

Relationship between psychosocial factors and work capacity of healthcare professionals



Relação entre fatores psicossociais e capacidade para o trabalho de profissionais da saúde
Relación entre factores psicossociales y capacidad laboral de profesionales de la salud

Márcia Andréia Queiroz Freitas dos Santos^a

Luciana Contrera^a

Andréia Insabralde de Queiroz Cardoso^a

Luciana Scarlazzari Costa^b

How to cite this article:

Santos MAQF, Contrera L, Cardoso AIQ, Costa LS. Relationship between psychosocial factors and work capacity of healthcare professionals. Rev Gaúcha Enferm. 2024;45:e20230172. <https://doi.org/10.1590/1983-1447.2024.20230172.en>

ABSTRACT

Objective: To analyze the relationship between work ability and psychosocial factors of professionals from the healthcare area.

Method: Cross-sectional study with 197 healthcare professionals from a teaching hospital. The Work Ability Index and the Copenhagen Psychosocial Questionnaire III were applied. For data analysis, association tests and logistic regression models were used.

Results: Most participants were female (60.9%) with an average age of 40.12 ± 7.14 years. The participants' good/optimal ability to work was 75.1%. The independent factors associated with work ability were recognition, self-rated health, somatic stress, leisure, commitment to time and interaction between work commitment and physical activity.

Conclusion: There was a reduction in the good/optimal work capacity of professionals who worked on the front line of care during the COVID-19 pandemic, with frequent exposure to psychosocial risks at work and of those who did not practice physical and leisure activities.

Descriptors: Assessment of work capacity. Psychosocial risks. Occupational health. COVID-19. Healthcare professional.

RESUMO

Objetivo: Analisar a relação entre a capacidade para o trabalho e os fatores psicossociais de profissionais da saúde.

Método: Estudo transversal com 197 profissionais da área da saúde de um hospital de ensino. Foram aplicados o Índice de Capacidade para o Trabalho e o *Copenhagen Psychosocial Questionnaire III*. Para análise dos dados, foram utilizados testes de associação e modelos de regressão logística.

Resultados: A maioria dos participantes era do sexo feminino (60,9%), com uma média de idade de $40,12 \pm 7,14$ anos. A capacidade boa/ótima para o trabalho dos participantes foi de 75,1%. Os fatores independentes associados à capacidade para o trabalho foram: reconhecimento, saúde autoavaliada, estresse somático, lazer, compromisso com horário e interação entre compromisso com trabalho e atividade física.

Conclusão: Houve uma redução na capacidade boa/ótima de trabalho entre os profissionais que atuaram na linha de frente do cuidado durante a pandemia da COVID-19, com exposição frequente a riscos psicossociais no trabalho e dos que não praticavam atividades físicas e de lazer.

Descritores: Avaliação da capacidade de trabalho. Riscos psicossociais. Saúde ocupacional. COVID-19. Pessoal de saúde.

RESUMEN

Objetivo: Analizar la relación entre la capacidad laboral y los factores psicossociales de los profesionales de la salud.

Método: Estudio transversal con 197 profesionales de la salud de un hospital de enseñanza. Se aplicó el Índice de Capacidad para el Trabajo y el *Copenhagen Psychosocial Questionnaire III*. Para el análisis de los datos se utilizaron pruebas de asociación y modelos de regresión logística.

Resultados: La mayoría de los participantes fueron mujeres (60,9%) con una edad promedio de $40,12 \pm 7,14$ años. La capacidad laboral buena/ótima de los participantes era del 75,1%. Los factores independientes asociados con la capacidad para el trabajo fueron: reconocimiento, salud autoevaluada, estrés somático, ocio, compromiso de tiempo e interacción entre el compromiso laboral y la actividad física.

Conclusión: Hubo reducción de la capacidad laboral buena/ótima entre los profesionales que trabajaron en la primera línea de atención durante la pandemia de COVID-19, con exposición frecuente a riesgos psicossociales en el trabajo y para aquellos que no practicaban actividades físicas y de ocio.

Descriptores: Evaluación de capacidad de trabajo. Riesgos psicossociales. Salud laboral. COVID-19. Personal de salud.

^a Universidade Federal de Mato Grosso do Sul. Instituto Integrado de Saúde. Programa de Pós-Graduação em Enfermagem. Campo Grande, Mato Grosso do Sul, Brasil.

^b Universidade Estadual de Campinas, Faculdade de Ciências Aplicadas, Limeira, SP, Brasil.

■ INTRODUCTION

The actions of healthcare professionals during a pandemic can trigger situations harmful to their health and well-being. Changes in high-stress situations impact mental health, resilience, the functional workforce, and the healthcare system⁽¹⁾.

The pandemic caused by the new coronavirus, Corona Virus Disease 2019 (COVID-19), in 2020, was a milestone in global health. During that period, due to the high speed of dissemination, the lack of information about the virus, the high level of lethality, and the severity of the disease, there was an increase in psycho-emotional illnesses among healthcare professionals⁽²⁾.

Changes in the routine of healthcare professionals due to the COVID-19 pandemic were caused by a lack of human resources, a shortage of personal protective equipment (PPE), and high physical and mental workloads. These facts impact the psychosocial factors that influence the health and safety of workers, in addition to individual, collective, and organizational factors⁽³⁾.

Therefore, it is important to understand the risks or protective factors to prevent psychosocial factors, based on interventions in the work environment aimed at preserving health professionals' wellbeing and the organizational context⁽⁴⁾.

To promote the quality of life of workers, reduce the risk of occupational diseases, and decrease the chances of absenteeism or early retirement, it is necessary to understand the work ability⁽⁵⁾ of these professionals.

Work ability is defined based on the relationships between workers' individual resources (physical and mental capacity, lifestyle, sociodemographic conditions, skills) and the physical, mental and social demands of work, the work community, management, organizational culture and the work environment⁽⁶⁻⁹⁾.

A study conducted in Portugal, which monitored 1,667 municipal workers over two years, analyzed the elements that influenced work ability. The results showed that the main factors that predicted this ability were age, occurrence of lower back pain, negative perception of health, presence of burnout, and performing manual efforts. On the other hand, indicators that pointed to an optimal work capacity included training in the last two years, positive interpersonal relationships, and a favorable view of work⁽¹⁰⁾.

The longitudinal study Nurses' Early Exit Study (NEXT)⁽¹¹⁾ uses the Work Ability Index and its association with psychosocial factors in health professionals. It involved the participation of 7,516 nursing professionals from seven European countries and analyzed whether favorable and rewarding work-related factors increased the nursing team's work ability. It was found that a higher quality and quantity of sleep, as well as more

favorable psychosocial factors, contributed significantly to increasing levels of work capacity⁽¹¹⁾.

In a study with 3,051 nursing professionals registered with the Regional Nursing Council of São Paulo (COREN/SP), the profile of work ability and the intention to leave the nursing profession were identified based on the relationship between the WAI and psychosocial factors⁽⁸⁾. It was found that 55.4% of the professionals had compromised work capacity and that the intention to leave nursing work was greater among these professionals.

Research shows that individual and professional factors, as well as demographic and lifestyle variables, are related to work ability⁽⁵⁻⁷⁾. However, there are other predictors of work ability that require further investigation, such as psychosocial factors^(8,11). Thus, given the complexity and variety of psychosocial factors associated with the context of the COVID-19 pandemic, the present study aimed to analyze the relationship between work ability and psychosocial factors of health professionals.

■ METHOD

Cross-sectional study with health professionals from a state reference teaching hospital for infectious diseases and highly complex procedures, located in the city of Campo Grande, capital of the state of Mato Grosso do Sul, Brazil. The hospital has 232 beds, distributed across approximately 20 specialties. In June 2021, seven clinical beds and 11 ICU beds were made available for the treatment of COVID-19. The team of active health professionals, involved in direct patient care, comprised 270 doctors, 256 nurses, 355 nursing technicians, 37 physiotherapists, five speech therapists, six nutritionists, four dentists, and two occupational therapists, totaling a population of 935 health professionals.

A convenience sample was used in this study; it included nursing technicians and assistants, nurses, doctors, physiotherapists, and speech therapists, from the following hospital units: emergency room, medical clinic, surgical clinic, intensive care unit, coronary unit, neonatal intensive care unit, neonatal intermediate care unit and hemodialysis. The inclusion criteria established were health professionals, of both genders, involved in direct patient care, active in their position, and working any shift during the COVID-19 pandemic in the aforementioned teaching hospital. Professionals on vacation, on maternity leave, or extended leave (for health or social security reasons), students, residents, administrative professionals, cleaning professionals, those working in outpatient clinics, and those hired for less than six months were excluded.

Two hundred and forty professionals were invited to participate in the study. Of these, 37 refused or did not

complete the instruments, resulting in 203 participants. After data collection, six professionals were excluded, as follows: three professionals due to prolonged absence during the pandemic, two administrative professionals and one professional who had been hired less than six months ago, totaling a sample of 197 participants.

Data collection was carried out on the hospital premises, during the professionals' working hours, in December 2022. The researcher was on site and available to clarify any doubts about the research, following the current biosafety protocols. The health professionals were informed about the objectives of the research, the risks and benefits involved, as well as the data collection and analysis procedure. After the invitation, the Informed Consent Form (ICF) was presented to the participants. Envelopes containing the study data collection instruments were then distributed so that participants who agreed to participate could respond at that time. The instruments did not contain titles in order to avoid influencing participants' responses. Data collection lasted approximately 20 minutes on average and participants answered three questionnaires: the first, aimed at obtaining individual, occupational, and health-related information from participants; the second, aimed at assessing the Work Ability Index⁽⁷⁾; and the third represented the Copenhagen Psychosocial Questionnaire (COPSOQ III)⁽¹²⁾.

The development of the first instrument was based on a previous study⁽¹³⁾, containing questions about gender, age, education, marital status, place or sector of work, shift, function, exercise of management position, type of employment relationship, and length of time working in the profession, in addition to questions about the social and occupational context related to COVID-19.

The Work Ability Index (WAI) is an instrument developed by researchers at the Finnish Institute of Occupational Health, through research carried out in the 1980s^(6,7), consisting of seven dimensions: current ability to work compared with the best ability throughout life (1 question); work ability in relation to job requirements (2 questions); current illnesses diagnosed by a doctor (list of 51 illnesses); estimated loss of work due to illness (1 question); absences from work due to illness in the last year (1 question); prognosis of work capacity in the next two years (1 question); mental resources (3 questions)⁽⁷⁾. According to the original authors of the WAI, work ability can be considered low (7-27 points), moderate (28-36 points), good (37-43 points) and optimal (44-49 points). The original version of the WAI was translated and adapted to the Brazilian context in 1997 by Fischer and collaborators⁽⁷⁾.

The Copenhagen Psychosocial Questionnaire (COPSOQ III) was used to assess the psychosocial work environment. The third version of the COPSOQ contains 33 questions and represents the reduced version of the instrument, which was

translated and adapted to the Brazilian context in 2020⁽¹²⁾. A 5-point Likert-type scale was used, ranging from 1 (never/ almost never or not at all/almost nothing); 2 (rarely or a little); 3 (sometimes or moderately); 4 (frequently or very much); to 5 (always or exactly).

The COPSOQ III has already been validated in countries such as Canada, France, Germany, Spain, Sweden, Turkey⁽¹⁴⁾ and Portugal⁽¹⁵⁾. The questionnaire is divided into the following dimensions: demand for hiding emotions (1 question); conflict between personal and private life (4 questions); influence at work (4 questions); meaning of work (2 questions); commitment in the workplace (1 question); social support from supervisors (2 questions); sense of community at work (2 questions), recognition (2 questions); horizontal trust (1 question); insecurity at work and about working conditions (4 questions); job satisfaction (4 questions); self-rated health (1 question); somatic stress (1 question) and symptoms of depression (4 questions)⁽¹⁴⁾.

The data were analyzed descriptively through frequency distribution. To verify the factors associated with the work ability index, binomial logistic regression modeling was used^(16,17), whose score was categorized into two class groups, one referring to "optimal/good" ability and the other referring to "moderate/low" ability (as a reference category). Initially, the work ability index score was classified into four categories (low, moderate, good and optimal). However, the decision was made to combine the four categories into two, due to the low frequencies of occurrence in the moderate and low categories, which would make multinomial logistic regression modeling unfeasible. Thus, the value of the work ability index was considered as the dependent variable, categorized into two groups: "optimal/good" and "moderate/low" ability. The independent variables considered were sociodemographic, work-related, lifestyle, COVID-19-related characteristics, and the dimensions of COPSOQ III. All independent variables were also categorized into two groups.

To test the association between the dependent variable "work ability" and the independent variables, a bivariate analysis was initially performed using the chi-square test and, when necessary, Fisher's exact test was used. All variables with p-values <0.20 in the bivariate analysis were tested in the multiple logistic regression model for good/optimal capacity compared to moderate/low capacity. The modeling process was performed by entering each variable into the model (stepwise selection). The raw and model-adjusted Odds Ratios (OR) were estimated. In the multiple modeling process, it was found that many independent variables were correlated (multicollinearity) because, although the two variables included in the model were significantly correlated to the outcome, one of them would virtually disappear.

To deal with this issue, a matrix was created with the associations between all independent variables, which allowed the choice of the variable to be considered in the model. During modeling, possible confounding and interaction variables were considered. Model fit was evaluated using the Hosmer and Lemeshow test. The analyses were performed using R-Studio® software and the significance level of the tests was 0.05.

The present study was approved by the Ethics Committee and Scientific Committee of Universidade Federal de Mato Grosso do Sul, under CAAE No 56756522.4.0000.0021.

■ RESULTS

The sample consisted of 197 professionals, with an average age of 40.12 years, minimum age of 22 and maximum age of 66 years (standard deviation = 7.14), and most were female (60.9%). A little more than half were married or in a stable relationship (68.5%), 73.1% had children and 78.2% had completed college.

Regarding the distribution by professional occupation, the largest participation was of nursing technicians (55.8%, n=110); followed by nurses (31.5%, n=62); physiotherapists (4.6%, n=09); doctors (4.1%, n=08); nursing assistants (3.5% n=07); and speech therapists (0.5% n=01). The average length of experience in the health sector was 15.5 years and most professionals worked 36 hours per week (95.4%). As for the frequency of physical activities, just over half (51.8%) stated that they did not do any and 80.7% had abnormal body mass index (BMI) (overweight or obesity). Most health professionals

had good (44.7%) and optimal (30.5%) work capacity, followed by moderate (22.8%) and low (2%). The average work ability score was 40 (minimum: 23 and maximum: 49).

Table 1 shows the distribution of work ability (good/optimal and moderate/low) according to sociodemographic, work, lifestyle and COVID-19 variables. It can be seen that the prevalence of good/optimal work capacity was 75.1 (95% CI: 0.68-0.81) and the distribution of work capacity was homogeneous for almost all sociodemographic variables, except for marital status ($p=0.035$), which showed a significantly higher prevalence for married individuals and working hours ($p=0.05$). There was also an exception for professionals who worked less than 60 hours per week. Regarding lifestyle, the prevalence of work capacity was significantly higher for those who practiced physical activity ($p=0.002$) and leisure activities ($p<0.001$). As for the variables related to the COVID-19 pandemic, professionals who did not have health problems after COVID-19 infection ($p=0.047$) and did not have health problems after managing patients with COVID-19 ($p=0.024$) had a statistically significant prevalence of good/optimal work capacity.

Table 2 shows the distribution of work capacity (good/optimal and moderate/low) with the COPSOQ III variables (psychosocial factors). The variables statistically associated with work ability were demand for hiding emotions ($p=0.032$); conflict between personal and private life ($p=0.015$); horizontal trust ($p=0.012$); meaning of work ($p=0.002$); and job satisfaction ($p=0.002$). The highest prevalence rates with statistical significance were commitment in the workplace ($p<0.001$), recognition ($p<0.001$), self-rated health ($p<0.001$), somatic stress ($p<0.001$) and symptoms of depression ($p<0.001$).

Table 1 – Prevalence of work capacity according to sociodemographic, work, lifestyle and COVID-19 characteristics of health professionals at a teaching hospital, Campo Grande, Mato Grosso do Sul, Brazil, 2022.

Variable	Work Capacity		P value
	Good/Optimal	Moderate/Low	
	n=148 (75.1)	n=49 (24.9)	
Gender			
Male	59 (39.9)	18 (36.7)	0.826
Female	89 (60.1)	31 (63.3)	
Age range (years)			
21-39 years	87 (58.8)	24 (49.0)	0.301
40-66 years	61 (41.2)	25 (51.0)	
Marital status			
Married/living together	95 (64.2)	40 (81.6)	0.035
Single/divorced/widowed	53 (35.8)	9 (18.4)	

Table 1 – Cont.

Variable	Work Capacity		P value
	Good/Optimal	Moderate/Low	
	n=148 (75.1)	n=49 (24.9)	
Children			
No	40 (27.0)	13 (26.5)	1
Yes	108 (73.0)	36 (73.5)	
Education			
Completed graduation	113 (76.3)	41 (83.7)	0.381
Completed secondary education	35 (23.7)	8 (16.3)	
Professional occupation			
Nurse + physiotherapist + physician+ speech therapist	56 (37.8)	24 (49.0)	0.226
Nursing technician + Nursing assistant	92 (62.2)	25 (51.0)	
Length of time working in the health sector (years)			
0 -10 years	38 (25.7)	10 (20.4)	0.580
11-49 years	110 (74.3)	39 (79.6)	
Workload			
<60 hours	139 (93.9)	41 (83.7)	0.055
>60 hours	9 (6.1)	8 (16.3)	
Work Shift			
Day/Afternoon	90 (60.8)	29 (59.2)	0.973
Night	58 (39.2)	20 (40.8)	
Bond with the institution			
Tenured/Statutory	20 (13.5)	10 (20.4)	0.34
Temporary/CLT employment contract*	128 (86.5)	39 (79.6)	
Management Position			
No	145 (98.0)	46 (94.0)	0.164
Yes	3 (2.0)	3 (6.0)	
BMI Classification			
Healthy	30 (20.3)	6 (12.2)	0.550
Overweight/Obesity I,II,III	118 (79.7)	43 (87.8)	
Smokers			
No	136 (91.9)	43 (87.7)	0.396
Yes	12 (8.1)	6 (12.3)	
Alcohol			
No	69 (46.6)	26 (53.1)	0.537
Yes	79 (53.4)	23 (46.9)	

Table 1 – Cont.

Variable	Work Capacity		P value
	Good/Optimal	Moderate/Low	
	n=148 (75.1)	n=49 (24.9)	
Leisure			
Yes	117 (79.0)	25 (51.0)	<0.001
No	31 (21.0)	24 (49.0)	
Physical Activity			
Yes	81 (54.7)	14 (28.6)	0.002
No	67 (45.2)	35 (71.4)	
Contracted COVID-19 Infection			
No	33 (22.3)	9 (18.4)	0.703
Yes	115 (77.7)	40 (81.6)	
Had health problems post-COVID-19 infection			
No	124 (90.5)	34 (69.4)	0.047
Yes	24 (16.2)	15 (30.6)	
Provided direct care to patients with COVID-19 infection			
No	12 (8.1)	2 (4.1)	0.524
Yes	136 (91.9)	47 (95.9)	
Did the professional have health problems after handling a patient with COVID-19?			
No	138 (93.2)	40 (81.6)	0.024
Yes	10 (6.8)	9 (18.4)	

Source: Authors, 2022

Note: * Chi-square test or Fisher's exact test

Table 2 – Characteristics of the COPSOQ III of health professionals at a teaching hospital, according to their work capacity, Campo Grande, Mato Grosso do Sul, Brazil, 2022.

Variable	Work Capacity	P value	Variable
	Good/Optimal	Moderate/Low	
	n=148 (75.1)	n=49 (24.9)	
Demand for Hiding Emotions			
Protection	97 (65.5)	23 (46.9)	0.032
Risk	51 (34.5)	26 (53.1)	
Conflict between Personal and Private Life			
Protection	100 (67.6)	23 (46.9)	0.015
Risk	48 (32.4)	26 (53.1)	

Table 2 – Cont.

Variable	Work Capacity		P value	Variable
	Good/Optimal	Moderate/Low		
	n=148 (75.1)	n=49 (24.9)		
Influence at Work				
Protection	85 (57.4)	24 (49.0)		0.386
Risk	63 (42.6)	25 (51.0)		
Meaning of Work				
Protection	144 (97.3)	41 (83.7)		0.002
Risk	4 (2.7)	8 (16.3)		
Commitment in the Workplace				
Protection	142 (95.9)	39 (79.6)		<0.001
Risk	6 (4.1)	10 (20.4)		
Social Support from Supervisors				
Protection	135 (91.2)	41 (83.7)		0.224
Risk	13 (8.8)	8 (16.3)		
Sense of Community at Work				
Protection	137 (92.6)	42 (85.7)		0.159
Risk	11 (7.4)	7 (14.3)		
Recognition				
Protection	136 (91.9)	35 (71.4)		<0.001
Risk	12 (8.1)	14 (28.6)		
Horizontal Trust				
Protection	114 (77.0)	28 (57.1)		0.012
Risk	34 (23.0)	21 (42.9)		
Insecurity at Work				
Protection	124 (83.8)	36 (73.5)		0.164
Risk	24 (16.2)	13 (26.5)		
Insecurity about Working Conditions				
Protection	102 (68.9)	31 (63.3)		0.577
Risk	46 (31.1)	18 (36.7)		
Job Satisfaction				
Protection	90 (60.8)	17 (34.7)		0.002
Risk	58 (39.2)	32 (65.3)		

Table 2 – Cont.

Variable	Work Capacity	P value	Variable
	Good/Optimal	Moderate/Low	
	n=148 (75.1)	n=49 (24.9)	
Self-rated Health			
Protection	76 (51.3)	6 (12.3)	<0.001
Risk	72 (48.7)	43 (87.7)	
Somatic Stress			
Protection	135 (91.2)	34 (69.4)	<0.001
Risk	13 (8.8)	15 (30.6)	
Symptoms of Depression			
Protection	125 (84.5)	22 (44.9)	<0.001
Risk	23 (15.5)	27 (55.1)	

Source: Authors, 2022

* Chi-square test or Fisher's exact test

The result of the multiple logistic regression analysis is shown in Table 3. An inverse association was observed between the variables and good/optimal work capacity. The independent variables associated with work ability were: recognition (OR=0.26; 95%CI: 0.09-0.75), self-rated health (OR=0.15; 95%CI: 0.06-0.43), somatic stress (OR=0.19; 95%CI: 0.08-0.66), leisure activity (OR=0.27; 95%CI: 0.12-0.64), commitment to working hours and interaction between commitment in the workplace and physical activity (OR=0.17; 95%CI: 0.07-0.82). Reduction in the good/optimal work capacity of health professionals was observed, both for those who were exposed to psychosocial risks at work and for those who affirmed not practicing physical and leisure activities. The model was adequate according to the Hosmer & Lemeshow test ($p=0.649$).

DISCUSSION

Analysis of the sociodemographic profile of the health professionals in this study shows that most of them are female, married, and with children, confirming the predominance of this gender in the health area compared to other Brazilian studies^(8,18). The independent factors that interfere with work ability are recognition, self-assessed health, somatic stress, leisure activity, commitment to working hours, as well as commitment in the workplace and physical activity.

Recognition and work ability index remained significantly associated after multiple modeling. In COPSOQ III, recognition refers to the perception of efforts at work by management or

supervisors. Although no previous studies were found on the relationship between recognition and ICT, the relationship found shows that workers who did not feel recognized had a reduction in good/optimal work ability. It should be noted that this is one of the first studies involving the COPSOQ III, short version, in Brazil, in which validation has already been carried out in health professionals⁽¹⁵⁾.

Self-rated health, which refers to the individual's perception of their own health, was also an important variable to explain good/optimal work ability in the context investigated, corroborating the results of a Brazilian study with 72 nurses and 195 nursing technicians and assistants in which it was observed that self-reported health perception was an important predictor of work capacity⁽¹⁸⁾. The lack of perception about one's own health generates neglect with food, strenuous work hours, family distance and lack of commitment to self-care⁽¹⁹⁾. Therefore, this study reinforces the importance of health perception, as it indicates that there is a reduction in work capacity for those who have a worse self-rated health.

Somatic stress was significantly associated with participants' work ability. The work scenario was greatly impacted by the COVID-19 pandemic and new demands were imposed on healthcare professionals' daily lives. In addition to physical suffering, these professionals faced psychological risk factors linked to difficulties in balancing professional and family responsibilities⁽²⁰⁾. A study with 653 healthcare professionals from a teaching hospital in Italy detected a 16.8% prevalence of irritable bowel syndrome (IBS), associated

Table 3 – Odds ratio (crude and adjusted ORs) of the association of sociodemographic, work, lifestyle, COPSOQ III variables and good/optimal work capacity of health professionals at a teaching hospital in Campo Grande, Mato Grosso do Sul, Brazil, 2022.

Variable	Crude OR	CI 95% ^a	Adjusted OR	CI 95% ^a	p*value
Recognition	0.22	0.09 – 0.52	0.26	0.09 – 0.79	0.017
Self-rated Health	0.13	0.05 – 0.33	0.15	0.05 – 0.43	<0.001
Somatic Stress	0.22	0.09 – 0.5	0.19	0.07 – 0.55	0.002
Commitment in the Workplace	0.16	0.06 – 0.48	0.82	0.34 – 1.98	0.661
Physical Activity	0.33	0.16 – 0.67	0.71	0.05 – 9.22	0.796
Commitment in the Workplace and physical activity	–	–	0.17	0.03 – 0.92	0.039
Leisure activity	0.28	0.14 – 0.55	0.27	0.12 – 0.64	0.003
Workload	0.33	0.12 – 0.91	0.23	0.07 – 0.82	0.023
Marital status	2.48	1.12 – 5.50	–	–	–
Management position	0.32	0.12 – 0.85	–	–	–
Health problems following COVID-19 infection	0.32	0.12 – 0.85	–	–	–
Health problems after managing a patient with COVID-19	0.32	0.12 – 0.85	–	–	–
Hiding emotions	0.47	0.24 – 0.90	–	–	–
Personal and private life conflict	0.42	0.22 – 0.82	–	–	–
Meaning of work	0.14	0.04 – 0.50	–	–	–
Sense of Community at Work	0.48	0.18 – 1.32	–	–	–
Horizontal trust	0.40	0.20 – 0.79	–	–	–
Insecurity at work	0.54	0.25 – 1.16	–	–	–
Job Satisfaction	0.34	0.17- 0.67	–	–	–

Source: Authors, 2022

^a95% confidence intervals

* p-value of Multiple Logistic Regression

Hosmer and Lemeshow goodness of fit (GOF) test p-value = 0.649

with a higher prevalence of psychiatric diagnoses and sleep disorders and high levels of tension at work. Severity of IBS was positively correlated with occupational stress and both were negatively associated with work capacity⁽²¹⁾. The findings of this study show that decrease in work ability for those with somatic stress is consistent with the data from the Italian study and indicate that somatic stress in workers deserves attention both from the individuals involved and from institutional policies.

In the context of social life, leisure activities were also an important characteristic that significantly impacted the participants' ability to work, as those who reported not having leisure activities had a reduction in good/optimal ability to work. These results corroborate findings from a longitudinal study with 10,968 Chinese adults, which demonstrated that playing sports, going to gyms, and meeting friends and relatives in person and/or virtually is strongly associated with a lower likelihood of experiencing symptoms of depression⁽²²⁾.

Furthermore, a study with 483 German workers from various production sectors found that social activities unrelated to work and physical exercise in free time were associated with fewer illnesses, less absenteeism, and better work capacity⁽²³⁾. Thus, leisure activities must be valued by individuals and institutions to improve health and work capacity.

Another important finding concerns the commitment to working hours, as workers with a workload of more than 60 hours per week had their work capacity reduced. In the teaching hospital where the study was conducted, as in several other institutions, there was an increase in shifts and work overload during the pandemic period. In a study with nurses from São Paulo, long and frequent double work shifts were observed, including night work. Symptoms such as insomnia and poor sleep quality were associated with exposure to an inadequate psychosocial environment (shift work or night work) and more than half of the nursing professionals had impaired work capacity⁽⁸⁾. Furthermore, another study with 225 healthcare professionals conducted in a hospital in Asia used the second version of the Copenhagen Psychosocial Questionnaire (COPSOQ II) and found that increased working hours generate demotivation and negatively impact productivity⁽²⁴⁾. The findings of these studies, as well as those of the present study, suggest the need for a balance between working hours and work capacity so that the gains received (material or psychosocial) do not compromise or reduce work capacity.

The variables commitment in the workplace and physical activity showed a significant interaction effect with the ability to work, demonstrating that lack of commitment and lack of physical activity significantly reduced the participants' ability to work. In a study with 497 German nurses, with the administration of the COPSOQ, there was a reduction in

burnout with increased commitment in the workplace, as commitment generates a feeling of belonging, security, and stability⁽²⁵⁾. Another study with 724 nurses from hospitals and community health services in Europe indicated that the main engagement factor that contributed to work capacity was dedication⁽²⁶⁾. The same authors concluded that promoting work capacity is beneficial for improving job satisfaction and also for reducing turnover among nurses⁽²⁶⁾.

Regarding physical activity, an integrative review showed that physical exercise promotes health, reduces stress, and increases well-being and productivity⁽¹⁹⁾. A study with 407 workers in the construction sector in Iran showed that those who did not exercise had lower work capacity⁽⁵⁾. A Polish study with 373 soldiers showed that physical activity associated with work and leisure periods correlates with the ability to work according to physical and mental demands⁽²⁷⁾. A Finnish study with 921 workers revealed that, for individuals with more physically demanding jobs, performing physical activity during leisure time is associated with better work capacity⁽²⁸⁾. Despite the possible effects, commitment in the workplace and physical activity were not shown to be isolated as in the studies discussed above. The interaction found reflects the simultaneous effect of the two characteristics on good/optimal work ability.

The outcomes related to health problems post-COVID-19 infection and post-exposure to COVID-19 patient management among healthcare workers demonstrated a significant association with work ability in univariate analysis. This association is considered important. However, this relationship did not persist in multivariate analysis, as expected.

Two Italian studies investigated the effects of post-COVID symptoms on the ability to work. The first study examined 56 healthcare professionals from a teaching hospital in Italy, and the results indicated impacts on physical well-being, memory impairment, persistent anxiety and depression, and reduced work ability⁽²⁹⁾. In the second study, 115 people had persistent post-COVID symptoms, mostly healthcare workers (59.1%), who experienced changes in sleep patterns, increased fatigue, anxiety, depression, and reduced work capacity compared to those whose symptoms quickly disappeared⁽³⁰⁾.

One of the main limitations of the present study is its cross-sectional design, which does not allow for establishing a causal relationship between the variables investigated. Convenience sampling can also contribute to data biases, because the selected subjects are the most available, resulting in low representativeness. Also, health professionals on leave were not investigated. This may influence the results due to the healthy worker effect, whereas the healthiest workers who manage to survive and adapt to the working conditions remain at work.

CONCLUSION

It was concluded that the ability to work was good or optimal for most health professionals, and moderate or low for one quarter of these workers. The factors related to good/optimal work ability were recognition, self-rated health, somatic stress, leisure activity, commitment to working hours, and commitment in the workplace and physical activity.

A reduction in good/optimal work capacity was observed in healthcare professionals who worked during the COVID-19 pandemic, in those workers exposed to psychosocial risks at work, and in those who did not engage in physical and leisure activities.

These results should be carefully considered and thought about by managers when making decisions and creating occupational health public policies and by healthcare workers. Furthermore, public institutions and bodies should provide, through policies, investments to promote the quality of life of these professionals, as well as healthy retirement.

REFERENCES

- Pollock A, Campbell P, Cheyne J, Cowie J, Davis B, McCallum J, et al. Interventions to support the resilience and mental health of frontline health and social care professionals during and after a disease outbreak, epidemic or pandemic: a mixed methods systematic review. *Cochrane Database Syst Rev*. 2020;5;11(11):CD013779. <https://doi.org/10.1002/14651858.CD013779>
- Pinheiro JMG, Macedo ABT, Antonioli L, Vega EAU, Tavares JP, Souza SBC. Quality of professional life and occupational stress in nursing workers during pandemic by COVID-19. *Rev Gaúcha Enferm*. 2023;44:e20210309. <https://doi.org/10.1590/1983-1447.2023.20210309.pt>
- Afshari D, Nourollahi-darabadi M, Chinisaz N. Psychosocial factors associated with resilience among Iranian Nurses During COVID-19 Outbreak. *Front Public Health*. 2021;9:714971. <https://doi.org/10.3389/fpubh.2021.714971>
- García-Iglesias JJ, Gómez-Salgado J, Ortega-Moreno M, Navarro-Abal Y. Relationship between work engagement, psychosocial risks, and mental health among Spanish Nurses: a cross-sectional study. *Front Public Health*. 2021;8:627472. <https://doi.org/10.3389/fpubh.2020.627472>
- Mokarami H, Cousins R, Kalteh HO. Comparison of the work ability index and the work ability score for predicting health-related quality of life. *Int Arch Occup Environ Health*. 2022;95(1):213-21. <https://doi.org/10.1007/s00420-021-01740-9>
- Ilmarinen J. From work ability research to implementation. *Int J Environ Res Public Health*. 2019;16(16):2882. <https://doi.org/10.3390/ijerph16162882>
- Tuomi K, Ilmarinen J, Jähkölä A, Katajarinne L, Tulkki A. Índice de capacidade para o trabalho. São Carlos: EdUFSCar; 2010. 59 p.
- Martínez MC, Latorre MDRDO, Fischer FM. Capacidade para o trabalho e intenção de deixar a profissão de enfermagem em São Paulo. *Rev Enferm UERJ*. 2021;29:e57941. <https://doi.org/10.12957/ruerj.2021.57941>
- Andrade MA, Castro CSM, Batista MV, Mininel VA, Sato TO. Occupational profile, psychosocial aspects, and work ability of Brazilian workers during COVID-19 Pandemic: IMPPAC Cohort. *Safety Health Work*. 2022;13(1):104-11. <https://doi.org/10.1016/j.shaw.2021.11.004>
- Cotrim TP, Ribeiro C, Teles J, Reis V, Guerreiro MJ, Janicas AS, et al. Monitoring work ability index during a two-year period among Portuguese Municipality Workers. *Int J Environ Res Public Health*. 2019;16(19):3674. <https://doi.org/10.3390/ijerph16193674>
- Camerino D, Conway PM, Sartori S, Campanini P, Estryn-Béhar M, Van der Heijden BI, et al. Factors affecting work ability in day and shift-working nurses. *Chronobiol Int*. 2008;25(2):425-42. <https://doi.org/10.1080/07420520802118236>
- Rodrigues CA. Estudos das Propriedades Psicométricas do Copenhagen Psychosocial Questionnaire COPSQ III [Tese][Internet]. Campinas: Programa de Pós-Graduação Stricto Sensu em Psicologia da Universidade São Francisco; 2020 [cited 2023 Jul 30]. 225 p. Available from: <https://www.usf.edu.br/galeria/getImage/427/3997748629022170.pdf>
- Monteiro I. Questionário de dados sociodemográficos, estilo de vida e aspectos de saúde e trabalho - QSETS: duas décadas. In: Monteiro I, Iguti AM, organizadores. Trabalho, saúde e sustentabilidade: diálogo interdisciplinar internacional Sul – Norte [Internet]. Campinas: BFCM-Unicamp; 2017 [cited 2023 Jul 30]. Available from: <https://www.biblioteca digital.unicamp.br/bd/index.php/detalhes-material/?code=80420>
- Burr H, Berthelsen H, Moncada S, Nübling M, Dupret E, International COPSQ Network, et al. The third version of the Copenhagen Psychosocial Questionnaire. *Saf Health Work*. 2019;10(4):482-503. <https://doi.org/10.1016/j.shaw.2019.10.002>
- Cotrim TP, Bem-Haja P, Pereira A, Fernandes C, Azevedo R, Antunes S, et al. The Portuguese Third Version of the Copenhagen Psychosocial Questionnaire: preliminary validation studies of the middle version among municipal and healthcare workers. *Int J Environ Res Public Health*. 2022;19(3):1167. <https://doi.org/10.3390/ijerph19031167>
- Hosmer DW, Lemeshow S. *Applied Logistic Regression*. 2nd ed. New York: John Wiley and Sons; 2000.
- Kleinbaum DG, Kupper LL, Muller KE, Nizam A. *Applied Regression Analysis and other Multivariate Methods*. 4th ed. Boston: Thomson Brooks/Cole; 2008.
- Bordignon M, Marziale MHP, Sutherland MA, Monteiro I. Factors related to work ability among nursing professionals from urgent and emergency care units: a cross-sectional study. *Work*. 2023;74(2):673-83. <https://doi.org/10.3233/WOR-211300>
- Silva TF, Soares PDFL, Rodrigues DP, Soranso CAM, Coelho IVS, Silva EA. Health promotion actions for the quality of life of health workers. *J Health NPEPS*. 2022;7(1):e6370. <http://dx.doi.org/10.30681/252610106370>
- Buselli R, Corsi M, Baldanzi S, Chiumiento M, Del Lupo E, Dell'Oste V, et al. Professional quality of life and mental health outcomes among health care workers exposed to Sars-Cov-2 (Covid-19). *Int J Environ Res Public Health*. 2020;17(17):6180. <https://doi.org/10.3390/ijerph17176180>
- Buselli R, Veltri A, Corsi M, Marino R, Necciarri G, Baldanzi S, et al. Irritable Bowel Syndrome prevalence and work ability in a sample of healthcare workers exposed to occupational stress. *J Psychosom Res*. 2021;148:110566. <https://doi.org/10.1016/j.jpsychores.2021.110566>
- Bian J, Xiang Z. Do the various leisure forms have equal effects on mental health? a longitudinal analysis of self-selected leisure activities. *Front Public Health*. 2023;11:1134854. <https://doi.org/10.3389/fpubh.2023.1134854>
- Rieker JA, Gajewski PD, Reales JM, Ballesteros S, Golka K, Hengstler JG, et al. The impact of physical fitness, social life, and cognitive functions on work ability in middle-aged and older adults. *Int Arch Occup Environ Health*. 2023;96(4):507-20. <https://doi.org/10.1007/s00420-022-01943-8>
- Adib Ibrahim M, Abdul Aziz A, Suhaili NA, Zahid Daud A, Naing L, Abdul Rahman H. A study into psychosocial work stressors and health care productivity. *Int J Occup Environ Med [Internet]*. 2019 [cited 2023 Jul 27];10(4):185-193. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6820312/pdf/ijoom-10-185.pdf>

25. Diehl E, Rieger S, Letzel S, Schablon A, Nienhaus A, Escobar Pinzon LC, et al. The relationship between workload and burnout among nurses: the buffering role of personal, social and organizational resources. *PLoS One*. 2021;16(1):e0245798. <https://doi.org/10.1371/journal.pone.0245798>
26. Tomietto M, Paro E, Sartori R, Marichio R, Clarizia L, PN Nursing Group, et al. Work engagement and perceived work ability: an evidence-based model to enhance nurses' well-being. *J Adv Nurs*. 2019;75(9):1933-942. <https://doi.org/10.1111/jan.13981>
27. Grabara M, Sadowska-Krępa E. Occupational and leisure time physical activity of territorial army soldiers during the COVID-19 pandemic in the context of their perceived work ability. *Int J Occup Med Environ Health*. 2022;35(3):327-37. <https://doi.org/10.13075/ijom.1896.01881>
28. Päivärinne V, Kautiainen H, Heinonen A, Kiviranta I. Relationships of leisure-time physical activity and work ability between different occupational physical demands in adult working men. *Int Arch Occup Environ Health*. 2019;92(5):739-46. <https://doi.org/10.1007/s00420-019-01410-x>
29. Mendola M, Leoni M, Cozzi Y, Manzari A, Tonelli F, Metruccio F, et al. Long-term COVID symptoms, work ability and fitness to work in healthcare workers hospitalized for Sars-CoV-2 infection. *Med Lav*. 2022;24;113(5):e2022040. <https://doi.org/10.23749/mdl.v113i5.13377>
30. Magnavita N, Arnesano G, Di Prinzio RR, Gasbarri M, Meraglia I, Merella M. Post-COVID symptoms in occupational cohorts: effects on health and work ability. *Int J Environ Res Public Health*. 2023;20:5638. <https://doi.org/10.3390/ijerph20095638>

■ Acknowledgements:

- a) The Universidade Federal de Mato Grosso do Sul.
- b) This study was financed in part by the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil* (CAPES) – Finance Code 001.

■ Authors' contribution:

Conceptualization: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera, Andréia Insabralde de Queiroz Cardoso.

Data curation: Márcia Andréia Queiroz Freitas, Luciana Scarlazzari Costa.

Formal analysis: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera, Andréia Insabralde de Queiroz Cardoso, Luciana Scarlazzari Costa.

Investigation: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera.

Methodology: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera, Andréia Insabralde de Queiroz Cardoso.

Project administration: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera, Andréia Insabralde de Queiroz Cardoso.

Supervision: Luciana Contrera

Validation: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera, Andréia Insabralde de Queiroz Cardoso, Luciana Scarlazzari Costa.

Visualization: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera, Andréia Insabralde de Queiroz Cardoso, Luciana Scarlazzari Costa.

Writing – original draft: Márcia Andréia Queiroz Freitas dos Santos.

Writing – review & editing: Márcia Andréia Queiroz Freitas dos Santos, Luciana Contrera, Andréia Insabralde de Queiroz Cardoso, Luciana Scarlazzari Costa.

The authors declare that there is no conflict of interest.

■ Corresponding author:

Márcia Andréia Queiroz Freitas dos Santos
E-mail: m.andreiafreitas@gmail.com

Received: 09.11.2023

Approved: 03.29.2024

Associate editor:

Fernanda Ludmilla Rossi Rocha

Editor-in-chief:

João Lucas Campos de Oliveira

