Covid-19 Pandemic Impact in Pediatricians: Stress Factors and their Consequences

Ana Muñoz Lozón

Hospital Universitario Infanta Leonor

Arístides Rivas García

b. Hospital General Universitario Gregorio Marañón. Unidad de Urgencias de Pediatría. Madrid, Spain.

Leticia González Vives

Hospital Universitario Infanta Leonor

María Cristina Muñoz López

Hospital Universitario Infanta Leonor

Ana Jové Blanco

b. Hospital General Universitario Gregorio Marañón. Unidad de Urgencias de Pediatría. Madrid, Spain.

CLARA FERRERO GARCÍA- LOYGORRI (✉ claraferrerogl@gmail.com)

b. Hospital General Universitario Gregorio Marañón. Unidad de Urgencias de Pediatría. Madrid, Spain.

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COVID-19 PANDEMIC IMPACT IN PEDIATRICIANS: STRESS FACTORS AND THEIR CONSEQUENCES

AUTHOR INFORMATION:

Ana Muñoz Lozón^a amunozlozon@gmail.com

Arístides Rivas García^b aristides.rivas@salud.madrid.org

Leticia González Vives^a leticiagvives@gmail.com

María Cristina Muñoz López^a mcristml@hotmail.com

Ana Jové Blanco^b ajoveblanco22@gmail.com

Clara Ferrero García- Loygorri^b claraferrerogl@gmail.com

a. Hospital Universitario Infanta Leonor. Madrid, Spain.

b. Hospital General Universitario Gregorio Marañón. Unidad de Urgencias de Pediatría. Madrid, Spain.

Corresponding autor: Clara Ferrero García- Loygorri. claraferrerogl@gmail.com

ABSTRACT

Previous studies have demonstrated that COVID-19 pandemic has had negative psychological consequences in healthcare professionals, however, few of them concentrate on pediatricians' experience. The aim of this study is to evaluate anxiety among spanish pediatricians after the first COVID-19 wave as well as to identify possible risk factors.

A transversal and multicentric study of questionnaires was designed. Demographic, socio-familiar and laboral information was collected, as well as emotional self perception information, psychosomatic symptoms, tobacco consumption and psychotropic treatment. Participants fulfilled the State-Trait Anxiety Inventory (STAI).

440 questionnaires were registered. Globally, 42.2% of the participants expressed moderate-intense anxiety symptomatology according to the Anxiety-State scale and 26.8% in the Anxiety-Trait scale. Domiciliary isolation was associated with a higher score in both scales. Changes in the cohabitants' working situation was associated with a higher score in the Anxiety-State scale. With respect to the psychological impact perceived by participants during pandemic situation, 41.1% classified it as mild, 50% as moderate, and 8.9% as severe. Up to 71.8% of the participants suffered psychosomatic symptoms. A linear association was found between suffering from multiple psychosomatic symptoms and higher scores in both scales.

Conclusion: After the first pandemic wave pediatricians have suffered anxiety, which has caused physical and emotional discomfort. Personal circumstances have been the main worry of medical staff. Coexistence of various psychosomatic symptoms has been associated with higher anxiety levels.

Key Words: pandemic, COVID-19, pediatrics, medical staff, anxiety, psychological problem.

INTRODUCTION

In december 2019, a series of viral pneumonia were described in the chinese region of Wuhan. These were associated with a new coronavirus, identified as SARS-CoV-2. Cases spread worldwide, determining an international pandemic named COVID-19 (illness caused by SARS-COV2), as declared by the World Health Organization in March 11 2020. In Spain, the state of emergency was declared on March 14, forbidding geographic mobility and establishing domiciliary confinement[1]. From May 11 onwards, restrictive measures' de-escalation were introduced, entering what was named as "new normality". The first pandemic wave concluded with a total of 231765 cases and 18352 deaths[2] in Spain.

Since the beginning of the pandemic, healthcare professionals have been exposed to an overstrain worldwide, with an increased workload and pressure originated by healthcare demand. Other factors such as lack of knowledge of the illness, lack of specific preparation, fear of infection transmission and the moral load of assigning limited resources to an excessive number of severely ill patients, have generated a high stress level among healthcare professionals with consequences that could persist for a long time[3]. All these factors are added to the personal situations experienced during the pandemic: isolation, suffering COVID-19, beloved ones' deaths, uncertainty and working instability.

The psychological effects of quarantine periods are evident and persist over time proportionally to the time the situation remains[4-6]. Namely, depression, anxiety and posttraumatic stress were present both in the general population[5-9] and healthcare professionals[10] in the outbreaks of SARS-CoV in 2003, H1N1 flu in 2009 or MERS-CoV in 2012, .

COVID-19 pandemic has had a negative influence on healthcare professionals 'mental health, as described in a systematic review of thirty three studies where they detected a prevalence of anxiety of 23.2% and depression of 22.8%[11]. In Spain, the Health Ministry made a special reference to healthcare professionals' vulnerability in one of its documents[12]. The preliminary results of the "Sanicovid-19" study presented on May 18 studied the emotional impact of the COVID-19 pandemic among healthcare professionals and determined that 79.5% suffered from anxiety and 51.1% from depression[13].

COVID-19 cases among children have been less numerous and less severe than in adult population[14-16]. This circumstance, along with the closure of schools and domiciliary confinement, has led to a reduction in pediatricians' workload[15]. For this reason, numerous pediatricians have worked treating adult population, generating a greater feeling of insecurity, fear and distress with respect to other healthcare professionals.

The main aim of this study was to evaluate the levels of anxiety among pediatricians working in Spain after the first COVID-19 wave, as well as to identify possible factors related to a greater state of anxiety. Secondly, we evaluated healthcare professionals' capacity of emotional self perception and the presence of psychosomatic symptoms secondary to stress.

MATERIALS AND METHODS

A study of questionnaires was designed, which was developed between June 10 and July 5 of 2020. The study was multicentric and transversal.

All questionnaires fulfilled by pediatricians (working in outpatient or inpatient settings) were included. Those who did not sign informed consent, pediatric medical intern residents and those pediatricians who had temporary inability during the first COVID-19 wave in Spain, were excluded.

This study meets the Helsinki Declaration rules and has the approval of the Clinical Investigation and Ethic Committee of Hospital Universitario Infanta Leonor (code 058-20) to which the principal investigator pertains.

Variables and data collection

Demographic variables were collected (gender, age, main residence characteristics), as well as socio-familiar data (steady partner, children, if they had suffered from SARS-COV2 infection or other family members, admission or death for COVID-19, isolation), laboral information (usual working center before and during the pandemic situation, working situation of cohabitants), factors related to emotional self-perception, psychosomatic symptoms, consumption of tobacco, alcohol and psychotropic treatment (sleep inductors, anxiolytics and antidepressants).

A questionnaire was elaborated with Google docs® platform. The link with which participants accessed the questionnaire was distributed by the mailing list of the Spanish Pediatric Association and was published in the web page. The questionnaire was fulfilled online and anonymously. Results were collected and stored following the current data protection regulation and were only available to the principal investigators.

Firstly, participants had to accept their consent to participate in the study. Once informed consent was accepted, the questionnaire continued by asking questions concerning the variables mentioned above and finally explored the level of anxiety with the State-Trait Anxiety Inventory (STAI).

Anxiety evaluation

In order to evaluate the levels of anxiety among participants, the State-Trait Anxiety Inventory (STAI) was used. This test was validated in Spanish in 1982[17]. This test evaluates anxiety in two dimensions: anxiety-state as a transitory state (20 items) and anxiety-trait as an innate personality trait (20 items). Each question of the questionnaire is rated using a Likert type scale from 0 to 3 points, up to a total score of 60 points. On one hand, the questionnaire is composed of positive questions which explore the presence of anxiety where the answers “nothing”, “a little”, “quite a lot” and “a lot” correspond to scores from 0 to 3. Answers with score 2 or 3 were considered as a moderate or intense manifestation of anxiety symptoms. On the other hand, negative questions denote absence of anxiety, where the same answers are qualified oppositely, with scores from 3 to 0. There are no established anxiety categories based on the scores obtained; higher scores correspond to a higher level of anxiety. The adapted version in Spanish of this questionnaire has an internal consistency ranging from 0.9 to 0.93 for anxiety-state and from 0.84 to 0.87 for anxiety-trait [18].

Statistical analysis

The collected data was analysed with the statistical program SPSS version 21. Qualitative variables are presented as absolute frequencies and percentages, and quantitative variables as mean and standard deviation (SD) or median and interquartile interval (Q1-Q3) depending on the distribution. The association between anxiety level in the STAI scale and qualitative variables was evaluated with the parametric test T Student or ANOVA, and with simple linear regression in the case of quantitative variables.

In order to analyze how different factors influence anxiety as a state and as a personality trait, multivariable linear regression models were created, using anxiety-trait and anxiety-state scores as dependent variables. Those variables which obtained a statistically significant association in the univariable analysis were used as independent variables. The strength of the association was

evaluated with the regression coefficient (B) which expresses the magnitude of the change in the scores obtained in STAI for every unit of variation of the variable analyzed and its confidence interval (95%).

Emotional self-perception was analyzed with the Spearman Rho coefficient by associating the scores of the questions related to emotions and concern (which was measured with a Likert-like scale with values ranging 0=nothing to 2=a lot) with the scores obtained in the STAI scale. Considering Rho absolute value, correlation was considered perfect for the value 1, strong for values between 0,76 and 0,99, moderate between 0,51 and 0,75, weak between 0,26 and 0,50 and scarce or void between 0 and 0,25.

Statistical significance was established in $p < 0.05$.

RESULTS

440 questionnaires were fulfilled by pediatricians of 15 spanish autonomous communities. None of the questionnaires met exclusion criteria.

Anxiety level analysis

The mean score in the scale anxiety-state was 26,9 (SD: 11,4) and 20,6 (SD: 10,1) in the scale anxiety-trait. Between 17.7 and 79.8% of the participants expressed moderately or intensely some symptom related to anxiety state (mean: 42,2%; SD: 20,6%) and between 11,1% and 64,1% related to anxiety trait (mean: 26,9%; SD: 14,4%). The scores for each item in the STAI scale are described in Appendix 1.

Participants' sociodemographic characteristics and their personal and working situation as well as its association with anxiety as a state and as a personality trait are described in tables 1 and 2.

The multivariable analysis showed that domiciliary confinement ($B=2,7$; $CI_{95\%}: 0,1-5,4$; $p=0,047$) and changes in cohabitants' working situation ($B=1,7$; $CI_{95\%}: 0,1-3,2$; $p=0,040$) were related to a higher score in the anxiety-state score. No association was obtained in those cases which had required a change from their usual home ($B=2,6$; $CI_{95\%}: -5,1-10,3$; $p=0,503$), living in a house smaller than 60 m² ($B=3,5$; $CI_{95\%}: -1,6-8,6$; $p=0,173$) nor having to work in adult Emergency Department ($B=5,3$; $CI_{95\%}: -1,1-11,7$; $p=0,103$), despite having found association in the univariable analysis.

A second multivariable analysis was performed, which showed that having required domiciliary isolation ($B=2,6$; $CI_{95\%}: 0,5-4,8$; $p=0,018$) was the only factor related to a higher score in the anxiety-trait scale. On the contrary, lower scores in this scale were found in participants who had children ($B=-3,3$; $CI_{95\%}: -1,4-(-5,2)$; $p=0,001$) and those who had a family member who had been diagnosed of COVID-19 ($B=-3,4$; $CI_{95\%}: -1,3-(-5,5)$; $p=0,002$). No association was found with age ($B=-0,0$; $CI_{95\%}: -0,1-0,1$; for every year increase in age; $p=0,932$), living in a home smaller than 60 m² ($B=-0,7$; $CI_{95\%}: -4,2-2,9$; $p=0,715$) nor having experienced family members' decease due to COVID-19 ($B=-3,2$; $CI_{95\%}: -7,8-1,3$; $p=0,165$).

Emotional self-perception

The answers to the questions related to worry and emotions during the first pandemic wave and at the moment of fulfilling the questionnaire, as well as their association with the scores obtained in Anxiety-State and Anxiety-Trait in the STAI scale are shown in table 3.

With respect to the psychological impact perceived by participants during pandemic situation, 180 (41.1%) classified it as mild, 220 (50.0%) as moderate, and 39 (8.9%) as severe ($r=0,587$ with respect to Anxiety-State score; $p < 0,001$. $r=0,394$ with respect to Anxiety-Trait score; $p < 0,001$).

Somatic symptoms related to stress

Among the pediatricians surveyed, 316 (71,8%) had experimented physical fatigue; 117 (26,6%) sense of increased cardiac frequency; 270 (61,4%) uneasiness; 321 (73,0%) fear or sadness; 249 (56,6%) concentration problems; 230 (52,3%) headache; 267 (60,7%) bad humour or hypersensitivity; 288 (65,5%) difficulties falling asleep, frequent awakenings or nightmares and 144 (32,7%) abdominal pain, loss or excessive appetite. The presence of these symptoms was associated with higher scores in the anxiety scales (table 4). For each symptom present, 2.5 points more were obtained in the Anxiety-State scale ($p<0.001$) and 1.9 points more in the Anxiety-Trait scale ($p<0.001$).

With respect to other circumstances which can be associated to anxiety, 82 professionals (18,6%) referred having increased alcohol consumption, 16 of those who declared themselves as smokers referred having increased tobacco consumption or had started smoking again (6,0%), 102 (23,2%) used treatment to ameliorate sleep quality (29, 6,6%, used medication previously) and 56 (12,7%) required anxiety or depression treatment (27, 6,1% received these treatments previously).

DISCUSSION

COVID-19 has constituted a great challenge worldwide, causing a sanitary, economic and social crisis without precedent. The pandemic effects among healthcare professionals are currently tangible as previous studies have demonstrated[11,19,20]. However, literature concerning pediatricians' experience during this situation is limited. This is the first published study which analyses pediatricians' experience in Spain, both in inpatient and outpatient settings.

Despite the variety of anxiety scales used in previous studies, results obtained point towards an upgrowing prevalence of anxiety among pediatricians during COVID-19 pandemic, ranging from 14% and 18% in China[19,20] and 19.4% in Italy[21]. A systematic review obtained similar results among other healthcare professionals, with a combined anxiety prevalence of 23.2%[11], with increases to 37% in Spain[22] or 44.6%[23] in other populations. In our study, the validated spanish version of the State-Trait Anxiety Inventory (STAI)[24] was used: 42.2% of the participants surveyed expressed moderate-severe anxiety symptoms according to the Anxiety-State scale and 26.9% according to the Anxiety-Trait scale.

Studies performed in previous pandemics have demonstrated that inadequate or lack of professional preparation and working in high risk of infection settings have a negative effect on emotional well-being[6,25]. In this line, academic training is considered as a mental health protection factor and losing control over work as a risk factor[6]. In China, healthcare professionals dedicated to pediatric care which had been exposed to COVID-19, were those who presented a higher anxiety and depression rate[20,26]. In our sample, a higher level of anxiety was detected among pediatricians who had worked in the adult Emergency Department during COVID-19 pandemic, however no statistically significant association was found.

The difficulties suffered in working settings did not have a significant impact on anxiety levels, highlighting that emotional management and adaptive capacity were adequate. However, certain changes in the personal or familiar situation did have a negative influence on anxiety.

Isolation altered both Anxiety-State and Anxiety-Trait, proving to be the factor most strongly associated with stress, even months after having been isolated. Severity has proved to be proportional to the time period of quarantine[7,27,28]. Anxiety-State was also affected negatively because of changes in cohabitants' working situation. Previous studies have demonstrated that changes in the personal situation such as salary reduction or job loss[6,27,29], determine detrimental effects on mental health. On the other hand, having a single child compared to not having children or having several children increases psychological distress[27,29]. In this line, our results show lower scores in the Anxiety-Trait scale among participants with children. Fearing transmission is a common factor among healthcare professionals during pandemics[30,32].

However, lower Anxiety-Trait scores were obtained in participants whose family relatives had been diagnosed of COVID-19. These results can be explained by a decrease in anxiety levels once COVID-19 diagnosis is made and clinical evolution is positive.

Healthcare professionals demonstrated an effective capacity in identifying their emotions, as previously reported by other studies. In a study performed in 194 chinese cities, 53,8% of the surveyed participants considered the psychological impact to be moderate or severe, 28.8% suffered from moderate-severe anxiety and 16.5% presented moderate-severe depression symptoms[33].

During COVID-19 pandemic situation, the prevalence of psychosomatic symptoms has been high and has been associated with negative psychological effects[30,34]. Fatigue is the most frequent psychosomatic symptom as well as the most associated with anxiety[30-34]. A combination of psychosomatic symptoms can be present in a single person[30]. The prevalence of psychosomatic symptoms in our study was high and fatigue was the most referred symptom. Higher scores in anxiety scales were associated with the presence of multiple somatic symptoms simultaneously.

Anxiety and stress can negatively influence sleep quality[35,36]. During COVID-19 pandemic, 34% of healthcare professionals[22] and 30% of pediatricians in China referred sleep disorders[19], which increased to 67.4% among italian pediatricians[21]. In line with these results, sleep disorders among healthcare professionals who assisted COVID-19 patients have been associated with the prevalence of posttraumatic distress[35,37]. During the first COVID-19 wave, 28.9% spanish healthcare professionals had insomnia[23]. Our results are similar to those obtained in italian pediatricians.

Study limitations

The diffusion of the questionnaire was performed through the Pediatric Spanish Association, therefore neither the projects' scope nor the response rate is known. Additionally, it is possible that those who took part in the study could have been those who were more worried. Those participants who had had temporary incapacity during the first wave were excluded, however, we consider our sample to be representative of all spanish pediatricians. Therefore, our results are extrapolable.

On the other hand, the questions which address emotional self-perception and physical symptoms are not validated. These questions were suggested by the main investigators in order to explore different emotional areas, based on questions used in other studies. We consider that an elevated number of questions addressing different areas were included, which allowed a broad approach of the evaluated areas.

Conclusions

The psychosocial impact of a pandemic can be devastating. After the first COVID-19 wave, spanish pediatricians suffered from anxiety, especially in relation to their personal situation. Anxiety has been associated with their emotional self-perception as well as to physical discomfort generated due pandemic situation. However, more studies are needed to determine the psychological consequences and factors related to the emotional impact.

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