Common mental disorders and associated factors in healthcare workers during the COVID-19 pandemic: A cross-sectional study

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Abstract.
BACKGROUND: The coronavirus 2019 (COVID-19) pandemic changed the way people live. As a result, workload and mental health problems increased, especially in healthcare workers.
OBJECTIVE: To verify the prevalence of common mental disorders (CMD) and its association with sociodemographic and work variables in healthcare workers of a Family Health Support Center in the Primary Health Care context (NASF-AB) in Brazil during the COVID-19 pandemic.
METHODS: This cross-sectional study was conducted with 68 healthcare workers, both sex (55 female/13 male), from the Primary Health Care context in Brazil, particularly NASF-AB of Salvador Bahia. NASF-AB is part of a policy to consolidate Primary Health Care in Brazil. NASF-AB of Salvador has twelve multidisciplinary teams distributed in twelve health districts. The data collection was performed from May to August 2021. The self-reporting questionnaire - 20 (SRQ-20), that assessed the prevalence of CMD, and a sociodemographic questionnaire assessed sociodemographic and work variables via Google forms.
RESULTS: The prevalence of CMD was 39.71%. On SRQ-20, 70, 59% of participants felt nervous; 54, 41% felt tired all the time and 51, 47% felt tired easily. CMD was also significantly associated with females ($p < 0.001$).
CONCLUSION: The prevalence of CMD was high (39, 71%), with females ($n = 27/55$) being more susceptible to CMD than males ($n = 0/13$). Feel nervous, tired all the time and easily tired were the most frequent symptoms reported by the participants, indicating depressive/anxious mood, and reduced vital energy. Our findings highlight the need for specific measures to improve health and quality of life of healthcare workers.

Keywords: Mental health, primary health care, public health, coronavirus, occupational health

1. Introduction

Physical, psychological, cultural, economic, and social fields of individuals and communities were affected by the coronavirus 2019 (COVID-19) pan-

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demic [1–5] and interpersonal and work relations were also profoundly impacted by restrictions of the pandemic [6]. Besides isolation, healthcare workers were exposed to increased workload, fear of contamination, reduced leisure activities, and restricted number of material supplies. In this context, some studies evaluated the effects of COVID-19 on healthcare workers, including the prevalence of common mental disorders (CMD) related to work [7–12].

In Brazil, Family Health Support Center in the Primary Health Care context (NASF-AB) are multidisciplinary teams of physiotherapists, occupational therapists, physical education professionals, social workers, nutritionists and psychologists that supports the health workers teams of doctors, nurses, dentists and health technicians that assist the population of a specific territory, considering health as a result of social changes. The duties of NASF-AB are based on clinical-assistance and technical-pedagogical perspectives. In the first perspective care is provided directly to the service user and his/her family, which can be shared with others in the service network, including specialized care. In the second perspective, educational activities are performed with the family health teams, including the user of the service, health network or other sectors, mainly in the territory [13].

Work routine of healthcare workers from NASF-AB altered significantly at each pandemic stage and required frequent readjustments. For example, they had to adapt to long-term monitoring of patients with COVID-19, monitor COVID-19 transmission, increase workload due to reduced availability of professionals and high healthcare demand, and implement rigorous hygiene routines and sanitary barriers [13–15].

Recent studies indicated that healthcare workers faced adverse working conditions during the pandemic, such as direct exposure to infected patients and stress related to the care of infected patients, commonly under inadequate working conditions and scarce personal protective equipments [8, 9, 16]. Therefore, considering the multifactorial and complex characteristics of NASF-AB duties and the fact that NASF-AB is setting a new way of producing healthcare in Brazil [17], it is important to screen symptoms underlying mental health problems in this population. Accordingly, we can understand the potential implications of the pandemic in order to suggest and set plans to enhance the context of Primary Health Care in Brazil. We hypothesized that the prevalence of CMD was high in these workers, and the variables sex, race/color, workload (in hours),

intensification of workload or restriction regarding rest during the pandemic, and other jobs were associated with CMD in healthcare workers. Therefore, we evaluated the prevalence of CMD and its association with sociodemographic and work variables in healthcare workers of NASF-AB in Salvador (Bahia - Brazil) during the COVID-19 pandemic.

2. Methods

A primary, descriptive, quantitative, and cross-sectional study was conducted at the NASF-AB in Salvador (Bahia, Brazil) in 2021. All NASF-AB have the same composition of professionals, differing only in number. In Salvador, twelve multidisciplinary teams are distributed in twelve health districts, with an average of 108 family health teams supporting approximately 3,000 people each.

The study was conducted according to the Declaration of Helsinki and approved by the human research ethics committee of the State University of Bahia (CAEE: 39364120.3.0000.0057). All participants signed an informed consent form and completed the online survey. The data collection was performed from May to August 2021.

2.1. Participants and sample size

The participants were included if they were health care workers working for at least six months in the NASF-AB, regardless of race, color, and gender aged between 21 and 70 years. This age range was chosen because 21 years old is the minimum age to enter the public service and 70 years old is the limit for retirement in Brazil. The exclusion criteria were workers who were on vacation or absent from work.

Sample size was calculated using the OpenEpi platform (https://www.openepi.com/) and considering the following parameters for associations between CMD and sociodemographic and work characteristics: 80 health workers, prevalence of CMD of 30%, alpha of 5%, 95% confidence interval, and expected effect size of 1.0. A minimal sample size of 65 participants was estimated.

Data were obtained from the primary care management of the city or health districts, and the initial sample consisted of 80 healthcare workers. However, ten healthcare workers were excluded due to vacation or absence from work (allowed by the public administration), and two refused to participate.

All participants were working in person on the front line of the pandemic during the data collection period. The final sample consisted of 68 participants. Fifty-five out of these were female (80.88%) and 13 male (19.12%). Regarding the professionals categories, 19 (28%) were physiotherapists, seven (10.29%) occupational therapists, 10 (15%) social workers, 13 (19.12%) nutritionists, nine (13.24%) psychologists, and 10 (14.71%) physical education professionals.

2.2. Variables and instruments

We used the Self-Reporting Questionnaire - 20 (SRQ-20) to screen CMD in healthcare workers [18]. SRQ-20 was developed by the World Health Organization [19] and is a globally accessible tool to identify CMD in primary health care contexts [20]. Besides screening symptoms related to mental illness in a general epidemiological field, the questionnaire was considered feasible for developing countries. SRQ-20 was validated in Brazil (high sensitivity [83%] and specificity [80%]) [18] and widely used in rural [21] and urban population contexts [22].

The questionnaire is composed of 20 screening questions for non-psychotic disorders with dichotomous answers (yes or no). Symptoms are subdivided into four categories: somatic symptoms, depressive or anxious mood, reduced vital energy, and depressive thoughts [18]. Thus, to identify the prevalence of CMD, we used the cutoff point of seven or more "yes" answers, regardless of sex [23, 24].

A questionnaire comprises of demographic and work characteristics was developed. It includes variables regarding occupation, sex (female or male), age (in years), marital status (single, married or living with a partner, separated, divorced, or widowed), type of housing (own, leased, borrowed, financed), children (yes or no) and educational level (higher education, specialization, master's, or doctorate). Regarding work characteristics, participants were asked about weekly workload, employment relationship (i.e., special administrative law regime, contracted, permanent, cooperative, or outsourced), multiple jobs (yes or no), and professional experience. The continuous variables "age in years" and "time working in the family health" were dichotomized according to median values: age was classified as ≤ 40 or ≥ 41 years, and time working in family health as ≤ 6 or ≥ 7 years. We also included questions related to leisure time (i.e., vacations or days off) and increase of CMD symptoms during the pandemic. The current epidemiological literature was used for these questions [9, 25].

2.3. Procedures

Online questionnaires were sent to participants via Google forms. Disclosure and recruitment of participants occurred via Worker Support and Care Centers (NAAT) and official e-mails. NAAT are centers that assist workers during work-related illnesses and the COVID-19 pandemic, providing psychological support and referral to healthcare professionals. We also disclosed the study in social networks, such as Instagram and WhatsApp. A pilot study was conducted with workers not eligible for the study to standardize procedures, improve data collection instruments, and train researchers, in which no changes were made to the questions.

2.4. Statistical analysis

Data were presented as frequency, mean, and standard deviation. Bivariate analysis was performed using Chi-squared test, considering CMD as dependent variable and work and sociodemographic factors as independent variables. In addition, we described information for each of the SRQ-20 Categories and Items in order to identify the most frequent occurrence among the 20 Items presented in the questionnaire. Data were analyzed using Stata software version 13.0, and significance was set at 5%.

3. Results

Our sample consisted of 68 healthcare workers from NASF-AB (mean age of 40.51 ± 6.06 years), mostly female (80.88%), brown (35.29%), and married (54.41%). Most participants had a specialization course (80.88%) and worked with family health for seven or more years (64.71%). Moreover, 50% of participants reported having more than one job, while 71% reported work overload or restriction of leisure activities during the first year of the pandemic (Table 1). The prevalence of general CMD (considering the cutoff point of seven positive questions of SRQ-20) was 39.71% in the healthcare workers.

Table 2 shows absolute and relative frequencies of SRQ-20 items. In this table we are showing descriptive information for each of the SRQ-20 Categories and Items in order to identify the most frequent occurrence of each symptoms screened by the ques-

Table 1
Sociodemographic and work characteristics of healthcare workers of NASF-AB during the COVID-19 pandemic

Variables frequency N (%)	
Age (years)	
≤40	38 (55.88)
≥41	30 (44.12)
Sex	
Female	55 (80.88)
Male	13 (19.12)
Race/color	
Black	22 (32.35)
Brown	24 (35.29)
White	20 (29.41)
Yellow	2 (2.94)
Marital status	
Single	5 (7.35)
Separated	55 (80.88)
Divorced	8 (11.76)
Married or living with a partner	37 (54.41)
Educational level	
Higher education	5 (7.35)
Specialization	55 (80.88)
Master's degree	8 (11.76)
Occupation	
Psychologist	9 (13.24)
Social worker	10 (14.71)
Physical therapist	19 (27.94)
Physical education professional	10 (14.71)
Occupational therapist	7 (10.29)
Nutritionist	13 (19.12)
Workload (hours)	
20	33 (48.53)
30	4 (5.88)
40	31 (45.59)
Workload in the family health (years)	
≤6	24 (35.29)
≥7	44 (64.71)
Other jobs	
Yes	34 (50.00)
No	34 (50.00)
Intensification of workload or restriction regarding rest during the pandemic	
Yes	48 (70.59)
No	20 (29.41)

tionnaire. The item "feel nervous, tense, or worried" of the "depressive or anxious mood" category and items "feel tired all the time" and "easily tired" of the "reduced vital energy" category were the most frequent symptoms screened by the SRQ-20 in these participants.

Table 3 shows CMD screening considering the sociodemographic characteristics of participants. The frequency of items related to positive screening for CMD was significantly higher in females than males ($p < 0.001$). No significant associations were observed between other sociodemographic variables.

4. Discussion

We aimed to verify the prevalence of CMD and its association with sociodemographic and work variables in healthcare workers of NASF-AB in Salvador (Bahia, Brazil) during the COVID-19 pandemic. Results confirmed our initial hypothesis (i.e., high prevalence of CMD) and suggested implications of the pandemic on mental health of healthcare workers.

Despite the high prevalence of general CMD in this population, its magnitude varies in the literature [25]. For instance, a systematic review and meta-analysis with Brazilian workers showed a 30% prevalence of CMD in the general population [27]. Our findings corroborate previous studies performed with primary healthcare professionals in Brazil using SRQ-20 to screen general CMD. Braga et al. [28] observed a prevalence of 42.6% of CMD in primary healthcare workers in Botucatu, São Paulo. Similarly, Silveira et al. [29] found a prevalence of 40.7% of CMD in primary healthcare workers in Porto Alegre, Rio Grande do Sul. Knuth et al. [30] and Santos et al. [31] reported CMD prevalence of 48.69% and 41.6% in healthcare workers from Rio Grande do Sul and Minas Gerais, respectively. In Northeast Brazil (Feira de Santana, Bahia), Carvalho, Araújo, and Bernardes [32] observed a prevalence of 31.6% of CMD in healthcare workers from NASF-AB.

Considering the symptoms of CMD, Urzua et al. [33] also observed symptoms of depression (65%), anxiety (75%), and distress (57%) in primary and secondary healthcare professionals from Chile. A study conducted in Kenya showed that 32.1% and 36% of healthcare professionals had depression and anxiety, respectively, during the COVID-19 pandemic [7]. Despite our main aim was to verify the prevalence of general CMD considering the cutoff point of seven, the descriptive analysis of SRQ-20 Categories also followed the literature [7] with regard high prevalence of symptoms of depressive or anxious mood and reduced vital energy, particularly workers who felt nervous, tense, worried, tired all the time and easily tired were more common in that NASF-AB in Brazil.

A study conducted before the pandemic observed that 50% of public healthcare workers felt nervous, tense, or worried, 20% felt tired all the time, 26% were easily tired, and 16.2% reported difficulty in enjoying their daily activities [34]. In contrast, the frequency of these items was higher in our study, indicating healthcare workers faced overload of work and personal demands during the COVID-19 pan-

Table 2
Relative and absolute frequencies of SRQ-20 items responded by healthcare workers of NASF-AB during the COVID-19 pandemic

SRQ-20 Categories	SRQ-20 Items	Yes N (%)	No N (%)
Somatic symptoms	Headaches - 1	23 (33.82)	45 (66.18)
	Poor appetite - 2	2 (2.94)	66 (97.06)
	Sleep badly - 3	34 (50.00)	34 (50.00)
	Hands shake - 5	5 (7.35)	63 (92.65)
	Poor digestion - 7	24 (35.29)	44 (64.71)
	Uncomfortable feelings in the stomach - 19	20 (29.41)	48 (70.59)
Depressive or anxious mood	Easily frightened - 4	17 (25.00)	51 (75.00)
	Feel unhappy - 9	31 (45.59)	37 (54.41)
	Feel nervous, tense, or worried - 6	48 (70.59)	20 (29.41)
	Cry more than usual -10	19 (27.94)	49 (72.06)
Reduced vital energy	Trouble thinking clearly - 8	20 (29.41)	48 (70.59)
	Feel tired all the time - 18	37 (54.41)	31 (45.59)
	Easily tired - 20	35 (51.47)	33 (48.53)
	Difficult to enjoy your daily activities - 11	34 (50.00)	34 (50.00)
	Daily work suffering - 13	20 (29.41)	48 (70.59)
	Difficult to make decisions - 12	23 (33.82)	45 (66.18)
Depressive thoughts	Unable to play a useful part - 14	2 (2.94)	66 (97.06)
	Lost interest in things - 15	20 (29.41)	48 (70.59)
	Feel that you are a worthless person - 16	2 (2.94)	66 (97.06)
	Thought of ending your life - 17	2 (2.94)	66 (97.06)

demic. Also, the high prevalence of CMD observed was interesting because data were collected in the second moment of COVID-19 in Brazil, in which vaccination coverage reached all healthcare workers in Brazil and the number of cases and deaths decreased significantly. In the face of a high prevalence of mental problems before the pandemic in Brazil [32, 34] and considering the current evidence [35] regarding implications of the pandemic on psychosocial health of these workers, we can hypothesize that the increased number of previous cases also influenced the high prevalence observed in our study during the pandemic.

The high prevalence of CMD and symptoms of stress and energy loss in primary healthcare workers from NASF-AB, suggest the interference of work issues and the pandemic. Work overload and restriction of leisure time due to changes in living conditions caused by COVID-19 pandemic may have led to psychological distress. Other causes of suffering were also suggested in the literature, such as precarious employment, lack of work infrastructure, ambiguity of interpersonal relationships in the work environment, and difficulty in observing the result of their actions in the short term [12, 32, 36]. Some researchers also suggested other stressors and triggers of CMD in healthcare workers during the COVID-19 pandemic, such as secondary exhaustion, burnout, shortage of professionals, lack of medical supplies,

social isolation, long-term care of patients with negative emotions, stigmatization, risk of infection, and fear of contaminating family members [9, 12, 16, 37, 38].

Furthermore, we hypothesized that sex, race/color, workload, intensification of workload or restriction regarding rest during the pandemic, and other jobs were sociodemographic and work characteristics associated with CMD in healthcare workers. Only sex was associated with CMD, rejecting the null hypothesis regarding other factors associated with CMD.

Females had a higher prevalence of CMD than males, suggesting that these health care workers are more susceptible to developing depression, anxiety, and somatic symptoms. Several studies corroborate this finding [6, 7, 9–11, 25, 33, 39], which may occur because most health care workers are females with different social roles and more likely to develop CMD. Despite the underlying mechanisms are not totally clear, female susceptibility for CMD is due to hormonal changes [40] and poorer interpersonal relationships compared to men [25], respectively from a biological and sociocultural perspective [33]. Another hypothesis is that occupational stress plays a key role in mental health of female workers, compromising social and matrimonial life [41].

Double shifts (domestic and work) also increase physical burden and reduce resting time of females,

Table 3
Screening for common mental disorders, according to sociodemographic characteristics of healthcare workers of NASF-AB during the COVID-19 pandemic

Characteristics	CMD						p-value
	Negative		Positive		Total		
	N	%	N	%	N	%	
Age (years)							
≤40	21	55.26	17	44.74	38	100	0.34
≥41	20	66.67	10	33.33	30	100	
Sex							
Female	28	50.91	27	49.09	55	100	<0.001
Male	13	100	0	0	13	100	
Race/color							
Black	13	59.09	9	40.91	22	100	0.65
Brown	15	62.5	9	37.5	24	100	
White	11	55	9	45	20	100	
Yellow	2	100	0	0	2	100	
Type of housing							
Own	23	60.53	15	39.47	38	100	0.90
Leased	7	53.85	6	46.15	13	100	
Borrowed	1	50	1	50	2	100	
Financed	10	66.67	5	33.33	15	100	
Marital status							
Single	13	56.52	10	43.48	23	100	0.62
Separated	2	100	0	0	2	100	
Divorced	3	50	3	50	6	100	
Married or living with a partner	23	62.16	14	37.84	37	100	
Children							
Yes	26	60.47	17	39.53	43	100	0.97
No	15	60	10	40	25	100	
Educational level							
Higher education	3	60	2	40	5	100	0.24
Specialization	31	56.36	24	43.64	55	100	
Master's degree	7	87.5	1	12.5	8	100	
Occupation							
Psychologist	5	55.56	4	44.44	9	100	0.27
Social worker	6	60	4	10	10	100	
Physical therapist	12	63.16	2	36.84	19	100	
Physical education professional	3	30	7	70	10	100	
Occupational therapist	6	85.71	1	14.29	7	100	
Nutritionist	9	69.23	4	30.77	13	100	
Workload (hours)							
20	21	63.64	12	36.36	33	100	0.15
30	4	100	0	0	4	100	
40	16	51.61	15	48.39	31	100	
Time of work in the family health (years)							
≤6	17	70.83	7	29.17	24	100	0.19
≥7	24	54.55	20	45.45	44	100	
Other jobs							
Yes	19	55.88	15	44.12	34	100	0.45
No	22	64.71	12	35.29	34	100	
Intensification of workload or restriction regarding rest during the pandemic							
Yes	15	75	5	25	20	100	0.11
No	26	54.17	22	45.83	48	100	

leading to adverse effects [42] and psychological distress. Studies suggested that stress caused by working against COVID-19 could potentiate CMD in this population [7, 9, 43].

Another point to be highlighted was the choice of SRQ-20. Although mental health problems can be screened in the general population or community using various tools, literature including the screening

of nonspecific psychological distress (e.g., CMD) is still scarce. Moreover, most questionnaires are specific for depression, anxiety, or identification of other mental illnesses, whereas SRQ-20 comprises symptoms of most common mental health problems. Since this tool identifies nonspecific psychological distress [44], it facilitates the indication of severity and level of intervention needed, essential for primary care settings and developing countries due to scarcity of resources for specific interventions in mental health [45].

As a limitation, the highest frequency of females in the sample may add a bias since prevalence of CMD was higher in women. Despite this, we consider that implications of the COVID-19 pandemic significantly affected personal and professional lives. Data was collected during the pandemic, and participants reported feelings not explained only by the pandemic scenario. Therefore, a longitudinal study could demonstrate the real impacts of the pandemic on mental health of healthcare workers. Nevertheless, our findings are important for creating actions to improve mental health of healthcare workers.

5. Conclusion

We screened a high ocurrence of general CMD in the healthcare workers of NASF-AB (39.71%), with females (49.09%) reporting significantly ($p < 0.01$) more CMD than males (0%). Regarding specific symptoms of SRQ-20, 70.59% of participants felt nervous, 54.4% felt tired all the time and 51.47% felt tired easily, following the literature with regard depressive and anxious behaviors. Despite we assumed these symptoms might be presented before the pandemic due to the interference of work issues, COVID-19 pandemic may have led to psychological distress in this population. Specific measures to improve health and quality of life of healthcare workers are needed, such as local and national programs for supporting their mental health, connecting health workers' standard policies to the public health systems in the country, especially considering the impacts of the COVID-19 pandemic in this population.

Ethical approval

Ethical approval was obtained from the Human Research Ethics Committee of the State Univer-

sity of Bahia (no. 39364120.3.0000.0057, date 15/12/2020).

Informed consent

All participants signed an informed consent form and completed the online survey.

Conflict of interest

The authors have no conflict of interest to report.

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