Janaki Medical College Journal of Medical Sciences (2024); Vol.12 (3):21-29

JMCJMS

Research Article

Depression and anxiety during COVID-19 pandemic in remote community of Western Nepal

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Background and objectives: Depression and anxiety are significant mental health concerns, particularly in low-resource settings. This study aimed to screen depression and anxiety using ultra-short questionnaires in a remote rural population of Nepal.

Materials and Methods: A cross-sectional study was conducted among 218 participants of Guthichaur Rural Municipality, Nepal. Depression and anxiety were assessed using patient health questionnaire – 2 and generalised anxiety disorder questionnaire – 2 , respectively. Data were analysed using descriptive statistics, Chi-square tests, and Pearson correlation.

Results: The mean age of participants was 40.39 ± 17.64 years, with 65.14% being male. Depression (PHQ-2 ≥3) was identified in 9.63%, and anxiety (GAD-2 ≥3) in 12.84% of participants, with 5.50% showing both conditions. No significant differences were found between genders or COVID-19 status. A mild positive correlation was observed between age and both scores.

Conclusions: Depression and anxiety were prevalent in this rural community, highlighting the utility of ultra-short questionnaires for mental health screening in low-resource settings. Community-based mental health programs and early interventions are recommended to address these conditions effectively.

Key words: Anxiety, COVID-19, Depression, Patient Health Questionnaire, Rural population

INTRODUCTION

COVID-19 has caused widespread effect in every sector of society including health, academics, social and religious ones, causing significant mortality, morbidity and economic disruption [1,2]. Mental health issues including stress, anxiety and depression are important aspects throughout the globe, which get less attention but have long term effect in individuals as well as in society. The proportion of the global population living with depression is estimated to be 4.4%, and with anxiety is 3.6% [3]. Prevalence of mental health disorder is increasing over past few

decades with urbanization and busy lifestyle, anxiety being more common in high income countries [4]. Its prevalence is increasing also in low- and middle-income countries over past decades [5]. WHO report in 2019 shows that the prevalence of mental health disorders in South-East Asia is 13.2%, and of Nepal is 13.5% - out of which nearly half (49.0%) is accounted by depression and anxiety [6]. It is estimated that COVID-19 pandemic has triggered 25% rise in prevalence of both anxiety and depression worldwide [7]. Their public health burden is complicated as get neglected by patient and families. In countries like Nepal, mental health issues are commonly ignored and remain undiagnosed. The demographic and health survey 2022 data of Nepal has shown that less than a third of the patients (32.9%) of depression and anxiety seek medical help for the conditions [8]. Limited literature is available regarding mental health diseases in rural community of Nepal [8-9]. COVID-19 related studies are even sparse in Nepal and Indian subcontinent; among those done, most of them focus on COVID patients, ignoring the general population [10-12]. Hence in this study, authors aimed to estimate the occurrence of depression and generalized anxiety disorder in Guthichaur rural municipality of Jumla.

MATERIALS AND METHODS

This was a descriptive cross-sectional study done in Guthichaur Rural Municipality (RM) of Jumla, Karnali province which is a remote rural municipality of eastern part of the district. A screening campaign was conducted in Guthichaur RM as a part of the COVID-management program by the local RM office. The program lasted from Jestha to Asadh 2078 (May to July 2022), which included screening of COVID as well as of depression and anxiety by mobile campaigns in all the 5 wards of the RM separately. The ethical approval for this study was taken from Santwana Research Center, Santwana College, Kathmandu (Ref no: 123-RC-78-79). The follow-up of this study will be carried out with the ethical clearance of Institutional Review Committee, Karnali Academy of Health Sciences, Jumla, Karnali.

Participants were evaluated for any apparent illness by general physical examination. All participants over 13 years of age and consenting to the screening was included. They were explained about the study, and consent were taken from each before administering the questionnaire. The standard two-item PHQ-2 questionnaire and GAD-2 questionnaire were administered by face-to-face interview [13-15]. The PHQ-2 questionnaire includes two symptoms of depression experienced over past 15 days – loss of interest in daily activities, and feeling of hopelessness. Similarly, GAD-2 questionnaire includes items experienced over past 15 days of feeling nervous, and excessive worrying. Each of the four questions in PHQ-2 and GAD-2 weigh points ranging from 0 to 3 according to frequency of symptoms (never, some days, more than half, almost every day). For diagnosis, the cutoff point of 3 or more in each for diagnosis of anxiety (in GAD-2) and depression (PHQ-2) has been shown to be effective with sensitivity of 83% and a specificity of 92% [14,16,17]. Mendoza et. al. (2024) also supports the reliability, validity, and measurement invariance of the PHQ-4 as an ultra-brief screener of depression and anxiety in a large community sample in Southeast Asia, and recommend the tool for screening during COVID-19 and other disasters [18]. The subjects with positive screening test were counselled to follow-up in hospital. All

the presenting subjects were sent for COVID screening by rapid-diagnostic test. Confidentiality of data of each individual was maintained by anonymous coding while entering in LibreOffice program, and analyzed using GNU PSPP version 2.0.1. Descriptive data were expressed as mean and standard deviation, or median and interquartile range, and presented in bar diagram. Chi square test was utilized for comparison between categorical groups, and Pearson correlation was done to comparison between numerical values. A *p*-value of <0.05 was taken as statistically significant at 95% confidence level.

RESULTS

Out of 10,922 total population of Guthichaur RM (Census 2021), 218 citizens participated for screening of depression and anxiety. Their mean age was 40.39 ± 17.64 (range 13 to 81) years, and 142 were male (65.14%). The PHQ-2 score ranged from 0 to 6; maximum people scored 0 (153, 70.18%). Similarly, GAD-2 scores also ranged from 0 to 6, with 0 being most common score (137, 62.84%). Their median score was 0 and interquartile range was 0 to 1 for each score. Twenty-one people scored 3 or higher (9.63%) in PHQ-2 questionnaire and 28 scored 3 or higher (12.84%) in GAD-2 (Figure 1). Twelve people had both the scores positive (5.50%). Comparison of the scores in gender shows no significant difference between men and women (p=0.542, for PHQ score and p=0.123 for GAD score; table 2).

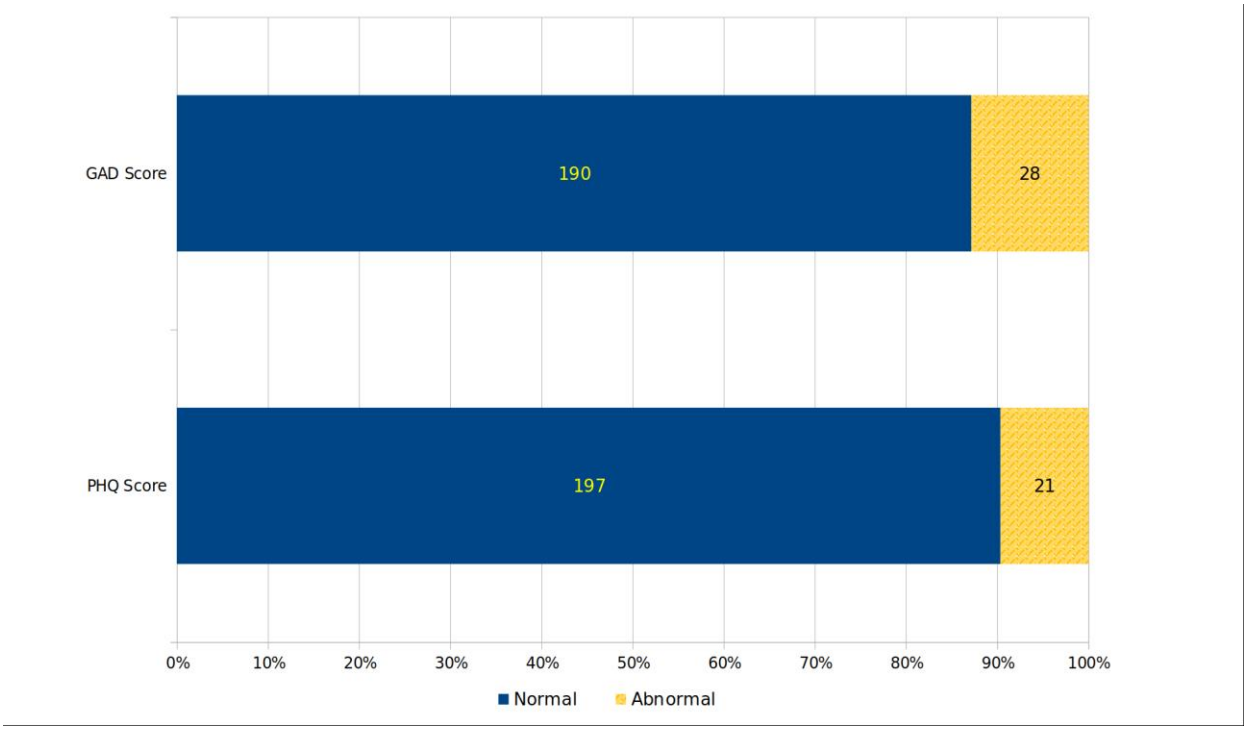

Figure 1: Frequency and proportion of normal (<3) and abnormal (≥3) scores of PHQ-2 and GAD-2 in participants (n=218)

Table 2. Comparison of different scores in gender (Chi square test, n=218)

	Frequency of PHQ and GAD scores		**Chi Square**	***p*-value**
	PHQ score ≥3	**PHQ score <3**		
Female	7 (33.33%)	69 (35.0%)	0.02	0.542
Male	14 (66.67%)	128 (65.0%)		
Total	21	197		
	GAD score ≥3	**GAD score <3**		
Female	13 (46.43%)	63 (33.16%)	1.89	0.123
Male	15 (53.57%)	127 (66.84%)		
Total	28	190		

Table 3. Comparison of COVID test and PHQ-2 and GAD-2 tests (Chi Square Test, n=218)

	Frequency of PHQ and GAD scores		**Chi Square**	***p*-value**
	PHQ score ≥3	**PHQ score <3**		
COVID Negative	19 (90.5%)	166 (84.3%)	0.57	0.352
COVID Positive	2 (9.5%)	31 (15.7%)		
Total	21	197		
	GAD score ≥3	**GAD score <3**		
COVID Negative	25 (89.3%)	160 (84.2%)	0.49	0.355
COVID Positive	3 (10.7%)	30 (15.8%)		
Total	28	190		

COVID-19 was screened by COVID antigen kit [Panbio Covid-19 Rapid Antigen Test device, by Abott®] in the community, and out of 218 people, 33 came to be positive for COVID (15.14%). Comparison of the COVID positive and negative groups with the screening result showed no significant difference in the group (Table 3, Chi Square test).

The relation between age and the scores were examined by Pearson correlation analysis. It revealed that both the scores had mild but significant positive correlation with age (Table 4). This suggests that as participants got older, their depression as well as anxiety levels tended to increase.

Table 4. Correlation between age and the two score values (Pearson correlation, n=218).

	PHQ score	**GAD score**
Correlation coefficient	0.121*	0.197*
p-value (1-tailed)	0.04	<0.001

(Significant at 95% confidence level)*

DISCUSSION

This study aimed to include general population of Guthichaur municipality, a remote rural community of western Nepal, which has hardly been covered in literature [19]. In our study, depression was found in 9.63%, and anxiety in 12.84% among the participants. These figures are higher than global prevalence, but is comparable to that of South-East Asia region [6]. A secondary analysis of Nepal Demographic and Health Survey 2022 data reports depression to be present in 4% and anxiety in 17.7% of Nepalese population of 15-49 years of age [8]. In a nationwide cross-sectional study on 2100 Nepalese adults aged 18–65 years conducted on 2013, the point prevalences of anxiety, depression and its combination were 16.1, 4.2 and 5.9 % respectively, using hospital anxiety-depression scale [20].

Such variation in prevalence is likely attributed to diversity in population as well as difference in tools used to measure the conditions. Our study revealed depression as well as anxiety scores increased with age. Similar findings were reported in a Nepalese population where distress was higher in people >45 years [21].

COVID-19 can be related to social isolation, low income and stress; which are risk factors to both depression and generalized anxiety. COVID-19-associated increase in mental illness, including depression and anxiety has been reported by multiple studies [11,12,22,23]. Pandey *et. al.* reported in 2021 a high prevalence of depression (17%) and anxiety (35.6%) in healthcare workers of Nepal during the pandemic [24]. Another study conducted at Karnali Province has shown that depression, anxiety and stress were present in 8%, 11.2% and 4%, respectively, in home-isolated COVID-19 patients, using Depression, Anxiety and Stress Scale-21 (DASS-21) [10]. But these figures were much higher (50.5, 52.5, and 44.6%, respectively) in undergraduate health-science students, using the same scale, as reported by Kalauni *et.al.* [25]. In both the studies, social isolation had significant association with the conditions. Low socioeconomic status and poverty are also risk for depression and anxiety [26,27]. However, a study using Global Burden of Disease dataset has reported anxiety to be higher in high-income countries, and is continuously increasing over past 3 decades, with urbanization and higher elder population [4]. Another risk factor of the conditions is female gender, as shown in multiple studies [11,12,23]. We did not find any such difference in gender, which may be due to the low sample size and remote population with minimum heterogeneity in our study sample.

The essential features of depression are persistent feeling of hopelessness, and low interest or pleasure in routine works. Similarly, excessive and enduring fear, feeling of anxiety or avoidance of perceived threats are features of anxiety disorder. The diagnosis and treatment of depression and anxiety are challenging due to its etiological and phenotypic heterogeneity, co-occurrence, non-specific complaints and complex interplay in its neurobiology [28-30]. Diagnosis of anxiety and its type is best done in clinical settings by experts; but a community setting demands a quick tool to screen the conditions, for which the two-item questionnaire are commonly used. Spitzer *et. al.* (2006) developed a screener for generalized anxiety disorder (GAD) in primary care settings, which was reduced from 13 item to 7 item [31]. Out of these, the 2-item tool GAD-2 assesses the first two

parameters of anxiety – nervousness and inability to control worry. Although GAD questionnaire was developed primarily for detecting generalized anxiety disorder, it has been used for other anxiety types such as post-traumatic stress disorder, social anxiety disorder, and also panic disorder, with some loss of specificity [32]. Similarly, the first-two items of 9-item questionnaire for depression make the PHQ-2. A combination of the two sets of questionnaires, PHQ-4 was recommended for detection of both the conditions simultaneously. Higher score was strongly associated with functional impairment, disability days and healthcare use [13].

Depression and anxiety may co-exist, and its symptoms overlap. They may also complicate each other [33]. However, multiple authors have also highlighted the different mechanism of the two diseases. Authors have described the generalized anxiety disorder and depression being distinct dimensions, and have independent effects on functional impairment and disability [13,31].

Due to low specificity of the 2-item ultra-short questionnaire, it has been criticized as having rule-in inclusive ability; which makes it suitable for screening test only. Mitchell & Coyne (2007) claim that it should be used when the positive cases can be assessed at second stage. This two-step method may be effective in detecting mental health disorders even at primary care level [34]. Although we did advise our screening-positive cases for follow-up in hospital, we could not follow them up due to time and resource constraints. However, findings from this study have important implications for mental health diagnosis, particularly in low-resource settings where access to specialized care may be limited. This would identify individuals at risk of depression or anxiety, allowing early intervention and potentially improving treatment outcomes.

An ideal approach to mental illness is to have its accurate biological model, with the brain structural and functional explanation of the disease. Analysis of neural networks holds promise for diagnosis as well as treatment of depression and anxiety. Such models may be personalized for each patient, deviating away from one-size-fits-all model to more tailored treatments based on a person's unique brain network activity. We may find different “biotypes” based on coherent neurobiological features in relation to a disease, which explains the biological heterogeneity of depression and anxiety [35].

The Mental Health Atlas 2020 highlights stark inequalities in mental health resources between high- and low-income countries and regions. It reveals global gaps in implementing policies, plans, laws, and primary health care services. Specifically, it mentions that median 2.1% of health budget is spent in mental health (with much variation in high- and low-income countries), and many low-income countries reported having fewer than 2 mental health workers per 100000 population. Service utilization rate for mental health is also only 48.8 persons per 100 000 population, compared to 506.5 for high income countries [36].

Our study has shown no significant difference in Depression and anxiety in COVID. This shows that mental health conditions are generalized in our population, irrespective of their COVID status. It also implies that mental health programs need to be invested in general population, as suggested by WHO directorate of department of mental health, neurological and substance use (MNS); which emphasizes member countries to act urgently to ensure that mental health support is

available to all [37]. Also, the WHO Comprehensive Mental Health Action Plan 2012–2030 emphasises shifting care from centralised hospitals to community-based settings. This approach promotes community-level diagnosis and treatment through integrated networks, including primary care, mental health centres, and family-based support systems [38].

This was a cross-sectional study using ultra-short questionnaire without any follow-up, and with low sample size. This limits its generalizability. We could not include other related data such as detailed past medical history, associated risk factors and lifestyle, due to resource constraints. Future studies can utilize a longitudinal model in diverse population of higher size, including different factors affecting the scores, which is an ongoing project in the same community.

CONCLUSIONS

This study demonstrated the utility of ultra-short questionnaire in detecting depression and anxiety in low-resource settings at a rural community. Depression and anxiety are present in significant proportion in remote rural community. Such tools can be easily administered and scored even by non-specialist healthcare workers. Future studies should investigate the generalizability of these results to other populations and explore ways to integrate ultra-short questionnaires into existing mental health care systems.

Acknowledgement: Authors want to express gratitude to Nirmala Pahadi of Karnali Academy of Health Sciences, and to the team of COVID screening test program of Guthichaur rural municipality, Jumla.

Conflict of interest: None declared

Funding: None

Author's Contribution: Framework of the study design, data collection and analysis, writing of 1st drat-**JPJ;** reviewed literatures, revision to 1st draft, reference cross check and concluding the final version prior to publication**-KUD.** Both the authors reviewed final version and agreed it towards publication.

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