Original article

Prevalence of negative self-rated health and associated factors among healthcare workers in a Southeast Brazilian city*

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Abstract

Objective: to investigate the prevalence of negative self-rated health and associated factors among municipal health service workers in Diamantina, MG, Brazil. **Methods**: this was a cross-sectional census study using Poisson regression. **Results**: 203 health workers took part in the study, 70.9% were female, and 57.1% were up to 38 years old; prevalence of negative self-rated health was 28.6% (95%CI22.4;34.8); in the multivariate analysis, the following were associated with the outcome: being 39 years old or more (PR=1.56 – 95%CI1.01;2.40), monthly family income >3 minimum wages (PR=0.63 – 95%CI0.41;0.97), having another paid occupation (PR=0.55 – 95%CI0.34;0.89), poor sleep quality (PR=1.99 – 95%CI1.32;2.99), diagnosis of one disease (PR=2.33 – 95%CI1.13;4.81) or multiple diseases (PR=2.63 – 95%CI1.32;5.24), suffering aggression at work (PR=1.92 – 95%CI1.29;2.85), and frequent participation in domestic activities (PR=0.55 – 95%CI0.38;0.80). **Conclusion**: prevalence of negative self-rated health was high and was associated with sociodemographic, occupational, behavioral and health situation factors.

Keywords: Diagnostic Self Evaluation; Health Personnel; Occupational Health; Prevalence; Cross-Sectional Studies.

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Introduction

Measurement of health can be done using medical information based on signs, symptoms and diagnostic examinations, or by the perception that individuals have of their own health – self-rated state of health.[1-3] It is a subjective indicator that encompasses people's physical and emotional components, as well as aspects relating to well-being and satisfaction with their own lives.[3-5]

Self-rated health has characteristics that extrapolate the meaning of health in the strict sense, taking on representativeness with regard to perceptions of the body, and can reflect not only experience of exposure to disease but also knowledge about its causes and consequences.[6]

Studies conducted in Brazil and in other countries have used self-rating of health as an indicator of the real or objective state of health of the general population[3-5,7-10] and of occupational groups.[6,11-13] This growing use is justified by the relative ease of operationalizing the indicator and also because of its role as a predictor of morbidity and mortality.[3]

> *Measurement of health can be done using medical information based on signs, symptoms and diagnostic examinations, or by the perception that individuals have of their own health – self-rated state of health*

Research conducted with health workers, on the different levels of care provided by them, have revealed association between negative self-rated health and sociodemographic characteristics and work-related aspects.[14-20] A study published in 2010 found this association with being female, being older, having worked for longer in the sector and presence of multiple diseases among Primary Healthcare Workers in Florianópolis, SC.[15] Another study published in 2013 found evidence of association with psychosocial aspects in the workplace among nursing professionals working in emergency services of public hospitals in Campo Grande, MS.[17] In a more recent study, published in 2018, negative self-rated health was found to be associated with burnout syndrome among Primary Health Care professionals in Juiz de Fora, MG.[19]

Considering the fundamental role of these workers in the consolidation of the Brazilian National Health System (SUS) – especially with regard to the process of care regionalization –, knowledge is needed of aspects related to their health and working conditions on the different health care levels, in different places and contexts.

The objective of this study was to investigate prevalence and factors associated with negative self-rated health among municipal health workers in Diamantina, Minas Gerais, Brazil.

Methods

This was a cross-sectional study of health workers in the urban area of Diamantina, a municipality in the Jequitinhonha mesoregion of Minas Gerais state. Diamantina covers an area of approximately 3,900km^2, with an estimated population of 47,723 inhabitants in 2019, and a human development index (IDH) of 0.716.[21]

At the time the data was gathered – between December 2016 and March 2017 –, Diamantina City Health Department had 374 staff members. These workers were distributed over 22 health establishments: two psychosocial care centers, a polyclinic, a pharmacy, a laboratory, seven urban primary health care centers, four rural primary health care centers, a warehouse, a transport sector, a central administration unit and health, environmental and epidemiological surveillance sectors.

Permanent workers at health establishments in the urban area of the municipality were eligible for participation in the study. Of the total number of health workers (N=374), 117 were ineligible: 55 worked in primary health care centers in the rural area of the municipality, 15 had been assigned to other institutions and 47 were absent on sick leave or annual leave. As such, 257 workers met the study's inclusion criteria.

Structured interviews were conducted with the workers in health establishments where they worked, after they had read and signed a Free and Informed Consent form. The interview form was comprised of 59 questions, separated into seven blocks of questions covering sociodemographic information, habits and lifestyle, state of health, work environment, acts of violence suffered, psychosocial characteristics of their work and working capacity. Data collection was the responsibility

of a researcher with experience in conducting interviews, who took all necessary care to ensure the integrity of the study and to protect the participants' well-being.

The outcome under investigation – negative self-rated health – was defined based on the answers to the question:

"Generally speaking, how would you classify your state of health? (Very good, Good, Regular, Poor, Very poor)"

For the purposes of analysis, this variable was dichotomized: the first two categories (Very good, Good) were grouped together as 'positive self-rating' while the latter three categories (Regular, Poor, Very poor) were grouped together as 'negative self-rating'.

The explanatory variables taken into consideration in the analysis were (Figure 1):

a) sociodemographic variables
- sex;
- age (in years: up to and including 38; 39 and over);
- schooling (in years of study: up to 11; 12 or more);
- marital status (with partner; without partner);
- presence of children (yes; no);
- race/skin color (self-reported: White; non-White); and
- monthly family income (in minimum wages: up to 3; over 3), taking the amount of the minimum wage in 2017, at the end of data collection, BRL 937;

b) occupational variables
- type of position held (administrative and general services; basic level position; technical or auxiliary level position; high level position);
- length of time in current position (in years: up to 5; over 5);
- length of time working in the SUS (in years: up to 10; over 10);
- weekly working hours (in hours: under 40; 40 or more);
- employment status (permanent; not permanent); and
- any other paid activity (yes; no);

c) behavioral and health situation variables
- practices physical activities regularly (yes; no);
- participation in leisure activities, such as hobbies, cultural activities, going on trips with family and friends (yes; no);
- tobacco smoking (never smoked, former smoker, current smoker);
- abusive use of alcohol (yes; no);
- quality (subjective) of sleep in the last month (good or very good; poor or very poor);

Level 1	**Sociodemographic variables** **Sex** **Age** **Schooling** **Marital status** **Presence of children** **Race/skin color** **Family income**
Level 2	**Occupational variables** **Type of current position** **Length of time in current position** **Length of time in Brazilian National Health System** **Weekly working hours** **Employment status** **Other paid activity**
Level 3	**Behavioral variables and state of health** **Practices physical activities regularly** **Participation in leisure activities** **Tobacco smoking** **Abusive use of alcohol** **Sleep quality** **Self-reported diseases** **Absence from work due to health problems** **Aggression at work** **Frequent participation in domestic activities**

Note: adapted from Garcia et al.[15]

Figure 1 – Hierarchical model of multiple analysis of factors associated with self-rated health among health workers, Diamantina, Minas Gerais, 2017

- self-reported diseases (none; one disease; two or more diseases);
- absence from work in the last 12 months, due to health problems (yes; no);
- having suffered some form of aggression by health service users, their family members or friends, bosses or work colleagues, in the workplace, in the last 12 months (yes; no); and
- frequent participation in domestic activities (yes; no).

The 'age' variable was dichotomized, based on the mean age of the respondents. The 'non-White' category of the 'self-reported race/skin color' variable included the brown, black, yellow and indigenous origin categories. Income was categorized into minimum wages, based on the amount of the minimum wage in force.

Regular practicing of physical activities was assessed using the short version of the International Physical Activity Questionnaire (IPAQ). Those who practiced physical activities regularly ('Yes" category) were considered to be those who reported at least 150 minutes of physical activities a week, including 10 uninterrupted minutes, or minimum frequency of three times a week.[22]

Abusive use of alcohol was assessed using the CAGE questionnaire, consisting of four dichotomous questions (yes; no), with a final score varying between 0 and 4 points. The cut-off point for two or more positive answers was taken to be 'Yes'.[23]

Subjective quality of sleep was obtained from the answers to the question:

"During the last month, how would you classify the quality of your sleep in general?(Very good, Good, Poor, Very poor)."

The answer options were grouped together into two categories: Good or very good; and Poor or very poor.

The answers to the following questions were considered in relation to the 'self-reported diseases' variable:

"Have you had medical diagnosis of any of the diseases listed below?"

followed by a list of possible diagnoses – diabetes, high cholesterol, obesity, overweight, hypertension, cardiovascular diseases, respiratory diseases, gastritis/ulcer, depression/stress, repetitive strain injury (RSI)/work-related musculoskeletal disorder (WMSD) – and two reply options: 'Yes' and 'No'.

Frequent participation in domestic activities was verified according to the answers to this question:

"In the last 3 months, how frequently have you done domestic chores, such as cleaning your home, washing and ironing clothes and cooking? (Never or hardly ever, Rarely, Sometimes, Frequently)."

This variable was dichotomized: the first three categories were grouped together as 'No' while the final category was taken to be 'Yes'.

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 24.0 and Stata version 13.0. Initially, descriptive analysis of the study population was performed by estimating relative frequencies according to the categories of the selected variables (sociodemographic; behavioral and heath situation; and occupational variables). In addition, prevalence of negative self-rating of health among the study population was calculated, as was prevalence of the categories of the explanatory variables. Bivariate analysis was then performed to check for the existence of crude associations between negative self-rated health and each category of the explanatory variables, taking positive self-rating as a reference. The selection criterion of variables for multiple analysis (p value $p \leq 0.20$) was estimated using Pearson's chi square test or Fisher's exact test, when necessary. Multiple analysis was then performed using Poisson regression with robust estimation of variance, as per the hierarchical model adapted from Garcia et al. (2010)[15] (Figure 1). All the variables selected in the bivariate analyses were included; using the backward method, variables with a significance level >0.05 were removed from the model, one by one, on each level, until only variables associated with negative self-rated health with $p \leq 0.05$ remained in the model. The magnitude of the associations between the variables was estimated by calculating their prevalence ratios (PR) and their respective confidence intervals (95%CI).

The research project was approved by the Federal University of the Jequitinhonha and Mucuri Valleys Research Ethics Committee (Mucuri Campus REC/UFVJM): Certification of Submission for Ethical Appraisal (CAAE) No. 56754616.3.0000.5108, dated September 22nd 2016, as per Opinion No. 1.739.249.

Results

Of the 257 workers who met the study inclusion criteria, 203 were interviewed, accounting for 79.0% of the subjects eligible for the study.

Of the total participating workers, 70.9% were female, 57.1% were up to 38 years old, 52.2% had studied for 12 years or more and 63.5% lived with a partner. The majority (71.9%) had worked for the SUS for less than 10 years, 78.3% worked 40 hours or more a week, and

56.7% had monthly income of up to three minimum wages (Table 1).

Prevalence of negative self-rated health was 28.6% (95%CI22.4;34.8), with greater frequency among workers aged 39 years old or more (40.2%) and among those with family income of up to three minimum wages (33.9%) (Table 2).

With regard to the behavioral and health situation variables, greater frequencies of negative self-rated health were found among workers who reported poor or very poor sleep quality (50.0%), those who had multiple diseases (42.3%), those who had been absent from work because of illness in the previous 12 months (38.0%), those who had suffered aggression at work in the last year (39.0%) and those who did not carry out domestic activities frequently (40.7%) (Table 2).

In the adjusted multiple hierarchical model, the 'schooling', 'has children', 'type of current position', 'weekly working hours' and 'having been absent from work because of illness' variables did not remain associated with negative self-rated health ($p>0.05$). The following variables continued to be associated: age equal to or greater than 39 years (PR=1.56 – 95%CI1.01;2.40); family income greater than three minimum wages (PR=0.63 – 95%CI0.41;0.97); having another paid activity (PR=0.55 – 95%CI0.34;0.89); reporting poor or very poor sleep quality in the month prior to the study (PR=1.99 – 95%CI1.32;2.99); presence of a disease (PR=2.33 – 95%CI1.13;4.81) or multiple diseases (PR=2.63 – 95%CI1.32;5.24); having suffered aggression at work in the 12 months prior to the interview (PR=1.92 – 95%CI1.29;2.85); and frequent participation in domestic activities (PR=0.55 – 95%CI0.38;0.80) (Table 2).

Discussion

This study revealed high prevalence of negative self--rated health among health workers in the urban zone of the municipality of Diamantina and its association with sociodemographic, occupational, behavioral and health situation factors.

Prevalence found in this study (28.6%) was higher than that found in three other studies also conducted with health sector workers: (i) 15.8% among Primary Care nurses (2018);[20] (ii) 21.8% among Primary Care workers (2010);[15] and (iii) 22.4% among public hospital nursing workers (2013).[17] Nevertheless, the prevalence found in Diamantina was lower than the prevalence of 37.1% found among nurses from different health care levels in Pelotas, RS (2013).[16]

The differences found in prevalence of negative self-rated health among health workers in the studies mentioned above may be related to the characteristics of the work process in the different levels of health care services.[20] Constant contact with patient deaths and the suffering of patients submitted to higher complexity procedures, for instance, could possibly produce greater harm, with potential repercussions on the mental health of these workers, when compared to other levels of health care services.[20] Furthermore, factors such as demands and control over work, autonomy, social support and satisfaction have shown themselves to be associated with occupational stress, suspected burnout syndrome and poorer self-rated health among health workers.[17,19] In order to verify these hypotheses, studies need to be conducted that enable assessment of association between negative self-rated health and the characteristics of work processes in the different levels of health care services in Brazil.

In this study, health workers aged 39 years old or more had higher prevalence of negative self-rated health, when compared to younger health workers. This result was also found by other studies that used the same indicator.[3,4,15] Together, these results provide evidence of a worsening of overall state of health as age increases – possibly because of the presence of multiple diseases and functional incapacities more prevalent among older people –, which may lead to negative self-rated health.[24]

There is evidence that duration and quality of sleep are related to a wide range of negative health outcomes, including hypertension, diabetes, obesity and depression.[25] Previous studies provided evidence of associations between low quality sleep and negative self-rated health among health sector workers,[18] university students[26] and the general population.[8,10] Occupational stress is a possible risk factor for insomnia and changes in sleep pattern and quality.[27]

Greater prevalence of negative self-rated health with a positive gradient was found among individuals reporting medical diagnosis of a single disease or multiple diseases, when compared to prevalence found among the group that reported having no such medical diagnosis.

Table 1 – Description of the study population according to sociodemographic and occupational characteristics, behavioral aspects and state of health, among health workers, Diamantina, Minas Gerais, 2017

Variables	n	%
Sex		
Male	59	29.1
Female	144	70.9
Age (in years)		
≤38	116	57.1
≥39	87	42.9
Schooling (in years of study)		
≤11	97	47.8
≥12	106	52.2
Marital status		
Without partner	74	36.5
With partner	129	63.5
Has children?		
Yes	140	69.0
No	63	31.0
Race/skin color		
White	37	18.2
Non-White	161	79.3
Monthly family income (in minimum wages: SM[a])		
≤3 MW	115	56.7
>3 MW	88	43.3
Type of current position		
Administrative and general services	56	27.6
Basic level position	73	36.0
Technical or auxiliary level position	36	17.7
High level position	38	18.7
Length of time in current position (in years)		
≤5	80	39.4
>5	123	60.6
Length of time in Brazilian National Health System (SUS) (in years)		
≤10	146	71.9
>10	57	28.1
Weekly working hours		
<40h	44	21.7
≥40h	159	78.3
Employment status		
Permanent	65	32.0
Not permanent	138	68.0
Has another paid activity		
No	140	69.0
Yes	63	31.0
Practices physical activities regularly		
Yes	163	80.3
No	40	19.7
Takes part in leisure activities		
Yes	138	68.0
No	65	32.0
Tobacco smoking		
Never smoked	164	80.8
Former smoker	21	10.3
Current smoker	18	8.9
Abusive use of alcohol		
No	190	93.6
Yes	13	6.4

To be continue

a) MW: minimum wage at end of data collection = BRL 937.

continuation

Table 1 – Description of the study population according to sociodemographic and occupational characteristics, behavioral aspects and state of health, among health workers, Diamantina, Minas Gerais, 2017

Variables	n	%
Sleep quality in the last month		
Good or very good	147	72.4
Poor or very poor	56	27.6
Self-reported diseases		
None	78	38.4
One disease	47	23.2
Two or more diseases	78	38.4
Absent from work in the last 12 months due to illness		
No	124	61.1
Yes	79	38.9
Suffered aggression at work in the last 12 months		
No	121	59.6
Yes	82	40.4
Takes part in domestic activities		
No	54	26.6
Yes. frequently	149	73.4

a) MW: minimum wage at end of data collection = BRL 937.

This result is in line with results found in other studies documented in the literature.[3,7,9,16] This reinforces that a person becoming aware – by means of medical diagnosis – that they have one or more diseases is a determining factor in self-rated state of health.[3]

Workers who reported having been victims of some form of aggression in the twelve months prior to the interview had higher prevalence of negative self-rated health. Exposure to violent acts, such as conflicts in the workplace and experiences of aggression practiced by work colleagues or health service users, is recognized as a dimension of occupational stress and compromises the physical and mental health of health workers, with negative repercussions on self-perceived state of health[15,17] as well as on subjective quality of sleep.[27]

Among individuals who had monthly family income of more than three minimum wages, lower prevalence of negative self-rated health was found when compared to those with income of less than three minimum wages. Studies indicate a positive relationship between socio-economic indicators, such as income and schooling, and better state of health, as well as better working conditions.[3,15,28,29] It has been reported, for example, that individuals in higher income brackets have more possibility of investing in medical care and adequate dietary intake; as well as tending to adopt healthy behaviors which improve quality of life, such as practicing physical activity and the habit of not smoking.[3,29]

In this study, workers who reported having another paid activity and those who frequently carried out domestic activities had lower prevalence of negative self-rated health. Generally, time spent in multiple jobs or domestic chores is analyzed as an extension of working hours, which could result in negative consequences for health and, consequently, poor assessment of state of health.[20,30] However, consideration must also be given to the hypothesis of positive self-rated health being a factor that provides the individual with the perception of being able to do another paid activity and domestic activities. According to Rodrigues & Maia,[29] health is a fundamental determinant of people's productive capacity, i.e. having good health would mean being more disposed to carry out activities both inside and outside the job market.

This study has limitations to be taken into consideration when analyzing its results: (i) its cross-sectional design does not allow inference of temporality in the relationships between part of the independent variables and the outcome; (ii) absence of associations may be related to reduced prevalence of some factors in the population studied; (iii) the results may have been underestimated owing to the healthy worker effect, by considering to be eligible those who were working at the time of data collection; and (iv) only including health workers from the urban area of the municipality did not allow investigation of specificities of the health worker population in health establishments located in the rural area of the municipality.

The main result of the study was that approximately one third of municipal health workers in Diamantina

Table 2 – Prevalence (%) of poor self-rated health and analysis of its association with sociodemographic and occupational characteristics, behavioral aspects and state of health, among health workers, Diamantina, 2017

Variables	Prevalence (%)	p-value[a]	Crude PR[b] 95%CI	Adjusted PR[c] 95%CI	p-value[d]
Sex					
Male	25.4		1.00	–	
Female	29.9	0.525	1.17 (0.71;1.95)		
Age (in years)					
≤38	19.8		1.00	1.00	
≥39	40.2	0.001	2.03 (1.30;3.17)	1.56 (1.01;2.40)	0.043
Schooling (in years of study)					
≤11	33.0		1.00	–	
≥12	24.5	0.183	0.74 (0.48;1.15)		
Marital status					
Without partner	24.3		1.00	–	
With partner	31.0	0.310	1.27 (0.79;2.06)		
Has children?					
Yes	32.1		1.00	–	
No	20.6	0.093	0.64 (0.37;1.10)		
Race/skin color					
White	21.6		1.00	–	
Non-White	29.8	0.518	1.39 (0.72;2.69)		
Monthly family income (in minimum wages: MW[e])					
≤3 MW	33.9		1.00	1.00	
>3 MW	21.6	0.054	0.64 (0.40;1.02)	0.63 (0.41;0.97)	0.037
Type of current position					
Administrative and general services	30.4		1.00	–	
Basic level position	30.1		0.99 (0.58;1.69)		
Technical or auxiliary level position	38.9		1.28 (0.72;2.27)		
High level position	13.2	0.091	0.43 (0.17;1.08)		
Length of time in current position(in years)					
<5	27.5		1.00	–	
>5	29.3	0.785	1.06 (0.68;1.67)		
Length of time in Brazilian National Health System (SUS) (in years)					
≤10	27.4		1.00	–	
>10	31.6	0.553	1.15 (0.72;1.84)		
Weekly working hours					
<40h	38.6		1.00	–	
≥40h	25.8	0.095	0.67 (0.42;1.05)		
Employment status					
Permanent	26.2		1.00	–	
Not permanent	29.7	0.601	1.14 (0.70;1.84)		
Has another paid activity					
No	32.1		1.00	1.00	
Yes	20.6	0.093	0.64 (0.37;1.10)	0.55 (0.34;0.89)	0.016
Practices physical activities regularly					
Yes	29.4		1.00	–	
No	25.0	0.577	0.85 (0.47;1.53)		
Takes part in leisure activities					
Yes	27.5		1.00	–	
No	30.8	0.634	1.12 (0.71;1.76)		

a) P value: probability of significance – Pearson's chi-square test or Fisher's exact test.
b) PR (prevalence ratio) and 95%CI (95% confidence interval) – bivariate analysis.
c) PR (prevalence ratio) and 95%CI (95% confidence interval) – multiple analysis.
d) P value: probability of significance – final multiple analysis model (backward method), adjusted by the following variables: 'age', 'monthly family income', 'has another paid activity', 'sleep quality in the last month', 'self-reported diseases', 'suffered aggression at work in the last 12 months' and 'takes part in domestic activities'.
e) MW: minimum wage at end of data collection = BRL 937.

to be continue

continuation

Table 2 – Prevalence (%) of poor self-rated health and analysis of its association with sociodemographic and occupational characteristics, behavioral aspects and state of health, among health workers, Diamantina, 2017

Variables	Prevalence (%)	p-value[a]	Crude PR[b] 95%CI	Adjusted PR[c] 95%CI	p-value[d]
Tobacco smoking					
Never smoked	28.0		1.00	–	
Former smoker	28.6		1.02 (0.50;2.09)		
Current smoker	33.3	0.895	1.19 (0.59;2.39)		
Abusive use of alcohol					
No	27.9		1.00	–	
Yes	38.5	0.299	1.38 (0.67;2.85)		
Sleep quality in the last month					
Good or very good	20.4		1.00	1.00	
Poor or very poor	50.0	0.001	2.45 (1.62;3.71)	1.99 (1.32;2.99)	0.001
Self-reported diseases					
None	11.5		1.00	1.00	
One disease	34.0		2.95 (1.42;6.15)	2.33 (1.13;4.81)	0.022
Two or more diseases	42.3	0.001	3.67 (1.88;7.16)	2.63 (1.32;5.24)	0.006
Absent from work in the last 12 months due to illness					
No	22.6		1.00	–	
Yes	38.0	0.018	1.68 (1.09;2.59)		
Suffered aggression at work in the last 12 months					
No	21.5		1.00	1.00	
Yes	39.0	0.007	1.82 (1.17;2.81)	1.92 (1.29;2.85)	0.001
Takes part in domestic activities					
No	40.7		1.00	1.00	
Yes, frequently	24.2	0.021	0.59 (0.39;0.91)	0.55 (0.38;0.80)	0.002

a) P value: probability of significance – Pearson's chi-square test or Fisher's exact test.
b) PR (prevalence ratio) and 95%CI (95% confidence interval) – bivariate analysis.
c) PR (prevalence ratio) and 95%CI (95% confidence interval) – multiple analysis.
d) P value: probability of significance – final multiple analysis model (backward method), adjusted by the following variables: 'age,' 'monthly family income,' 'has another paid activity,' 'sleep quality in the last month,' 'self-reported diseases,' 'suffered aggression at work in the last 12 months' and 'takes part in domestic activities'.
e) MW: minimum wage at end of data collection = BRL 937.

negatively rated their own health. Individual and occupational factors were associated with this perception. These findings corroborate other studies with conclusive evidence of high negative self-rated health among health workers.

Results of diverse studies reinforce the relevance of investigations involving self-assessment of health, including study designs that enable relationships with work to be established. Understanding the causes of negative self-rated health is, therefore, a way forward for proposing priority health promotion actions, with a view to improving working conditions and preventing harmful effects on health workers. These interventions have potential positive effects in various dimensions, ranging from individual aspects to occupational aspects extending to these workers as a whole, with repercussion on the quality of care provided to service users and, ultimately, contributing to fulfillment of the guidelines and objectives of the Brazilian National Health System.

Authors' contributions

Barbosa REC and Fonseca GC contributed to data analysis and interpretation, writing and critically reviewing the contents of the manuscript. Azevedo DSS and Simões MRL contributed to data interpretation and critically reviewing the manuscript. Duarte ACM contributed to the conception and design of the study, as well as critically reviewing the manuscript. Alcântara MA contributed to the conception and design of the study, data interpretation and critically reviewing the manuscript. All the authors have approved the final version of the manuscript and declare themselves to be responsible for all aspects of the work, guaranteeing its accuracy and integrity.

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