriers to care and proposals to reduce them





Emociones en mujeres embarazadas mayas: barreras de atención y propuestas para reducirlas

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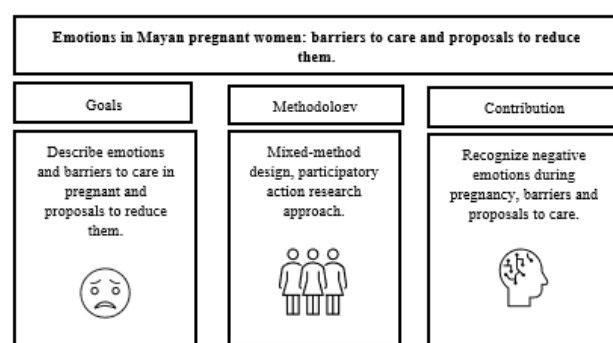


Abstract

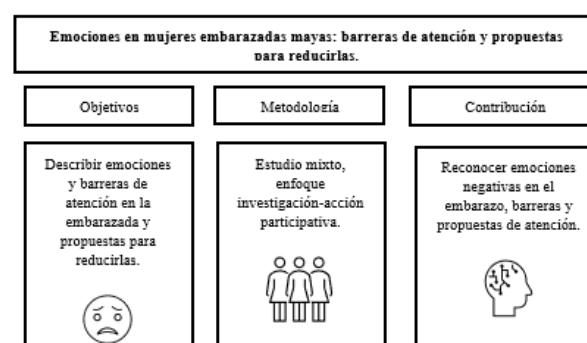
Negative emotions during pregnancy can lead the mother to states of anxiety and depression. In Mexico, one in two pregnant women suffers from emotional disorders that are beyond their ability to control. Objective. To describe the main emotions perceived and barriers to care in a sample of pregnant women who attended prenatal care at a community hospital in the southern state of Yucatán, Mexico; and put forward proposals to incorporate the emotional care and risk prevention service. Methodology. A mixed-method design, participatory action research approach, with workshops with focus groups of pregnant women and healthcare personnel. Narrative analysis was used for the qualitative and descriptive analysis for the quantitative. Results. 34 pregnant women and twenty health personnel participated. The emotions perceived were despair, anger, anxiety, euphoria, sadness, fear, frustration, anguish, happiness, and melancholy. Cultural barriers prevailed. Social and personal support for addressing emotional disorders were the main proposals.

Resumen

Las emociones negativas en el embarazo pueden llevar a la madre a estados de ansiedad y depresión. En México, una de cada dos embarazadas presenta trastornos emocionales que rebasan su capacidad para controlarlos. Objetivo. Describir las principales emociones percibidas y barreras de atención, en una muestra de embarazadas que acudieron a un hospital comunitario del sur del estado de Yucatán, México; y plantear propuestas para incorporar el servicio de atención emocional y prevención de riesgos. Metodología. Diseño mixto, enfoque investigación-acción participativa con talleres con grupo focal de embarazadas y personal de salud. Análisis narrativo para lo cualitativo y descriptivo para lo cuantitativo. Resultados. Participaron 34 embarazadas y 20 miembros del personal de salud. Las emociones percibidas fueron: desesperación, enojo, ansiedad, euforia, tristeza, miedo, frustración, angustia, felicidad y melancolía. Predominaron las barreras culturales. El apoyo social y especialistas para tratar los trastornos emocionales fueron las principales propuestas.



Emotions, barriers, proposals



Emociones, barreas, propuestas.

Area: Advocacy and attention to national problems

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Introduction

Paying attention to the emotions experienced by women during pregnancy should be an important task, just as monitoring the risk of maternal complications is. Failure to pay attention to emotions can lead to disorders such as anxiety and depression. For this reason, more and more studies are reporting the need to monitor the mental health of pregnant women in order to detect these disorders in a timely manner and be able to treat them [Crane et al., 2021].

In Mexico, according to data from the National Institute of Perinatology [INPer], one in two women experience emotional disorders during pregnancy; and although these disorders originate from issues of adaptation to the new reproductive stage, when they exceed the woman's ability to control them, psychological support is required to provide her with tools to adapt to the condition and restore emotional balance [Ministry of Health, 2024].

During prenatal check-ups carried out by doctors and midwives to monitor pregnant women, clinical signs such as uterine height, abdominal circumference, foetal position, foetal heartbeat, blood pressure, and vaginal discharge, among others, are monitored. However, there are few occasions when questions are asked about the emotional state of the pregnant woman, who uses her own skills and resources to adapt to the changes that occur during this stage [Carpinelli et al., 2022]. Although the Official Mexican Standard establishes comprehensive health care for pregnant women, including mental health, as a guiding principle, centred on the individual [Official Mexican Standard, 2025]; in everyday life, more importance continues to be given to the biological aspect, underestimating the emotional aspect. There is also the Clinical Practice Guideline for Multidisciplinary Care and Attention during Pregnancy, which provides measurement tools to assess biopsychosocial risk, but it is not applied during prenatal care [Clinical Practice Guideline, 2022]. Therefore, prenatal care provides a good opportunity to address emotional disorders.

Several studies conducted with women during pregnancy have reported that having had a miscarriage led to emotional imbalance.

For this reason, it has been recommended that psychological interventions focus more on women who have experienced a miscarriage and are now pregnant again, as they are more prone to anxiety or depression [Donegan, 2023; Silverio et al., 2021]. Several of these studies were conducted during the COVID-19 pandemic and clearly show that a lack of attention to the emotional state of pregnant women leads to loneliness and anxiety, which have an impact on their mental health. The recommendations are based mainly on the importance of social support during pregnancy for a happy outcome [Silverio et al., 2024], through training doctors and midwives in specific programmes on family support using online education [Wash, 2025].

In addition, when women are transferred outside their community to receive care for childbirth, they require the support of family members, friends, the midwife and community health personnel, i.e. a support network that provides the pregnant woman not only with material assistance but also makes her feel accompanied and safe during this stage; as was the case with women in India who considered the support of their mother or husband to be the main source of support in reducing stress [Silverio et al., 2024; Patil et al., 2024].

In rural communities, where healthcare services for pregnant women are more limited than in urban areas, the importance of taking into account the emotional impact of a lack of support during consultations is often overlooked. This can cause feelings of fear and loneliness due to going through this stage without the support of family or friends [Jin et al., 2023].

Similarly, barriers to access to mental health care for pregnant women have been studied, and it has been found that the lack of psychiatrists and psychologists, the lack of medication in local health facilities, as well as social stigma that prevents women from deciding to seek help, are important barriers that must be considered in order to improve the quality of maternal health services [Dennis, 2024].

In a previous study conducted with a sample of pregnant women who attended the participating hospital, STAI and BID-II inventories were applied to explore levels of anxiety and depression and their association with risk factors.

The results revealed that 85.1% and 20.9% of women had high levels of anxiety and depression, respectively. The associated risk factors were lack of paid work associated with depression [OR=5.5, p=0.01] and being in the third trimester of pregnancy associated with anxiety [OR=3.3, p=0.02]. This demonstrates the need to implement preventive, diagnostic, care and follow-up protocols for women in the perinatal period and the importance of intersectoral work to promote employment [Rodríguez et al., 2025].

In places where prenatal consultations do not include mental health screening for pregnant women, there is a failure to identify negative emotions that can affect the overall health of the mother and the unborn child. Barriers to care have been identified, such as the failure to identify changes in emotions during pregnancy, which are considered 'natural' and can lead to mental disorders such as depression and anxiety during the perinatal period if there are no management tools to deal with them [Ministry of Health, 2024].

Therefore, the objective of the study was to describe the main emotions perceived and barriers to care in a sample of pregnant women who attended prenatal check-ups at a community hospital in the southern state of Yucatán, Mexico, and to provide tools for emotional self-care and risk prevention.

Methodology

A mixed medical-social study with a participatory action research approach [López de Ceballos, 2023], carried out with a sample of pregnant women of Mayan descent from communities in the southern state of Yucatán. From March to June 2024, participatory workshops were scheduled to reflect on emotions during pregnancy, their meaning, and ways of managing them. Three focus groups were formed with pregnant women who attended their prenatal appointment on the day scheduled for each workshop. A survey was administered to determine sociodemographic and gynaecological-obstetric characteristics. For the variable 'residence far from the hospital,' all women who came from a municipality outside the municipal capital of Ticul were considered.

The workshops were held in a designated area of the community hospital where the women could be calm, comfortable, and free to express their emotions. Using participatory techniques, attendees were encouraged to express the emotions they felt during pregnancy and their impact on the health of the mother and the foetus. Through brainstorming, the participants commented on their emotional state and what they do when they feel emotions that affect them. Subsequently, questions about emotions were written on flipchart paper, such as: What is melancholy? What is sadness? What is fear? What is happiness? The questions were numbered and posted on the walls around the group of participants, taking care to ensure that they were visually accessible to everyone. For the answers, the women were asked to voluntarily spin the wheel, and the number that came up would correspond to the question they had to answer. Next, with the participation of a psychiatrist and a psychologist, feedback was provided, comments were made, and emotional management techniques used for negative emotions were reinforced. Other facilitators who supported the workshops were a Mayan language translator, a public health doctor, a general practitioner, and medical students, all of whom had been trained beforehand. In this way, the meanings of the main emotions perceived and how to control them were obtained in both Mayan and Spanish. Another topic addressed in the workshops was the cultural, geographical, social [institutional], and economic barriers that women face in seeking care for emotional disorders. This information was also obtained from hospital health personnel through meetings attended by medical, psychology, nursing, and social work staff.

The qualitative data were transcribed, incorporating predefined codes and those that emerged during the workshops. Through discourse analysis [Sayago, 2014], the codes led to defined categories. A list was made of the main emotions perceived, how they are expressed in the Mayan language and their meaning in Spanish; the types of barriers were described and proposals were made to reduce them. Percentages were calculated for the qualitative variables and averages for the quantitative variables. Finally, tables were created to show the results.

The study was reviewed and approved by the ethics committee of the Dr. Hideyo Noguchi Regional Research Centre of the Autonomous University of Yucatán, with registration number CIRB-2024-0004. Prior to the participation of the women and health personnel in the workshops, their voluntary consent was requested, with the support of the head of teaching and the hospital director, who gave their authorisation to carry out the study.

Results

Thirty-four women with incomplete primary education participated in the three workshops. Their sociodemographic and gynaecological-obstetric characteristics are shown in Table 1

Box 1

Table 1

Sociodemographic and gynaecological-obstetric profile of pregnant women who attended the participatory workshops [n= 34]

Variables	Media [DE]; Núm. [%]
Age [in years]	27 ± 9.6
No. Current pregnancy	2.04 ± 1.07
Months of pregnancy	6.7 ± 1.8
Number of children	1.7 ± 1.01
Number of caesarean sections	1.06 ± 0.40
Number of abortions	1 ± 0.56
No. Prenatal consultations	3.6 ± 1.58
Quarter of pregnancy.	
First	13 [37.31]
Second	3 [8.21]
Third	18 [54.48]
Marital status	
In a relationship	31 [93.3]
Not in a relationship	3 [6.7]
Contraceptives	
No	24 [70.1]
Yes	10 [29.9]
Work	
Unpaid	32 [93.3]
Paid	2 [6.7]
Residence	
Away from the hospital	22 [64.7]
Near the hospital	12 [35.3]

Table 2 presents the main emotions perceived during pregnancy, their translation into the Mayan language, the ways in which women express them in Mayan, and their meaning in English. The women expressed each emotion differently in Mayan, but agreed on their meaning in English; therefore, they repeated their meaning more than once.

Box 2

Table 2

Main emotions perceived during pregnancy and their meaning

Perceived emotion [name in Yucatec Maya]	Expression in Maya	Meaning
Despair [Yáayanki]	Va'in pool	Thinking
	Tu'ukul	Thinking
	Ma'u pa'ajtal in be'etik	I can't do it
	Munkaxtik ba'al u be'ete	Despair
Anger [Tachi'achil]	T'ak in be'etik ma'u pa'ajtal	I did something but it's not working.
	K'uxil	Be upset
	Te'ne'dz'iikem	I am upset
Anxiety [Ansiedad]	Dz'iiki [2]	Be upset
	Ta'an in dz'iiki	Be upset
	Ta'ak in k'aati'k in cha'amba'l	I want to meet my baby.
	Se'e ma'anak tu la'kal	I want it to happen.
Euphoria [Euforia]	Ta'ak in be'etik miin tza'li	Anxious
	We'ki'imak o'ol	Very happy
	Ja'achta'ki'imak o'ol [2]	Very happy [2]
Sadness. [Yaayaj óolal]	Ki'imak o'ol	Very happy
	Ta'ki'imak o'ol	Very happy
	Ta'ak in wok'ol	I want to cry.
Fear. [Saajkilil]	O'ok'ol	Cry.
	Ma'ki'imak in wo'oli [2]	Sad, I am sad.
	Ta'j sa'akech	You are afraid.
	Ja'ach tá sa'akem	I am afraid.
Frustration. [Frustración]	Sa'ajak	Fear.
	Ta'j sa'akem	Fear.
	Sa'akem	Fear.
	Munjo'ok'ol biix in k'aat	It didn't turn out the way I thought it would.
Distress. [Ok'ol óol]	Ma'pa'ajchái	Something isn't working out for me.
	Ma'tu pa'jtal in be'etik	I can't do it.
	Ta'an in tu'ukul	Thoughtful
Happiness. [Ki'imak óolal]	Ja'ach ta'ki' tuklik	I'm thinking about it
	Tu'ukul	Thinking
	Sa'ba'axten sa'akem	Fear
	Ti'in tu'ukul	I'm thinking
Melancholy [Melancolía]	Kiimak o'ol [4]	Happy
	Ja'ach ta'kiimak yo'ol	Happy
	Ti'in tuklik ba'ax uchil	I'm thinking about something sad.
	Tu'ukul	Thinking.
	Ke'en k'aajak te'ene ma'kiimak in wo'oli	Sadness about something in the past.
	Ta'an in tuklik lé ba'ax uchtenó	Thinking about something sad

With regard to managing their emotions, the women commented that they put into practice some actions that helped them to cope, such as listening to music, talking to someone else, or thinking about something nice.

The participating health personnel consisted of two obstetrician-gynaecologists, two general practitioners, five general nurses, three nursing assistants, one psychologist, two social workers, and five medical students. Their ages ranged from 26 to 42, with 5-10 years of experience.

The main perceived barriers were cultural, with 73.4% for women and 60.0% for healthcare personnel [Table 3].

Box 3

Table 3

Percentage of barriers perceived by women and healthcare personnel for the care of mental disorders.

Type	Women		Healthcare personnel	
	Number	%	Number	%
Cultural	11	73.4	6	60.0
Institutional	2	13.3	4	40.0
Economic	2	13.3	-	-
TOTAL	15	100.0	10	100.0

Women mentioned cultural, institutional [social], and economic barriers, while health personnel mentioned cultural and institutional barriers.

Both groups had similarities in their discourse on most cultural barriers, such as rejection of the newborn, failure to recognise warning signs of emotional disorders, poor relationship with the husband, among others [Table 4].

Box 4

Table 4

Barriers to accessing mental health care perceived by women and health personnel.

Type of barrier	Women	Healthcare personnel
Cultural	<ul style="list-style-type: none"> -Influence of family members in deciding to seek help -Poor communication with partner -Fear of seeking help -Not knowing when to seek help -Taboo about being judged if their condition becomes known -Religions that do not allow them to seek help -Lack of self-confidence and shame -Lack of culture for going to a psychologist -Not knowing where to go for help -Not being allowed to cry because it is bad for the baby -No support from family or neighbours -Rejection of the baby 	<ul style="list-style-type: none"> -Rejection of the baby -They do not recognize warning signs -They attribute their emotions to pregnancy -They are afraid of “what people will say,” of being judged -They are pressured by their husbands -Healthcare personnel do not know where and to whom to refer women
Geographical	<ul style="list-style-type: none"> -They do not perceive distance as a barrier, nor other geographical barriers. 	<ul style="list-style-type: none"> They did not comment on the matter.
Institutional [social]	<ul style="list-style-type: none"> - There are no psychologists or psychiatrists. They give appointments for a month or a month and a half away at a distant hospital. 	<ul style="list-style-type: none"> - There is no one to treat cases of mental disorders. -Isolated cases have been referred to another institution. -They do not make home visits. -There is no specialised centre.
Economical	<ul style="list-style-type: none"> - They don't have money to go to a psychologist -You have to pay for transport 	<ul style="list-style-type: none"> They did not comment on the matter.

In this regard, some proposals were made that could be implemented to reduce barriers.

Women proposed more talks and specialised staff to support them emotionally, especially in difficult pregnancies; in addition to the talks, health personnel proposed having access to courses on emotional support tools, in order to help women and activate code 100* [Table 5].

Box 5

Table 5

Proposals from women and health personnel to reduce barriers to access to mental health care

Barriers	Proposals from women	Proposals from healthcare personnel
- They do not know when to seek help.	- More conversations to stay informed	- Go to the hospital when you feel unwell.
-They are unaware of the signs of mental disorder.	-Local visits to the family circle	-Identify cases among our staff and refer them for help.
-Fear of being judged.	-Talking to someone when you are angry	-Seek out a support network to help you cope.
-No attention is paid to emotional disorders.	-Do your part to move forward	-Thanatology is very helpful in overcoming depression.
-Rejection of the newborn.	-Go out to distract ourselves when we are bored	-Do not judge women in postpartum if they refuse to feed their newborn.
-Long waiting times for treatment.	-Get psychological support when pregnancy is difficult	-Connect with social services for referral, appointment, and referral to DIF
	-As a maternity hospital, there should be a psychologist and psychiatrist, medicines	-Specialised centre not only for talks, but also for emotional, mental, and spiritual support.
		-Take support workshops that help express emotions and control negative ones
		-Be well informed so we can help women with these issues and recognise them in time
		-Activate code 100*, communication via WhatsApp.

*Code 100 is a clinical decision support system for suicidal behaviour in general hospitals or care centres within integrated health system networks [RISS]. It allows the care of a mental health service user to be equated with that of a public health service user, minimising stigma and within the framework of the four cross-cutting themes of gender equality, interculturality, life cycle and human rights.

Discussions

Caring for the emotions of pregnant women is as important as monitoring obstetric warning signs that can lead to complications [UNICEF, 2025]. Feelings of fear, sadness, and uncertainty that can lead to despair due to lack of information are common in pregnant women, as observed in the women in this study, who had no one to turn to when they needed support because they were experiencing strong emotions that disrupted their daily tasks. However, emotions may differ depending on the trimester. In the case of this study, the majority of participants were in their third and first trimesters, with emotions such as fear of childbirth and the baby's health and how to care for it in the newborn stage prevailing in the third trimester, and uncertainty and fear of losing the baby in the first trimester, although happiness is also more present in this trimester. In the second trimester, fear becomes minimal, especially if tests confirm that the pregnancy is going well [Jiménez, 2025; Silverio et al., 2022].

With regard to the expression of emotions in the Mayan language and their meaning in Spanish, it was noted that there are different ways of naming an emotion that mean the same thing in Spanish. Several of them include the word o'ol, which in modern Mayan refers to emotions such as euphoria, sadness, frustration, happiness and melancholy. Some studies mention that these different ways of expressing moods [emotions] are due to the fact that the Maya do not separate emotions from the biological body, but rather unite mind and body, in which the mental, not material, heart is the target organ for them [Jiménez et al., 2020].

Regarding how women manage their emotions during pregnancy, they reported that it has been through what they have learned at home from family and friends, because they do not have the support of a specialist who can provide psychological management tools to help them control their emotions.

However, despite the lack of such support in the community, the management methods were similar to those of women who have received information, as reported by pregnant women in Ecuador, who, although they were university students, had very similar practices [Andino et al., 2024].

In a study on barriers to access to prenatal care [PNC] for pregnant women treated at the Dr. Arnaldo Calderón Type C Health Centre in Tosagua, Manabí, Ecuador, the main individual/psychosocial barriers were identified as unplanned, unwanted pregnancies, symptoms of depression and demotivation, and difficulty attending appointments due to caring for other children. Economic difficulties [90.2%], difficulties in travelling to the institution [93.46%] and difficulties with domestic chores [87.58%] were the socioeconomic barriers that most affected prenatal care. Other factors that had an impact were difficulty in accessing appointments [98.69%], long waiting times for care [97.38%] and short consultation times [96.08%] [Cano et al., 2024]. In another study conducted in Australia with disadvantaged pregnant women, economic barriers were also reported as the main barriers [Penman et al., 2023]. However, in our study, although most of the women who attended the workshops came from places far from the participating hospital, only a few considered lack of financial resources and lack of transport to be the main barriers, because cultural barriers, such as stigma and fear of being judged, and institutional barriers, such as the lack of psychologists and psychiatrists to treat emotional disorders, were more prevalent among them. These same barriers were reported by health personnel in a similar way to the women, adding that they do not know how to identify emotional disorders in them.

These cultural and institutional barriers, which are part of the social determinants of health, have been analysed in other studies, which demonstrated the lack of questions about cultural aspects and their relationship with emotional health and institutional care [Osorio, 2023]. These studies report that it is very important to incorporate questions about social determinants of health during interviews in order to better understand the cultural aspects that limit the care of emotional issues, such as stigma and lack of human resources to address mental health [Aggarwal et al., 2023], which were the main cultural and social barriers for the participants.

In 2023, a model emerged to reconsider cultural intersubjectivity in clinical practice, which takes into account the similarities and differences in mental health care through collaborative work between doctors and patients.

This model could serve as a guide and be adapted to the conditions of women in communities who attend community hospitals, in the ongoing search for factors that are determinants in mental health care [Aggarwal, 2023].

The review of the Official Mexican Standard for the care of women during pregnancy, childbirth and the postpartum period, and of newborns, mentions a wide range of policies to address maternal and perinatal health, but in terms of mental health, there are only indications against addictions, neglecting those aimed at managing emotions during the perinatal period to prevent mental disorders such as anxiety and perinatal depression [Official Mexican Standard, 2016]. This is a pending task.

It is necessary to highlight the need to address the mental health of pregnant women, taking into account that health is a right, especially in vulnerable populations with less access and who are also disadvantaged, even more so if they live far from healthcare facilities [Negash et al., 2025], as was the case with the women in this study. Since 2024, work has been underway in collaboration with the health personnel of the participating hospital and the pregnant women who attend their prenatal check-ups, in the search for better strategies, such as dissemination materials and online education [Carrión, 2025], which allow for the incorporation of mental health care services, for equitable access to comprehensive health care that includes emotional health.

Conclusions

Although the traditional prenatal care system at the participating community hospital seeks to be universally accessible, the incorporation of emotional management care, identification of mental disorders, as well as treatment and follow-up for disadvantaged pregnant women is very limited; these women mainly face cultural and institutional barriers. This study revealed that social stigma and fear of being judged are barriers to seeking prenatal care for emotional disorders, which are often experienced simultaneously and cause women considerable despair and fear.

Although the women in this study did not perceive the lack of financial resources for transportation to the hospital as important, the findings indicate that the current prenatal care system is an area of opportunity for improvement in providing adequate emotional support to many disadvantaged women and their families. For these women and health personnel, the main barriers to accessing emotional prenatal care stemmed from social determinants of health, such as cultural stigmas and limited knowledge about tools for emotional management and identification of cases with mental disorders. However, the findings also suggest several avenues to guide the development of specific strategies to improve timely and adequate assistance for emotional prenatal care consultations. With the participatory methodology implemented in this study, the foundation was laid for continuing community workshops at the hospital. Social determinants of health are complex and addressing them requires interventions that take multidisciplinary approaches into account. Nevertheless, incorporating psychological and psychiatric care services in the hospital will be an important step toward more equitable health and development outcomes for women and children in these communities.

Declarations

Conflict of interest

The authors declare that there is no financial or personal conflict of interest that could influence the publication of this article.

Author contribution

Rodríguez-Angulo, Elsa: Conceptualisation of the project idea, design, methodology, original writing, analysis, software, discussion and conclusions.

Ojeda-Rodríguez, Ricardo: Conceptualisation of ideas, methodology, software, analysis, revision of the final manuscript.

Santana-Carvajal, Andrés: Conceptualisation of ideas, methodology, techniques, analysis, revision of the final manuscript.

Caballero-Canul, Ricardo: Methodology, supervision and analysis.

Availability of data and materials

The data collected in this research are stored in confidential archives under the custody of the first author, both qualitative and quantitative. Any requests for consultation should be sent to the following email address: rangulo@correo.uady.mx

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Abbreviations

BID-II	Beck Inventory Depression II
CENETEC	Centro Nacional de Excelencia Tecnológica en Salud
CIRB	Centro de Investigaciones Regionales Biomédicas
COVID-19	Coronavirus Disease-19
INPer	Instituto Nacional de Perinatología
STAI	State-Trait Anxiety Inventory
UNICEF	United Nations International Children’s Emergency Fund

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Hardiness and coping strategies in retired national selected athletes during the Covid -19 pandemic

Personalidad resistente y estrategias de afrontamiento en atletas seleccionados nacionales retirados durante pandemia Covid -19

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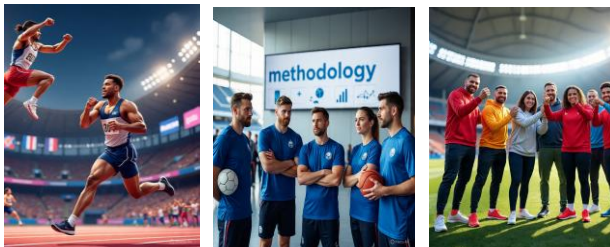


Abstract

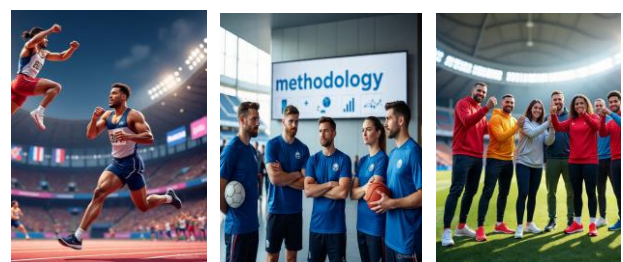
The Covid-19 pandemic revealed emotional instabilities due to stress in the entire sports population. The objective of this work is to identify the existence of a relationship between the variables of the resistant personality and those of coping approach in sport, in conditions of confinement, in the COVID-19 pandemic. The sample is made up of 42 nationally selected athletes, with experience in world championships in their sport, 23 men participated, equivalent to 54.8% and 19 women corresponding to 45.2%, the age of the athletes ranged between 16 and 54 years, with a mean of 22.67 and a standard deviation of 7.64. This research was developed with a non-experimental quantitative approach with a cross-sectional, descriptive and correlational design, descriptive and reliability analyses, in addition to Spearman correlations with SPSS 25 software. The instruments used were Hardiness in Central American and Caribbean Athletes [HPCACA; Ponce et al. 2015] instruments were used, composed of 18 items. The second is the Approach to Coping in Sport Questionnaire [ACSQ 1] in Spanish version [Kim et al., 2003]. The results are an adequate reliability in the measurement instruments and a correlation value of $r = .584$ [$p < .05$]. The conclusion is the confirmation of the existence of a positive and significant correlation between the resilient personality control variable and mental withdrawal approach coping in sport.

Resumen

La pandemia de Covid-19 puso de manifiesto, inestabilidades emocionales por estrés en toda la población deportiva. El objetivo de este trabajo es identificar la existencia de relación entre las variables de la personalidad resistente y las de aproximación del afrontamiento en el deporte, en condiciones de confinamiento, en pandemia COVID-19. La muestra está conformada por 42 atletas seleccionados nacionales, con experiencia en mundiales de su deporte, participaron 23 hombres que equivalen al 54.8% y 19 mujeres correspondientes al 45.2%, la edad de los atletas osciló entre los 16 y 54 años, con una media de 22.67 y una desviación típica de 7.64. Esta investigación se desarrolló con un enfoque cuantitativo de tipo no experimental con un diseño transversal, descriptivo y correlacional, los análisis descriptivos y de fiabilidad, además de las correlaciones de Spearman con el software SPSS 25. Los instrumentos utilizados fueron el Cuestionario de Personalidad Resistente en Deportistas Centroamericanos y del Caribe y Cuestionario de Aproximación al Afrontamiento en el Deporte. Los resultados son una fiabilidad adecuada en los instrumentos de medición y un valor de correlación de $r = .584$ [$p < .05$]. La conclusión es la confirmación de la existencia de una correlación positiva y significativa entre la variable de control de la personalidad resistente y retraimiento mental de aproximación del afrontamiento en el deporte.



Stress, Sport and Control



Estrés, Deporte, Control

Area: Promotion of frontier research and basic science in all fields of knowledge

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Peer review under the responsibility of the Scientific Committee MARVID®- in the contribution to the scientific, technological and innovation Peer Review Process through the training of Human Resources for continuity in the Critical Analysis of International Research.



Introduction

Psychology, at the present time has gained an essential importance given the circumstances in the pandemic by Covid-19. Respiratory syndrome [SARS-CoV-2], was identified as COVID-19 in December 2019, this global event affected humanity economically, educationally [Falasifah, Fitria, & Hakim, 2021] and socially Xing et al., 2020; De La Serna, [2022], therefore, it has wreaked havoc on the emotional and psychological health of people [Seale et al., 2020], subsequent to the forced confinement for prevention of increased contagion [Urzúa et al., 2020]. Psychological and emotional health was compromised with the appearance of stress, anxiety [Valiente et al., 2020], fear [Broche-Pérez et al., 2020] due to the presence and consequences of the pandemic and confinement.

Without pandemic, the athlete when presented in competitions and in the training itself faces situations that lead him to feel stress, this is where the psychology of sport in recent decades has had enormous relevance, it is already part of the multidisciplinary team that helps in the development and control of emotions of high-level athletes [Ponce, 2017; Piñeros, 2021]. The sports psychologist develops skills in elite athletes, since it has been identified that when there is no emotional balance, there are physical complaints, mental debilitation or drowsiness, so psychological care allows the athlete to learn to recognize their moods, stressful moments and establish a balance between the mental load and training and thus establish an optimal environment for personal development and of course sport, which is why the sport psychologist is increasingly necessary for the achievement of results, and the improvement of performance, health and education of the people involved in this sport. [García-Naveira, 2018].

Sports competition represents a confrontation with stress, this emotional state, causes phenomena of lack of concentration, control, confidence, appearance of nervousness and negative thoughts, some researchers have done work where they provide tools such as self-dialogue, obtaining as a result that anxiety and stress decrease considerably and therefore athletes can get ahead with their competitive commitments [Barahona-Fuentes, Soto, & Huerta, 2019].

There is no doubt that psychology has made more important contributions for the proper management of emotions, and that is why it is indicated that it is a concept, which is based on existential psychology, with a positivist approach, since the experiences although difficult, are part of learning, This concept was born with Maddi and Kobasa [Maddi, 2002], who together with students were interested in resolving the question of why there are people who, being subjected to constant stress, get sick, but in the same situation others do not? , On the contrary, those who did not get sick, experienced processes of personal development, after going through challenges and problems, they perceived themselves as more capable of solving and improving, feeling that in some way, there was a gain in these experiences. Resilient personality is defined as an integral concept that measures resistance to stress, if there is a higher resilient personality, the subject perceives as opportunities for growth their problems, or their challenges and assumes them with pleasure because they see it as a benefit, and on the contrary someone who has a low resilient personality, can even get sick of stress, does not resist being exposed to constant challenges [Ponce, 2017; Ponce-Carbajal, Tristán, Jaenes, Rodenas, & Peñaloza, 2020; Ponce-Carbajal, López-Walle, Jaenes, Peñaloza, & Méndez, 2020].

The resilient personality is integrated by variables that are control, commitment and challenge, the scale has evidence of adequate reliability not only in a trifactorial way but also in a unifactorial way and also presents a quality that is, that it has the ability to measure in both ways according to its adequate values in internal consistency analysis and confirmatory factor analysis [Jaenes, 2008; Jaenes, Godoy, & Román, 2009; Ponce, 2017; Ponce-Carbajal, Tristán, Jaenes, Rodenas, & Peñaloza, 2020; Ponce-Carbajal, López-Walle, Jaenes, Peñaloza, & Méndez, 2020; Ponce-Carbajal, López-Walle, & Méndez, 2021a; Ponce-Carbajal, López-Walle, & Méndez, 2021b].

The very nature of training every day and maintaining a high level of fatigue and sustaining it for years represents a stress for athletes, in some athletes, stress does not allow them to act normally and manifest, loss of control of their emotions and are prone to make mistakes and on the other hand we have those who like to be the center of attention and enjoy the competition [Jaenes and Caracuel, 2006].

The resilient personality has been studied in various sports, since sport is an environment where there is the presence of stress due to the nature of training, for example there are investigations in marathon [Jaenes, et al., 2008; 2009], long-distance and ultra-distance running [De la Vega, Rivera and Ruiz, 2010], rugby [Sheard and Golby, 2010], soccer [Franco, 2009; López-López, 2011], swimming [Franco, 2009; Prieto, Ortega, Garcés de los Fayos, & Olmedilla, 2014], athletics [Franco, 2009], rhythmic gymnastics [Jaenes, Carmona, Lopa, 2010], volleyball, handball and basketball [Franco, 2009; Sheard and Golby, 2010], wrestling [Sheard and Golby, 2010] and crossfit [Vezzani, 2015]. Also in research in various sports such as studies in Central American and Caribbean athletes [Ponce, 2017], as well as in World Cup and Olympic athletes [Ponce-Carbajal, López-Walle, Méndez, 2021].

Athletes, unlike people who are not, tend to develop a greater life experience, since they have a sporting social context and a non-sporting one, where the environments in which they develop are practically double, since they interact in one day, with their school teacher, and with their sports coach, with his group mates at school and with his training partners and so on, when a person who is not in sport only interacts with half of these environments, therefore, there is the assumption of accelerated social learning in the case of athletes, as established in their research by Henriksen [2009] and Ponce [2021].

Therefore, mental health is a more compromised state in the athlete as he/she experiences a greater number of situations and that is why in this research we will involve Coping or Coping with various situations.

The definition of coping, as those cognitive and behavioral efforts that are made internally and externally that the individual perceives as a threat or considers that overcome it, then, coping strategies are those developed by athletes to confront situations or complications, with the conviction to control their emotions, there are two types of coping, the first, The second type is focused on the problem and seeks to generate solutions, taking into consideration the cost-benefit and choosing an alternative and this gives the opportunity to make improvements for subsequent events or competitions with those strategies that have given better results [Lazarus and Folkman, 1984].

Roth and Cohen [1986] presented two different coping styles. The first is the approach style, which refers to the athlete's interest in solving the problem by facing the facts. The second is the avoidance style, in which the athlete avoids the situation that causes him/her discomfort. These researchers propose the analysis of the four relationships and establish a recognition of the way in which the athlete usually acts [Krohne, 1996].

Coping in athletes is something they will always struggle with, therefore, strategies are important to act appropriately. For this reason, athletes must develop various strategies as a tool to cope with stressful situations that are typical of the competitive climate in order to achieve goals and improve athletic performance [Weinberg, & Gould, 2010].

Coping in sports is about athletes choosing an appropriate strategy during competitions that helps them manage their negative emotions, receive information in an organized manner, plan their responses according to the resources available to them, and executing the most appropriate actions, giving them the opportunity to control their anxiety by choosing the right actions to resolve the conflictive situation [Cantón-Chirivella, Checa-Esquiva, & Vellisca-González, 2015].

The approach to coping in sport is made up of various variables such as Calm Emotion, Active Planning/Cognitive Restructuring, Mental Withdrawal, Risk Behaviors, and Seeking Social Support. This questionnaire has been used in various studies, finding adequate values in its internal consistency [Kim, Duda, Tomás, and Balaguer, 2003; Balaguer, Duda, Kim, 2003; Ponce-Carbajal, López-Walle, and Méndez, 2021b]. Approach strategies for coping in sport have been used in various studies in multiple sports such as soccer [Catalá and Peñacoba, 2019; Piñeros, 2021], water polo [Sepúlveda-Páez, Díaz-Karmelic, and Ferrer-Urbina, 2019], golf [Pinto and Vázquez, 2013], athletics, boxing, cycling, diving, gymnastics, weightlifting, karate, modern pentathlon, taekwondo, and volleyball [Ponce-Carbajal, López-Walle, and Méndez, 2021b], judo [Castillo, 2016; Ponce-Carbajal, López-Walle, and Méndez, 2021b], in another study, other sports were examined, such as rhythmic gymnastics, athletics, soccer, tennis, taekwondo, basketball, and volleyball [Iancheva, 2021].

Few studies have been conducted during the pandemic and lockdown, and the lack of studies of this nature is surprising given that there is a whole world of sport to explore and multiple options for emotional responses. We therefore believe that we are promoting the idea of enriching this field of study with the aim of finding better tools for active athletes to be more emotionally stable and improve their competitive performance, drawing on the experience of those who have already finished their sporting careers.

Therefore, this research aims to identify the existence of a relationship between the variables of resilient personality and those of approach coping in sport, under conditions of confinement during the COVID-19 pandemic, in a sample of retired athletes who were national team members and had worldwide experience in competitions in their sport, making them a very special group of athletes.

Methodology

The design of this research is empirical, non-experimental quantitative approach with a cross-sectional, descriptive and correlational design [Hernández, Fernández-Collado, & Baptista, 2006].

Participants

The population for this research consisted of 42 athletes, all nationally selected, with experience in world championships in their sport, the sample consisted of 23 men equivalent to 54.8% and 19 women corresponding to 45.2%, the age of the athletes ranged between 16 and 54 years, with a mean of 22.67 and a standard deviation of 7.64. As inclusion criteria, it was established that those athletes who had ever been part of the Mexican national team in any sport should participate, another selection criterion were those athletes who had participated in at least one world championship in their sport specialty and the last one was that they were exclusively those who are already retired.

In the exclusion criteria, those athletes who did not finish the instruments properly, another criterion was those who were currently still contemplated for any competition and finally those who decided to withdraw their participation for some personal reason.

Instruments

The first assessment instrument is called the Resilient Personality Questionnaire in Central American and Caribbean Athletes [PRDCC; Ponce-Carbajal et al. 2015] which measures resilient personality, this questionnaire is made up of 18 items, and is integrated by three factors: commitment [6 items], control [6 items] and challenge [6 items]. This instrument has been used in a trifactorial way by some investigations [Kobasa, 1979a; 1982; Kobasa, [1979b]; Kobasa, Maddi and Kahn, 1982; Jaenes, Godoy-Izquierdo and Román, 2008; Meda-Lara, Yeo-Ayala, Juárez-Rodríguez, Palomera-Chávez, and Moreno-Jiménez, 2021], commonly the properties are adequate obtaining acceptable reliability values for all subscales [Commitment $\alpha = 0.81$, Control $\alpha = 0.79$, Challenge $\alpha = 0.75$]. The response scale is Likert-type from 0 to 3 where 0 is “strongly disagree” and 3 “strongly agree”.

The components of the resilient personality are defined as follows: sport commitment is the desire to persist in an effort for a certain period, according to Scanlan, Carpenter, Schmidt, Simons, and Keeler [1993]; Peñaloza, Jaenes, Andrade, Méndez [2013]; control is a quality to think and execute with the conviction that one personally influences the course of events and consequently manage the stimuli to one's own benefit [López-López, 2011].

For Kobasa [1979a], control, contemplates by three variables: 1] cognitive control, or ability to interpret, appreciate, give meaning to and incorporate various types of stressful events into a life plan and act accordingly, as well as having the ability to defuse their negative effects; 2] decisional control, or ability to choose for oneself, among a variety of possibilities to act to manage stress, and; 3] coping control, or ability to execute, a wide range of appropriate responses to stress, which is developed, through motivation for success in all scenarios. Challenge refers to the perception of potentially stressful, difficult and changing stimuli, this quality makes people experience cognitive flexibility, establishing an opportunity to learn, grow and develop personally [Kobasa, 1979a].

The second is the Approach to Coping in Sport Questionnaire [ACSQ-1] in its Spanish version [Kim et al., 2003; Balaguer et al., 2003]. The questionnaire has 28 items and 5 variables: Emotional Calmness [7 items], Cognitive Restructuring [6 items], Search for Social Support [5 items], Mental Withdrawal [6 items] and Risky Behaviors [4 items]. This questionnaire has been used in several investigations showing appropriate internal consistency values of more than .70 [Kim, Duda, Tomás, & Balaguer, 2003; Ponce-Carbajal, López-Walle, & Méndez, 2021b]. The response scale is a 5-point Likert-type scale from 1 “never” to 5 “always”.

The psychometric properties of Approaching Coping in Sport, usually present adequate values, however, in the last factor of risk behaviors is below the $\alpha = .70$ of Cronbach's alpha, but this could be explained since it only has four items, specifically in the research of Kim et al., 2003, where the values of Emotional Calm [$\alpha = .71$], Active Planning/Cognitive Restructuring [$\alpha = .74$], Seeking Social Support [$\alpha = .78$], Mental Withdrawal [$\alpha = .78$] and Risky Behaviors [$\alpha = .64$] are adequate and the latter moderately acceptable according to researchers [Nunnally & Bernstein, 1994; Hair, Anderson, Tatham, & Black, 1998].

The variables of this Approach to Coping in Sport instrument are defined as follows: Emotional calmness referred to tests or attempts to have control of negative emotions by means of thoughts, physical symptoms and technique this strategy is geared; Active planning/Cognitive restructuring, this is referred to attempts to give a new meaning to an adverse situation and to organize thoughts and actions to achieve a particular goal and this strategy is problem oriented; Mental Withdrawal, focuses on the thought of acceptance in the face of perceived inability to achieve a goal, this is an avoidant strategy; Risk-taking behaviors, is focused on the assumed utilization of techniques and skills beyond performance levels referring to the maximum level of available resources to obtain a goal, and this strategy is problem-oriented and Seeking Social Support refers to the athlete's need for close interpersonal relationships in difficult times and is oriented to emotional control.

The procedure consisted of making the digital questionnaires in Google Forms and the questionnaire was launched on social networks and by invitation to some coaches, so that the athletes could respond online, since, due to the confinement, they were not in person at the facilities where they usually trained, however, thanks to the interest of the coaches and the athletes themselves, their participation in this study was possible. It is worth mentioning that in the questionnaire they were informed of the details of their participation such as informed consent, as well as the anonymity of their answers and that they would only be used for scientific research purposes, respecting the moment in which they wished to withdraw from the study. Therefore, they were free to leave the study at any time they wished, and if there were any questions, a WhatsApp number was provided where they could communicate with any questions at any time.

Data Analysis

The data analysis was performed with the statistical package SPSS version 25, the descriptive statistics such as mean, standard deviation and frequencies were calculated, the internal consistency by means of Cronbach's alpha of the evaluation instruments and correlation analysis was performed to confirm the existence of Spearman's correlations between the resistant personality variables and the coping approach variables in sport.

Results

Table 1 presents the descriptive statistics of the frequencies of the various sports to which the athletes belong and who participated in this study.

Box 1

Table 1

Frequencies of sports participating in this study

	Sports	Frequencies
1	Swimming	9
2	Taekwondo	8
3	Soccer	6
4	Cheerleading	5
5	Diving	4
6	Field Hockey	3
7	Triathlon	2
8	Modern Pentathlon	1
9	Gymnastics	1
10	Baseball	1
11	Track & Field	1
12	Chess	1
	Total	42

NOTE: self-authored table

Table 2 presents the reliability or internal consistency by means of Cronbach's alpha of the components of the resilient personality and the approach to coping in sport, showing mostly adequate results above .70, and some evidenced moderately adequate values.

Box 2

Table 2

Cronbach's alpha reliability of the variables of the Resilient Personality and Approach to Coping with Sport questionnaires.

	Variables	Reliability
1	Control	0.85
2	Commitment	0.60
3	Challenge	0.70
4	Total Hardiness	0.85
5	Cognitive Restructuring	0.74
6	Mental Withdrawal	0.70
7	Emotional Calm	0.50
8	Seeking Social Support	0.84
9	Risky Behaviors	0.60

NOTE: self-authored table

Table 3 [See Annexe 1] presents the results of Spearman's correlation matrices, showing the relationship between resilient personality control and mental withdrawal approach to coping in sport with a value of $r = .584$ [$p < .05$] only.

The objective of this research was to identify correlations between resilient personality factors and coping approach factors in sport, finding a positive and significant relationship in resilient personality control and mental withdrawal, under conditions of confinement in the Covid-19 pandemic. The perception of control lowers stress through the acceptance of the situation, since there is nothing I can do to solve it since it is a global problem, therefore, the acceptance that the plans must stop and therefore the goals and objectives as well, without causing emotional imbalance, thus contributing to emotional health. This result is unprecedented, since similar conditions had not been presented by the pandemic and being high-level athletes the results are new knowledge, however we can partially find results that share similar evidence with our research as is the work of Sepúlveda-Páez, Díaz-Karmelic and Ferrer-Urbina [2019], since in a research with water polo players they found that this variable of mental withdrawal, helps to balance the emotions through the decrease of stress and the acceptance of difficult situations.

The COVID-19 pandemic has had a significant adverse impact on the mental health of college students and the main coping strategy adopted by students is problem-focused coping by seeking social support from their friends, family and university unlike our results [Falasifah, Fitria, & Hakim, 2021]. In other research conducted in pandemic times, in athletes of rhythmic gymnastics, athletics, soccer, tennis, taekwondo, basketball, volleyball, they found correlations different from our results as they found correlations in emotional calm, cognitive restructuring and behavioral risk [Iancheva, 2021].

In another research, unlike our results, in golfers were studied the coping strategies used and what they found is that they use the strategy of social support, those amateur athletes who have a better performance [Pinto, and Vázquez, 2013]. Different from our results in a research in skiers, the coping strategy used by athletes is risk behaviors [Sarries and Pinto, 2016].

Conclusions

The existence of a relationship between the control variable of the resistant personality and mental withdrawal of coping approach in sport is confirmed, that is to say, in a situation of confinement they took with acceptance and awareness that all the activities directed towards their objectives should wait until the health alert was lifted, taking this control measure with responsibility in favor of a healthy mentality and waiting for health indications, to resume their activities gradually. Considering that due to the nature of the pandemic there was not much they could do, although it is an avoidant coping strategy, a strategy that is not usually found in the mental map of the high performance athlete.

It is worth mentioning that the strategies to face a problem, the athletes decide to do it in a positive way, practically take things as they come and face to solve the problem, since it is a characteristic that they are regularly exposed to stress and do not turn the problems around, they simply solve, but being this time so different from normal situations, it is considered an atypical result, typical of the consequences and stressful emotional blows, given the circumstances of confinement and stress in the face of uncertainty and trying to preserve their health.

The athletes in this sample lived a very strong stressful situation when experiencing confinement, but being athletes their own ability to constantly measure themselves and be in the midst of stressful situations, they have strengthened their resistance to problems in such a way that their ability to solve them led them to use effective strategies, but controlled to a problem that perhaps for others would mean, However, for these retired athletes, it meant evolving to isolation, performing activities in an autonomous and digital way, which in the end allowed them to continue with their current activities, without this meaning uncertainty, stress or worse, problems caused by stress such as insomnia, colitis, gastritis, or psychological problems such as fear, anxiety, panic, etc. Therefore, mental strength and resistance to stress are elements present in this sample in the face of a problem for which there was no control, such as the COVID-19 confinement.

Therefore, being a retired athlete leaves a mark of greater resistance to stress and an evident tolerance to problems, and facing with greater security and calm the difficult situations that may arise to these retired athletes, then, having practiced sport has given them different tools for everyday life and allowing them to maintain mental health, balance and a more accurate decision making under stress.

Declarations

Conflict of interest

The authors declare no interest conflict. They have no known competing financial interests or personal relationships that could have appeared to influence the article reported in this article.

Author contribution

Ponce-Carbajal, Nancy: Supervision general leadership of the research group

Ramírez-Nava, Rubén: Conceptualization, Formulation of the objectives and general goals of the research.

Durazo-Terán, Luis Alberto: Review and critique, comments and editing of the manuscript.

De La Cruz-Ortega, Manuel Francisco. Analysis and confirmation of results, methods and analysis of conclusions.

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Article

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Annexes

Annexe 1

Box 3**Table 3**

Spearman correlations of variables from the Resilient Personality and Approach to Sport Coping questionnaires.



Variables	1	2	3	4	5	6	7	8
1 Control								
2 Hardiness								
3 Challenge								
4 Total Hardiness								
5 Cognitive Restructuring								
6 Mental Calm								
7 Coping Strategies								
8 Emotional Support								
9 Risky Behaviors								



NOTE: $p < .01^{**}$; $p < .05^{*}$; self-authored table



Retrograde percutaneous closure of patent ductus arteriosus experience at the 20 de Noviembre National Medical Center

Experiencia de cierre percutáneo de conducto arterioso persistente vía retrógrada en el Hospital Centro Médico Nacional 20 de Noviembre

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Abstract

Patent ductus arteriosus (PDA) accounts for 5–10% of all congenital heart diseases. This study describes the experience with retrograde percutaneous closure of PDA in the Pediatric Cardiology Department at the Centro Médico Nacional 20 de Noviembre between 2015 and 2024. A retrospective cross-sectional study was conducted in 16 pediatric patients (mean age: 5.06 ± 4.4 years; weight: 22.2 ± 18.0 kg), 62.5% of whom presented with malnutrition and hemodynamic compromise. Retrograde closure was indicated due to small pulmonary artery end (56.2%), inability to cannulate the PDA (31.2%), and vascular anomalies such as interrupted inferior vena cava and aortic coarctation. Various devices were used, mainly ADO II and Coil. Minor complications (18.7%) and clinical improvement (93.8%) were observed. The study concludes that retrograde access is an effective alternative for PDA closure in patients with complex anatomy or when antegrade access is technically unfeasible.

Resumen

El conducto arterioso persistente (CAP) representa entre el 5 y 10% de las cardiopatías congénitas. Este estudio describe la experiencia del cierre percutáneo retrógrado de CAP en el servicio de Cardiología Pediátrica del Centro Médico Nacional 20 de Noviembre entre 2015 y 2024. Se realizó un estudio transversal y retrolectivo en 16 pacientes pediátricos (edad media: 5.06 ± 4.4 años; peso: 22.2 ± 18.0 kg), de los cuales el 62.5% presentaba desnutrición y repercusión hemodinámica. El cierre retrógrado fue indicado por tamaño reducido de la boca pulmonar (56.2%), imposibilidad de canulación (31.2%), y anomalías vasculares como interrupción de la VCI y coartación de aorta. Se utilizaron diversos dispositivos (ADO II y Coil, principalmente). Se reportaron complicaciones menores (18.7%) y una mejoría clínica en el 93.8% de los casos. Se concluye que el abordaje retrógrado es una alternativa efectiva ante anatomías complejas o limitaciones técnicas del acceso anterógrado.

Retrograde Percutaneous Closure of Patent Ductus Arteriosus experience at the 20 de Noviembre National Medical Center



Patent Ductus Arteriosus, Pulmonary End, Amplatzer Ductus Occluder II

Experiencia de cierre percutáneo de conducto arterioso persistente vía retrógrada en el Hospital Centro Médico Nacional 20 de Noviembre



Conducto Arterioso Persistente, Boca Pulmonar, Amplatzer Ductus Occluder II

Area: Advocacy and attention to national problems

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Introduction

The ductus arteriosus is a vital fetal vascular structure that connects the left pulmonary artery to the descending aorta. Persistence beyond three months of age defines a patent ductus arteriosus (PDA), with an estimated incidence of 1 in 2,000 live births (Allen, 2022), (Díaz Góngora, 2018). PDA accounts for 5% to 10% of all congenital heart defects and is more frequently observed at altitudes above 2,500 meters and in preterm infants, affecting 30% to 32% of those born after 32 weeks' gestation, 77% to 83% between 28 and 30 weeks, and up to 90% of those born before 28 weeks or weighing less than 1,200 grams (Attie, 2013), (Carey, 2003), (Park, 2021).

Echocardiography remains the first-line diagnostic tool, offering a comprehensive assessment of ductal anatomy, encompassing its size, configuration, and classification, while also providing critical insight into its hemodynamic consequences (Singh, 2020), (van Laere, 2018). Percutaneous closure is the treatment of choice, most commonly performed via an antegrade (venous) approach (Allen, 2022), (Attie, 2013), (Campanhã, 2012). A retrograde (arterial) approach is less frequently used but offers several potential advantages, including shorter procedure time and reduced radiation exposure (Dalby, 2024), (Damien K., 2012).

Although existing literature has compared antegrade and retrograde techniques in terms of procedural time, radiation exposure, and complications, few studies have addressed the clinical indications for choosing the retrograde approach. This study aims to describe and unify criteria for retrograde percutaneous PDA closure, with the goal of informing clinical decision-making and contributing to current evidence.

Given the high prevalence of PDA and the risk of serious long-term complications if left untreated including endarteritis, heart failure, pulmonary hypertension, Eisenmenger syndrome, and increased long-term mortality, timely diagnosis and appropriate intervention are essential (Díaz Góngora, 2018).

Methodology

A retrospective cross-sectional study was conducted involving pediatric patients who underwent retrograde percutaneous closure of PDA at the National Medical Center 20 de Noviembre between 2015 and 2024. Patients ranged in age from under 6 months to 15 years. Descriptive statistical analysis was performed using SPSS (Statistical Package for the Social Sciences).

Quantitative data were reported using measures of central tendency and dispersion (mean and standard deviation or median and percentiles), according to data distribution. Qualitative variables were presented as frequencies and percentages, based on the results of the Kolmogorov-Smirnov normality test. Graphs and tables were generated to illustrate findings according to the type of variables analyzed.

In the medical literature, approximately 15% of patients undergo percutaneous closure via the retrograde (arterial) approach. Assuming a similar proportion in the study population and using a sample size formula for proportions with a 95% confidence level, a study population of 16 patients was required.

$N = Z^2 \cdot p \cdot q / e^2$, where $Z = 1.96$, $p = 30\%$ and $e = 10\%$

Results

A total of 190 patients diagnosed with PDA were identified in the SIAH system (Sistema de Información de Autorizaciones Hospitalarias). Of these, 174 patients (91.5%) were excluded due to antegrade closure attempts, unsuccessful PDA closure, or diagnostic catheterizations. Twenty-five patients (13.1%) underwent retrograde PDA closure; however, 9 were further excluded because 5 records were unavailable in the system and 4 lacked video documentation, resulting in a final cohort of 16 patients (8.4%).

Data were collected from the SIAH system on 16 patients who underwent percutaneous retrograde PDA closure between 2015 and 2024. Ten patients (62.5%) were female and 6 (37.5%) were male, with a mean age of 5.06 ± 4.4 years.

The mean weight was 22.2 ± 18.0 kg, and the mean height was 102.7 ± 33.9 cm. Functional class assessment revealed that 13 patients (81.2%) were classified as New York Heart Association (NYHA) functional class I/VI, and 3 patients (18.8%) as class II/VI. Physical appearance at inspection was recorded as gracile in 6 patients (37.5%), mesomorphic in 9 (56.3%), and endomorphic in 1 (6.2%).

Hemodynamic impact variables included heart rate, with a mean of 108.2 ± 19.0 beats per minute. Nutritional status assessment showed 10 patients (62.5%) were malnourished, while 6 (37.5%) were not.

Precordial palpation characteristics were defined as hyperdynamic in 9 patients (56.3%) and normodynamic in 7 patients (43.8%). Murmur characteristics were continuous in 8 patients (50%), systolic in 3 (18.8%), and absent in 5 (31.2%). Echocardiographic assessment revealed hemodynamic repercussion in 10 patients (62.5%), and no repercussion in 6 (37.5%).

Associated lesions requiring additional interventions alongside PDA closure were identified: 10 patients (62.5%) had no associated lesions, 3 (18.8%) had atrial septal defects (ASD), 2 (12.5%) had ventricular septal defects (VSD), and 1 (6.2%) had aortic coarctation (CoAo).

Angiographic classification of PDA types showed type A in 14 patients (87.5%) and type E in 2 patients (12.5%). The mean diameter of small PDAs was 1.7 ± 0.7 mm in 14 patients, whereas moderate-sized PDAs averaged 5.2 ± 1.4 mm in 2 patients.

Devices utilized for closure included ADO I in 1 patient (6.2%), ADO II in 6 patients (37.6%), Cera in 1 patient (6.2%), Coil in 6 patients (37.6%), Occlutech in 1 patient (6.2%), and Piccolo in 1 patient (6.2%) (Box 1).

Box 1

Table 1

Population characteristics

Variable	N	Min	Max	Mean \pm SD
Age (years)	16	1	15	5.06 \pm 4.4
Sex-n (%)				
Female	10 (62.5%)			
Male	6 (37.5%)			
Weight (kg)	16	2.3	65.2	22.2 \pm 18.0
Height (cm)	16	48	168	102.7 \pm 33.9
Heart rate (bpm)	16	80	140	108.2 \pm 19.0
Functional class-n (%)				
I/VI	13 (81.2%)			
II/VI	3 (18.8%)			
Nutritional status-n (%)				
Undernourished	10 (62.5%)			
Well-nourished	6 (37.5%)			
Inspection-n (%)				
Ectomorphic	6 (37.5%)			
Mesomorphic	9 (56.3%)			
Endomorphic	1 (6.2%)			
Palpation-n (%)				
Hyperdynamic	9 (56.3%)			
Normodynamic	7 (43.8%)			
Auscultation-n (%) Murmur				
Continuous	8 (50%)			
Systolic	3 (18.8%)			
No murmur	5 (31.2%)			
Murmur grade-n (%)				
Grade I/VI	1 (6.3%)			
Grade II/VI	4 (25%)			
Grade III/VI	6 (37.5%)			
No murmur	5 (31.2%)			
Hemodynamic repercussion-n (%)				
Present	10 (62.5%)			
Absent	6 (37.5%)			
Associated lesions-n (%)				
ASD	3 (18.8%)			
CoAo	1 (6.2%)			
VSD	2 (12.5%)			
No Lesions	10 (62.5%)			
Ductal size (mm)				
Small (n=14)	14	0.5	2.8	1.7 \pm 0.7
Moderate (n=2)	2	4.2	6.3	5.2 \pm 1.4
Device type-n (%)				
ADO I	1 (6.2%)			
ADO II	6 (37.6%)			
Cera	1 (6.2%)			
Coil	6 (37.6%)			
Occlutech	1 (6.2%)			
Piccolo	1 (6.2%)			

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The characteristics of the pulmonary end (PE) and aortic end (AE) of the ductus arteriosus in patients undergoing retrograde percutaneous closure of a PDA were analyzed to identify the indications that led to this approach.

It was found that 3 patients (18.7%) had a PE diameter ≤ 1 mm, 7 patients (43.7%) had a PE diameter > 1 mm and ≤ 2 mm, 4 patients (25%) had a PE diameter > 2 mm and < 3 mm, 1 patient (6.3%) had a PE diameter of 4.2 mm, and 1 patient (6.3%) had a PE diameter of 6.3 mm (Box 2, Figure 1).

Box 2

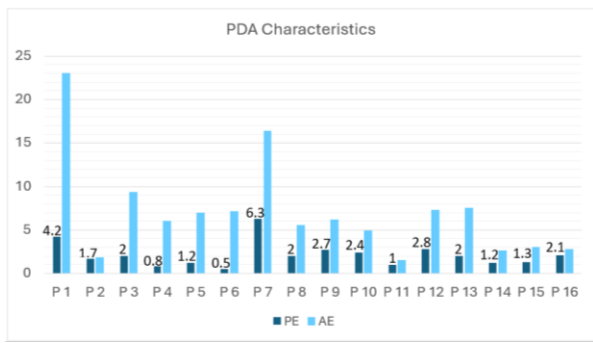


Figure 1
PDA Characteristics
National Medical Center 20 de Noviembre

Based on these measurements, the ductus was classified as small in 14 patients (87.5%) and moderate in 2 patients (12.5%) (Box 3, Figure 2).

Box 3

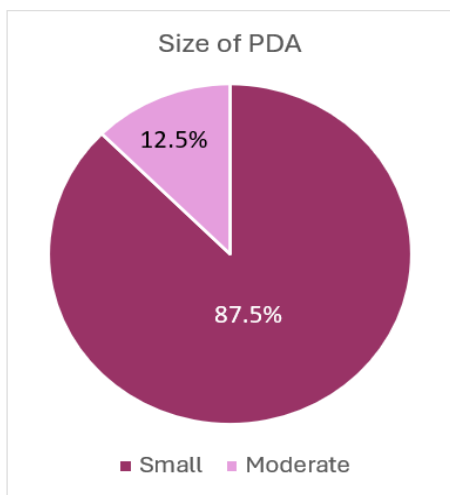


Figure 2
Definition according to the size of the PDA
National Medical Center 20 de Noviembre

The indications leading to the decision for retrograde closure of the PDA were analyzed. Among the identified causes, 1 patient (6.3%) had an interrupted inferior vena cava (IVC), 1 patient (6.3%) had CoAo, 5 patients (31.2%) had failed attempts at anterograde cannulation of the PDA, and in 9 patients (56.2%) the decision was based on the size of the PE as defined by angiographic measurements (Box 4, Figure 3).

Box 4

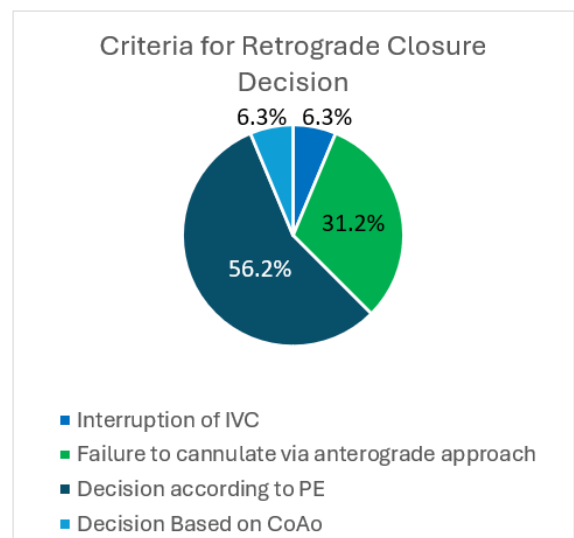


Figure 3
Criteria for Retrograde Closure Decision
National Medical Center 20 de Noviembre

The devices used for retrograde percutaneous closure of PDA were as follows (Box 5, Figure 4): ADO I in 1 patient (6.2%), ADO II in 6 patients (37.6%) (Box 6, Figure 5), Cera in 1 patient (6.2%), Coil in 6 patients (37.6%) (Box 7, Figure 6), Occlutech in 1 patient (6.2%), and Piccolo in 1 patient (6.2%).

Box 5

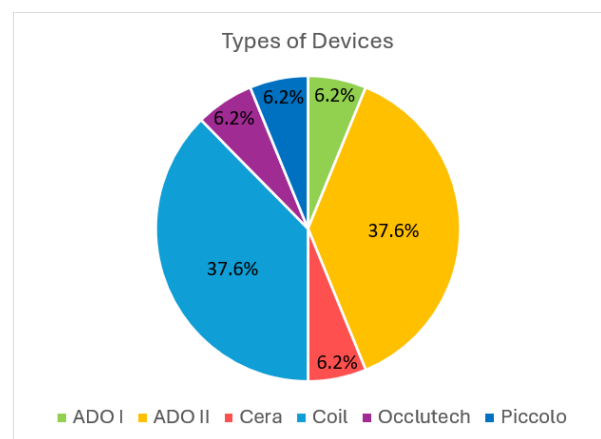
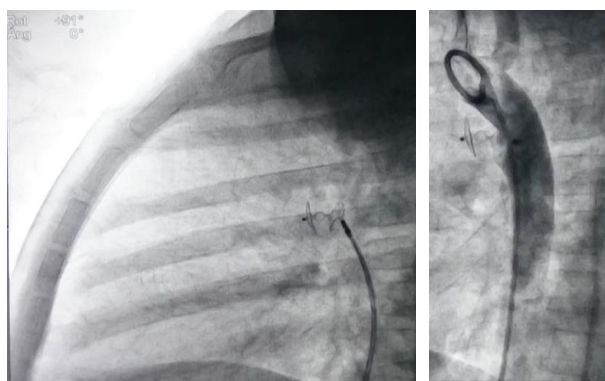
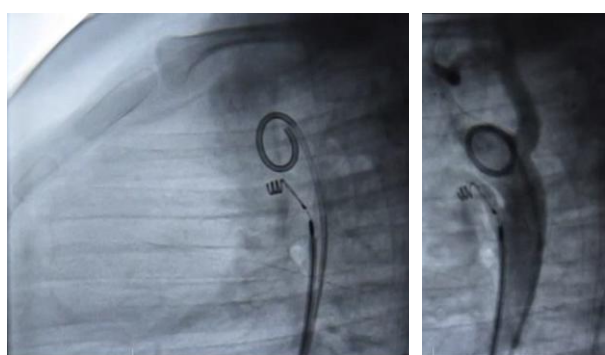


Figure 4
Types of Devices
National Medical Center 20 de Noviembre

Box 6**Figure 5**

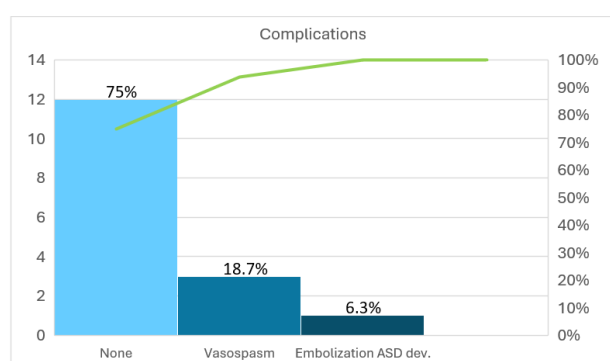
ADO II

*National Medical Center 20 de Noviembre***Box 7****Figure 6**

Coil

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The reported complications included vasospasm in 3 patients (18.7%), embolization of an ASD device in 1 patient (6.3%), and no complications in 12 patients (75%) (Box 8, Figure 7).

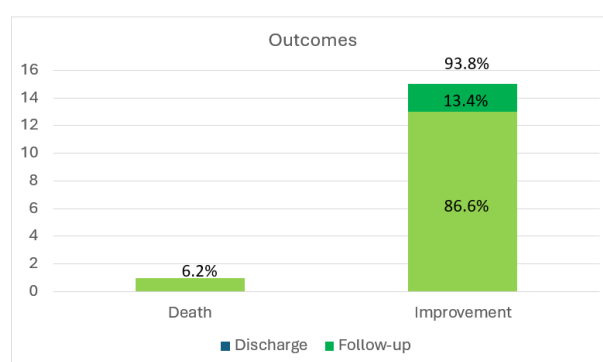
Box 8**Figure 6**

Complications of Retrograde Percutaneous Closure

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There was one reported death (6.2%), unrelated to the cardiac procedure, due to aplastic anemia one year after retrograde percutaneous PDA closure. The remaining 15 patients (93.8%) showed improvement in functional class, weight and height gain, preserved biventricular function, and absence of upper respiratory tract infections.

Of these, 13 patients (86.6%) were discharged at one-year follow-up, while 2 patients (13.4%) remain under ongoing follow-up (Box 9, Figure 7).

Box 9**Figure 7**

Outcomes of Patients Undergoing Retrograde Percutaneous Closure of PDA

*National Medical Center 20 de Noviembre***Discussions**

Patent ductus arteriosus (PDA) is among the most common congenital heart defects in Mexico (Attie, 2013). Among the various treatment options, percutaneous closure has become the preferred approach since the first successful attempt by Porstmann in 1967, particularly following advances in closure techniques and the development of new occlusion devices. This method has proven effective across all age groups, from preterm neonates to adults (Campanhã, 2012), (Dalby, 2024).

Percutaneous closure can be performed using an antegrade or retrograde approach; however, literature lacks clear and specific indications for retrograde closure. Our results are consistent with both contemporary and historical literature, supporting that retrograde percutaneous closure is safe and associated with a lower complication rate. In this study, we aimed to identify and group both definitive and probable indications for the retrograde percutaneous approach.

In our cohort, the mean age was 5.06 ± 4.4 years, with a predominance of female patients (62.5%, $n = 10$) like the reports by (Sarmiento J., 2021), (Sathanandam S., 2020), (Ye Z., 2020), and (Gruenstein D., 2017).

The PDAs treated with retrograde percutaneous closure had a mean minimal pulmonary end (PE) diameter of 1.7 ± 0.7 mm, ranging from 0.5 mm to 6.3 mm. PDAs were classified as small in 87.5% of patients (0.5 to 2.8 mm) and moderate in 12.5% (4.2 and 6.3 mm). These findings are consistent with previous literature: (Zaoui N., 2023) and (Zhou Z., 2022) affirm that retrograde closure is feasible and appropriate for PDAs <3 mm; (Gruenstein D., 2017) described retrograde closure in 64 patients, primarily with small to moderate PDAs (<3 mm). (Sudhakar, 2018) reported the necessity of retrograde closure following surgical ligation of PDA with residual shunting and distortion, where antegrade access was limited, aiming to prevent infective endarteritis. Although Coil devices are typically recommended for PDAs <2.5 mm, he successfully closed a 4.5 mm PDA. In our study, Coils were used for PDAs with PE diameters from 1.0 to 2.8 mm.

Similarly (Campanhã, 2012), described retrograde percutaneous closure in PDAs measuring less than 3 mm. (Zaoui N., 2023) reported successful Coil closure in all their cases, comparable to our population, where 37.6% underwent retrograde Coil closure.

(Ye Z., 2020) performed retrograde closure in 32 patients using transthoracic echocardiography alone, avoiding angiography and radiation.

Unlike their study, which included only patients weighing >10 kg and with PDAs between 2–5 mm, our study included 3 patients weighing <10 kg (2.265 kg, 4.980 kg, and 9.7 kg), and successful closure was achieved with PE diameters as small as 0.5 mm, with a mean of 1.7 ± 0.7 mm.

(Zanjani K., 2017) reported retrograde closure in 43 patients, with PE diameters ranging from 0.4 to 2.8 mm and use of Coil devices, consistent with our findings. (Mahmoud H., 2016) reported on 95 patients with PDA sizes of 2.3 ± 0.6 mm and 2.2 ± 0.5 mm, treated with the ADO II device, achieving a 98.2% success rate.

In our cohort, ADO II was used in 37.6% of patients, with 100% success. They recommend using ADO II in patients >6 kg, consistent with our cohort, except for one patient (4.980 kg), who had no post-procedure complications. (Damien K., 2012) demonstrated safety of the ADO II in newborn piglets weighing 2.3–2.5 kg and later applied it in human infants as small as 1.7 kg. Their mean PDA size was 2.2 ± 0.7 mm. (Gruenstein D., 2017) also noted that ADO II was designed specifically for retrograde closure, aligning with our study population.

Although our study did not report abdominal aorta diameter, (Zhou Z., 2022) recommend that an abdominal aortic diameter >10 mm is desirable for safe ADO II delivery, minimizing the risk of severe arterial injury. They also affirm that elongated or tortuous PDAs (Krichenko type E) can be closed via the retrograde route like two of our patients (12.5%).

The Piccolo device was used in one patient weighing 2.265 kg, in line with Food and Drug Administration (FDA) approval (2019) for use in preterm infants ≥ 700 g, as reported by (Kavurt A., 2023). Most PDAs in our study (87.5%) were small, except in two cases (12.5%): one with an associated aortic coarctation (CoAo) and a PE diameter of 6.3 mm, closed during aortic balloon angioplasty with a 5/7 Occlutech device; and another with absent IVC, where a 4.2 mm PDA was successfully closed with a 12/10 Cera device.

Most patients (75%) had no complications. The most common was transient vasospasm in 3 patients (18.7%), resolved with Jones compression bandage and pentoxifylline. One patient (6.3%) had an unrelated complication embolization of an ASD closure device, which was retrieved without further issues. Literature describes complications such as device embolization, branch pulmonary artery or aortic obstruction, device infection, hemolysis, residual shunting, femoral AV fistula, hematoma, pseudoaneurysm (Sarmiento J., 2021), (Sathanandam S., 2020), (Gruenstein D., 2017), (Zhou Z., 2022), (Kavurt A., 2023), (Zahn E., 2016), (Shah J., 2020). These complications were not observed in our study. Like (Gruenstein D., 2017), (Damien K., 2012), and (Shah J., 2020), vasospasm was identified as a rare, transient, and easily managed complication of retrograde closure.

(Sivakumar K., 2007) reported a case of abnormal IVC drainage to the portal vein, preventing anterograde Access comparable to our case of absent IVC, which required retrograde closure. (Shah J., 2020) also reported failed anterograde closure due to IVC anomalies, comparable to our findings.

In agreement with the literature, 93.8% of our patients showed clinical improvement, including weight gain, and 86.6% were discharged. The strengths of our study lie in its exclusive focus on retrograde percutaneous PDA closure, with detailed sociodemographic data, PDA characteristics, and specific indications for the chosen approach, allowing us to address the primary objective.

Limitations include the absence of some planned variables, particularly the length of the PDA, which was not consistently reported via echocardiography or angiography despite being a criterion for retrograde closure in some literature. Future studies in our population should include these measurements to further refine the indications for retrograde percutaneous closure.

Conclusions

At the National Medical Center 20 de Noviembre, we routinely perform percutaneous closure of PDA, with retrograde closure being used less frequently and only in specific, well-defined clinical scenarios.

The most common ductal morphology was Krichenko type A, observed in 14 patients (87.5%), with PE diameters ranging from 0.5 to 6.3 mm. The mean diameter for small PDAs was 1.7 ± 0.7 mm, and 5.2 ± 1.4 mm for moderate PDAs.

We propose the following as definitive indications for the retrograde approach: PE diameter <3 mm, Krichenko type E tubular ducts, absence of the IVC, IVC-related malformations (e.g., anomalous venous drainage), and failed anterograde PDA cannulation.

Probable indications include the presence of aortic coarctation (CoA), to avoid multiple vascular punctures and reduce procedural time; residual postoperative shunts with distorted ductal anatomy; and body weight >2.0 kg and when the diameter of the abdominal aorta is >10 mm.

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The devices that can be effectively used for retrograde percutaneous PDA closure include ADO I, ADO II, Coil, and Piccolo, particularly under the clinical conditions outlined above.

Retrograde percutaneous PDA closure is a safe and feasible procedure for patients of all ages. In our study cohort, the mean age was 5.06 ± 4.4 years, and all patients weighed more than 2.0 kg. The complication rate was low.

Most patients experienced no adverse events. The most frequent complication was transient arterial vasospasm, which resolved with local compression using a Jones bandage and pharmacologic therapy with pentoxifylline.

A total of 93.8% of patients showed improvement in functional class, weight gain, and height. At one-year follow-up, 86.6% were discharged from care, while 2 patients (13.4%) remained under clinical follow-up.

Declarations

Conflict of interest

The authors declare no interest conflict. They have no known competing financial interests or personal relationships that could have appeared to influence the article reported in this article.

Author contribution

Fokine, Anna, Salgado, Antonio García: Contributed to the project idea, research method and technique.

Fokine, Anna: Was responsible for data collection, database management, statistical analysis, and contributed to the interpretation of the findings.

All authors critically reviewed the manuscript, contributed their comments, and subsequently approved the final version, affirming its authenticity and integrity.

Availability of data and materials

Indicate the availability of the data obtained in this research.

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Abbreviations

ADO I	Amplatzer Ductus Occluder I
ADO II	Amplatzer Ductus Occluder II
AE	Aortic End
ASD	Atrial Septal Defect
AVP II	Amplatzer Vascular Plug II
CoAo	Aortic Coarctation
FDA	Food and Drug Administration
Fr	French
IVC	Inferior Vena Cava
PDA	Patent Ductus Arteriosus
PE	Pulmonary End
SIAH	Sistema de Información de Autorizaciones Hospitalarias
SPSS	Statistical Package for the Social Sciences
VSD	Ventricular Septal Defect

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Differences

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Inhibition of dental plaque after application of a dental Varnish

Inhibición de placa dentobacteriana después de la aplicación de un barniz dental

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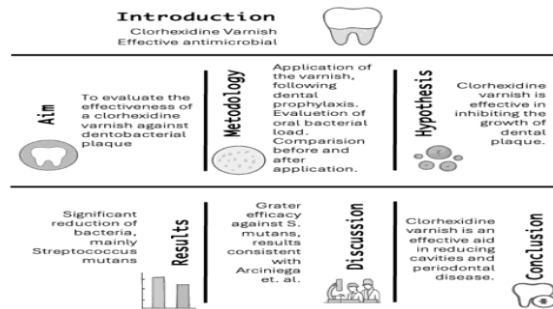
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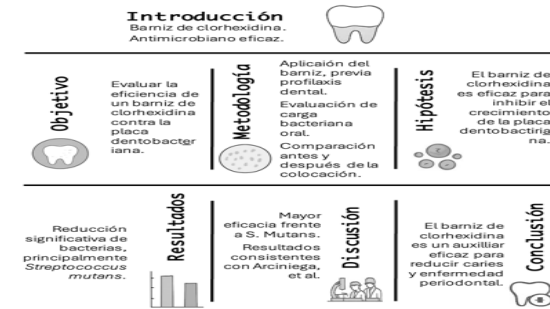
Abstract

Introduction: Chlorhexidine varnish is a dental coating widely used for its antimicrobial properties and its effectiveness in the prevention and control of dentobacterial plaque. **Objective:** To evaluate the effectiveness of a chlorhexidine dental varnish in inhibiting dental plaque formation. **Materials and Methods:** A descriptive observational study was conducted in a population of 26 patients. Oral samples were collected before and after the application of the chlorhexidine varnish following dental prophylaxis. **Hypothesis:** Chlorhexidine varnish is effective in inhibiting dental plaque formation. **Results:** The application of chlorhexidine varnish resulted in a significant reduction in oral bacterial load after prophylaxis. **Discussion:** Previous studies, including that of Arciniega Aguilar, have reported higher efficacy of chlorhexidine against *Streptococcus mutans*, followed by *Porphyromonas gingivalis*, *Lactobacillus acidophilus*, and *Streptococcus salivarius*, supporting the findings of the present study. **Conclusion:** Chlorhexidine varnish is an effective adjunctive agent for patients with periodontal disease and high susceptibility to dental caries.



Chlorhexidine varnish, dentobacterial plaque, inhibition

Introducción: El barniz de clorhexidina es un recubrimiento dental ampliamente utilizado por sus propiedades antimicrobianas y su eficacia en la prevención y el control de la placa dentobacteriana. **Objetivo:** Evaluar la eficacia de un barniz dental de clorhexidina para inhibir la formación de placa dental. **Materiales y métodos:** Se realizó un estudio observacional descriptivo en una población de 26 pacientes. Se recolectaron muestras orales antes y después de la aplicación del barniz de clorhexidina después de la profilaxis dental. **Hipótesis:** El barniz de clorhexidina es eficaz para inhibir la formación de placa dental. **Resultados:** La aplicación de barniz de clorhexidina resultó en una reducción significativa en la carga bacteriana oral después de la profilaxis. **Discusión:** Estudios previos, incluido el de Arciniega Aguilar, han informado una mayor eficacia de la clorhexidina contra *Streptococcus mutans*, seguido de *Porphyromonas gingivalis*, *Lactobacillus acidophilus* y *Streptococcus salivarius*, lo que respalda los hallazgos del presente estudio. **Conclusión:** El barniz de clorhexidina es un agente adyuvante eficaz para pacientes con enfermedad periodontal y alta susceptibilidad a la caries dental.



Barniz de clorhexidina, placa dentobacteriana, inhibición

Area: Promotion of frontier research and basic science in all fields of knowledge

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Peer review under the responsibility of the Scientific Committee MARVID® - in the contribution to the scientific, technological and innovation Peer Review Process through the training of Human Resources for continuity in the Critical Analysis of International Research.



Introduction

In dentistry, oral health depends largely on the prevention of oral diseases, with dental plaque and bacterial proliferation being key factors in the development of caries and periodontal diseases. Various therapeutic strategies have been implemented to control these, including the use of chlorhexidine varnish.

The World Health Organisation [WHO] defines dental biofilm as a constantly developing bacterial ecosystem responsible for multiple oral pathologies that affect not only the teeth but also the surrounding tissues [López, 2020]. Chlorhexidine varnish stands out for its antimicrobial properties and its effectiveness in reducing bacterial load and controlling dental plaque. The objective of this research is to analyse the advantages of chlorhexidine varnish, evaluating its effectiveness in reducing plaque, inhibiting bacteria and preventing oral diseases

Methodology

The research was descriptive and observational. It was carried out in the basic sciences laboratory of the Veracruz Region Faculty of Dentistry. For this research, the study population was randomly selected, with a total of 26 samples from students of the Veracruz Region Faculty of Dentistry aged between 19 and 29 years.

The objective was to evaluate the effectiveness of chlorhexidine varnish in inhibiting the formation of dental plaque. In this study we used VIARCLEAN UP 5 from Viarden Company. All participants underwent dental prophylaxis, which included the use of a cavitrón, polishing with prophylactic paste, and air polishing, with the aim of completely removing dental plaque. Subsequently, an initial culture of the tooth surface was obtained. The sample was divided into two groups: the experimental group was treated with Chlorhexidine varnish, which was left to act in the oral cavity, while the control group received no treatment. After a period of 15 days, a second culture of the tooth surface was performed on all participants. The effectiveness of the varnish was evaluated by analysing bacterial growth, considering the inhibition of Gram-positive and Gram-negative bacteria associated with dental plaque formation.

In addition, cultures were performed for bacterial differentiation in order to identify the microorganisms with the highest resistance to chlorhexidine.

The data were digitised in Minitab, applying standard deviation, variance and Bonett and Levene analysis tests.

Results

The test results demonstrated that chlorhexidine varnish is effective in reducing the proliferation of bacteria that lead to dental plaque formation, showing a decrease in bacterial load in the mouth 15 days after application.

The research collected data and performed cultures to analyse the bacterial load after prophylaxis and 15 days with and without the application of Chlorhexidine varnish. The results showed that this varnish effectively reduces bacterial proliferation and plaque formation. Previous studies, such as that by Arciniega Aguilar, confirm that microorganisms such as *S. mutans* and *P. gingivalis* are particularly susceptible, demonstrating the effectiveness of chlorhexidine.

Box 1

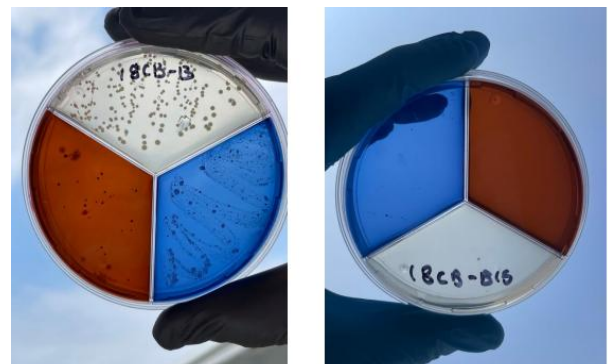


Figure 1

Decrease in Gram-positive bacteria, Gram-negative bacteria and candida: own work

Conclusions

Chlorhexidine varnish is an effective preventive aid thanks to its antimicrobial action, which reduces the oral bacterial load. Chlorhexidine varnish is useful in patients with periodontal disease or high susceptibility to caries. It is recommended that the sample size be expanded in future research to obtain more accurate results.

Declarations**Conflict of interest**

The authors declare that there are no conflicts of interest. They also declare that they have no competing financial interests or personal or professional relationships that could have directly or indirectly influenced the content of this article.

Contribution of the authors

The authors participated jointly in the design and development of the research. Data collection, analysis of results, and interpretation of information were carried out by the researchers involved. All authors contributed to the writing, critical review, and final approval of the manuscript.

Availability of data and materials

The data and materials used in this research are available upon reasonable request to the corresponding authors.

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Pharmacotherapeutic follow-up in geriatric hypertensive patients in the State of Campeche [Mexico]

Seguimiento farmacoterapéutico en pacientes hipertensas geriátricas del Estado de Campeche [México]

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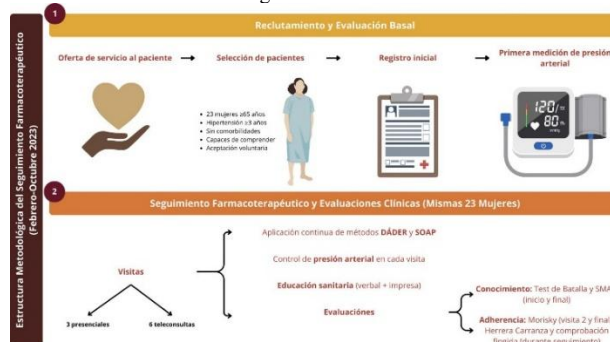
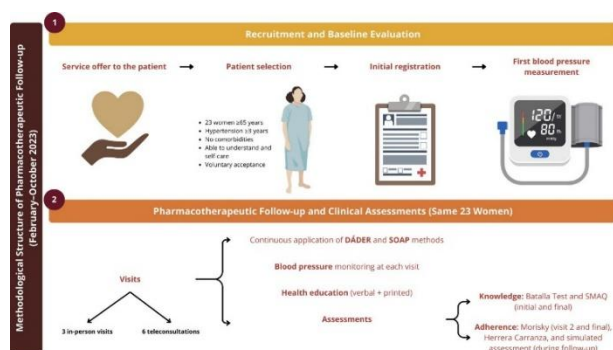


Abstract

The work consisted of a quasi-experimental, longitudinal study carried out on 23 adult patients with a diagnosis of arterial hypertension of three years or more of evolution, who voluntarily agreed to participate, through 9 home consultations [three in person and 6 teleconsultations] in a period of nine months, using the SOAP and DÁDER method that evaluates pharmacotherapeutic follow-up. Standardized instruments were used to evaluate the patient's level of knowledge about their disease and pharmacotherapy and adherence to treatment; Monitoring of arterial hypertension values was carried out with a digital baumanometer and was monitored using a record sheet. It was found that the intervention carried out had a positive effect on the patients' level of knowledge about their disease and their pharmacotherapy. For the degree of adherence, in the ninth visit 64% patients were considered adherent. Regarding blood pressure values, in the adherent patients, it started with an average of 150/85 mmHg, decreasing to 117/77 mmHg on the ninth home visit.

Resumen

El trabajo consistió en un estudio es cuasi-experimental, longitudinal realizado en 23 pacientes adultas con diagnóstico de hipertensión arterial que voluntariamente aceptaron participar, mediante 9 consultas domiciliarias [tres presenciales y 6 teleconsultas] en un período de nueve meses, utilizando el método SOAP y DÁDER. Se emplearon instrumentos estandarizados para evaluar el nivel de conocimiento del paciente sobre su enfermedad y farmacoterapia, y adherencia al tratamiento; la monitorización de los valores de hipertensión arterial se realizó con un baumanómetro digital. Se encontró que la intervención realizada tuvo un efecto positivo para el nivel de conocimiento de los pacientes sobre su enfermedad y su farmacoterapia. Para el grado de adherencia, en la novena visita el 64% de los pacientes se consideraron como adherente. Respecto a los valores de presión arterial, en las pacientes adherentes, se inició con una media de 150/85 mmHg, descendiendo a 117/77 mmHg a la novena visita domiciliaria.



Therapeutic adherence, Negative results to medication, Community pharmacy

Adherencia terapéutica, Resultados negativos a la medicación, Farmacia comunitaria

Area: Promotion of frontier research and basic science in all fields of knowledge

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Peer review under the responsibility of the Scientific Committee MARVID®- in the contribution to the scientific, technological and innovation Peer Review Process through the training of Human Resources for continuity in the Critical Analysis of International Research.



Introduction

Blood pressure is defined as the pressure exerted by blood on the walls inside the arteries; high blood pressure is when a person has a reading equal to or greater than 140/90 mmHg on repeated occasions or for a prolonged period of time; In older adults, high blood pressure [HBP] is a growing public health problem because it is the main cause of outpatient consultations and the most common chronic disease in geriatric patients, which can lead to acute myocardial infarctions, strokes, renal failure, atrial fibrillation, and diabetes mellitus.

High blood pressure does not usually cause symptoms, and its aetiology depends on various risk factors such as unhealthy eating, physical inactivity, and metabolic factors such as obesity and diabetes [Campos-Nonato *et al.*, 2019; García-Castañeda, *et al.*, 2016; Osorio-Bedoya & Amariles, 2018].

For a correct diagnosis of high blood pressure, at least three blood pressure measurements must be taken in an appropriate manner and on different days; blood pressure must also be assessed after three minutes of standing to rule out orthostatic hypotension, which is more common in older adults.

These same parameters apply to both older and younger adults. In older adults, optimal blood pressure is considered to be less than 120/80 mmHg and normal blood pressure is considered to be 120-130/80-85 mmHg. Blood pressure should be assessed annually in patients over 75 years of age. Grade I is determined with values of 140-159/90-99 mmHg and must be confirmed within two months, grade II with measurements of 160-179/100-109 mmHg with confirmation within one month, and grade III with values greater than 180/110 mmHg, which must be confirmed within one week [Campos-Nonato *et al.*, 2019; García-Castañeda, *et al.*, 2016; Osorio-Bedoya & Amariles, 2018].

In elderly hypertensive patients, systolic blood pressure [SBP] and pulse pressure [PP, which is the difference between SBP and DBP] are more important markers of vascular risk than diastolic blood pressure; isolated systolic hypertension [SBP >140 mmHg, with DBP ≤ 90 mmHg] is common in elderly women; its clinical significance is related to the occurrence of strokes and renal impairment that is two to four times higher than in the normal population.

In the control of high blood pressure, timely diagnosis, knowledge of the disease, access to antihypertensive drugs, and quality health services are considered essential. In Mexico, it is estimated that only 40% of patients with hypertension are diagnosed, and the prevalence of this disease in socioeconomically vulnerable populations is high, while the proportion of patients receiving treatment and control is low [García-Castañeda, *et al.*, 2016; Osorio-Bedoya & Amariles, 2018; García-Falcón, *et al.*, 2018].

Education and risk prevention for hypertension are the most relevant, universal, and least costly health measures.

Therefore, adequate control and monitoring of blood pressure should be a priority for health institutions due to its impact on personal, economic, and health issues. Consequently, educational actions associated with this disease are the pillars of action in its approach and precede pharmacotherapeutic management [García-Falcón, *et al.*, 2018; Miño, *et al.*, 2021]. In this regard, the importance of pharmaceutical care lies in improving the patient's quality of life through pharmacotherapeutic monitoring, which leads to successful treatment by optimising medication management, preventing and detecting problems related to the use of medicines, and supporting health education for a better understanding of the pathology by the patient and promoting adherence to pharmacotherapy [García-Falcón, *et al.*, 2018; Miño, *et al.*, 2021; Velasco, 2008; Vargas & Pachucho, 2024]. Therefore, the objective of this study is to determine the impact of implementing outpatient pharmacotherapeutic follow-up in geriatric and hypertensive female patients in the state of Campeche [Mexico].

Methodology

This study had a quantitative approach and was based on a quasi-experimental, longitudinal design. To this end, a therapeutic monitoring and pharmacovigilance model was established, with a population of 23 patients selected through non-probabilistic convenience sampling. The inclusion criteria were: adult female patients over 65 years of age diagnosed with arterial hypertension [for more than 3 years] without other comorbidities who voluntarily agreed to participate by signing an informed consent form.

Hypertensive patients with difficulty understanding, communicating, and self-managing their health were excluded.

Pharmacotherapeutic follow-up was carried out through nine home visits [three in person and six teleconsultations] over nine months [from February to October 2023], using the SOAP and DÁDER methods to evaluate pharmacotherapeutic follow-up [Amariles et al., 2012; Arroyo & Castro, 2017; Marques et al., 2013]. Standardised instruments were used to assess the patient's level of knowledge about their disease [Batalla test, with simple questions to check the patient's knowledge about their disease] and their pharmacotherapy [SMAQ questionnaire, Medication Adherence Questionnaire]. their adherence to treatment was determined by the Morisky-Green-Levine test, an indirect measurement method based on a voluntary interview consisting of a four-question questionnaire on treatment adherence, considering the person who answers 'NO' to all four questions as adherent and 'non-adherent' if they answer 'YES' to at least one of the questions.

This test was administered during the second and final visit; the Herrera Carranza test [designed to improve the monitoring of therapeutic compliance in the community pharmacy setting] and the fake check test [the patient is asked for a urine sample to calculate the amount of medication consumed]; blood pressure values were monitored using a digital sphygmomanometer and recorded on a log sheet [Pagès-Puigdemont & Valverde-Merino, 2018; Esquivel & Díaz, 2019; Jiménez, 2014; Conte et al., 2020; Pinillos-Pozo et al., 2022].

The work was carried out in two stages; initially, the service was offered, registration was carried out, patients were selected and informed consent was signed; this first stage was carried out in the first month of the study and the first blood pressure measurement was obtained [Pagès-Puigdemont & Valverde-Merino, 2018; Esquivel & Díaz, 2019; Jiménez, 2014; Conte et al., 2020; Pinillos-Pozo et al., 2022]. In the second stage, the DÁDER method was applied, adapted for pharmacotherapeutic follow-up, and included the second home visit, during which written educational information was provided in the form of personalised, didactic printed material on their pharmacological treatments.

Verbal health education was carried out individually, focusing on resolving doubts and addressing concerns [Pagès-Puigdemont & Valverde-Merino, 2018; Esquivel & Díaz, 2019; Jiménez, 2014; Conte et al., 2020; Pinillos-Pozo et al., 2022]. Descriptive statistics were used to manage the data obtained during the study, using Excel® for data processing. Numerical variables are expressed as means \pm standard deviation. The ethical considerations taken into account in this research include the principles of the Declaration of Helsinki and international ethical guidelines related to health research in humans to ensure data confidentiality.

Results

Twenty-three female patients with an average age of 72 years and a range between 66 and 81 years participated in this study. According to the tests to measure the patients' adherence to their pharmacological treatment, it was observed during the second home visit that only four patients were adherent, while during the ninth visit, nine patients were considered adherent. Based on this classification of patients, it was found that the intervention had a positive effect on both types of patients, both in terms of their level of knowledge about their disease [scores obtained by all patients: pre-test 5.0, post-test 8.9] and their pharmacotherapy [pre-test 4.7, post-test 7.8], as shown in Figure 1. although it can be seen that patients considered adherent to treatment show greater knowledge of both their disease and their pharmacological treatment compared to the group of non-adherent patients, as they had significantly higher scores in both post-tests.

Box 1

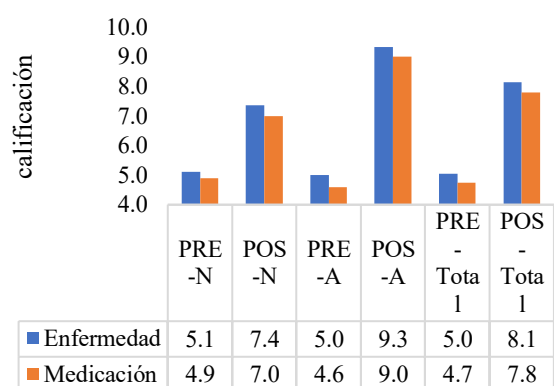


Figure 1

Scores obtained in the questionnaires on knowledge about their disease [hypertension] and their medication in the pre-test [PRE] and post-test [POS] evaluations administered to patients [N: non-adherent, A: adherent].

With regard to the blood pressure values recorded for patients during the intervention [Figure 2], positive results were observed over time, as there was a progressive decrease in the recorded blood pressure values; non-adherent patients started with an average of 149/84 mmHg and adherent patients with an average of 150/85 mmHg; In non-adherent patients, the decrease in pressure was slower, with an average value of 142/79 and 136/79 mmHg obtained at the fourth and fifth visits, respectively, and finally an average of 123/78 mmHg was recorded.

In the case of patients who adhered to pharmacological treatment at the fourth visit, measurements averaged 129/79 mmHg, and at the end of the pharmaceutical intervention, records showed an average value of 117/77 mmHg. This is due to the positive effects obtained from adherence to pharmacotherapy and the health education provided to patients.

Box 2

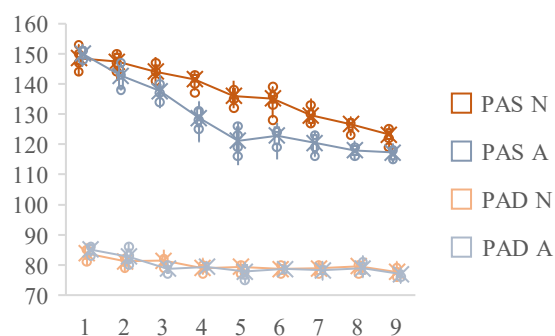


Figure 2

Systolic [SBP] and diastolic [DBP] blood pressure values during pharmacotherapeutic follow-up in hypertensive patients [N: non-adherent, A: adherent].

Discussion

Patients suffering from high blood pressure are generally on multiple medications, and their pharmacological treatments last for long periods of time, which increases the likelihood of non-adherence to their pharmacotherapy and negative results from the medication.

Therefore, pharmacotherapeutic follow-up is a service provided by pharmacists that has a positive impact on patients' health because it ensures appropriate, safe, and effective pharmacotherapy for patients and is a good strategy for preventing or resolving negative outcomes of medication and controlling blood pressure.

This service is offered and provided by community pharmacies for outpatients [Martínez & Martínez, 2012; Rincon, Goncalves & Andrade, 2012; Robles & Macias, 2015]. High blood pressure is a risk factor for cardiovascular morbidity and mortality, particularly in geriatric patients, because ageing is inevitable and brings with it two undesirable events: physiological deterioration and disease. Therefore, the prevalence of hypertension increases with age, as it is a chronic disease that requires adequate compliance with pharmacotherapy in order to optimally control blood pressure and thus reduce the risk of complications [Velasco, 2008; Robles & Macias, 2015].

Pharmacotherapeutic follow-up allows the pharmacist to become part of the multidisciplinary team and contribute professionally to improving the quality of life of hypertensive patients by optimising medication management, the prevention and detection of problems related to the use of medicines and, above all, through the implementation of health education programmes that allow patients and their carers to better understand their condition and gain greater knowledge of their medication, leading to greater adherence to treatment [Velasco, 2008; Robles & Macias, 2015].

Older adults are the age group with the highest prevalence of chronic diseases such as high blood pressure. This means an increase in medication in geriatric patients, leading to a higher risk of problems related to their pharmacological treatment. In general, various studies report that female patients predominate in the participating older adult populations [Osorio-Bedoya & Amariles, 2018; Robles & Macias, 2015].

There are several reasons why patients do not adhere to their medication prescriptions, including their level of education, the number of medications prescribed and, particularly in geriatric patients, forgetfulness as a result of the memory loss that accompanies ageing.

Therefore, strategies should be sought to help patients remember and organise their medication administration [Osorio-Bedoya & Amariles, 2018; Elias, Garcia & Gerrero, 2020].

Pharmacotherapeutic follow-up helps to improve blood pressure control; however, for blood pressure values to improve substantially, there must be a change in the patient's behaviour, starting with the implementation of a health education programme so that the patient knows, understands and applies the knowledge about their disease and their medication [Formentin-Zayas et al., 2021; Franco & Cardona-Arango, 2017; Moscoso & Suárez, 2023]. The patients who learned best were those who were considered adherent because health education reciprocally influences therapeutic adherence; consequently, greater adherence to treatment resulted in better blood pressure control, as demonstrated by the decrease in the values obtained in the different measurements throughout the research. Empirically, changes in their behaviour, attitude and lifestyle towards healthier habits could also be observed, such as the start of physical activity, participation in recreational activities and control of their diet, all of which contribute to improving the patients' health status [Formentin-Zayas et al., 2021; Franco & Cardona-Arango, 2017; Cano-Montoya et al., 2016].

In the present study, we interacted with doctors, nurses, and gerontologists to offer better healthcare services. In the future, other professionals such as nutritionists, physiotherapists, psychologists, and social workers may be included in the programme, as it is the patients and their life context that determine therapeutic adherence and the adoption of hygienic and health measures. Therefore, individualised agreements must be reached with patients to establish the most appropriate treatment and measures to be taken in their particular condition [Franco & Cardona-Arango, 2017; Cano-Montoya et al., 2016; Schmidt Rio-Valle et al., 2006; Quintero et al., 2021].

The experience gained during this research can be expanded and is likely to be replicated in other community pharmacies interested in implementing a pharmacotherapeutic follow-up service that is useful to the healthcare team in adopting a programme of identification and personalised intervention for hypertensive patients with low treatment adherence [Elias, Garcia & Guerrero, 2020; Zapattini, & Ortiz, 2021].

Conclusions

Patients who showed adherence to treatment with antihypertensive drugs had better control of their blood pressure and showed greater knowledge about their disease and the medication prescribed to them. These patients had better acceptance of the treatment and health education actions implemented during this research, and were particularly receptive to the therapeutic advice offered by the pharmacist.

Declarations

Conflict of interest

The authors declare that they have no conflict of interest. They have no known competing financial interests or personal relationships that could have appeared to influence the article reported in this article.

Contribution of the authors

Specify the contribution of each researcher to each of the points developed in this research.

Abbreviations

HTA	High blood pressure	
PAD	Diastolic pressure	
PAS	Systolic pressure	
PP	Pulse pressure	
SMAQ	Medication Questionnaire	Adherence

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Antecedentes

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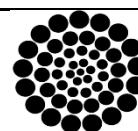
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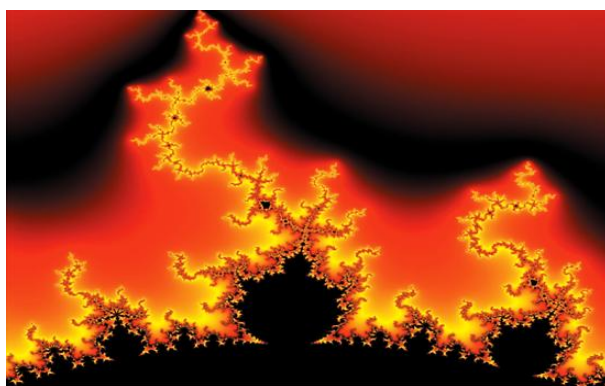


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