

Working conditions and mental health of community health workers in the COVID-19 pandemic

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Abstract *This study examined the prevalence of anxiety and depression associated with Community Health Workers' (CHWs) working conditions in the context of the COVID-19 pandemic. This cross-sectional study was carried out in the north of Minas Gerais, Brazil by applying a questionnaire addressing sociodemographic conditions, command of technologies and working conditions during the pandemic, as well as the State-Trait Anxiety Inventory and the Patient Health Questionnaire-9 (PHQ-9). Descriptive and multiple Poisson regression analyses were performed with robust variance, to a 5% level of significance ($p < 0.05$) for the final model. A total of 1,220 CHWs from 36 municipalities participated in the study. Prevalences were 41.8% and 31.6% for anxiety and depression, respectively, while 22.5% of the group displayed symptoms of both conditions. Being female, up to 40 years old, having more than 500 users registered for monitoring, and inadequate supply of personal protective equipment were associated with anxiety and depression among the CHWs. Prevalence of anxiety and depression was high among CHWs during the pandemic and working conditions figured prominently among the associated factors.*

Key words *Community health workers, Primary health care, Occupational health, COVID-19*

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Introduction

The prevention and control of an epidemic requires an approach focused on populations with a view to protecting them from contagion, by early detection of symptoms, contact tracing, isolation, treatment and rehabilitation of those affected, giving priority to disadvantaged individuals and vulnerable social groups¹. Accordingly, primary health care (PHC) plays an essential role in combating COVID-19. In Brazil, PHC implemented through the Family Health Strategy (FHS), with its multidisciplinary teams and a focus on communities and territories, has the potential to deploy the community approach necessary to tackle the epidemic^{2,3}.

As members of FHS teams, professional Community Health Workers (CHWs) are notable for fostering health promotion, disease prevention and control, and reinforcing the community orientation attribute derived from PHC³. Studies suggest that CHWs can help strengthen PHC by promoting closer ties between communities and the health system, encouraging health-seeking behaviour and ensuring that patients receive preventive care in their own communities^{4,5}.

In Brazil, the lack of definition of the scope of CHWs' work and the steady expansion of their responsibilities has been much discussed⁶⁻⁹ and pointed to as one factor undermining their performance in the territories¹⁰⁻¹². This situation may have been aggravated during the pandemic, because of the need to reorganize their work process⁴, particularly as a result of the high rate of transmission, morbidity and mortality of the coronavirus⁵. Social distancing measures can also have unwanted consequences, such as social isolation, loneliness, abrupt changes in daily habits, unemployment and financial insecurity¹³. All these new job and social demands can cause intense psychological suffering expressed in anxiety disorders, sleep disorders, depression, fear of falling ill and contaminating colleagues and family and so on¹⁴.

The changes caused by COVID-19 directly influenced the relationship and dynamics among the components of the CHW's work process, thus altering community health care provision⁵. The particular features of their work also place these personnel in situations of high risk to their physical and mental health, bringing high levels of insecurity to their work¹⁵. There is also evidence to suggest a preponderance, among people infected by the virus, of people whose mental health is affected¹⁶, while research addressing the psycholog-

ical effects of the disease and their public health implications is still scarce¹⁶. Some studies¹⁶⁻¹⁸ have examined the mental health of health care personnel during the pandemic, but no quantitative studies addressing this issue among CHWs during that period were found in the literature.

There is an urgent need to assess CHWs' working conditions in PHC at the front line of the fight against the coronavirus, as well as their mental health in that context. The findings can inform public policymaking to meet workers' workplace safety and health needs¹⁹. It is essential to discover what factors are associated with the mental health of health workers, especially CHWs, who are a mainstay of the FHS. Prominent among the main mental health problems are anxiety and depression, which occur in association and significantly impair the social relationships of those affected^{13,17}. This article examines the prevalence of anxiety and depression associated with community health workers' working conditions during the Covid-19 pandemic.

Method

This study forms part of the project "Work and Health Conditions of Community Health Workers in the North of Minas Gerais in the COVID-19 pandemic", which was carried out from July to October 2020 with CHWs from 36 municipalities in the North health macro-region of Minas Gerais.

The North region of Minas Gerais comprises 86 municipalities, 13 of which host offices for the microregions. Preparation of the sampling plan contemplated two domains: host municipalities and other municipalities. At the time of data collection, the region held a population of 3747 CHWs, 1862 working in the host towns and 1885 in the other towns. All municipalities in the host-municipalities domain were selected and 23 municipalities were drawn at random in the other municipalities domain. Sample size was specified, given that the study included other objectives, to following parameters: 50% estimated prevalence (which yields the largest sample size), 95% confidence level and 4% margin of error, with correction for finite population. Design effect was corrected by using $deff = 2.0$ and a 12% increase was set to compensate for possible non-responses and losses. Minimum sample size was estimated at $n = 1167$ CHWs, with $n_1 = 567$ (48.6%) agents from the host municipalities and $n_2 = 600$ (51.4%) from the other municipalities

in northern Minas Gerais. The sampling process took the number of CHWs in each municipality in order to specify an equiprobabilistic sample.

The scope of this study was broader, however, and the survey instrument developed addressed several aspects inherent to CHWs' activities specifically in the pandemic context. For this purpose, the authors developed two questionnaires addressing working conditions during the pandemic and command of technologies, as well as using sociodemographic and labour data and the State-Trait Anxiety Inventory (IDATE-6 reduced form)²⁰ and the Patient Health Questionnaire-9 (PHQ-9)²¹, which assess anxiety and depression, respectively.

IDATE is a validated instrument designed to measure anxiety levels by way of two components, IDATE-state (IDATE-E) and IDATE-trait (IDATE-T), where "state" refers to how the respondent feels at the time and trait, to how they usually feel²². IDATE-E, considered more appropriate to the needs of this study, consists of six items: 1. I feel calm; 2. I am tense; 3. I feel at ease; 4. I feel nervous; 5. I am relaxed; and 6. I am worried. The responses, on a four-point Likert scale, were: 1. Absolutely not; 2. A little; 3. A lot; and 4. Very much. The final score was obtained by inverting the affirmative items (1, 3 and 5) and adding the item scores, the minimum final score being 6 and the maximum, 24. Cutoff was at the median, with lower scores "not indicating anxiety" and those above, "indicating anxiety".

The PHQ-9 consists of nine questions that examine for the presence of each of the symptoms of a major depressive episode described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)²³. These nine symptoms are depressed mood, diminished interest or pleasure in doing things (anhedonia), insomnia or hypersomnia, fatigue or lack of energy, change in appetite or weight, feelings of guilt or worthlessness, difficulty concentrating, psychomotor agitation or retardation, and suicidal ideation²⁴. The frequency of each symptom in the prior two weeks is evaluated on a Likert scale from 0 to 3 corresponding to the answers "Never", "Several days", "More than half the days" and "Almost every day", respectively, to give final scores indicating symptoms of depression classified as: 0 to 4 (none); 5 to 9 (mild); 10 to 14 (moderate); 15 to 19 (moderately severe); and 20 to 27 (severe)²¹. In this study, a cutoff score of > 9 in the continuous form was taken to indicate the presence of depressive symptoms, as this was more useful as a screening test²⁵.

Given that the International Classification of Diseases (ICD)²⁶ defines mixed anxiety and depressive disorder (ICD-10) as the concomitant presence of symptoms anxiety and depression, it was decided to combine the dichotomized scores of the IDATE-E and PHQ-9, in order to identify CHWs who displayed anxiety and depression. The sample was thus divided into two groups: those with no symptoms or one symptom (anxiety or depression) and those with mixed anxiety and depressive disorder. The outcome variable in the final model was the presence of mixed anxiety and depressive disorder.

The instruments were applied remotely. Initially, the health secretary or PHC manager of each municipality was contacted by telephone to explain the study aims, data collection instrument and analysis and the use to be made of the information. Managers who agreed to the research authorized teams from their municipality to be included in the project, after consenting to the study and signing an online Institutional Agreement Declaration, a link to which was sent them by email. After indicating their acceptance electronically, the managers provided telephone contacts for the nurses in each FHS unit, who after hearing the aims of the study and that it had the municipal manager's agreement, forwarded the questionnaire access link to the CHWs in their teams.

Completion of the questionnaire was monitored against the National Register of Health Establishments (*Cadastro Nacional dos Estabelecimentos de Saúde*, CNES), which gives the names, job category and date of admission of all FHS team members. CHWs on medical leave or vacation or absent from work for other reasons were excluded.

The data were processed using the Statistical Software Package for Social Sciences (SPSS), version 20.0. Descriptive analysis using simple (absolute and relative) frequency distributions was followed by Pearson's chi-square test. Results with $p < 0.20$ were treated by multiple Poisson regression analysis to estimate association magnitudes through crude and adjusted prevalence ratios (PRs) and respective 95% confidence intervals (95% CIs). Variables returning 5% significance ($p < 0.05$) were retained in the final model. All analyses were corrected for study design effect.

The research project was appraised and approved by the research ethics committee (CEP) of the Universidade Estadual de Montes Claros (Opinion No. 2,425,756).

Results

With 1220 CHWs participating in the study, participation rate was greater than 97%, and refusal or loss rates were low. Group members were mostly women, 26 to 40 years old, living without a partner and had up to 11 years' schooling, had been working for more than five years, most under private contract or the (non-civil service) labour laws, and supervised fewer than 500 registered users in their micro area (Table 1).

The prevalence of CHWs with anxiety symptoms, depressive symptoms, symptoms of one condition and both is shown in Graph 1. It was found that 58.2% and 68.4% had no symptoms of anxiety or depression, respectively.

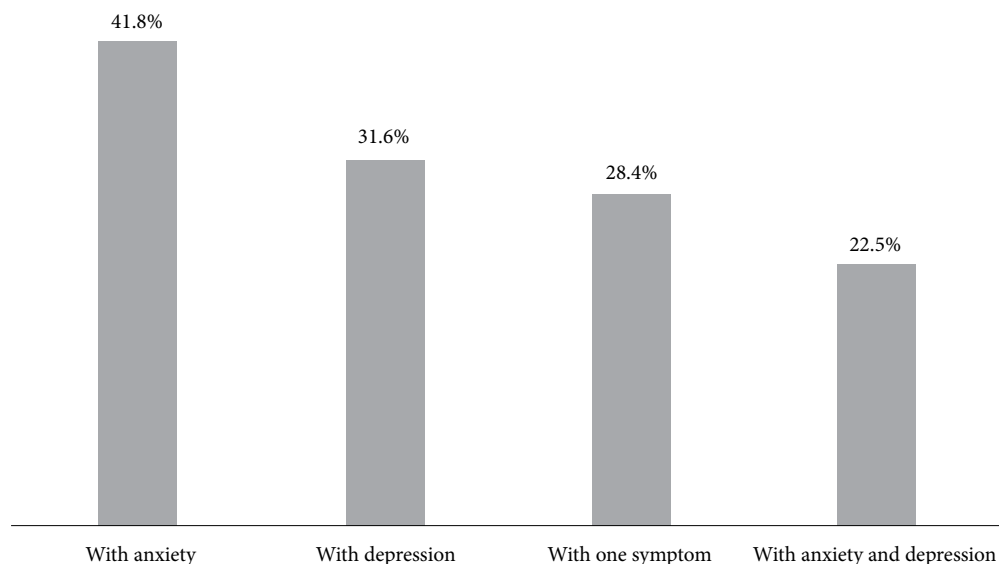
Bivariate analysis found associations at the 20% level with the variables gender, age, education, marital status, number of registered users supervised, working hours during the pandemic, provision of personal protective equipment (PPE), monitoring of patients with flu syndrome, training in COVID-19 prevention and access to a workplace computer (Table 1).

Table 2 shows the variables retained in the final model, with adjusted prevalence ratios and respective confidence intervals.

Discussion

This study found prevalence of anxiety symptoms similar to that observed in another study of CHWs, where prevalence was 47.3%²². A study of PHC workers found prevalences of 54.2% for anxiety and 56.6% for depression²⁷. These studies were carried out outside the pandemic period, however, pointing to the lack of studies of CHWs' mental health in that specific scenario. A study carried out during the pandemic period, of workers in other job categories working mainly in hospitals and with suspected COVID-19, found around 47% prevalence of anxiety and 35%, of depression – results that are similar to those of this study¹⁷.

Research in the PHC context has found higher prevalence of anxiety and depression among CHWs than in any other PHC job category^{27,28}, revealing a worrying mental health situation among CHWs²⁹, which may be workload related²⁷. Other authors have also found mental suffering and psychological disorders resulting from CHWs' experiencing suffering from situations in their work^{8,30-32}. Lack of appropriate working conditions needed for them to do their job, precarious physical structure, in addition to relations with the public and managers, have impacts on these workers' psychological and emo-



Graph 1. Prevalence of anxious and depressive symptoms in CHWs in the north of Minas Gerais, 2020.

Source: Authors.

Table 1. Depression and anxiety among community health workers, by sociodemographic variables and working conditions, northern Minas Gerais, 2020.

Variables	Total n(%)	No symptom or one symptom n (%)	With anxiety and depression n (%)	Crude PR* (95%CI)**	P- Value
Sociodemographics					
Sex					0.001
Male	182(14.9)	159(87.4)	23(12.6)	1	
Female	1038(85.1)	786(75.7)	252(24.3)	1.921(1.292-2.857)	
Age					0.044
41 years or older	352(28.9)	286(81.3)	66(18.8)	1	
Up to 40 years	868(71.1)	659(75.9)	209(24.1)	1.284 (1.003-1.645)	
Education					0.003
Up to 11 years' schooling	818(67.0)	654(80.0)	164(20.0)	1	
More than 11 years' schooling	402(33.0)	291(72.4)	111(27.6)	1.377(1.117-1.698)	
Marital Status					0.171
Lived with partner	454(37.2)	342(75.3)	112(24.7)	1	
Lived without a partner	766(62.8)	603(78.7)	163(21.3)	0.863 (0.699-1.065)	
Working conditions					
Length of service					0.357
Up to 5 years	571(46.8)	449(78.6)	122(21.4)	1	
More than 5 years	649(53.2)	496(76.4)	153(23.6)	1.103(0.895-1.361)	
Employment relationship					0.825
Civil servant/permanent	739 (60.6)	371(77.1)	110(22.9)	1	
Private contract /CLT	481 (39.4)	574(77.7)	165(22.3)	0.976 (0.790-1.207)	
Number of users supervised					0.006
Fewer than 500	795(65.2)	635(79.9)	160(20.1)	1	
500 or more	425(34.8)	310(72.9)	115(27.1)	1.344 (1.091-1.656)	
Workload in the pandemic					0.022
Up to 2 days a week	299(24.5)	246(82.3)	53(17.7)	1	
More than 2 days a week	921(75.5)	699(75.9)	222(24.1)	1.360 (1.038-1.781)	
PPE provision					< 0.001
Adequate	470(38.5)	400(85.1)	70(14.9)	1	
Inadequate	750(61.5)	545(72.7)	205(27.3)	1.835 (1.436-2.346)	
Home visits					0.501
Yes	818(67.0)	629(76.9)	189(23.1)	1	
No	402(33.0)	316(78.6)	865(21.4)	0.926(0.739-1.160)	
Monitored patients with flu syndrome					0.004
Yes	771(63.2)	583(75.6)	188(24.4)	1	
No	449(36.8)	362(80.6)	87(19.4)	0.795(0.634-0.996)	
Reception/Intake					0.012
Yes	696(57.0)	521(74.9)	175(25.1)	1	
No	524(43.0)	424(80.9)	100(19.1)	0.759(0.610-0.944)	
Covid-19 prevention training					0.076
Yes	470(38.5)	442(79.8)	112(20.2)	1	
No	750(61.5)	503(75.5)	163(24.5)	1.211(0.979-1.497)	
Technology					0.736
Good	694(56.9)	540(77.8)	154(22.2)	1	
Moderate or poor	526(43.1)	405(77.0)	121(23.0)	1.037(0.841-1.278)	
Workplace computer available					0.083
Yes	918(75.2)	722(78.6)	196(21.4)	1	
No	302(24.8)	223(73.8)	79(26.2)	1.225(0.977-1.537)	

* PR = prevalence ratio. ** CI = confidence interval.

Source: Authors.

Table 2. Variables associated with depression and anxiety, after multivariate analysis, among community health workers in northern Minas Gerais, 2020 (n = 1220).

Variables	Adjusted PR* (95%CI)**	p-Value
Sex		0.002
Male	1	
Female	1.86(1.26-2.75)	
Age		0.017
41 years or older	1	
Up to 40 years	1.34(1.05-1.71)	
Number of users supervised		0.011
Less than 500	1	
500 or more	1.31(1.07-1.61)	
PPE provision		< 0.001
Adequate	1	
Inadequate	1.80(1.41-2.30)	

* PR = prevalence ratio. ** CI = confidence interval.

Source: Authors.

tional state²⁷, which – it is reasonable to suppose – worsen in a pandemic situation.

In this study, depression and anxiety were more prevalent among women, among CHWs aged up to 40 years, who supervised more than 500 registered users and who lacked an adequate supply of personal protective equipment (PPE).

The association of prevalence of anxiety and depression with gender found in this study – prevalence being higher among women – has been observed in other studies^{22,33,34}. Higher prevalences of depression and anxiety among women can be explained by a number of genetic and even social factors connected with the female gender³⁴. The CHWs' profession enables them to enter the job market and increase their family income without leaving their place of residence. That factor can be important for women, who are generally also responsible for taking care of the home and family¹⁰. As a result, women are more exposed to overwork and stressful environments, resulting in their developing anxiety and depressive symptoms, which potentially worsened during the COVID-19 pandemic³⁴.

Prevalences of depression and anxiety were higher among CHWs up to 40 years old, coinciding with the findings of another survey of PHC personnel, which found higher percentages of

depression among participants in the 21- to 35-year age group²⁷. The stronger association with these symptoms in this age group is believed to relate to the need to find employment and professional recognition and often to the experience of forming a family³⁵.

Brazil's national primary care policy (*Política Nacional de Atenção Básica*, PNAB) sets a maximum of 750 users per CHW³⁶. Most participants in this study supervised fewer than 500 people in their micro-area, while the highest prevalences of depression and anxiety were found among those with more than 500. This is understandable, because more uses to supervise generates more home visits and demands from the public, added to which, in the pandemic, may pose greater risk of COVID-19 infection. These factors can overload CHWs, culminating in psychological symptoms⁹.

As regards provision of PPE, a national survey to assess PHC challenges in Brazil, pointed out that only 24% of health care personnel reported having a full PPE set (face protection, eye protection, gloves and apron) available at basic healthcare facilities³⁷. This study, in line with other studies carried in Brazil^{15,38,39}, found that most CHWs reported inadequate supply of PPE. Difficulties of PPE procurement and subsequent provision to CHWs has been used as the main justification for these workers not to be in the field, which has weakened the FHS and the PHC gateway to the health care system⁴⁰. Accordingly, failure to prepare and protect CHWs hindered their work, put them at risk and contributed to neglect of care in the community, particularly for marginalized groups³⁸.

The challenge of reconciling emotions and doing their job in the midst of adversities (including insufficient PPE, loss of essential characteristics of their work, lack of management support, fear of contamination, stress and overwork) followed as integral to the dynamics of working as a CHW during the Covid-19 pandemic¹⁵. The working conditions to which health personnel were subjected led to increased symptoms of anxiety, depression, loss of sleep quality, increased drug use, psychosomatic symptoms and fear of being infected or of transmitting the disease to family members⁴¹.

Studies are needed to examine the pandemic's effects on the daily lives and working and health conditions of PHC personnel, particularly CHWs, so as to inform strategies to minimize the impact of the pandemic context on these workers' mental health.

This article can contribute substantially to understanding the working conditions and mental health of CHWs, although certain limitations should be noted. The most important relates to the data, which were collected at a specific point in the pandemic (July to October 2020) and thus represent only the characteristics of that distinct period and its findings cannot be extended to the pandemic period as a whole, given the changeable nature of the event. The work of CHWs must thus be studied in other periods of this crisis. Also, in view of the physical isolation imposed by social distancing measures, data was collected remotely and, as this was a cross-sectional study, there is limited scope for establishing relationships of determination among the observed variables.

Even considering the study's limitations, its findings highlight areas in need of restructuring and may thus be useful to PHC managers setting parameters for the implementation of strategies for early identification of CHWs with anxiety and depressive symptoms and, depending on the screening results, confirming the diagnosis and taking the necessary follow-up measures. The findings can also provide input to possible

review of CHWs' working conditions, to identify factors that harm their mental health, with a view to developing strategies to improve aspects of their work. These measures can work to improve CHWs' quality of life and consequently help improve the quality of the service to the community.

Final remarks

This study showed that, in the context of the Covid-19 pandemic, the CHWs' characteristics associated with prevalence of depression and anxiety were being female and under 40 years of age. Of their working conditions, overseeing more than 500 users and an inadequate supply of PPE were also associated with higher prevalences of depression and anxiety. Given CHWs' importance to effective PHC, further knowledge of their working conditions in critical scenarios is essential in order to understand their work. That understanding can generate proposals for improving their performance, particularly in pandemic situations, which can impact the quality of care provided to the public.

Collaborations

TF Fernandes TF, CCM Lima, PLN Silva contributed to the project conception and design, data acquisition, analysis and interpretation, drafting of the article and review of the manuscript. LAR Rossi-Barbosa, L Pinho and AP Caldeira contributed to the project conception and design, analysis of results, drafting and revision of the manuscript. All contributed to writing the preliminary versions of the article, approved the final version and declare themselves responsible for all aspects of the work.

Acknowledgements

We thank the municipal health officers, primary care coordinators and nurses of the FHS units who made this study possible in a scenario as challenging as the COVID-19 pandemic. In particular, we thank the CHWs who participated in the study and helped us understand their daily work in these peculiar conditions.

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Article submitted 30/04/2022

Approved 01/06/2023

Final version submitted 26/06/2023

Chief editors: Romeu Gomes, Antônio Augusto Moura da Silva