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Presentation of Content

As the first article we present, *Neuropsychological functions and reading competence in medical students*, by SANTOYO-RIVAS, Beatriz, RÍOS-VALLES, José Alejandro, HERRERA-VARGAS, Isela Vanessa and SALAS-NAME, Sagrario Lizeth, with adscription in the Universidad Juárez del Estado de Durango, as the second article we present, *Type of cervicovaginitis in women from 15 to 49 years at the General Hospital de Escárcega*, by SARABIA-ALCOCER, Betty, LÓPEZ-GUTIÉRREZ, Tomás Joel, AKÉ-CANCHÉ, Baldemar and PÉREZ-BALAN, Román Alberto, with adscription in the Universidad Autónoma de Campeche, as third article we present, *Health mediation - the aseptic system for conflict management in health*, by MATSUI-SANTANA, Griselda, LÓPEZ-RAMOS, Mauricio Ernesto and ONGAY-FLORES, Carlos Alfredo, with assignment at the Instituto de Justicia Alternativa del Estado de Jalisco, Colegio de Corredores Públicos de la Ciudad de México, A. C. and Colegio Mexicano de Ortopedia y Traumatología A. C., as last article we present, *Productivity of medical services of a medical care program in the state of Tabasco*, by ARREDONDO-PÉREZ, Carlos Arturo, MOREJÓN-SÁNCHEZ, Juana María, ELISEO-DANTÉS, Hortensia and DE LEÓN-DE LOS SANTOS, Brissa Roxana, with adscription in the Tecnológico Nacional de México - Instituto Tecnológico de Villahermosa.

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Neuropsychological functions and reading competence in medical students

Funciones neuropsicológicas y competencia lectora en estudiantes de medicina

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Abstract

Introduction. Medical students require a high capacity for comprehension; therefore, one of the main competencies required by these students during their training is reading comprehension, which allows them to obtain and adequately process the necessary information that corresponds to the progress of their training. Deficiency in this reading competence limits learning and causes them to resort to short-term rote learning, limiting its use in the future. **Objective.** To describe the behavior of neuropsychological functions and reading competence of medical students. **Methods.** Documentary, descriptive, quantitative, retrospective and cross-sectional study of a database with the results of the neuropsychological evaluation with NEUROPSI Brief in Spanish, applied to medical students. **Results.** Moderate and severe impairments were observed in up to 41% of the analyzed sample showing impairment in recall memory, attention and concentration and encoding. **Conclusion.** In the sample studied, the neuropsychological variables affected contribute to impair inferential reading comprehension, which demonstrates the need to provide attention to university students in order to improve mental functioning for learning.

Neuropsychological functions, Reading competence, Medical students

Resumen

Introducción. El estudiante de medicina requiere alta capacidad de comprensión, debido a esto, una de las principales competencias que requieren estos estudiantes durante su formación es la comprensión lectora, la cual les permite obtener y procesar de forma adecuada la información necesaria que corresponda a los avances propios de su formación. La deficiencia en esta competencia lectora limita el aprendizaje y ocasiona que se recurra a un aprendizaje memorístico a corto plazo, limitando que pueda ser utilizado en un futuro. **Objetivo.** Describir el comportamiento de las funciones neuropsicológicas y de la competencia lectora de los estudiantes de medicina. **Métodos.** Estudio documental, descriptivo, cuantitativo, retrospectivo y transversal, de una base de datos con los resultados de la evaluación neuropsicológica con NEUROPSI Breve en Español, aplicado a estudiantes de medicina. **Resultados.** Se observaron deficiencias moderadas y severas hasta en un 41% de la muestra analizada mostrando afectación en la memoria de evocación, atención y concentración y codificación. **Conclusión.** En la muestra estudiada las variables neuropsicológicas afectadas contribuyen a demeritar la comprensión lectora inferencial, lo cual demuestra la necesidad de brindar atención a los estudiantes universitarios con la finalidad de mejorar el funcionamiento mental para el aprendizaje.

Funciones neuropsicológicas, Competencia lectora, Estudiantes de medicina

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Introduction

Reading is a cognitive activity of great importance used in the acquisition of knowledge (Pulido, 2020), with a formative and social function, it is a complex and systematic process where several cognitive elements participate that allow deciphering the code of the printed letter to then give it a meaning that allows understanding a text (Montaña et al. 2017).

The efficient process and understanding of a reading requires prior knowledge that allows generating the meaning of certain words (Romo, 2019).

Lexical access and reading comprehension are important components for the development of learning (González, 2008) and these are manifested during the cognitive development of each individual (Aznárez et al., 2017).

Lexical access is the process in which a word is recognized through visual perception, where graphic features are identified (González, 2008). In reading comprehension, the information extracted from the text manages to be associated with the information held in long-term memory (Zapata & Rodicio, 2017) and all the information is integrated, to form a coherent representation of what is being read, this level is conscious and not automated (González, 2008).

To obtain a true understanding of a text it must be interpreted at different levels: inferential, literal and critical, where inferential comprehension occurs when the global meaning of a text is understood through relationships and associations (Montaña et al., 2017), when this process activates knowledge structures that are stored in long-term memory and without the need to be explicit in the text, the mental representation of the meaning is created (Iglesias and Veiga, 2004).

To understand a text literally, the reader must resort to all the vocabulary he/she possesses, and to the different meanings that a word may have according to the context or culture in which it is found, also resorting to his/her intuitive knowledge of how his/her language works, how sentences and paragraphs are structured and how certain relationships between ideas are established (Carriazo et al., 2011).

To understand a text critically the reader must resort to his common sense, his ability to establish logical relationships, his knowledge about the text, his life experience, his scale of values, his personal criteria about the subject matter of the text and other readings he has done previously (Carriazo et al., 2011).

During reading several neuropsychological processes are carried out starting with the visual stimulus, which reaches the primary areas in the visual cortex of the occipital lobe, here the visual analysis system is responsible for identifying and encoding the letters, and can follow two different paths; One of them is known as the lexical route, in which the stimulus received is compared with the existing words in it and identified; the other is the phonological route, where the information from the visual analysis passes directly to the encoding of the grapheme-phoneme (Viquez et al., 2013).

According to Luria's neuropsychological model, interpreted by Manga & Ramos (2000); reading aloud a word would imply the following process: first the image formed in the retina is projected in the primary visual cortex (area 17 of Brodmann) all this through the visual geniculate-striate pathway, then this information passes to the visual association cortex (areas 18 and 19 of Brodmann) where all its characteristics are analyzed (Manga & Ramos, 2000).

Then an interhemispheric communication takes place through the corpus callosum, which allows the information to reach the angular gyrus (Brodmann's area 39), where the association of graphemes with their corresponding phonemes takes place. This information is then shared with Wernicke's area and here words are recognized and understood once auditory images are associated with visual stimuli (Manga & Ramos, 2000).

Finally, for oral reading to occur, Broca's area intervenes through the arcuate fasciculus, in this area the articulation of words and their emission aloud is programmed, this activity is carried out with the participation of the motor area (4 of Brodmann) which controls the speech musculature (Manga and Ramos, 2000).

As can be seen, the reading process is complex due to the involvement of numerous sensory, motor, language, cognition, attention and memory processes, all these components form a functional system integrated in the cortical structures (Escribano, 2019).

The reading system is located in the left hemisphere, where three main brain areas can be identified: the ventral area (occipito-temporal), the dorsal area, which basically corresponds to Wernicke's area, and the left frontal area, which includes Broca's area, the inferior frontal gyrus and the insular cortex. These three areas are involved in critical functions of reading: visual orthographic processes in the ventral region, phonological decoding in the dorsal region, and articulatory-phonological and semantic processes in the frontal region (Escribano, 2019).

Cognitive processes are also involved in reading comprehension and word recognition, achieving an association with concepts stored in memory, with the development of the main ideas of a text the drawing of conclusions and the relationship between what is read and what is already known, it also demands active attention to many things at the same time in order to coordinate the psychological processes that occur in the detection of written codes (Arándiga, 2005).

Cognitive processes are essential in reading comprehension, since the act of reading implies an interaction between the information obtained and the information stored in the reader's brain. Perception, attention and memory make it possible to capture all the data presented during reading, then fix attention specifically on some of them, represent them mentally through thought and relate them to previous information stored in memory to finally interpret and externalize them with an appropriate language (Fuenmayor and Villasmil, 2008).

The reader's mind processes information, and in this process different cognitive activities are used, some allow the entry and storage of information, such as attention and memory. Other activities help to accompany it and use it to solve problems or perform tasks; the cognitive processes that are activated when reading are perceptual, lexical, syntactic and semantic (Cotto et al., 2017).

For the evaluation of these cognitive functions, the use of an instrument that allows measuring them in a brief, reliable and objective way is recommended, such as the brief neuropsychological battery in Spanish NEUROPSI, which was developed in 1999 by Dr. Feggy Ostrosky, Dr. Alfredo Ardila and Dr. Mónica Rosselli, and its objective is to make an early diagnosis of cognitive alterations (Ostrosky-Solís et al, 2012).

The scoring system of this test provides quantitative and qualitative data, this system allows to have a total score and an individual profile of the cognitive functions of the subject of study, which indicates the skills and disabilities in each of the cognitive areas evaluated. Thus, taking into account the schooling and age of the subject to be evaluated, its execution can be classified as: normal, mild alterations, moderate alterations and severe alterations. Similarly, this test has high reliability indices, which indicates that the responses and errors are stable and that there are no defects of practice or deterioration in a normal population (Ostrosky-Solís et al, 2012).

The cognitive functions evaluated by the NEUROPSI are: orientation, attention and concentration, encoding and recall memory, language, reading, writing and executive functions (Ostrosky-Solís et al, 2012). For the purposes of this study, only those involved in the reading comprehension process were considered, which is the result of the combination of previous knowledge, decoding, strategies, vocabulary and the inferential ability of the individual to understand a written text (Martínez-Cubelos and Salceda, 2022).

For the choice of the variables studied, it was considered that the recognition of a written word is integrated from the visual, spatial and temporal information generated by the stimulation resulting from the identification of the straight and curved strokes that form the graphic linguistic signs (visuospatial process); the lexical information stored in the long-term memory that is activated and compared with that obtained from the visual stimulus being perceived at the moment (attention and concentration, encoding and recall memory) (Iglesias and Veiga, 2004), which, according to Alonso Ortiz T. (1997), memory is one of the most important aspects of the visual stimulus, (1997), memory is one of the base processes for the acquisition of reading, allowing to retain the shape of visual stimuli, recognizing graphemes and giving semantic meaning (Alonso Ortiz T, 1997, as cited in Rodríguez-Ríos et al, 2016); and finally the linguistic contextual information obtained from the text and extralinguistic information found in the reader's memory (reading and language) (Iglesias and Veiga, 2004).

The cognitive functions of the NEUROPSI that were studied in this work, in statistical terms are called variables, because these functions are precisely a characteristic of interest of the sample studied, which can be measured. Now, variables can be quantitative and qualitative, where the former are those where their values are numerical and are represented in quantity and the qualitative ones their values as their name says represent a quality (Rincón, 2017).

Similarly, variables are classified in terms of their characteristics as dependent or independent variable depending on the role it plays in the research question; the number of possible values which can be continuous or discrete; and their measurement scale which is classified as nominal, ordinal, intervals and ratios (Sangrador, 2018).

In order to perform a statistical analysis of the results of the neuropsychological test, the levels of measurement of the variables can be taken into account by means of a descriptive analysis, since in this case what is sought is to obtain information on the characteristics of the variables involved in reading comprehension in the group under investigation, focusing mainly on the measures of central tendency, mode and mean, and on the distribution of frequencies that allow identifying the scores with greater and lesser constancy and how their distribution is with respect to each variable (Sampieri et al., 2014).

There are several computer programs that are used to perform statistical analysis, one of them is SPSS which is a statistical computer program used for the analysis of records generated through surveys or research projects, it allows consulting data, formulating hypotheses, executing procedures to clarify the relationships between variables, identifying trends and making predictions (Sampieri et al., 2014).

The reliability of a measurement instrument can be defined as the accuracy with which it can measure an instrument without errors or with small errors (Martínez-Cubelos and Salceda, 2022). When the instruments intended for qualitative research and evaluation are only for research purposes, for reliability to be considered good it should not be less than 0.75. This allows us to show that the results obtained in the application of any instrument are truly useful, solid and consistent (Martínez-Cubelos and Salceda, 2022).

However, in order to carry out any research work that requires the participation of human beings, it is necessary to ensure respect for the integrity of the participants, protect their health and their individual rights, which is safeguarded in the Declaration of Helsinki adopted by the World Medical Association in 1964 (Cantera et al., n.d.). Similarly, the General Health Law, in Art. 100/4, states that:

Informed written consent must be obtained from the subject on whom the research will be performed, or from his/her legal representative in case of legal incapacity, once he/she has been informed of the objectives of the experimentation and of the possible positive or negative consequences for his/her health (General Health Law, 2022).

Similarly, Art. 98/2 of the General Health Law mentions that in the case of research on human beings, a Research Ethics Committee must be set up to oversee the practice of technical and auxiliary health professionals (General Health Law, 2022).

The objective of this work is to describe the efficiency of neuropsychological functions and reading competence in medical students of the Faculty of Medicine and Nutrition of the Universidad Juárez del Estado de Durango, knowing the trend in the efficiency of reading comprehension evaluated in the study group and identifying the neuropsychological function with the highest and lowest scores in the evaluation of reading competence.

Results

The validation results of the instrument reflect a reliability level of 0.773 in Cronbach's alpha. Of the documents reviewed, the most frequent population is female, as can be seen in the following table.

| | Frequency | Percent | % accumulated |
|--------|-----------|---------|---------------|
| Male | 126 | 43.8 | 43.8 |
| Female | 162 | 56.3 | 100.0 |
| Total | 288 | 100.0 | |

Table 1 Gender distribution

Source: Own elaboration

With respect to age, this is concentrated between 20 and 23 years of age, which can be seen in Table 2.

| Age | Frequency | Percent | % accumulated |
|--------------|-----------|---------|---------------|
| 18 | 3 | 1.0 | 1.0 |
| 19 | 28 | 9.7 | 10.8 |
| 20 | 62 | 21.5 | 32.3 |
| 21 | 56 | 19.4 | 51.7 |
| 22 | 60 | 20.8 | 72.6 |
| 23 | 35 | 12.2 | 84.7 |
| 24 | 21 | 7.3 | 92.0 |
| 25 | 12 | 4.2 | 96.2 |
| 26 | 6 | 2.1 | 98.3 |
| 27 | 1 | .3 | 98.6 |
| 28 | 1 | .3 | 99.0 |
| 29 | 1 | .3 | 99.3 |
| 34 | 1 | .3 | 99.7 |
| 43 | 1 | .3 | 100.0 |
| Total | 288 | 100.0 | |

Table 2 Distribution by age

Source: Own elaboration

Table 3 shows that the highest percentage is in the 5th semester.

| Semestre | Frequency | Percent | % accumulated |
|--------------|-----------|---------|---------------|
| 1 | 6 | 2.1 | 2.1 |
| 2 | 25 | 8.7 | 10.8 |
| 3 | 44 | 15.3 | 26.0 |
| 4 | 19 | 6.6 | 32.6 |
| 5 | 67 | 23.3 | 55.9 |
| 6 | 27 | 9.4 | 65.3 |
| 7 | 25 | 8.7 | 74.0 |
| 8 | 10 | 3.5 | 77.4 |
| 9 | 37 | 12.8 | 90.3 |
| 10 | 28 | 9.7 | 100.0 |
| Total | 288 | 100.0 | |

Table 3 Semesters completed by the sample of documents reviewed

Source: Own elaboration

The results obtained from the neuropsychological evaluation corresponding to digits in regression, 20-3, visual detection, naming, repetition, comprehension, verbal fluency, reading, visuospatial memory, spontaneous verbal memory, verbal memory by cues, and memory by recognition are as follows:

The scores observed in the variables studied show a symmetrical distribution in the values of central tendency, as can be seen in Table 4.

| Variable | Mode | Average | Máx. | Min. | Freq. | % of frequency | High Normal value | Normal Value |
|-----------------------------------|------|---------|------|------|-------|----------------|-------------------|--------------|
| Digits in regression | 4 | 4.07 | 6 | 2 | 101 | 35.1 | 6 | 3 a 5 |
| Visual detection | 16 | 15.36 | 16 | 0 | 202 | 70.1 | - | 11 a 16 |
| 20-3 | 5 | 4.27 | 5 | 0 | 203 | 70.5 | - | 4 a 5 |
| Coding- Spontaneous verbal memory | 5 | 4.91 | 6 | 2 | 106 | 36.8 | - | 4 a 6 |
| Coding-Process Spatial View | 12 | 11.72 | 12 | 6 | 224 | 77.8 | - | 11.5 a 12 |
| Visual-spatial memory | 12 | 10.93 | 12 | 4 | 126 | 43.75 | - | 9.5 a 12 |
| Spontaneous Verbal Memory | 5 | 4.27 | 6 | 0 | 106 | 36.8 | - | 4 a 6 |
| Verbal memory by keys | 5 | 4.48 | 6 | 0 | 101 | 35.1 | - | 5 a 6 |
| Verbal memory by recognition | 6 | 5.61 | 6 | 1 | 202 | 70.1 | - | 5 a 6 |
| Denomination | 8 | 7.94 | 8 | 6 | 273 | 94.8 | - | 8 |
| Repetition | 4 | 3.99 | 4 | 3 | 285 | 99 | - | 4 |
| Comprehension | 5.84 | 6 | 6 | 2 | 250 | 86.8 | - | 6 |
| Semantic verbal fluency | 25 | 24.5 | 40 | 2 | 26 | 9 | 30 a 32 | 16 a 28 |
| Phonological verbal fluency | 12 | 12.5 | 23 | 4 | 38 | 13.2 | 21 a 25 | 8 a 20 |
| Reading | 3 | 2.85 | 3 | 0 | 254 | 88.19 | - | 3 |

Table 4 Central tendency values of the variables studied.
Source: Own elaboration

Of the total number of documents reviewed (288), the variables with the lowest and highest scores can be seen in Table 5, with the highest frequency of minimum value, verbal memory by cues in 41% of the sample and with the highest frequency of maximum value, semantic verbal fluency and repetition with 99%.

| Variable | High of score obtain | Frecuency | % frecuencia | Norm al Value | High norm al value | Classificati on | Minimum score obtaine d | Frecuency | % de frecuencia | Moderat e disturba nce value | Severe disturba nce value | Classificati on |
|--|----------------------|-----------|--------------|---------------|--------------------|------------------------|-------------------------|-----------|-----------------|------------------------------|---------------------------|----------------------|
| Language-Semantic verbal fluency | >14 | 286 | 99.3 | 30 a 32 | 14 a 29 | Normal and high normal | <10 | 2 | 0.69 | 10 a 13 | 0 a 9 | Moder ate and severe |
| Language-Repetition | 4 | 285 | 99.0 | 4 | - | Normal | <3 | 3 | 1.04 | - | 0 a 3 | Severe |
| Attention and concentrati on in Visual detection | >11 | 284 | 98.6 | 11 a 16 | - | Normal | <8 | 4 | 1.39 | 8 a 10 | 7 a 0 | Moder ate and severe |
| Encoding- Spontaneous verbal memory | >4 | 278 | 96.5 | 4 a 6 | - | Normal | <3 | 10 | 3.47 | 3.00 | 0 a 2 | Moder ate and severe |
| Language- Phonologic al verbal fluency | >8 | 275 | 95.5 | 21 a 25 | 8 a 20 | Normal and high normal | <7 | 13 | 4.51 | 4 a 7 | 0 a 3 | Moder ate and severe |
| Language-Denominati on | 8 | 273 | 94.8 | 8 | - | Normal | <7 | 15 | 5.21 | - | 0 a 7 | Severe |
| Evocati on- Verbal memory by recognition | >5 | 267 | 92.7 | 5 a 6 | - | Normal | <4 | 21 | 7.29 | 4.00 | 0 a 3 | Moder ate and severe |
| Attention and concentrati on in Digits in regression | >3 | 256 | 92.4 | 3 a 5 | 6 | Normal and high normal | <2 | 22 | 7.64 | 2.00 | 0 a 1 | Moder ate |
| Reading | 3 | 254 | 88.2 | 3 | - | Normal | <2 | 34 | 11.81 | 2.00 | 0 a 1 | Moder ate and severe |
| Language-Comprehension | 6 | 250 | 86.8 | 6 | - | Normal | <5 | 38 | 13.19 | - | 0 a 5 | Severe |
| Evocati on- Visual-spatial memory | >9.5 | 248 | 86.1 | 9.5 a 12 | - | Normal | <9 | 40 | 13.89 | 8 a 9 | 7.5 a 0 | Moder ate and severe |
| Evocati on- Spontaneous Verbal Memory | >4 | 225 | 78.1 | 4 a 6 | - | Normal | <3 | 63 | 21.88 | 3.00 | 0 a 3 | Moder ate and severe |
| Encoding- Visual-spatial processes | >11.5 | 224 | 77.8 | 11.5 a 12 | - | Normal | <10.5 | 64 | 22.22 | 11.00 | 0 a 10.5 | Moder ate and severe |
| Atenci on and concentrati on 20-3 | >4 | 216 | 75.0 | 4 a 5 | - | Normal | <3 | 72 | 25.00 | 3.00 | 0 a 2 | Moder ate and severe |
| Evocati on- verbal memory x keys | >5 | 170 | 59.0 | 5 a 6 | - | Normal | <4 | 118 | 40.97 | 3 a 4 | 0 a 2 | Moder ate and severe |

Table 5 Maximum and minimum scores obtained in the variables that intervene in reading competencies
Source: Own elaboration

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Discussion

The importance of the study of reading comprehension in university students is due to the fact that good school performance depends mostly on the abilities and strategies they have to achieve good reading comprehension (Pulido, 2020; Rodríguez-Ríos, Ríos-Valles, Hernández-Tinoco, & Acevedo-Martínez, 2016).

According to Calderón-Ibáñez and Quijano Peñuela (2010), the study of reading comprehension, reading skills and verbalization of texts in university students has shown certain deficiencies in these aspects. A study conducted by these authors shows the problems that students have for inferential reading as well as the reduced lexicon of readers (Calderón-Ibáñez and Quijano Peñuela, 2010, as cited in Ríos-Valles et al., 2017).

Pulido (2020), during his research at a university in northwestern Mexico, where his objective was to determine whether it is possible to improve reading comprehension through reading strategies, found that one of the problems presented by the study group was the difficulty in selecting relevant information from a text, which he relates to the fact of not using effective strategies to extract the main ideas (Pulido, 2020), this study shows that most of the participants present problems in inferential reading comprehension.

On the other hand, Gonzalez & Machado (2020), during an investigation at a university in Barranquilla, Colombia, obtained results that show a very low level of literal comprehension, with a basic and limited interpretation of the text, and regarding the inferential level, difficulties are observed in adding elements that are not found in the text and relating them to their experiences or deducing ideas that are not explicit (Gonzalez & Machado, 2020).

For their part Macay-Zambrano & Véliz-Castro (2019), conducted a study of reading comprehension levels in university students in Ecuador, where it could be observed that the sample studied shows difficulty in comprehending readings from the literal, inferential and critical points of view (Macay-Zambrano & Véliz-Castro, 2019).

Among the neuropsychological functions involved in the reading comprehension process, selective attention stands out, since the reader must focus his attention on the text he is reading and thus block external stimuli that could create a distraction, this process requires self-regulation of attention (Arándiga, 2005).

Similarly, evocation memory is another neuropsychological factor involved in reading comprehension, which allows inferences to be made when reading (Domínguez, 2010). Also language, participates in the association of auditory images with visual stimuli that allow recognizing phonemes or words that are reading (Viquez et al., 2013), so that reading comprehension improves as language comprehension also increases (Tunmer and Hoover, 2019).

Perceptual processes also play an important role in the comprehension of a text, since they are responsible for gathering information from a text and transmitting it to the cortical structures of the brain, one of these processes is visual perception, since a correct visual discrimination will contribute to achieve a good reading comprehension (Arándiga, 2005).

In the present investigation it can be observed that the scores of the variables considered for this study tend to be located within normal values, however there are variables where scores below the normal limit can be observed according to the Neuropsi manual and which are classified in moderate to severe alterations, these variables are: of evocation the simple variables of verbal memory by cues and spontaneous verbal memory, of encoding the simple variable of visuospatial processes and of the attention and concentration variable the simple variable of 20-3, all of them with a frequency percentage ranging from 41% to 22% of the documents studied.

With respect to the variables where a better performance of the studied sample with results from normal to high normal is observed in the language functions, specifically in repetition and semantic verbal fluency, representing 99.3% and 99% of the frequency of the sample, respectively.

According to Montaña, Cárdenas, Orduz & Caro (2017), in order for inferential comprehension to be carried out, it is necessary the activation of knowledge structures that are stored in long-term memory, (Montaña et al, 2017), this neuropsychological function is evaluated in the NEUROPSI in the evocation functions section (Ostrosky-Solís et al., 2012).

Carriazo, Andrade & Martínez (2011), refer that in order to understand a text literally, the reader resorts to all the vocabulary he/she has and to the different meanings that a word has according to the context in which it is found (Carriazo et al., 2011). For the evaluation of this neuropsychological function in the NEUROPSI, the language section is used (Ostrosky-Solís et al., 2012).

According to Betancourth Zambrano et al. (2012), research conducted worldwide shows that there is a need to improve critical and analytical skills in university students. (Betancourth Zambrano et al., 2012, as cited in Ríos-Valles et al., 2017) which is coincident with the observation that recall memory presented results that show an area of opportunity to be improved and thus contribute to a more efficient reading comprehension.

Conclusions

In the sample studied there is a considerable percentage of participants, up to 41%, who present alteration in neurocognitive functions at the moderate and severe level, observing important failure in the neuropsychological functions involved in reading comprehension, highlighting with greater frequency the variable of evocation, respectively, in the variables of verbal memory by cues and spontaneous verbal memory; Likewise, in the attention and concentration variable the simple variable 20-3 and in the coding variable the simple variable of visuospatial processes; the above allows identifying, based on the information studied by the authors consulted, that the sample presents inferential comprehension problems.

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Type of cervicovaginitis in women from 15 to 49 years at the General Hospital de Escárcega

Tipo de cervicovaginitis en mujeres de 15 a 49 años en el Hospital General de Escárcega

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Abstract

Abstract. Objective: To determine the most frequent type of cervicovaginitis in women between 15 and 49 years of age. Material and methods: Observational, cross-sectional, descriptive, and retrospective study, reviewing a total of 466 number of patients who attended the performance of Papanicolaou, looking for the age of presentation, their marital status, the level of education, their beginning of sexual life, number of sexual partners, the use of contraceptive methods, their socioeconomic level and the type in which the pathology predominates. Contribution: Of a total of 460 women who attended the Pap smear, 39 presented CIN II – CIN III data, 80 gave results of cervicovaginitis, the most frequent being *Candida* (41.25%). Conclusions: The social group that experiences the greatest risk of suffering from sexually transmitted diseases are adolescent women.

Cervicovaginitis, Pap smear, Escárcega

Resumen

Objetivo: Determinar el tipo de cervicovaginitis más frecuente en mujeres de 15 a 49 años. Material y métodos: Estudio Observacional, transversal descriptivo, y retrospectivo, revisando un total de 466 pacientes que acudieron a la realización de Papanicolaou, buscando la edad de presentación, su estado civil, el nivel de escolaridad, su inicio de vida sexual, número de parejas sexuales, el uso de métodos anticonceptivo, su nivel socioeconómico y el tipo en el que predomina la patología. Contribución: De un total de 460 mujeres que acudieron a la toma de papanicolao 39 presentaron datos de NIC II – NIC III, 80 dieron resultados de cervicovaginitis la cual la más frecuente fue *Cándida* (41.25%). Conclusiones: El grupo social que experimenta mayor riesgo de padecer enfermedades de transmisión sexual son las mujeres adolescentes.

Cervicovaginitis, Papanicolao, Escárcega

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Introduction

Cervicovaginitis is a condition that is among the top twelve reasons for care in family medicine outpatient clinics and the main reason for care in the speciality of gynaecology and obstetrics.

Cervicovaginitis is a cause for concern and demand for health services by the female population of childbearing age, with the most affected group being between 18 and 35 years of age; a stage in which women are considered to be most reproductively active, as well as sexually active.

The recurrence and reason for subsequent visits to outpatient clinics by the female population with persistent clinical pictures and without remission with the treatment installed in the primary form to combat cervicovaginitis is alarming. It is considered that a point in favour of this condition is that there is no follow-up in the management of the sexual partner, their sexual behaviour habits, as well as the socio-demographic factors or circumstances (schooling, socio-economic level, marital status and locality where they live).

Methodology

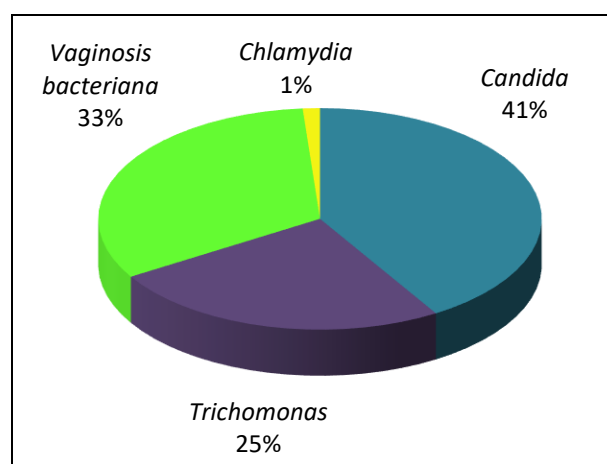
The present study is a descriptive, cross-sectional, retrospective observational study carried out in the General Hospital of Escárcega. The working universe was made up of all patients with a diagnosis of cervicovaginitis, who attended for a Pap smear and with an updated clinical record; all patients who were not of the age under study, those who did not undergo the study in the unit and those who did not have the diagnosis were excluded.

The variables to be investigated were the following: age of the patient, age at the beginning of sexual life, number of sexual partners, economic level, sexual behaviour, planning method used, school level, marital status.

The information was collected by means of a questionnaire that specifically included the data to be studied. Patient's age, age at sexual debut, number of sexual partners, economic level, sexual behaviour, planning method used, school level, marital status.

Results

During the period from January 2021 to December 2022, the results obtained from a total of 460 patients who came for Pap smears, 60 of these were poorly taken and a repeat Pap smear was needed, 281 were negative with inflammatory process and no infection, 39 presented data of CIN II - CIN III, 80 gave results of cervicovaginitis of these 33 reported *Candida* (41.25%), 20 *Trichomonas* (25%), 26 *Bacterial vaginosis* (32.5%), 1 *Chlamydia* (1.25%), the rest were reported negative with inflammatory process (Figure 1).

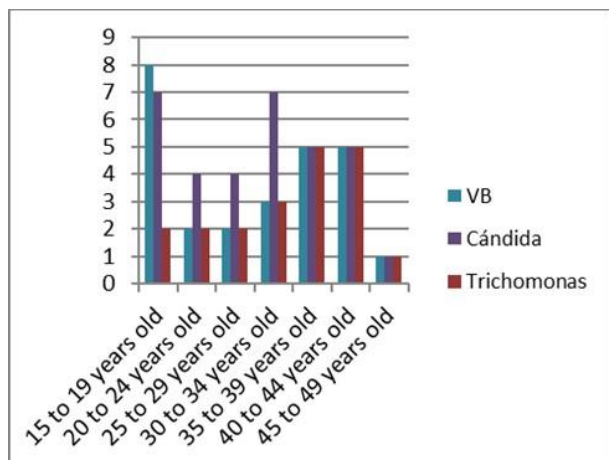


Graphic 1 Cervicovaginitis most common in women aged 15-49 years

The 33 patients who were *Candida* positive 7 were in the age range 15-19 years, 4 in the range 20-24 years, 4 in the range 25-29 years, 7 in the range 30-34 years, 5 in the range 35-39 years, 5 in the range 40-44 years and 1 in the range 45-49 years (Figure 2).

Of the 26 patients who had bacterial vaginosis, 8 were in the 15-19 age range, 2 were in the 20-24 age range, 2 in the 25-29 age range, 3 in the 30-34 age range, 5 in the 35-39 age range, 5 in the 40-44 age range, 1 in the 45-49 age range (Figure 2).

Of 20 patients who tested positive for *Trichomonas*, 2 were in the 15-19 age range, 7 were in the 20-24 age range, 2 in the 25-29 age range, 3 in the 30-34 age range, 3 in the 35-39 age range, 2 in the 40-44 age range, 2 in the 45-49 age range (Figure 2).



Graphic 2 Classification of pathologies based on the age of the patients

It was found that 36 of the patients studied were in union, 20 were married and 24 were single.

In the three entities studied, the patients have reached the following level of education: 9 finished high school, 30 finished secondary school, 26 reached primary school level and 15 are illiterate.

A number of 61 patients started their sexual life at the age of 15-19 years, 17 started at the age of 20-24 years and 2 patients at the age of 25-29 years.

Of the 80 with a diagnosis, 46 of the patients studied have had 2 or more sexual partners and 34 patients have had only one sexual partner.

The predominant level in this study was level 1, with a total of 55 patients and 20 in level 2 and 5 in level 3.

Of the 80 patients, 22 used oral contraception, 17 used hormonal IUDs, 9 hormonal injectables, 5 used condoms, 20 did not use any method and 7 had a hysterectomy.

Conclusions

We conclude that the main aetiology of cervicovaginitis was *Candida*, occurring most frequently in patients aged 15 to 19 years. The highest incidence of the pathology was found in women who were living in a union and those with an intermediate level of education. It was also observed that the sexual debut of the patients with the pathology was before the age of 18 and that they had a poverty level of 1.

It was also concluded that the number of sexual partners that the patients had was 2 or more and that the most used method of family planning was oral hormonal contraceptives.

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Health mediation - the aseptic system for conflict management in health

La mediación en salud - el sistema aséptico para la gestión de conflictos en materia de salud

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Abstract

Alternative Dispute Resolution Mechanisms (ADRM) are a possibility to resolve conflicts without the need to go to trial. The most used are mediation, conciliation, and arbitration. In this review we will focus specifically on mediation as an alternative for the resolution of medical legal conflicts. Where the history of the ADRM in Mexico and the evidence of the failure of the adversarial method for the resolution of doctor-patient conflicts will be reviewed. In addition, the incomplete role of the application in our country of the ADRM in the legal field will be highlighted and finally the successful experience of mediation to resolve this type of conflict in other countries of the world will be presented. In this way, the objective of this narrative review is to show that mediation can be an effective and beneficial option to resolve medical conflicts in a fair and equitable manner for all parties involved.

Mediation, Health Mediation, Healthcare Mediation, Alternative Justice, medical-legal conflicts

Resumen

Los Mecanismos Alternativos de Solución de Controversias (MASC) son una posibilidad para resolver conflictos sin necesidad de ir a juicio. Los más utilizados normalmente son la mediación, la conciliación y el arbitraje. En esta revisión nos enfocaremos específicamente en la mediación como una alternativa para la resolución de los conflictos medico legales. Donde se revisará desde la historia de los MASC en México y la evidencia del fracaso del método adversarial para la resolución de los conflicto médico-paciente. Además, se destacará el papel hasta el momento incompleto de la aplicación en nuestro país de los MASC en el ámbito legal y por último se presentará la experiencia exitosa de la mediación para resolver este tipo de conflictos en otros países del mundo. De esta forma, el objetivo de esta revisión narrativa es mostrar que la mediación puede ser una opción efectiva y beneficiosa para resolver conflictos médicos de manera justa y equitativa para todas las partes involucradas.

Mediación, Mediación en Salud, Mediación sanitaria, justicia alternativa, conflictos médico-legales

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Introduction

Alternative Dispute Resolution Mechanisms (ADR) are a possibility to resolve disputes without the need to go to court. The most commonly used are mediation, conciliation and arbitration. Mediation is an alternative in conflict resolution, recognised by the culture of peace, which facilitates the understanding and comprehension of the interests and needs of the conflicting parties, seeking the best way to reach an agreement with the intervention of a neutral and impartial third party (mediator), the guiding thread to the dialogue, based on the principles of voluntariness and confidentiality.

Mediation is a voluntary process of conflict resolution, which takes place through ethical communication during which people strive to resume dialogue in order to find a solution to their problems. During this process, a mediator accompanies them in an impartial manner and without influencing the outcome, while ensuring respect for the interests of each participant and the confidentiality of the exchanges"¹.

Mediation is seen as an alternative means of dispute resolution to reach a fair agreement that satisfies all parties and this depends largely on their willingness during the process. Mediation can result in an agreement that is considered a final and complete judgment, eliminating the need for a trial. The strength of the agreement lies in the will of the parties, and its enforcement is supervised by a judge. The agreement acquires the authority of *res judicata*, which means that it can be enforced in court if the parties do not comply with it voluntarily. If not complied with, the agreement can be challenged in court. The aim of this narrative review is to show that mediation can be an effective and beneficial option for resolving medical disputes in a way that is fair and equitable for all parties involved.

The history of ADR in Mexico

From a legal point of view, seven key historical points in the development of ADR can be identified:

- 1812 - Constitution of Cadiz: It imposed the conciliation of lawsuits as a compulsory mechanism before launching the judicial machinery, establishing the figure of conciliators in the town mayors and imperatively ordered that the conciliation instance had to be exhausted, prior to trial².
- 1824 - Constitution of Mexico: Articles 155 and 156 reaffirmed the provisions of the Cadiz Constitution.
- 1864-1843 - Within the framework of the seven laws: the concept of conciliation and arbitration as a priority method for the resolution of conflicts is raised once again.
- 1853 - Constitutional reform: Alternative Justice disappears from the constitutional provisions.
- 1997 - Ley de Justicia Alternativa de Quintana Roo (Alternative Justice Law of Quintana Roo): Measures related to alternative dispute resolution mechanisms are established and the first Legal Aid Centre is created, a decentralised body of the Judiciary³.
- 1997 to 2017 - Conciliation stages: Conciliation is established as a preliminary stage of arbitration or administrative proceedings (creation of different bodies: CONDUSEF, PROFECO, CONAMED) and mediation and restorative justice are promoted as an institutional policy of local judiciaries.
- 2017 - Constitutional reform in the area of substantive conflict resolution: Alternative Dispute Resolution Mechanisms are proposed as a means to directly address the substance of the conflict⁴.

¹ Definition agreed by the Council of Europe in 2015 following research led by Michelle Guillame-Hofnung 4(Munuera Gómez, La mediación sanitaria en Chile., 2020) (Pilar Munuera Gómez. (2020).

² The history of ADR in Mexico).



Figure 1

Lack of access to justice in Mexico

"There is a general consensus, which crosses all borders, about the ineffectiveness of justice delivery systems: the common opinion is that they do not fulfil their objectives or the tasks they are entrusted with"⁵.

Lack of access to justice is a reality that affects a large number of people around the world, especially those who lack economic resources and are far from legal institutions. This situation is further aggravated in contexts of inequality, where certain social groups face additional barriers to accessing justice, such as discrimination based on gender, race, sexual orientation or migration status.

In addition, even when a certain number of people can access justice systems, there is a high percentage who do not know the legal processes, which leads to a lack of participation and knowledge in their own case, which means that they have to rely on the lawyer they can hire, subject to the lawyer's own abilities. Thus, the relationship between the court case and those involved ends up being very distant; they lose control over the matter, and the result is a huge distrust of the whole system⁵. In addition, the slowness with which cases are resolved also discourages people from going to the judicial institutions, or puts pressure on the judges, who end up issuing rulings on the spur of the moment, without a good basis.

In medico-legal disputes, resolution requires not only legal knowledge, but also an understanding of medical issues. Hence, medical knowledge becomes relevant for the resolution of these cases, as well as for the implementation and correct orientation of ADR^{6, 7, 8}.

Failure in medico-legal disputes

The problems that have been identified in the judicial process in medico-legal cases are: slow proceedings, lack of discretion and confidentiality leading to leakage of information and biased interpretations, rigidity of the judicial system, lack of adequate medical advice, delay in assistance by professional organisations or insurance companies, difficulty in pursuing other legal avenues after failed criminal proceedings, and discredit or damage to the reputation of the medical professional⁵.

Medical care is a unique relationship in which the patient entrusts his or her health to the physician, who generally accepts the deal in exchange for financial compensation⁷. However, the patient's expectations may exceed what reality can deliver, and patient-physician communication may be hampered by a variety of factors, such as lack of time, lack of personal contact and patient mistrust.

The current culture of society privileges material satisfactions and rejects thinking about the fragility of human life and the inevitability of death and illness, leading some to assume that their ailments will always be curable and that any lack of a solution is due to errors or omissions by medical personnel⁹.

In this regard, he notes that a few decades ago the medical professional was recognised by society with honour, respect and reputation. Unfortunately, however, this recognition has been lost, in principle, due to an increase in demand for medical careers, but also due to a lack of governmental support and opportunities¹⁰.

Alternative Methods of Conflict Resolutions

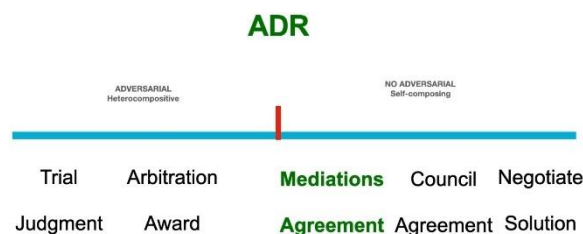


Figure 2

Principles of Alternative Dispute Resolution Mechanisms (ADR)

To speak of the principles of ADR is to refer to the duty to be of ADR Service Providers, since these criteria establish the theory and practice of the mediator during the development of an ADR session. These principles are the values, the maxims that guide and identify the actions carried out within the alternative dispute resolution procedures.

These principles are necessary to evaluate the services provided by the mediator and for the mediator to learn to evaluate himself/herself in the course of his/her personal and professional path. It should be noted that each subject or area in which ADR is applied has principles applicable to that activity and/or subject, however, there are universal principles.

With regard to the principles governing the mediation process, it is important to highlight voluntariness as one of the most relevant.

This principle implies that both parties must express their willingness to participate in the process and that it must be in force during the entire duration of the process. Furthermore, the mediator's impartiality is essential, as he/she cannot have a biased or preferential opinion towards any of the parties, but must be neutral and conduct the process in an objective manner, enhancing the positive and connecting aspects of the relationship between the people in conflict^{11,12}.

Confidentiality is another fundamental principle that obliges both the parties and the mediator to keep the information derived from the mediation process secret and not to use it in any judicial or administrative proceedings.

Likewise, the mediator's neutrality implies being detached from the legal interests of the parties, while fairness creates a level playing field for both parties. Flexibility allows for changes according to circumstances, without time limits, but always in strict compliance with the law. Only disputes established by law may be dealt with, and the resulting agreement will have legal effects comparable to a judgment.

The incomplete application of ADR in Mexico

ADR is currently gaining relevance, especially in view of the increasing number of legal claims against doctors. Hence, they are considered necessary to: 1) avoid going to court and 2) to resolve medico-legal disputes promptly. Four types are recognised in legal practice: arbitration, conciliation, mediation and negotiation.

In the medical field, few results have been obtained, with the result that more and more doctors and patients are dissatisfied with these methods, although it is true that the Alternative Justice Law has not been correctly applied. In addition, it should be noted that Alternative Justice Centres generally do not deal with health-related cases (perhaps because they are not trained in this field) and when they are referred to the public option that exists, they cannot apply the methods of the Alternative Justice Law^{13,14,15}, as they are not accredited centres and therefore cannot have certified people and therefore cannot make agreements that are considered *res judicata*.

This does not mean that the restorative acts of Mediation are not carried out in Mexico, but not with an approach and with a broad application that allows the conflict to be settled in a safe, agile, fast and confidential way, among many other benefits. Therefore, it is necessary that mediation in health should be combined by at least two mediators: the doctor, with experience in the area of the matter, and the other with a family member (this only as a generality), at least at the beginning of this system.

Mediation is the obligatory step in the evolution of doctor-patient conflict resolution, as history in other parts of the world has shown^{16,17}.

The experience of mediation in other parts of the world

It is relevant to consider the case of Chile. Law 19.966 on the Health Guarantees Regime promotes the use of mediation as a mechanism to de-judicialise conflicts over health damages, limiting the costs of compensation and providing those affected with rapid access to justice from the State Defence Council.

Likewise, in 2005, the "Regulation of Mediation for Claims against public institutional health care providers or their officials and private health care providers" was published. This regulation establishes the structure of the mediation process, with the aim of reaching agreements between the parties quickly and efficiently. In addition, it provides for a "Register of Mediators for claims against private health care providers".

In this regard, he highlights that the demand for mediation has increased from 2005 to 2018, going from 170 completed mediations, achieving settlements in 38 of them, to 1,274, with agreement in 277. Of the 136 cases resolved through mediation, 49% did not involve the payment of money, as the claimants waived taking legal action. The mediation method achieved settlements in 21% of cases over 13 years. 78% of mediations have no settlements. The professional's explanation or apology has increased from 3% to 21% in the period studied. In addition, a decrease in the number of settlements involving financial compensation and an increase in settlements after apologies and/or explanations has been observed over the 14 years of operation of the mediation system. This suggests that complainants have not taken legal action against the health services and hospitals involved. Although not all cases ended in settlement, about 80% of them did not go to trial, which helps to decongest the courts^{16,1}.

As mentioned above, ADR is the evolution of doctor-patient disputes. In the world, these conflicts have generally developed in four phases: 1) adversarial, 2) arbitration, 3) mediation and 4) restoration.

Mexico is in phase one, with an alarming increase in claims. Arbitration stands out in our country, phase two, as a stage that had its chance, but was not developed to its full potential because it belongs to an adversarial system, as its disuse is obvious, in addition to other drawbacks in the process (such as the technicality of the expert opinions on which the awards are based). Therefore, the experience of other parts of the world is of great relevance for assessing possible opportunities in Mexico.

As for the rest of the world, however, a study conducted by the Fondation Roi Baudouin hospital in 2007 analysed hospital mediation in several countries, including Canada, Finland, France, Germany, the Netherlands, Norway and the United Kingdom. The study found that four countries offered mediation services to resolve patient complaints, while six countries included mediation in the institution's quality and risk management, and in some cases also generated recommendations for new health policy. This demonstrates that mediation is an effective alternative in complaint management, even if it does not always result in settlements.

In addition, Mulcahy, Selwood and Netten conducted research sponsored by the British Department of Health over four years in the Anglia and Oxford, Northern and Yorkshire health regions, demonstrating the benefits of mediation in resolving disputes between patients and health professionals. The research highlighted that the professional's explanation of what happened generated benefits for both parties, allowing reflection on what happened and avoiding future mistakes. Patients were satisfied with the process because of the understanding of the incident in an atmosphere of dialogue, the apology by the professional and the promise of change in care policies.

In the 1980s, France started working with hospital mediators at the Paris Hospital. A medical conciliator was established to improve the relationship between health staff and patients or their families. However, Law 2002-303 abolished the conciliation commissions and replaced them with Commissions for User Relations and Quality of Medical Care. Currently, the main instances of citizen mediation in the hospital are representatives of voluntary associations, former users, doctors, retirees and patients with specific pathologies. These bodies listen to the parties and enable them to find solutions to the difficulties encountered by members of the community^{16,1}.

In Spain, the United States and Canada, the intervention of intercultural mediators has been favoured, which has allowed for better communication between health personnel and the diversity of patients, breaking down cultural and language barriers that may exist in order to resolve the conflict.

Health mediation has been able to flourish in other countries. In Mexico, this possibility exists and is present, but it has not been used adequately and in a timely manner. This is especially true in the medical field because there is a reluctance on the part of the health professional to accept it in legal procedures, which, added to the patient's lack of knowledge about the scope of the mediation procedure, has generated apparent irreconcilable situations. Likewise, the lack of technical preparation in this type of alternative procedures by health professionals also constitutes an obstacle. However, in procedures involving professional mediators and medical professionals, the results have been good

17,18,19,20,21,22,22,23,24,25,26

Conclusions

ADR is relevant because it has even been seen that the agreements reached in terms of reparation of possible or alleged harm have also shown that sometimes an explanation or an apology is enough, and in those cases where financial compensation has necessarily been needed, the figures and claims are adjusted to real and sufficient amounts. In addition, the legal costs of going to court for a long period of time are not assumed.

Mediation as a mechanism for the resolution of medico-legal conflicts is the necessary alternative for a clean and transparent practice of health professionals, with adequate knowledge of the patients, which translates into greater peace of mind for all parties, since it aims to preserve the relationship between doctor and patient, especially when a medical activity results in an undesired consequence that harms the patient.

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Productivity of medical services of a medical care program in the state of Tabasco**Productividad de los servicios médicos de un programa de atención médica en el estado de Tabasco**

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Abstract

The productivity of the medical services of the Medical Care program in the state of Tabasco aims to optimize human, material, capital and financial resources in an effective and efficient way, as an integral process system in the state of Tabasco, requires proper and systematic management that improves the production process and offers advantages in its monitoring for its availability at the appropriate place and time. In the Methodology, the Structural Analysis was used, where the Brainstorming technique was considered, with the participation of 4 chief coordinators of the medical care program in Tabasco, who provided the information for the investigation. His contribution will be to support the health services manager to make decisions that allow optimizing productivity and the rational use of resources, contributing to improving access and quality of medical care.

Resumen

La productividad de los servicios médicos del programa de Atención Médica en el estado de Tabasco tiene como objetivo la optimización de los recursos humanos, materiales, de capital y financieros de una manera eficaz y eficiente, como sistema integral de proceso en el estado de Tabasco, requiere un manejo adecuado y sistemático que mejore el proceso productivo y que ofrezca ventajas en su monitoreo para su disponibilidad en lugar y momento apropiado. En la Metodología se utilizó el Análisis estructural, donde se consideró la técnica de lluvia de ideas (Brainstorming), con la participación de 5 jefes coordinadores del programa de atención médica en Tabasco, quienes proporcionaron la información para la investigación. Su contribución estará en apoyar al gerente de servicios de salud a tomar decisiones que permitan optimizar la productividad y el uso racional de los recursos, contribuyendo a mejorar el acceso y la calidad de la atención médica.

Medical service, Productivity, Factors**Servicio médico, Productividad, Factores**

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Introduction

In the research presented here, an analysis of the productivity of a medical care programme in the state of Tabasco is carried out, the medical care indicator, dental care and health promotion actions will be considered since it was concluded that these are the ones that need to be studied in order to obtain relevant results that help to propose an improvement proposal for this programme and in turn be reflected in the general population of the state of Tabasco.

As productivity generates wealth and improves the standard of living for the population of a country, it is a tool to produce more with the available resources and this better use of resources and/or the reduction of production costs makes companies and countries more competitive, which results in higher profits and is reflected in a better standard of living for the inhabitants.

Research background. The research that has been carried out on the subject of business productivity and logistics provides information on the strategies and indicators that maintain the positioning of the productive sector under an integral scheme, some important aspects that are pointed out are the following: in the article "Productivity and its factors: incidence in organisational improvement" by Fontalvo-Herrera, Tomás; De La Hoz-Granadillo, Efraín & Morelos-Gómez, José (2017); they point out that productivity is very important in the management of companies as this indicator can give us the knowledge of the resources that are being consumed to achieve business objectives in the same way tells us that this concept is closely linked to the concepts of efficiency and effectiveness; and with these indicators we can assess the ability of an organisation to meet its goals and optimise its resources. He also says that it is worth highlighting the contribution of technology to the increase in productivity of companies, as it speeds up processes and reduces activity times, making production faster. In the article "Key factors in the evaluation of productivity: a case study".

Franco-López, J. A., Uribe-Gómez, J. A., Agudelo-Vallejo, S. (2021), points out that productivity is the support for the growth of any organisation and to achieve this it is necessary to improve the perceptions and valuations given by employees and this will allow a greater aggregate offer to the market, as long as it is linked to the concept of sustainability, achieving productivity with sustainability must be the paradigm of all levels of society, from the economic policy of the State, the healthy habits in consumption and the contribution that productive organisations must make. It means thinking and acting for future generations.

Problem statement. The need for health care for people without social security, especially those who live in regions with high and very high marginalisation, in municipalities that present an index of very high marginalisation and that do not have the presence of fixed health services, in areas that do not have comprehensive health actions that help to have the approach of health services, according to the WHO (World Health Organisation), in low and middle income countries, the coverage of services is still much lower than that of the richest countries. This severe inadequacy of coverage in resource-poor settings means that overall access to essential health services remains far below the optimal level (World Health Statistics 2020.pdf). According to the information registered in the dynamic cubes platform of the General Directorate of Health Information (DGIS): The indicator of medical consultations, in 2020 and 2021 compared to the other indicators (dental consultation and promotion actions) are lower, this decrease is due to the fact that doctors were commissioned to COVID care areas and stopped going to their localities. Of the 17 municipalities in the state of Tabasco, the municipalities of Balancán and Tenosique are the most marginalised in terms of health.

Justification. The research will provide a good understanding of the current scenario of medical services, through a diagnosis. This will help to design strategies to improve the medical services of the health care programme.

Objectives: To make a diagnosis to obtain a real panorama of the productivity of the health services of the medical care programme in the state of Tabasco. To generate a comprehensive proposal for improvement.

Contextual framework

International Context

In the Spanish autonomous community of Euskadi, as in high-income countries, chronic diseases represent the dominant epidemiological pattern. It is estimated that they currently account for 80% of interactions with the Health System. In the Basque Country, they consume more than 77% of health spending. In addition, there is a lack of integration of the health system with the social resources associated with health, which, as we have seen, are of substantial importance for the chronically ill.

According to the Basque Government's Department of Health and Consumer Affairs in its strategy for tackling the challenge of chronicity in the Basque Country in July 2010, the Basque Government is looking for ways to make its health system more efficient and more productive for society. National Context: In the communiqué issued by the Mexican Social Security Institute on 26 February 2020, they comment that, through the training of its specialists and the expansion of the hospital network licensed for procurement, the IMSS increases its productivity. In Mexico, more than 23,000 patients are on the waiting list for transplants, of which 70 per cent - 16,000 - are Mexican Social Security Institute (IMSS) patients.

To increase productivity by up to 10 percent annually, various mechanisms have been implemented through training and expansion of the hospital network to perform these interventions. IMSS nationally, in the period from September 2021 to June 2022, reported an increase of 4,369 net employment positions, of which 135 are trust positions and 4,234 basic positions.

And through the Programme to Strengthen Medical Care in hard-to-reach communities, in the same period, 485 resident doctors were hired for itinerant community social work, 60 management staff and 1,429 operational workers. Local Context: It can be observed that over time, efforts have been made to improve health services in the state of Tabasco, with the strengthening of medical areas with recent technology equipment, timely supply of medicines and improvement of patient care, as in the case of the Dr. Gustavo A. Rovirosa Hospital. Gustavo A. Rovirosa this supported by the press release No. 134/2015, which comments on exceeding the productivity of 2014 with 3 thousand 058 surgical procedures, 1 thousand 446 births and 8 thousand 850 radiological studies are some of the productivity indicators achieved by the nosocomio in the first four months of 2015.

Theoretical framework

Productivity: Productivity is the ratio of outputs (goods and services) to one or more inputs (resources such as labour and capital)" (Render, Barry, 2014, p.13). Resources are managed by people, who put all their efforts to produce goods and services efficiently, improving this production more and more, so any intervention to improve productivity in the organisation has its genesis in people (Singh, 2008). From the managerial point of view, productivity is understood as the output/input ratio, so it is a results-oriented variable and is a function of the behaviour of workers and other aspects outside the work environment (Fernández Ríos & Sánchez, 1997). Importance of Productivity: Productivity is represented in our daily life, everything is based on it, from the basis of society which is the family to the large companies or governments in our country, if we are not productive as people, society, companies or government we have a direct impact on the global economy. The relevance of productivity is related to the growth of an organisation. By improving efficiency in production processes, companies have ample room to generate actions and strategies that allow them to obtain greater profitability, such as, for example, placing more attractive prices in the market, or having the capacity to satisfy large volumes of orders.

By understanding what productivity is and its importance, companies can achieve higher profits by attracting new customers, facilitating investment in innovation projects and improvement plans. (BBVA, 2023). Importance of medical services: Medical services are of great importance for all countries, as the impact they have on their economies can be observed through data, which is why it is considered of utmost importance to generate strategies that help to improve them. The International Labour Organisation stresses the importance of health services as one of the fundamental sectors of society and the economy. The ILO endorses the fundamental principles of the human right to health and social protection. Providing social protection for health and equal access to quality health care has considerable positive effects on individual and public health, as well as enhancing economic growth and development. The health sector is also an important employment sector, with great potential for employment generation.

Methodology

The research is considered descriptive because the study variables are not manipulated, but are observed as they occur naturally. They will be described, and to describe is to measure. It is considered documentary because it attempts to obtain, analyse, interpret and compare information about an object of study from a collection of documentary sources (audiovisual records, books or archival documents).

The orientation of this research is more descriptive-deductive in scope, since it seeks to specify important properties and characteristics of any phenomenon that is analysed, and which seeks to specify the properties, characteristics and profiles of people, groups, communities, processes or any other phenomenon that is subjected to analysis (productivity of the medical services of the Medical Care programme), in order to describe trends in a group or population. It is also considered correlational, because it will determine how each of the independent variables (economic, political, social, cultural, environmental and technological) influences the research variable (the productivity of medical services).

To gather the information, four rounds of talks were held beforehand with the five actors in the Medical Care programme, and three experts were identified who have extensive knowledge of the information on the programme's productivity, followed by a meeting in which the tool known as brainstorming was applied as part of the structural analysis to detect the fundamental factors associated with the research variables. It is a tool that allows us to obtain information directly from the programme strategists.

Through the brainstorming applied to the expert strategists of the Health Care programme, fourteen factors associated with the context variables (economic, technological, cultural, social, technological and environmental) that the experts consider to have an impact on the Health Care programme are obtained and listed, as shown in figure 1.

| Factor | Description |
|--------|-------------|
| F1 | |
| F2 | |
| F3 | |
| F4 | |
| F5 | |
| F6 | |
| F7 | |
| F8 | |
| F9 | |
| F10 | |
| F11 | |
| F12 | |
| F13 | |
| F14 | |

Figure 1 Factors associated with the context variables
Source: Own elaboration 2023

Subsequently, the double-entry matrix is generated (figure 2), known as such because the factors are present vertically and horizontally with a direct influence between each of the factors, using the binary system (0 and 1), indicating with a number 1, when one of the factors influences another factor and with a 0, when it has no influence on the other factor. With a (-) when a factor cannot be related to the same factor in the other input.

The sum of the factors horizontally is called motoricity which is the degree of influence of the factor and the sum of the factors vertically is called factor dependence.

| Influence of/on | | Direct influence | | | | | | | | | | | | | | |
|-----------------|----------------------------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|----------------|
| Factor | Description | F 1 | F 2 | F 3 | F 4 | F 5 | F 6 | F 7 | F 8 | F 9 | F 10 | F 11 | F 12 | F 13 | F 14 | Total mobility |
| F 1 | Transfer of budgetary resources. | | | | | | | | | | | | | | | |
| F 2 | Incomplete template. | | | | | | | | | | | | | | | |
| F 3 | | | | | | | | | | | | | | | | |
| F 4 | | | | | | | | | | | | | | | | |
| F 5 | | | | | | | | | | | | | | | | |
| F 6 | | | | | | | | | | | | | | | | |
| F 7 | | | | | | | | | | | | | | | | |
| F 8 | | | | | | | | | | | | | | | | |
| F 9 | | | | | | | | | | | | | | | | |
| F 10 | | | | | | | | | | | | | | | | |
| F 11 | | | | | | | | | | | | | | | | |
| F 12 | | | | | | | | | | | | | | | | |
| F 13 | | | | | | | | | | | | | | | | |
| F 14 | | | | | | | | | | | | | | | | |
| | Total dependency | | | | | | | | | | | | | | | |

Figure 2 Double-entry matrix
Source: Own elaboration, 2023

The values of motoricity and dependence are obtained by dividing the value of each factor by the total sum of all the factors and then multiplying by 100, arriving at the percentage that each factor represents on the X and Y axes. Once the percentages have been identified, we proceed to list them in values of Dependence (X) and values of Motricity (Y), in order to subsequently position them in the corresponding quadrant. Then 4 quadrants are constructed (figure 3), in a Cartesian plane. In order to define the quadrants in which each of the factors belong, the total number of factors must be divided, which in this case are fourteen by one hundred, $(100/14) = 7.14$, and the initial quadrant (autonomous problem area) is placed. The quadrants are: Power Zone, Conflict Zone, Autonomous Problem Zone and Exit Zone,

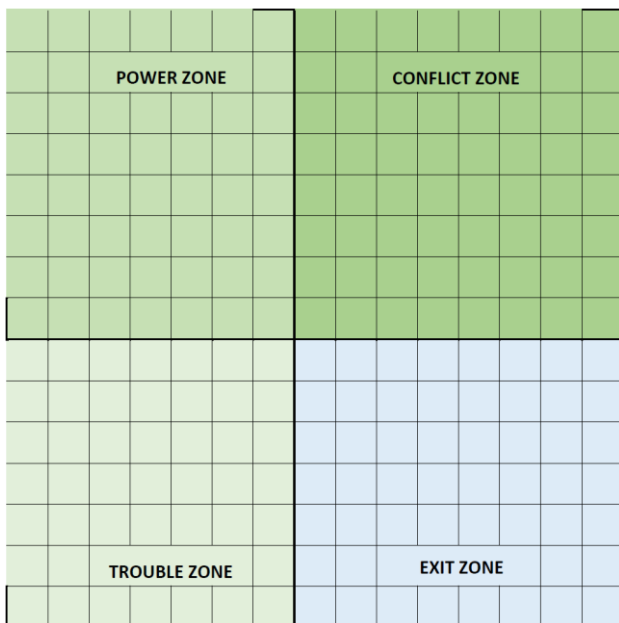


Figure 3 Quadrants
Source: Own elaboration, 2023

Results

Information on programme productivity, obtained from the meetings held with expert strategists of the Health Care programme, is presented in Figure 4 below. 14 factors associated with the context variables were identified.

| Factor | Description |
|--------|---|
| F 1 | Transfer of budgetary resources. |
| F 2 | Incomplete staffing. |
| F 3 | Maintenance of mobile units. |
| F 4 | Conclusion of agreements. |
| F 5 | Collaboration of municipal authorities. |
| F 6 | Existence of harmful fauna. |
| F 7 | Flora that makes access to communities difficult. |
| F 8 | Local customs. |
| F 9 | Indigenous languages. |
| F 10 | Virtual training. |
| F 11 | Productivity platforms. |
| F 12 | Insecurity. |
| F 13 | Community participation. |
| F 14 | Migration. |

Figure 4 Factors associated with the context variables
Source: Own elaboration, 2023

The double-entry matrix is then generated (Figure 5), as explained in the previous Methodology section.

| Influence of/on | | Direct influence | | | | | | | | | | | | | | |
|-----------------|---|------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|----------------|
| Factor | Description | F 1 | F 2 | F 3 | F 4 | F 5 | F 6 | F 7 | F 8 | F 9 | F 10 | F 11 | F 12 | F 13 | F 14 | Total mobility |
| F 1 | Transfer of budgetary resources. | - | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| F 2 | Incomplete staff. | 1 | - | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| F 3 | Maintenance of mobile units. | 1 | 0 | - | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| F 4 | Conclusion of agreements. | 1 | 1 | 1 | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| F 5 | Collaboration of municipal authorities. | 0 | 0 | 0 | 0 | - | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 4 |
| F 6 | Existence of harmful fauna. | 0 | 1 | 0 | 0 | 1 | - | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 4 |
| F 7 | Flora hindering access to communities. | 0 | 1 | 1 | 0 | 1 | 1 | - | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| F 8 | Local customs. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 1 | 1 | 1 | 0 | 1 | 0 | 4 |
| F 9 | Indigenous languages. | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | - | 0 | 0 | 0 | 1 | 0 | 3 |
| F 10 | Virtual trainings. | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | 1 | 0 | 1 | 0 | 3 |
| F 11 | Productivity platforms. | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | - | 0 | 0 | 0 | 0 | 2 |
| F 12 | Insecurity. | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | - | 1 | 1 | 5 | |
| F 13 | Community participation. | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | - | 0 | 3 | |
| F 14 | Migration. | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | - | 8 |
| | Total Dependency | 5 | 7 | 4 | 3 | 5 | 2 | 1 | 6 | 2 | 4 | 5 | 2 | 7 | 1 | 54 |

Figure 5 Double-entry matrix
Source: Own elaboration, 2023

Next, the values of Motricity and Dependence are obtained by dividing the value of each factor by the total sum of all the factors and then multiplying by 100, arriving at the percentage that each factor represents on the X and Y axes, Figure 6.

| Factor | Description | Motor values | Percentage Y | Dependency values | Percentage X |
|--------------|---|--------------|--------------|-------------------|--------------|
| F 1 | Transfer of budgetary resources. | 4 | 7.41% | 5 | 9.26% |
| F 2 | Incomplete staffing. | 4 | 7.41% | 7 | 12.96% |
| F 3 | Maintenance of mobile units. | 3 | 3.70% | 4 | 7.41% |
| F 4 | Conclusion of agreements. | 3 | 5.56% | 3 | 5.56% |
| F 5 | Collaboration of municipal authorities. | 4 | 7.41% | 5 | 9.26% |
| F 6 | Existence of harmful fauna. | 4 | 7.41% | 2 | 3.70% |
| F 7 | Flora that hinders access to communities. | 5 | 9.26% | 1 | 1.85% |
| F 8 | Local customs. | 4 | 7.41% | 6 | 11.11% |
| F 9 | Indigenous languages. | 3 | 5.56% | 2 | 3.70% |
| F 10 | Virtual training. | 3 | 5.56% | 4 | 7.41% |
| F 11 | Productivity platforms. | 2 | 3.70% | 5 | 9.26% |
| F 12 | Insecurity. | 5 | 9.26% | 2 | 3.70% |
| F 13 | Community participation. | 3 | 5.56% | 7 | 12.96% |
| F 14 | Migration. | 8 | 14.81% | 1 | 1.85% |
| Total | | 54 | 100% | 54 | 100% |

Figure 6 Double-entry matrix, Percentage of factors
Source: Own elaboration, 2023

Once the percentages have been identified, they are listed and then positioned in the corresponding quadrant, figure 7.

| Factor | Dependency values (X) | Motor values (Y) |
|--------|-----------------------|------------------|
| F 1 | 9.26% | 7.41% |
| F 2 | 12.96% | 7.41% |
| F 3 | 7.41% | 3.70% |
| F 4 | 5.56% | 5.56% |
| F 5 | 9.26% | 7.41% |
| F 6 | 3.70% | 7.41% |
| F 7 | 1.85% | 9.26% |
| F 8 | 11.11% | 7.41% |
| F 9 | 3.70% | 5.56% |
| F 10 | 7.41% | 5.56% |
| F 11 | 9.26% | 3.70% |
| F 12 | 3.70% | 9.26% |
| F 13 | 12.96% | 5.56% |
| F 14 | 1.85% | 14.81% |

Figure 7 Percentages of factors for dependency and Motor values
Source: Own elaboration, 2023

Then the 4 quadrants (figure 8) are constructed on a Cartesian plane - in order to define the quadrants in which each of the factors belong.

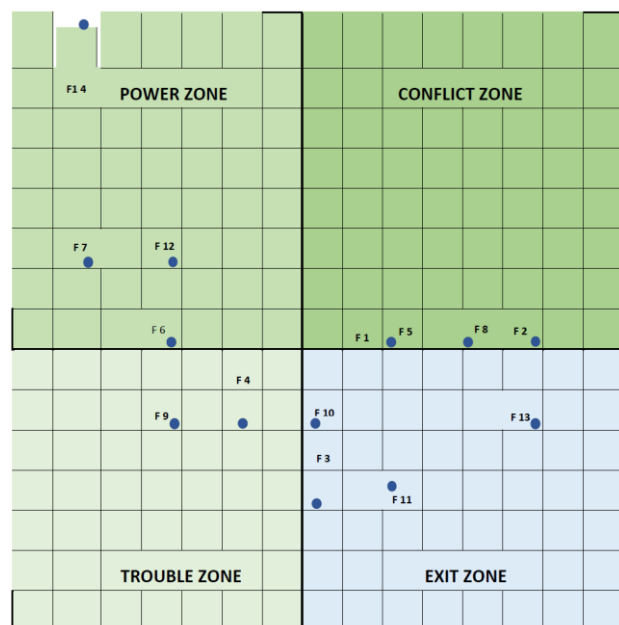


Figure 8 Quadrants with power zones
Source: Own elaboration, 2023

The result is that factors F1, F2, F5 and F8 are found in the conflict zone; therefore, it is recommended that alternatives for the organisation be sought for these factors so that they cease to influence and depend on each other.

| | |
|-----|---|
| F 1 | Transfer of budgetary resources. |
| F 2 | Incomplete staffing. |
| F 5 | Collaboration of municipal authorities. |
| F 8 | Local customs. |

In the power zone we have four factors which are F6, F7, F12 and F14 which we have to take care of because they have a high mobility and influence the other factors.

| | |
|------|---|
| F 6 | Existence of harmful fauna. |
| F 7 | Flora that makes access to communities difficult. |
| F 12 | Insecurity. |
| F 14 | Migration. |

We have two factors in the autonomous problem zone quadrant, F4 and F9, which are less problematic as they have low motor skills and dependence.

| | |
|-----|---------------------------|
| F 4 | Conclusion of agreements. |
| F 9 | Indigenous languages. |

In the exit zone we can observe four factors that represent less of a problem due to their low motoricity and low dependence, namely: F3, F10, F11 and F13.

| | |
|------|------------------------------|
| F 3 | Maintenance of mobile units. |
| F 10 | Virtual training. |
| F 11 | Productivity platforms. |
| F 13 | Community participation. |

It was possible to identify that the context variables that most affect the productivity of medical care are the social variable (incomplete staff), the cultural variable (local customs), the economic variable (transfer of budgetary resources) and the political variable (collaboration of municipal authorities).

Conclusions

The tools used in this research were key to the information of the same, since we had the opportunity to have the intervention of the medical area management personnel of the state of Tabasco. Therefore, the objective was achieved.

Attention will be paid to the factors identified that affect the productivity of medical care in the state, and also to all the factors identified in the research, but especially those in the conflict zone.

Recommendations

That health institutions in the state of Tabasco have greater communication with government authorities, so that they can achieve greater economic, social and cultural support for medical service programmes, and this will benefit the productivity of medical services.

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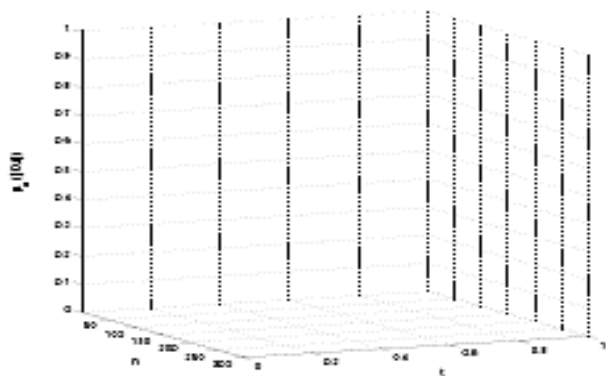
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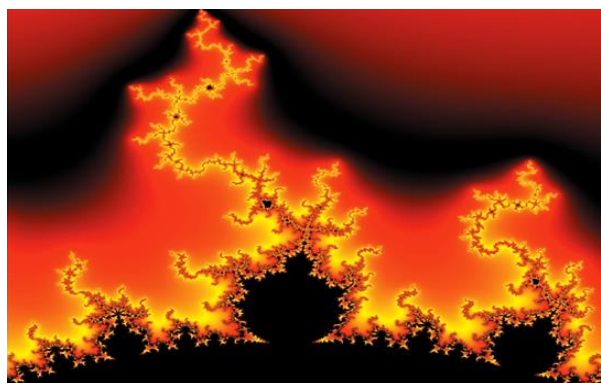


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