ORIGINALES

Relationship between working conditions and health-related quality of life of nursing and medical staff in Intensive Care Units during the COVID 19 pandemic in Santa Marta, Colombia

Relación entre condiciones de trabajo con la calidad de vida relacionada con la salud de trabajadores de enfermería y medicina de unidades de cuidados intensivos durante la pandemia COVID 19 en Santa Marta, Colombia

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ABSTRACT:

Objective: To determine the relationship between working conditions and dimensions of health-related quality of life during the COVID 19 pandemic among nursing and medical staff in intensive care units in Santa Marta, Colombia.

Method: Cross-sectional analytical study. The sample consisted of 110 health professionals (physician and nurses) selected by non-probability sampling. The MOS-36 questionnaire was used.

Results: The respondents were mostly female (69.09%), with children (64.54%), living with their nuclear family (90.00%), nursing assistant (59.09%), followed by nurses (23.63%) and physicians (17.27%), with postgraduate degrees (13.63%), with chronic illness (14.54%) and with multiple jobs (93.63%). The dimensions of quality of life with the best perception were physical functioning (M: 85.69, SD: 19.04) and role emotional (M: 81.79, SD: 33.92), while a lower mean was found in the vitality dimension (M: 59.95, SD: 17.51). The variables age, sex (male), having children, suffering from a chronic disease, profession (physician), hiring format, multi-employment, seniority at work and service seem to negatively influence workers' mental and physical health.

Conclusions: The mental component was the most affected. The health-related quality of life in the study group is generally evaluated as good; and this showed to be related to working conditions, meriting the design and implementation of strategies to minimize the impact of work on the health and integrity of health care professionals.

Key words: Quality of Life, Physicians, Nurses, Nursing Assistants, Critical Care, Occupational Health.

RESUMEN:

Objetivo: Determinar la relación entre las condiciones de trabajo y las dimensiones que integran la Calidad de Vida Relacionada con la Salud durante la pandemia COVID 19 en los trabajadores de enfermería y medicina de las Unidades de Cuidados Intensivos de Santa Marta, Colombia.

Métodos: Estudio analítico de corte transversal. La muestra estuvo comprendida por 110 profesionales sanitarios (médicos y enfermeros) seleccionados mediante muestreo no probabilístico. Se empleó el cuestionario MOS-36.

Resultados: Los encuestados fueron en su mayoría de sexo femenino (69.09%), con hijos (64.54%), conviven con su familia nuclear (90.00%), de profesión auxiliar de Enfermería (59.09%), seguido por Enfermeros(as) (23.63%) y médicos (17.27%), con posgrados (13.63%), con enfermedad crónica (14.54%) y con poliempleo (93.63%). Las dimensiones de la calidad de vida con mejor percepción fueron Función Física (M: 85.69, DE: 19.04), y Rol Emocional (M: 81.79, DE: 33.92), mientras, se encontró una media más baja en la dimensión Vitalidad (M: 59.95, DE: 17.51). Las variables edad, sexo (masculino), tener hijos, padecer una enfermedad crónica, profesión (médico), formato de contratación, poliempleo, antigüedad laboral y en el servicio, parecen influir negativamente sobre la salud psíquica y física de los trabajadores.

Conclusión: El componente mental fue el más afectado. La calidad de vida relacionada con la salud en el grupo de estudio es en general evaluada como buena; y esta mostró relacionarse con las condiciones de trabajo, ameritando del diseño e implementación de estrategias para minimizar el impacto del trabajo sobre la salud y la integridad del trabajador.

Palabras clave: Calidad de vida, Médicos, Enfermeras y Enfermeros, Auxiliares de Enfermería, Cuidados Intensivos, Salud Laboral.

INTRODUCTION

The pandemic caused by the SARS-CoV2 virus and its associated disease, COVID-19, has led to changes in all aspects of people's lives, including working places and conditions, both in primary, secondary, and tertiary care services. These changes have been reported in various international studies [1-3], which illustrate how the crisis resulting from the pandemic has generated an increased workload that can affect the lives of professionals in a multiplicity of ways.

Intensive Care Units (ICU) are one of the areas that have suffered the most modifications, since the way professionals, patients, and families interact has changed[4-5]. In addition, the variables previously described as influencing the mental and physical health of healthcare professionals have increased, such as workload (number of patients under care), contact with death, and duration of working hours, among others, adding in this context anxiety, stress, fear of getting sick and infecting the family, even leading to a greater risk of suicide[5,6]. This weakens health systems and services by influencing presenteeism, presenteeism, minimizes the safety provided to the patient during their hospitalization, inter alia[7-10].

Garouste-Orgeas et al.[11] and Shanafelt et al.[12] have established the relationship between working conditions and worker health, as well as their impact on the professional's personal spheres, such as the relationship with family and partner, the time they spend on leisure activities and habits of sleep, while, at the institutional level, they have proven to affect hospital morbidity and mortality, longer patient stays, cost overruns in care, in addition to increased sick leave, work-related disability and early retirement of workers.

On the other hand, Canova-Barrios and Oviedo-Santamaría[13] have reported a deterioration in the mental components of Health-Related Quality of Life (HRQoL) in ICU personnel, while Bueno Ferrán & Barrientos Trigo[6] have reported that, in the face

of the pandemic, these professionals experience high tension mobilized by the pressure of care, lack of personal protection elements, resulting in the presence of high levels of stress, sleep disturbance, and depressive symptoms, and these aspects have been identified in previous pandemics such as SARS-COV in 2003 and AH1N1 influenza in 2009[14].

The COVID-19 pandemic in Colombia has had a devastating effect, becoming the leading cause of death in 2020 and 2021, according to the National Administrative Department of Statistics (DANE)[15]. This has led to an increase in the demand for ICU beds, the organization of COVID and non-COVID areas, changes in changes in the duration of shifts, and the suspension of licenses (holidays, for studies, among others), but it has not been described with certainty how these work dynamics are related to the HRQoL of the workers[16,17].

HRQoL is defined as "people's subjective evaluations of the influences of their current health status, health care, and health-promoting activities on their ability to achieve and maintain a level of overall functioning that allows them to pursue valued life goals, and that is reflected in their general well-being"[18], and includes aspects such as social, physical and cognitive functioning, personal care and emotional well-being; other authors, such as Trujillo et al.[19] have defined it as "an individual's satisfaction with the physical, social and psychological aspects of his or her life, to the extent that they affect or are affected by his or her health". The measurement of HRQoL has become an emerging phenomenon in the medical literature over the last three decades, leading to a progressive increase in publications and studies aimed at measuring it in both healthy and sick populations, including health professionals[13].

For nurses, the measurement of HRQoL is considered relevant, and proof of this are the contributions of theorists such as Peplau, Leininger, Rogers, King, and Parse, who have addressed quality of life as a set of contextual elements, subjective, intangible, and related to health itself[20]. Most of the mentioned theorists mention that quality of life varies according to the changing circumstances, with which it is a situation that is related to the time and the circumstances in which it is measured, so, according to the purpose of the present work, in the same population at pre-pandemic, intra-pandemic and post-pandemic moments, a different perception of this variable would be found. Likewise, cultural, spiritual, environmental elements and life expectations and experiences will influence this subjective process[20].

Therefore, the present study was proposed with the objective of determining the relationship between working conditions and the dimensions that constitute the Health Related Quality of Life during the COVID 19 pandemic in nursing and medical workers in the ICUs of Santa Marta, Colombia.

METHOD

Type of study

Cross-sectional analytical study with a quantitative approach, carried out between September 2021 and February 2022.

Population and sample

The population consisted of approximately 180 workers, including physicians and nurses from critical areas (both from COVID and non-COVID areas) who work in the Intensive Care Units of the city of Santa Marta, Magdalena during the COVID-19 pandemic. The sampling was non-probabilistic and all professionals were invited to participate voluntarily. The sample consisted of 110 professionals who met the inclusion criteria and agreed to participate in the study.

Inclusion and exclusion criteria

Physicians and nurses (assistants and professionals) of any age working in ICUs (adult and pediatric), both public and private, who voluntarily agreed to participate in the study by signing the informed consent, were included. Workers with less than 6 months of service, temporary workers, interns, and students, as well as professionals on sick leave (without going to work due to illness, pregnancy, etc.) were excluded.

Instrument

The data were collected using the MOS-36 instrument, in its Spanish version, validated for the Colombian population with a Cronbach's alpha of 0.80.[21] This is a generic, brief, and self-administered instrument that consists of 36 questions, answered on a Likert-type scale with 2 to 6 response options, and which groups its items into two components (physical and mental) and eight dimensions: Physical Functioning (10 items), Role Physical (4 items), Bodily Pain (2 items), General Health (5 items), Vitality (4 items), Social Functioning (2 items), Role Emotional (3 items) and Mental Health (5 items), and a "health transition" item, which does not respond to any dimension.

The responses of the items were homogenized, the raw scores of their scales were calculated, and the summation and linear transformation necessary for the analysis of the instrument was performed. The dimensions in their final scores present scores between 0 and 100, interpreting that the higher the score, the better the state of health, with the cut-off point between poor and good health the scores higher or lower than 50 points, respectively[13, 21, 22].

The instrument was validated in our population using a Bayesian model, which has shown greater consistency even with limited data[23], finding a Cronbach's alpha of 0.93 (95%CI: 0.92-0.95), with scores on its different scales ranging from 0.87 to 0.91, which can be considered that the instrument has a high consistency to measure health-related quality of life in the participating population.

The information was supplemented with a battery of questions whose objective was to characterize the population surveyed socio demographically and occupationally, designed from similar studies[13,24].

Data Collection and Analysis Procedures

The professionals were invited to participate through their directors and service references. The instrument was sent to them using Google Forms questionnaire through instant messaging and e-mail applications, and their informed consent was

requested before filling it out. The information collected was extracted from a database in the Microsoft Excel program and analyzed in the Infostat/L program. For the descriptive analysis, means, medians, and standard deviations were calculated for the quantitative variables, while absolute and relative frequencies were used to describe the qualitative (categorical) variables. Given the sampling characteristics and the non-normal distribution of the variables, non-parametric tests were used for statistical analysis, implementing the U-Mann-Whitney, Kruskal-Wallis, and Spearman correlation tests. The statistical significance level was set at p:<0.05.

Ethical aspects

The study was approved by the Research Ethics Committee of the University of Magdalena under the Act 008 of July 1, 2021. Subjects' participation was always emphasized as voluntary, and informed consent was obtained before participation. Personal data were always protected and only the researchers of the study had access to them.

RESULTS

The sample consisted of 110 health professionals with a mean age of 35.8 years (SD: 9), with a minimum of 19 and a maximum of 58 years. The respondents were mostly female (69.09%), with children (64.54%), living with their nuclear family (90.00%), nursing assistants (59.09%), followed by nurses (23.63%) and Physicians (17.27%), whom 13.63% have postgraduate training, 14.54% have a chronic illness, 34.54% have more than one job, and 93.63% work rotating shifts. The mean seniority of the respondents was 10.28 years (SD: 7.47), seniority in the service was 7 years (SD: 6.44), and they work an average of 12 hours per day (SD: 4, Min: 6, Max: 24). The complete data are shown in Table 1.

Table 1: Sociodemographic characteristics

Variable		Frequency	Percent (%)
Gender			
	Male	34	30.90
	Female	76	69.09
	Other	0	0.00
Qualification			
	Nursing Assistant	65	59.09
	Nurse	26	26.63
	Physician	19	17.27
Level of education			
	Assistant	64	58.18
	Undergraduate	31	28.18
	Postgraduate	15	13.63
Children			
	Yes	71	64.54
	No	39	34.45
Chronic Disease			
	Yes	16	14.54
	No	94	85.45
Polyemployment			
	Yes	38	34.54
	No	72	65.45

Work Shift			
	Morning shift	5	4.54
	Afternoon shift	1	0.90
	Night shift	1	0.90
	Rotating shift	103	93.03
Hiring format			
	Provision of services	18	16.36
	Limited-term	18	16.36
	Open-ended	74	67.27

Source: self made.

When analyzing the dimensions of health-related quality of life, it was found that physical function had the highest mean of 85.69 (SD: 19.04, 95%CI: 82.90-89.28), followed by emotional role with 81.79 (SD: 33.92, 95%CI: 75.38-88.20), while vitality was the dimension with the lowest mean of 59.95 (SD: 17.51, 95%CI: 56.69-63.25) (Table 2).

Table 2: Characteristics of the HRQoL dimensions

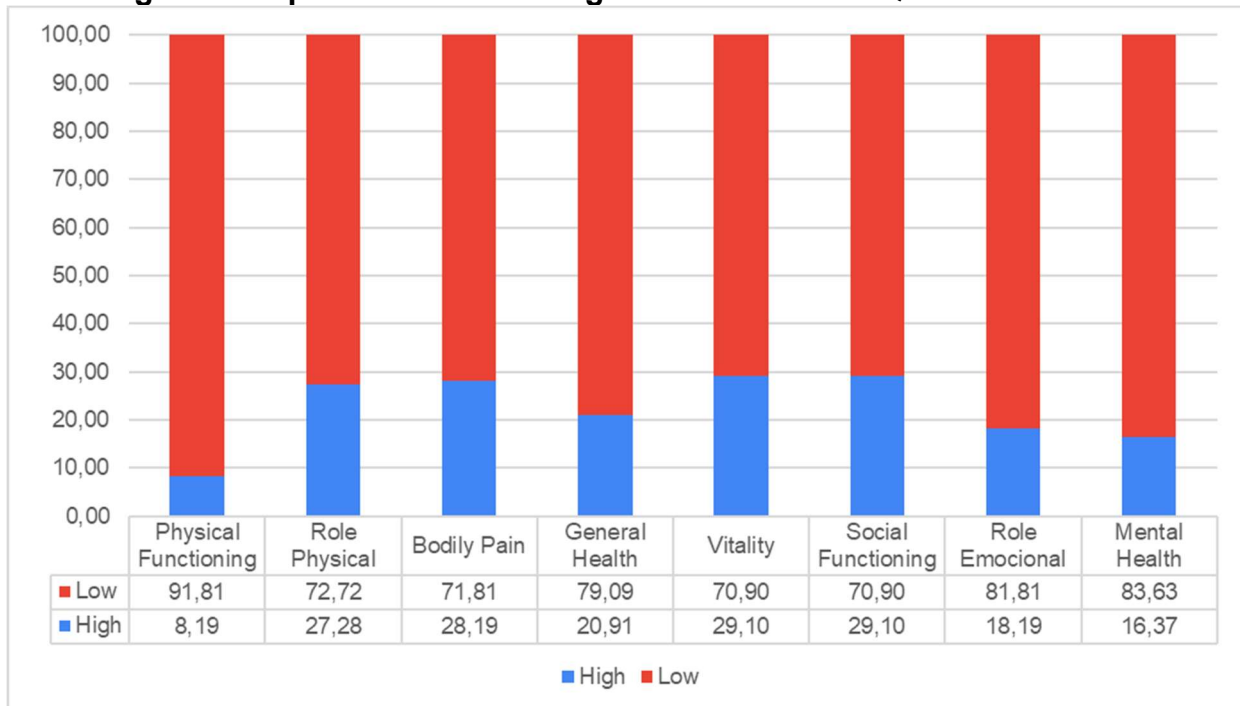| Dimensions	Mean	SD	Median	Q1	Q3
Physical Functioning	82.69	19.04	95.00	80.00	100.00
Role Physical	79.40	31.85	100.00	50.00	100.00
Bodily Pain	66.68	20.27	72.00	51.00	84.00
General Health	69.17	21.52	72.00	57.00	87.00
Vitality	59.95	17.51	60.00	50.00	70.00
Social Functioning	70.14	22.79	75.00	50.00	87.50
Role Emotional	81.79	33.92	100.00	66.67	100.00
Mental Health	68.70	17.36	68.00	56.00	84.00

Source: self made.
SD: Standard deviation, Q1: Quartile 1, Q3: Quartile 3.

In the Health Transition item, it was found that employees consider their health to be much better (14.54%), somewhat better (15.45%), about the same (54.54%), somewhat worse (11.81%), and much worse (3.63%) compared to one year ago.

When categorizing the scores of the HRQoL dimensions, it was found that the dimensions with the highest proportion of low scores were Vitality and Social Functioning with 29.10% of respondents with scores ≤50, while Physical Functioning was the least affected with only 8.19% of the sample with low scores. The complete data are shown in Figure 1.

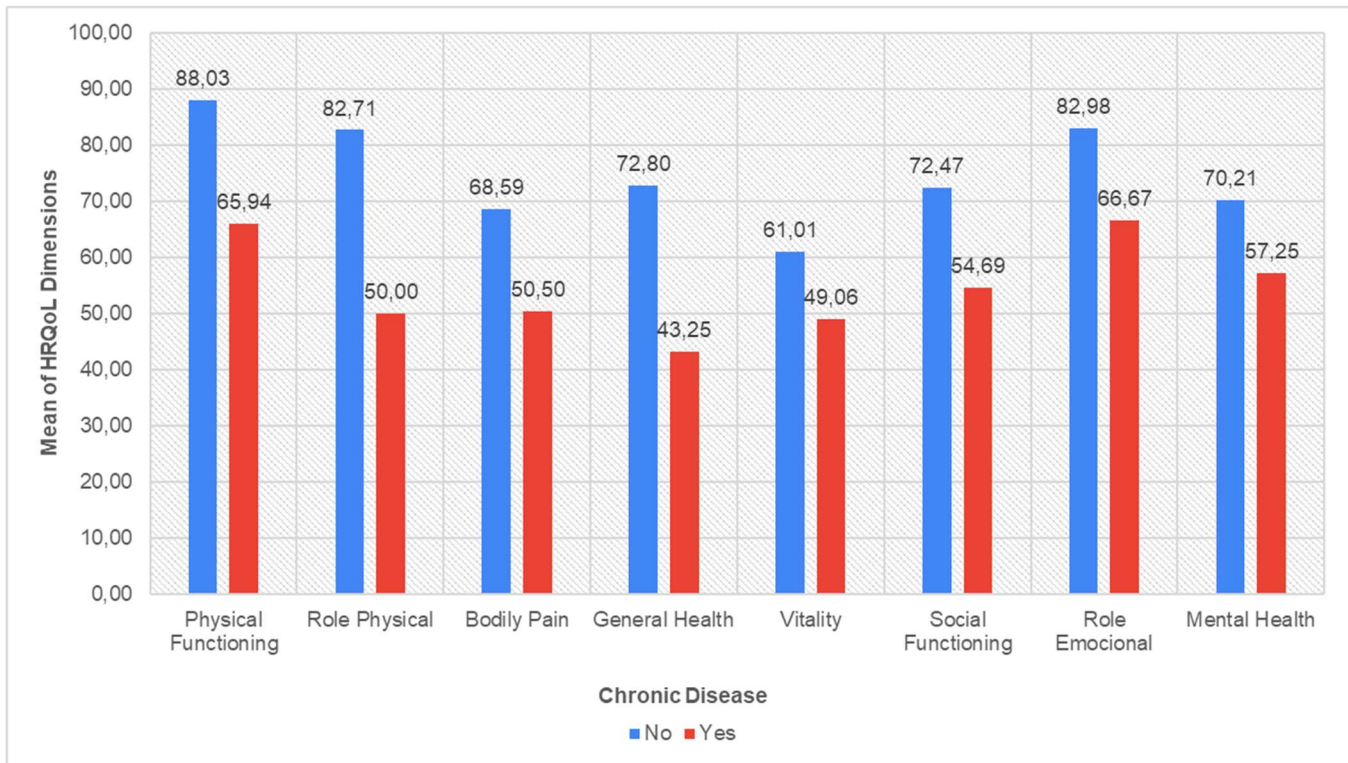**Figure 1: Impact level of working conditions on HRQoL dimensions.**

	Physical Functioning	Role Physical	Bodily Pain	General Health	Vitality	Social Functioning	Role Emocional	Mental Health
■ Low	91,81	72,72	71,81	79,09	70,90	70,90	81,81	83,63
■ High	8,19	27,28	28,19	20,91	29,10	29,10	18,19	16,37

■ High ■ Low

Source: self made

It was found that gender was related to the score of the Role Emotional dimension, with higher means in women (85.36 vs 68.63, *p*:0.026). It was found that having children was associated with lower standards in the dimensions of Physical Functioning (80.00 vs 93.59, *p*:<0.001), Role Physical (72.18 vs 88.46, *p*:0.045), Bodily Pain (61. 87 vs 73.38, *p*:0.001), General Health (65.17 vs 74.56, *p*:0.019), Vitality (56.13 vs 65.00, *p*:0.009), Social Functioning (67.08 vs 75.00, *p*:0.046), and Mental Health (64.51 vs 75.28, *p*:0.001).

Statistically significant differences were found in the means of the Role Physical dimensions (Physician: 51.32, Nurse: 81.73, Assistant: 84.23; *p*:0.004) and Physical Functioning (P: 73.95, N: 90.96, A: 85.54; *p*:0.035). In the case of physicians, there was a clear deterioration in the dimensions assessed, while better behavior in the Role Emotional dimension was associated with the position of nursing assistant (P: 45.61, N: 82.05, A: 90.26; *p*:<0.001). Regarding the hiring format, it was found that workers with an open-ended contract had higher scores in the Role Emotional dimension (open-ended: 85.84 vs. other: 70.27; *p*:0.014) and lower scores in General Health (open-ended: 65.63 vs. other: 74.16, *p*:0.039). Similarly, those who worked in more than one institution had lower mean scores in the Role Emotional dimension (64.04 vs. 89.35; *p*:0.001). No association was found between the variables work shift and who they live with with HRQoL.

Having a chronic disease was associated with lower mean scores on all dimensions (*p*:<0.05). The complete data are shown in Figure 2.

Figure 2: Chronic Disease vs. Mean HRQoL Dimensions.

Source: self made.

Using Spearman's correlation test, low negative correlations were found between the variables age, number of children, seniority at work, seniority in service, and the dimensions that constitute HRQoL. No correlation was found between weekly workload and HRQoL (Table 3).

Table 3: Correlation between socio-demographic and occupational variables and HRQoL.

Variable	Physical Functioning	Role Physical	Bodily Pain	General Health	Vitality	Social Functioning	Role Emocional	Mental Health
Age	-0.38 p:<0.001	-0.26 p:0.005	-0.21 p:0.026	-0.26 p:0.007	NS	-0.21 p:0.027	-0.27 p:0.004	NS
Number of children	-0.39 p:<0.001	NS	-0.30 p:0.011	-0.24 p:0.011	-0.21 p:0.025	-0.21 p:0.030	NS	-0.30 p:0.001
Seniority at work	-0.28 p:0.003	-0.34 p:<0.001	-0.24 p:0.011	-0.28 p:0.003	NS	-0.19 p:0.049	-0.34 p:<0.001	NS
Seniority in service	-0.32 p:<0.001	-0.35 p:<0.001	-0.31 p:<0.001	-0.20 p:0.036	-0.21 p:0.031	-0.22 p:0.019	-0.44 p:<0.001	NS

Source: self made.
NS: not significant.

DISCUSSION

Healthcare professionals working in intensive care units (ICUs) are the essential human resource to support care in critical life-threatening situations; the experience of caring for patients during times of COVID-19 pandemic has placed professionals in a hostile environment, with greater exposure to workplace stressors as well as the so-called psychosocial risk factors, which has affected the health of caregivers in various measures. Instruments such as the MOS-36 questionnaire (also called SF-36) allow, through self-reporting, to account for the professional's perception of their health and to identify the determinants of their quality of life, to design interventions aimed at minimizing and/or controlling.

The staff interviewed for this study have a high level of job seniority, with an average of 10 years, of which at least 7 years have been spent in the ICU, with a time commitment of 12 hours per day. It can be inferred that the long working day and factors such as low recognition and satisfaction with income, which leads to having more than one job, leading to a deterioration in HRQoL, in turn, that the role that is performed in the service and the burden of responsibility, have a negative impact on the associated dimensions. In this regard, a study conducted in China found that when comparing HRQoL scores between physicians and nurses, the latter had higher scores in all domains[25], although this contrasts with other studies that indicate a greater impact on the mental health of nurses[26,27].

On the other hand, the presence of chronic diseases was associated with low HRQoL scores, which is consistent with studies conducted in Argentina[13] and Vietnam[28]. Regarding the latter, it was found that during the peak of the COVID-19 outbreak, health workers with chronic diseases had an increased likelihood of experiencing psychological distress and sleep disturbances due to fear of serious illness and death, among other health problems. The presence of a chronic disease is associated with a lower quality of life in general, because it is a constant and simultaneous personal concern of the health worker for their own care, as well as that of the patient, added to the effects and complexities associated with each pathology. If we add to the above-mentioned elements derived from the pandemic, such as high work pressure, increased workload, uncertainty about a little-known and deadly disease, dehumanized working conditions, reduced time for social interactions with patients, increased exposure to pain and death in intensive care units, and prohibitions on family visits, we have a set of factors with the potential to affect workers physically, psychologically, and emotionally, worsening their HRQoL[29].

Regarding the high involvement of the mental component of the instrument, and especially the mental health dimension, which includes episodes of depression and anxiety, as well as the perception of the self-control and general well-being, there is evidence of a high impact on the workers surveyed, which is manifested in expressions of discouragement and anxiety, leading in some cases to the isolation of their family nucleus. As shown by Canova-Barrios & Oviedo-Santamaria[13], the vulnerability observed in ICU workers is consistent with emotional exhaustion due to the complexity of the functions performed and the threat of death of the patients under their care. Thus, being linked to these circumstances influences the manifestation of harmful emotions in health personnel, such as uncertainty and anxiety, which, combined with great professional obligations, manage to cause emotional

deterioration, and force a greater demand so as not to be overwhelmed. and that his mental health is not disturbed.

The perception of vitality is understood as the feeling of energy and the state of having life to face fatigue and discouragement. In the participants of the present investigation, this dimension is shown to be influenced by the length of service and the number of children, which explains the decrease in quality of life not only related to work variables but also to family variables, leading the worker to perceive physical and emotional exhaustion, coupled with the absence of a sense of accomplishment. Some studies are consistent with the results of the present research[9,25,28,30] and observed that during the COVID-19 pandemic, health professionals often developed professional burnout, various psychological disorders, and a significant impact on their vitality, leading to absenteeism and altering work dynamics.

In addition, the results of our research show that in some participants, physical pain persists, mainly associated with age, number of children, seniority at work, and seniority in the ICU, which leads to thinking about the influence on the development of their daily activities due to the limitation of physical functionality. Previous studies have shown that people with little or no pain have a better quality of life, and in healthcare workplaces, the intensity of musculoskeletal pain is associated with a reduction in work capacity[13].

Finally, the analysis of social function understood as the degree to which physical or emotional health problems interfere with normal social life, revealed that 30% of the professionals interviewed were affected. As a result of the pandemic, there was a period of isolation for a considerable time, and later, social distancing, in addition to the stigmatization component and the fear of infecting others, also reduced the search for leisure spaces with friends and with the non-nuclear family, compounded by feelings of depression, anxiety, and stress. This aspect is confirmed by several studies and systematic reviews that have found a high level of involvement in the social component during the pandemic period,[5,28] referring to interaction with friends and family, and the perception of social support as a protective element against stress and professional strain[5].

CONCLUSION

In conclusion, although in general a good HRQoL was found, it is important to highlight the affectation of the domains of Bodily Pain, Vitality, Role Emotional, and Social Functioning during the pandemic, which shows a predominant affectation of the mental component of the construct. Similarly, relationships were identified between lower scores in the quality of life dimensions and the variables of gender (female), having and the number of children, occupation (physician), type of employment (Limited-term), polyemployment, presence of chronic disease, and greater seniority at work and in the service.

Slightly more than half of the respondents reported little or no change in their health compared to the previous year (54.54%), while one-tenth reported a deterioration in their general health in its various aspects (15.45%). However, when analyzing the data from the assessment of general health, 12.72% of respondents reported having regular health and only 14.54% rated it as excellent.

Operationally, in the health institutions where the study was carried out, it is considered necessary to create and implement a care program that includes health promotion and disease prevention strategies aimed at increasing the perception of HRQoL in this group of health professionals, as well as intervening in occupational risk factors that may negatively affect the health of the worker. The results presented warn about a population that is vulnerable or at risk of presenting health problems that have the potential to affect the quality and continuity of care provided.

The results allow us to measure the need to develop a specialization program in critical care for physicians and nurses with a territorial emphasis and focused on the well-being of work, allowing more human talent in health, while guaranteeing better working conditions, in such a way that progress is made in promoting the quality of life of those professionals who will take care of the health and life of the population in the most critical moments.

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