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Research Article

Family Functionality and Its Relationship with Depression and Anxiety in Recovered COVID-19 Patients in a Primary Care Center of Tijuana, Mexico

Salazar-Perfecto MA*, Ruiz-Gonzalez F, Sanchez-Sanchez SS, Lopez-Hernandez JN, Ramonetti-Armenta MF and Alvarez-Franco CA

Department of Family Medicine, Family Medicine Unit #27, IMSS, Baja California, Mexico

***Corresponding author:** Salazar-Perfecto Mozelle Alin, Department of Family Medicine, Family Medicine Unit #27, IMSS, Baja California, Mexico

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Abstract

Background: In the coronavirus infection, it is important to consider the neuropsychiatric implications; preliminary studies of this new pandemic suggest that patients with COVID-19 may experience depression and anxiety. In that way, family functionality is a determining factor in health preservation of patients with mental disorders and COVID-19.

Objective: To determine the family functionality and its relationship with depression and anxiety in recovered COVID-19 patients in a primary care center of Tijuana, Mexico.

Methods: A review of clinical records of patients with COVID-19 was carried out at the Family Medicine Unit #27 in Tijuana, Mexico, from July to December 2020. A descriptive cross-sectional study was implemented to know the frequency of depression, anxiety and family functionality in recovered COVID-19 patients. Symptoms of depression were assessed with the Trait Depression Inventory – IDERE. Anxiety was measurement with Spielberger's Trait Anxiety Inventory. Family functionality was determined with family APGAR. Quantitative variables were described as median and interquartile range (IQR), and qualitative variables were expressed as frequency and percentage. The assumption of normality was made by the Kolmogorov-Smirnov test. The Chi-squared test was used to analyze differences in categorical variables, and the Odds ratio was used to calculate risk.

Results: 560 patients were studied, of which 179 met the selection criteria and 151 entered the study. 54.31% of patients have moderate to severe symptoms of depression, 80.13% moderate to severe symptoms of anxiety and 18.54% alteration in family functionality.

Conclusions: COVID-19 is a public health problem that affects multiple dimensions with significant repercussions. It is necessary to apply an early biopsychosocial approach to treat these alterations and avoid their chronicity in order to improve quality life of these patients.

Keywords: COVID-19; Depression; Anxiety

Introduction

Coronaviruses (COV) are members of the Coronaviridae family, a long single-stranded RNA virus with genomes ranging from 26 to 32 kilonucleotics. There are 7 viruses of this family that affect humans. The newest is SARS-CoV-2; this COV emerged in December 2019 in the city of Wuhan (China) which is the cause of the disease known as COVID-19 [1]. The route of transmission of SARS-CoV-2 is by air, allowing the virus into the respiratory tract of the host, attacking the cells of the alveolar epithelium type 2. In this location, the peak proteins of SARS-CoV-2 bind to ACE-2 receptors. These receptors are also found in the tubular epithelium of the kidney, heart, enterocytes, pancreas and endothelial cells, causing damage to these organs. The virus also releases inflammatory mediators, activating macrophages which release cytokines (IL-1, IL.6 and TNFα) and chemokines (CXCL10 and CCL2). All of these abnormal inflammatory responses can lead to septic shock and multiple organ failure [2].

SARS-CoV-2 infection generally causes mild or moderate respiratory illnesses such as the common cold, however due to its pathogenic mechanisms it has the potential to cause more serious illnesses. The main symptoms are headache, cough, fever, and odynophagia, which can progress to serious symptoms such as dyspnea, chest pain and kidney failure [3]. The complications of this disease are multiple and varied, for that reason it is important to contemplate the neuropsychiatric implications. Preliminary studies of this new pandemic suggest that patients with COVID-19 may experience delirium, depression, anxiety and insomnia. These psychopathological sequelae can develop by direct viral infection of the central nervous system or indirectly through an immune response. This is how the interaction between the adaptive, innate immune system and neurotransmissions emerged as a triggering mechanism for mood disorders, psychosis and anxiety disorders [4].

In that way, depression is a disorder characterized by a decrease in

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mood with loss of interest or pleasure in activities that were previously enjoyed, which if not attended can be aggravated with complications like death, suicidal ideation and autolysis. Anxiety disorders are those characterized by excessive fear and anxiety that produce behavioral disturbances. Fear is an emotional response to a real or imagined imminent threat, while anxiety is an anticipatory response to a future threat [5]. As the pandemic spreads throughout the world, it causes fear in the general population, in the same way due to the change in routines, uncertainty, economic pressures, social isolation and fear of getting sick. COVID-19 increases the sensation of stress, anxiety, fear, sadness and loneliness, which increases the possibility of mental health impairment [6].

Internationally research shows that fear of the unknown and uncertainty can lead to mental illnesses such as stress and depression disorders in general population, during the first phase of the pandemic, the presence of moderate to severe depressive symptoms were 16.5% and 28.8% for anxiety [7]. This pattern is constant in other populations where national surveys show a high prevalence of psychological distress in the population during the COVID-19 pandemic, reporting 35% in the Republic of China, 60% in Iran, 45% in the United States and 66% in India [8].

In Mexico, on February 27, 2020, the first case of Coronavirus disease was reported and the cases were increasing rapidly [9]. The second week of April 2020, the Research Institute for Development with Equity (EQUIDE) in partnership with the QUANTOS Company (statistical consultancy), conducted the EN-COVID19 survey to estimate the prevalence of anxiety and depression in population over 18 years, the presence of severe anxiety symptoms was 32.42% and symptoms of depression in 27.26% of the cases [10]. In Baja California (Mexicali), in February 2021, a study was carried out in the university of Mexicali, it was found that 19.7% of the students with a family member affected by COVID-19 had depression; in students with a history of COVID-19 infection, 13.6% developed depression [11].

The COVID-19 pandemic produces vital changes for society. Families have had to adapt to new routines, which directly influences the functioning and well-being of all family members. In the case of families with a history of negative relationships, it can increase or aggravate the suffering of emotional symptoms. Otherwise, families with positive relationships may experience resilience and post-traumatic growth [12]. The most important social defense mechanism is the family. Family functionality is a determining factor in the preservation of health in its members, and in patients with mental disorders it is essential to reduce the probability of relapses, the less need for hospital admission as they achieve greater symptomatologic and emotional stability, which ends in a favorable quality of life for the patient and the rest of the family members. The psychological and social aspects must be treated with the same priority as physical alterations [13].

The National Human Rights Commission of Mexico in its report of healthy family environments during the COVID-19 quarantine affirms that due to the pandemic, financial problems, isolation, situations of intrafamily violence may increase, causing family stress and various types of crisis that will favor the presence of emotional alterations. In that way, it is important to create preventive strategies focused on minimizing these crises by promoting communication in family members, improving interpersonal relationships and call to support centers during crises [14]. The objective of the research is to determine the family functionality and its relationship with depression and anxiety in recovered COVID-19 patients in a primary care center of Tijuana, Mexico.

Materials and Methods

Study design and population

An analytic cross-sectional study was carried out in Tijuana, Mexico between July to December 2020. The research was developed at the family medicine unit #27 of the Instituto Mexicano del Seguro Social (IMSS), a primary level care center. The patients with SARS-CoV-2 at SINOLAVE records were included. Patients without confirmatory test by PCR, incomplete records, death, history of depression and anxiety in treatment were excluded. Patients with incomplete information were eliminated from the study.

Variables

The collection of variables was done with a standardized data form; the variables collected were the following: sex, age, marital status, occupation, schooling. The diagnosis of Family Functionality was made with the family APGAR questionnaire which is validated in Mexico and has a correlation index of 0.83. For the diagnosis of Depression, we used the Trait Depression Inventory, which has been validated for Ibero-American countries including Mexico and has a Cronbach's alpha of 0.78. Finally, the anxiety disorder was identified by applying Spielberger's Trait Anxiety Inventory, which has been validated in Mexican population with a Cronbach's alpha of 0.81.

Statistical analysis

Quantitative variables were described as mean and standard deviation (SD), and qualitative variables were expressed as frequency and percentage. The assumption of normality was made by the Kolmogorov-Smirnov test. The Chi-squared test was used to analyze differences in categorical variables, and the Odds ratio was used to calculate risk.

Ethics

The study was approved by the Local Committee for Ethics and Health Research number 204, with registration number R-2021-204-032. The research was conducted under the General Health Law on Health Research, the Declaration of Helsinki and bioethical principles.

Results

We found 560 patients with COVID-19 from July to December 2020, of which 179 met the inclusion criteria and 151 were included in the study. Of the 151 patients included, a mean of 39.02 years (SD ± 10.68) were found. 26 patients were between 18-28 years (17.22%), 53 between 29-38 years (35.10%) 42 between 39-48 years (27.81%), 24 between 49-58 years (15.89%), 4 between 59-68 years (2.65%) and 2 patients between 60-78 years (1.32%) (Figure 1). Of the total number of patients included in the study, 87 patients were female (57.62%) and 64 patients were male (42.38%). According to their occupation, 80 patients were employees (52.98%), 4 merchants (2.65%), 14 were dedicated to the home (9.27%), 2 retired (1.32%), 1 student (0.66%) and 50 professionals (33.11%). In schooling, 23 patients had primary

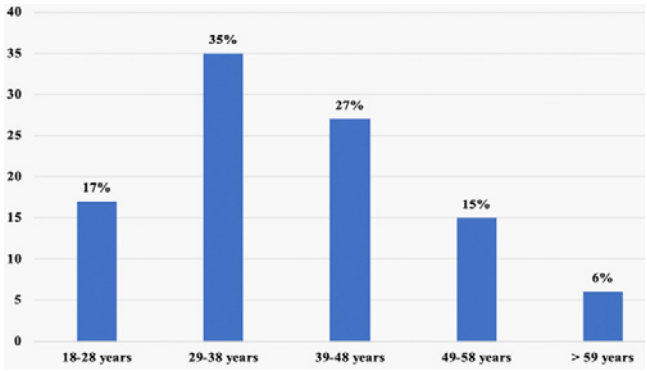

Figure 1: Frequency of age distribution (n=151).

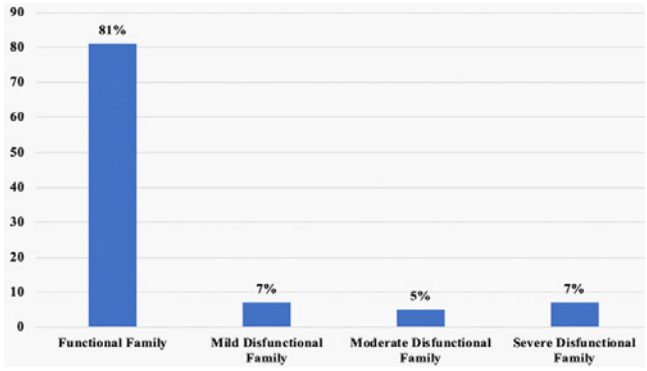

Figure 2: Frequency of family functionality (n=151).

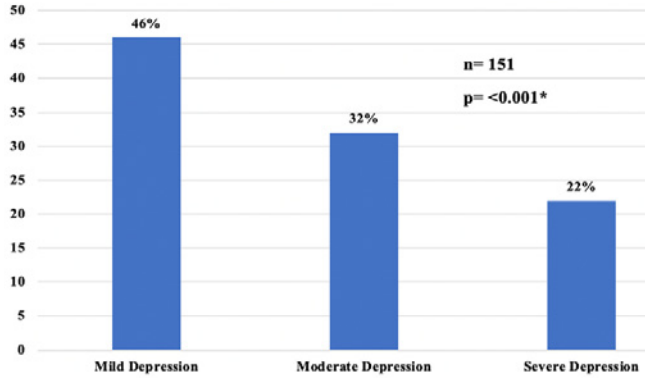

Figure 3: Frequency of depression levels.
*Association with family functionality.

(15.23%), 31 secondary (20.53%), 39 high school (25.83%), 33 bachelor's degree (21.85%) and 25 postgraduate (16.56%).

In the marital status, 44 were single (29.14%), 67 married (44.37%), 33 common law (21.85%), 1 widowed (0.66%) and 4 divorced (3.97%). To determine the perception of family functionality, the Family APGAR scale was applied, resulting in 123 functional families (81.46%), 11 patients with mild family dysfunction (7.28%), 7 patients with moderate family dysfunction (4.64%) and 10 patients with severe family dysfunction (6.62%) (Figure 2). In the anxiety level, 30 patients had low anxiety levels (19.87%), 63 with moderate anxiety (41.72%) and 58 with high anxiety levels (38.41%). In depression, 69

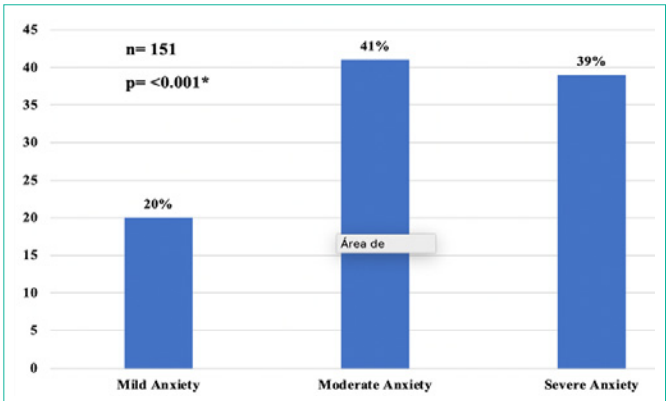

Figure 4: Frequency of Anxiety levels.
*Association with family functionality.

patients had low level of depression (45.70%), 48 moderate (31.79%) and 34 high (22.52%). The frequency of anxiety and depression and its association with family functionality can be seen in Figure 3 and 4.

To establish the relationship between family functionality and anxiety in patients with COVID, the Chi-square test was used by reason of plausibility, giving a value of 28.866 (p= <0.001), a significant relationship is found between these variables. Kendall's Tau test was implemented giving a value of 0.210 (p = <0.001), finding a low correlation strength between these variables. In the relationship between family functionality and depression a value of 42.386 (p = <0.001) was found, for which a significant relationship is found between these variables. Similarly, Kendall's Tau test was used, giving a value of 0.280 (p = <0.001) finding a low correlation strength between these variables.

Discussion

In the coronavirus infection, it is important to consider the neuropsychiatric implications; preliminary studies by Gennaro-Mazza suggest that patients with COVID-19 may experience delirium, depression, anxiety and insomnia [4]. These psychopathological sequelae may develop due to direct viral infection of the central nervous system or indirectly through an immune response. This is how the interaction between the adaptive, innate immune system and neurotransmissions emerged as a triggering mechanism for mood disorders, psychosis and anxiety disorders. From the onset of the COVID-19 pandemic in Wuhan China in 2019 during Phase I, depressive symptoms increased 16.5% and anxiety 28.8% in this community as reported by Wang et al [2,7]. The UN reports a constant rise in the prevalence of emotional disorders in other international communities such as India (66%), Iran (60%) and the United States (45%) [8].

In Mexico, IBERO EQUIDE carried out an estimate of the prevalence of anxiety and depression during phase I of the pandemic, where the presence of severe anxiety symptoms was reported in 32.42% and symptoms of depression in 27.26% [10]. Which are higher than those reported in the study by Wang et al during Phase I in the Republic of China. In our results we found that 54.31% of the patients participating presented moderate and high levels of depression and anxiety [7], which is congruent with the UN results [8]. The need of update in mental health it is a necessity of medical personnel and the

results of our study correlates this affirmation.

According to Prime et al, families have to adapt to new routines and situations in this pandemic, which directly influences the functioning and well-being of all family members, it is known that in the case of families with a history of negative relationships it can be increased or aggravated suffering from emotional symptoms or, on the other hand, through positive relationships, could develop resilience and post-traumatic growth [12]. Family functionality has been related to the presence and intensity of depressive symptoms according to Rodríguez et al, who carried out a correlational study between family functionality and depression in the City of Mexicali Mexico, obtaining a statistical significance ($p = <0.001$). In our study we found in the same way a significant relationship between the variables of family functionality and mental disorders (depression and anxiety, $p = <0.001$) [15].

In the perception of family functionality, it was found that 18.54% have a perception of mild to severe dysfunction and 81.46% perceive good family functionality, which is consistent with others studies in Mexico, the majority of patients 68.9-84.6% perceive good family functionality as reported by Jiménez-Aguilera and Peñarrieta [16,17]. Among the strengths of this study, we find that it is the first of its kind in this region of the country and this valuable information is currently not available in this region. It is important to highlight the use of instruments designed specifically for the screening of depression and anxiety as important tools in the early diagnosis of these diseases. The use of the Family APGAR as an instrument to assess the perception of the individual's family functionality is simple as it is short and evaluates the 5 basic components of family functionality.

Conclusions

Depression and anxiety disorders are pathologies which have a significant impact on the quality of life. The literature and this work show an increase in the incidence and prevalence in the population, it is extremely important to implement tools and intentional search for cases in these patients to make early diagnoses and timely management, considering that the family should be included in research and medical interventions. There are no studies that assess the relationship between the variables that we study in this population.

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