CONFRONTING ANXIETY IN THE ERA OF COVID-19: INVESTIGATING THE PREVALENCE AND IMPACT ON DAILY LIFE IN BANGLADESH

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ABSTRACT

Background: The COVID-19 pandemic has brought about unprecedented stress levels and has significantly impacted daily life activities, including changes in food patterns, sleep disturbances, and reduced physical activity. This survey study aims to analyze the pervasiveness of generalized anxiety disorder (GAD) among Bangladeshi adults and its association with daily life activities. **Methods:** A randomized phone number generator was utilized to approach 1438 individuals aged 18 and above, out of which 412 participants volunteered for the study. Participants' anxiety level was estimated by using the GAD-7 score. **Results:** Out of the 412 respondents, 11.89% experienced severe anxiety, while 17.72% and 39.32% suffered moderate and mild anxiety, respectively. Severe anxiety was more prevalent among women (16%) than men (9.54%). The study found that sleeping for less than eight hours was associated with an increased likelihood of severe anxiety (OR = 4.87), while fewer changes in food habits (OR = 0.27), less online exposure (OR = 0.01), and engaging in some physical activity (OR = 0.20) were associated with the reduced likelihood of anxiety. **Conclusion:** This survey study highlights to give more emphasis of monitoring anxiety during a public health emergency like the COVID-19 pandemic. The findings of this study establish a significant correlation between GAD and everyday life activities, emphasizing the need to prioritize mental health initiatives during such unprecedented times.

KEYWORDS: COVID-19 pandemic, Generalized anxiety disorder, Coronavirus, Stress, Psychological health improvement, Bangladesh

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Introduction

The novel coronavirus disease (COVID-19) is a severe respiratory illness that has emerged as a global threat (Peeri *et al.*, 2020). As of July 18, 2020, 13,876,441 confirmed COVID-19 cases were identified worldwide, with a mortality rate of approximately 5.70% (Baud *et al.*, 2020). The situation in Bangladesh is alarming, with 199,357 COVID-19-positive cases and 2,547 associated deaths reported until July 18, 2020 (World Health Organization, no date). The pandemic has had devastating effects worldwide and elevated psychological distress, such as confusion, anxiety, and fear among the general public (Duan and Zhu, 2020; Rajkumar, 2020). The strict rules imposed to halt the spread of COVID-19, including lockdowns, are crucial and may also affect people`s mental health and well-being (Galea, Merchant and Lurie, 2020). Previous outbreaks, such as SARS (Chen *et al.*, 2006), MERS (Al-Rabiaah *et al.*, 2020), Ebola (Blakey *et al.*, 2015), and Avian influenza (Yamazaki and Kikkawa, 2010), have been associated with mental health problems. However, there are few recent reports on the psychological impact of the current coronavirus outbreak on COVID-19-positive patients, frontline workers, and the general public. A systematic study of the prevalence of GAD, its distribution in the population, and its correlation with daily activities are necessary to understand the extent of outbreak-associated anxiety.

As people have been forced to adapt to the drastic changes in their daily routines, the COVID-19 pandemic has brought about a bizarre level of stress and anxiety. The global home confinement and strict restrictions on movement have affected several everyday activities, such as sleeping, eating, physical activity, and the frequency of online exposure. Research has shown that poor sleeping hours are associated with an increased risk of an anxiety disorder (Huang and Zhao, 2020).

Drastic changes in eating habits have also been shown to be associated with an elevated level of anxiety (Sun *et al.*, 2020). Moreover, several studies have indicated a close relationship between reduced physical activity and distress (DeWolfe *et al.*, 2020; Hearon and Harrison, 2021). During the latest MERS outbreak in South Korea, social media exposure has been observed to be directly proportional to the formation of risk perceptions (Oh, Lee and Han, 2021). We hypothesize that a similar association exists between daily activities and the impact of anxiety on the residents of Bangladesh during the COVID-19 outbreak.

To gauge the prevalence of anxiety disorder among citizens of Bangladesh during the COVID-19 crisis, we intend to employ the GAD Scale (GAD-7). The GAD-7, a self-administered questionnaire, serves as a convenient tool for evaluating the severity of Generalized Anxiety Disorder (GAD) (Cao *et al.*, 2020; Chen *et al.*, 2020; Pfefferbaum and North, 2020). Requiring less than 3 minutes for completion and straightforward scoring (Budikayanti *et al.*, 2019), the GAD-7 boasts diagnostic reliability and operational ease, rendering it a predominant measurement instrument for anxiety within clinical practice and research environments. Its utility extends to diagnosing and assessing the severity of anxiety disorders such as social phobia, post-traumatic stress disorders, and panic disorders (Moreno *et al.*, 2019).

The primary aim of this investigation is to establish a connection between anxiety disorders and the potential determinants encountered in everyday life in Bangladesh, utilizing the GAD-7 questionnaire amidst the backdrop of the COVID-19 pandemic. The results of this study will furnish insights essential for the formulation and execution of pioneering initiatives aimed at enhancing the psychological well-being of individuals in Bangladesh throughout and beyond the pandemic. The revelations stemming from this research endeavor possess the potential to inform the design of suitable interventions, facilitating the effective management of anxiety symptoms and fostering a holistic sense of well-being within the context of the ongoing COVID-19 pandemic.

Methodology

Design and participants

This online-based survey study was conducted between the period of May 14 and May 20, 2020. The survey used a preprogrammed random phone number generator in Python programming, and the Bangladeshi adults participated after their written consent. A total of 509 agreed to fill up the questionnaire using the Google Docs platform (https://forms.gle/Lf1uVzg8qdvKYFjX7) among the 1438 individuals approached. During the approach over the phone, respondents who fulfilled the augmentation criteria were allowed in this study. The augmentation features were that, participants should be healthy, have no medical complications related to stress, have regular sleeping time with no history of insomnia or narcolepsy, have regular food consumption, and have no previous record of anxiety. After excluding incomplete questionnaires, 412 participants were allowed in the final analysis. This study got approval from the Department of Biochemistry and Molecular Biology at Shahjalal University of Science and Technology in Sylhet, Bangladesh.

Measurements

Generalized Anxiety Disorder (GAD-7)

Utilizing the GAD-7 instrument in this study, participants were tasked with reporting the frequency of experiencing each of the seven symptoms within the preceding two weeks. Employing a Likert rating scale comprising four categories, participants used a range of responses from 0 (indicating absence) to 3 (almost daily occurrence) to quantify the frequency of each symptom. The cumulative scores on this scale encompassed a range of 0 to 21, as per the findings of Cao *et al.* (Cao *et al.*, 2020). Predicated on the aggregate score, the levels of anxiety were classified into four distinct categories: normal, mild, moderate, and severe. These categories were allocated scores of 0-4, 5-9, 10-14, and 15-21, respectively. Widely validated as a screening tool, the GAD-7 demonstrated exceptional internal consistency in this study, exhibiting a Cronbach's alpha coefficient of 0.85, surpassing the threshold of 0.70 (Gliem and Gliem, 2003).

Daily life activities

The daily life activities of each participant were evaluated using structured questions related to the few days since they have undergone home quarantine. The sleeping time was recorded on a scale of 0-5 h, 5-8 h, and 8-Above hours. Changes in food consumption were measured on a scale of Less, Moderate, and Heavy. The extent of online exposure was evaluated by inquiring about the frequency with which the participants came across online news and information concerning COVID-19 within the preceding week. Response options were Less, Moderate, and Frequent. Online usage of the participants was categorized as, Frequent ($\geq$ 2 hours/day), Moderate ($<$ 2 hours/day and $\geq$ 5 days/week), and Less ($<$ 2 hours/day and $\leq$ 4 days/week) based on previous research (Cassidy-Bushrow *et al.*, 2015). The extent of outdoor activities before the pandemic has scaled as Less, Moderate, and Heavy. Participants' current physical activity was classified as Inactive, Some activity, or Moderate or More. Current working status included whether they were working from home or at the workplace.

Covariates

In this study, several covariates have been taken into account, including sex and age (divided into categories of 18-30, 30-40, 40-50, 50-60, and above), educational level (categorized as uneducated, school, college, and university), marital status (as married and unmarried), and type of occupation (divided into categories of unemployed, self-employed, non-government employed, and government employed).

Statistical analysis

Demographic and pertinent participant characteristics were examined using IBM® SPSS® Statistics Version 27.0 (IBM Corp, Armonk, NY, USA). Employing a univariate analysis (nonparametric test), an exploration was conducted to comprehend the relationship between population traits and anxiety levels amid the COVID-19 period (Yao *et al.*, 2020). For the purpose of demonstrating the potency of associations across significant variables in multivariate logistic regression analyses, odds ratios (ORs) along with their corresponding 95% confidence intervals (CIs) were computed. Spearman's correlation coefficient, denoted as 'r,' was employed to assess the correlation between anxiety and factors entwined with daily life. Significance in statistical terms required a p-value of less than 0.05 for the two-tailed test.

Results

Prevalence of Anxiety

The prevalence of anxiety was assessed in a total of 412 participants, with 68.93% of them experiencing anxiety at varying levels, while 31.07% were considered normal with no symptoms of anxiety. The distribution of anxiety levels is shown in Figure 1 (a), where 39.32%, 17.72%, and 11.89% of participants reported mild, moderate, and severe anxiety, respectively.

Anxiety and Participant demographics

The study analyzed the characteristics of the participants with their anxiety levels, as presented in Figure 1 (b-f). Among the 262 male participants, 9.54% had severe anxiety, whereas, among the 150 female participants, the rate was 16%. The majority (89.32%) of respondents were in the 18-30 age group, and most of them (40.22%) had mild anxiety, while only 11.14% had severe anxiety. Among unmarried participants, over 68% had anxiety at different levels, while for married participants, the ratio was 73.63%. A significant majority (94%) of respondents had a university degree, and 11.63% of them had severe anxiety. However, among the uneducated group, 33.33% experienced severe anxiety. In terms of occupation, a small number (11.15%) of unemployed respondents showed severe anxiety, while a relatively higher number of respondents with severe anxiety (21.88%) were observed in the self-employed group. The study conducted a nonparametric Kruskal-Wallis H test and found no significant association between the demographic variables of Bangladeshi people and anxiety at the level of P > 0.05.

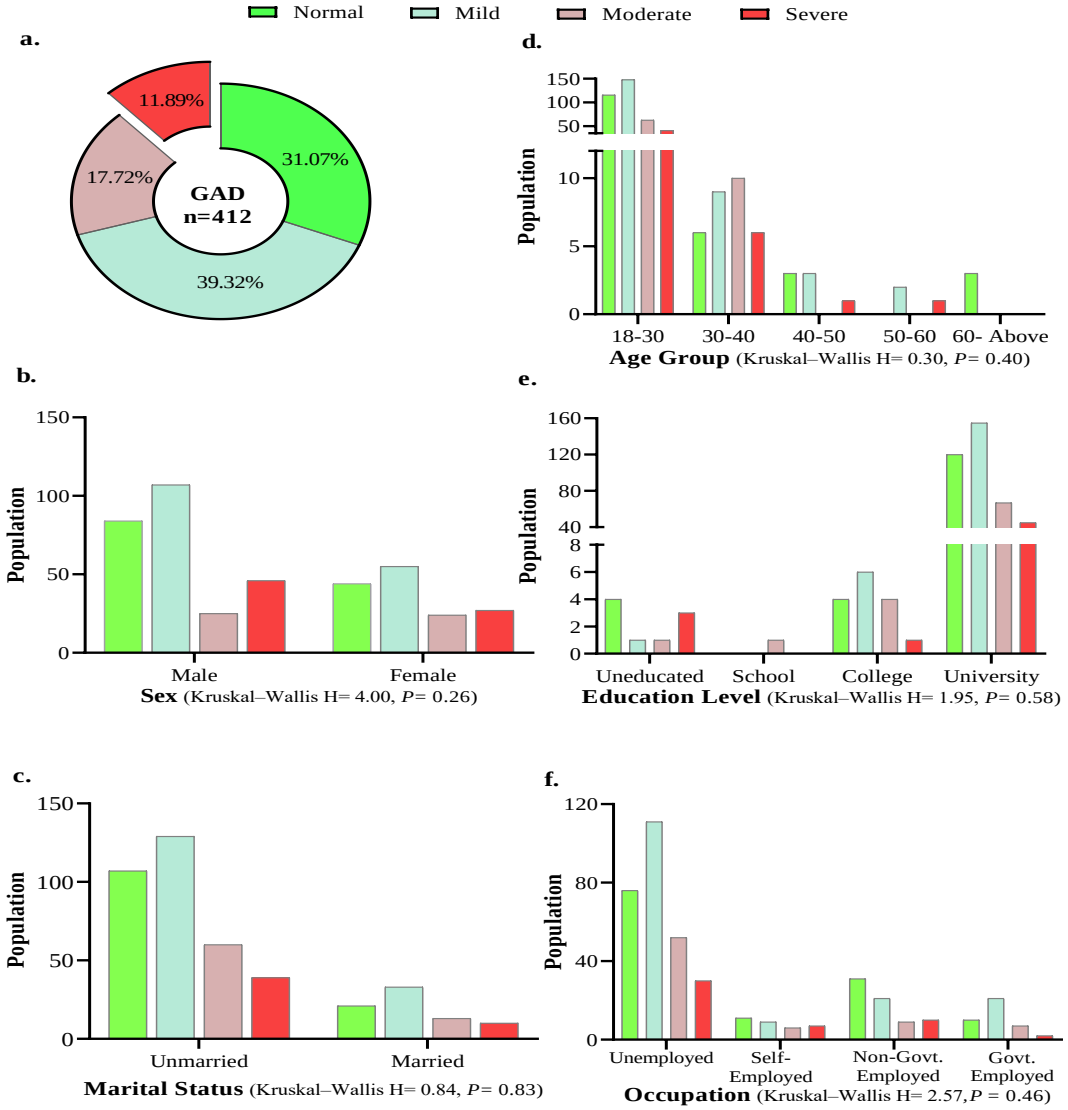

Figure 1. Incidence of Generalized Anxiety Disorder and Demographics of the Bangladeshi Population (n=412). a) Anxiety levels among individuals; b) Distribution of anxiety levels categorized by gender; c) Distribution of anxiety levels categorized by marital status; d) Distribution of anxiety levels categorized by participant age groups; e) Distribution of anxiety levels categorized by participant education levels; f) Distribution of anxiety levels categorized by participant occupational statuses.

Anxiety and daily activities of the Participants'

The relationship between daily life activities during the COVID-19 pandemic and anxiety levels is shown in Table 1. Participants having shorter sleeping duration (less than 5 hours) had increased anxiety levels (P > 0.01), while a drastic change in food habits also resulted in elevated anxiety levels (P > 0.01). People engaged in frequent outdoor activities were more prone to anxiety (P > 0.01), though, in lockdown conditions, people with moderate physical activity showed decreased anxiety levels (P > 0.01). There was no significant relationship between people working in different places (i.e., working from home or at the workplace) using univariate analysis (Nonparametric: Kruskal-Wallis H test).

Table 1. Daily life factors influencing the level of anxiety

Variables		Total	Level of Anxiety				Statistics[a]	*P*
			Normal	Mild	Moderate	Severe		
Current working Status	From Home	363 (88.11)	107 (29.48)	144 (39.67)	67 (18.46)	45 (12.40)	4.16	0.24
	At Office	49 (11.89)	21 (42.86)	18 (36.73)	6 (12.24)	4 (8.16)		
Sleeping Hours	0-5	74 (17.96)	13 (17.57)	11 (14.86)	8 (10.81)	42 (56.76)	92.18	<0.01
	5-8	229 (55.58)	79 (34.50)	102 (44.54)	44 (19.21)	4 (1.75)		
	8-Above	109 (26.46)	36 (33.03)	49 (44.95)	21 (19.27)	3 (2.75)		
Level of Food Habit Change	Less	191 (46.36)	80 (41.88)	80 (41.88)	29 (15.18)	2 (1.05)	110.67	<0.01
	Moderate	140 (33.98)	44 (31.43)	64 (45.71)	28 (20.00)	4 (2.86)		
	Heavily	81 (19.66)	4 (4.94)	18 (22.22)	16 (19.75)	43 (53.09)		
Online Exposure	Less	164 (39.81)	78 (47.56)	64 (39.02)	20 (12.20)	2 (1.22)	131.95	<0.01
	Moderate	191 (46.36)	49 (25.65)	96 (50.26)	40 (20.94)	6 (3.14)		
	Frequent	57 (13.83)	1 (1.75)	2 (3.51)	13 (22.81)	41 (71.93)		
Outdoor Activities Before Pandemic	Less	187 (45.39)	79 (42.25)	78 (41.71)	28 (14.97)	2 (1.07)	96.40	<0.01
	Moderate	143 (34.71)	40 (27.97)	67 (46.85)	28 (19.58)	8 (5.59)		
	Heavily	82 (19.90)	9 (10.98)	17 (20.73)	17 (20.73)	39 (47.56)		
Physical Activity	Inactive	92 (22.33)	61 (63.33)	0 (0.00)	0 (0.00)	31 (37.78)	230.03	<0.01
	Some Activity	226 (54.86)	48 (21.23)	162 (71.69)	0 (0.00)	16 (7.08)		
	Moderate or More	94 (22.81)	19 (20.21)	0 (0.00)	73 (77.66)	2 (2.13)		

[a] Kruskal-Wallis H

Table 2 presents an ordinal multivariate analysis examining the connection between daily life factors and anxiety experienced throughout the COVID-19 era. The ordered logistic regression analysis integrates noteworthy attributes identified through the univariate analysis. To deem the model test valid, the odds ratio (OR) value for at least one variable must reach statistical significance at a level of $P < 0.01$. Consequently, the assessment of parallel lines yielded a result of $\chi 2 = 20.01$, $P = 0.46$ (> 0.05), demonstrating a favorable model fit in alignment with observed values.

According to the findings, getting less than eight hours of sleep per day increased the risk of anxiety (OR = 4.87, 95% CI = 2.35-10.03). However, less (OR= 0.27, 95% CI = 0.01 - 0.75) and moderate (OR= 0.19, 95% CI = 0.08-0.46) changes in the food habit were the protective factors against anxiety. Compared to moderate or frequent physical activity, some form of activity was found to be working as an antagonist for anxiety levels (OR = 0.20, 95% CI = 0.12 - 0.34). Interestingly, inactivity showed nearly the same result as that moderate activity (OR = 0.03, 95% CI = 0.01 - 0.06). Respondents with fewer outdoor activities before the crisis were less likely to experience anxiety than those involved in heavy outdoor activities (OR = 0.31, 95% CI = 0.18 - 0.81). Less (OR = 0.01, 95% CI = 0.00 - 0.03) and moderate (OR = 0.02, 95% CI = 0.00 - 0.05) exposure to online regarded as the protective factor against severe anxiety compared to frequent online access.

Table 2. Ordinal Logistic regression of daily life factors influencing Anxiety

Factor	Number	SE	OR	95% Confidence Interval		*P*
				Lower Bound	Upper Bound	
Sleeping Hours						
0-5	74	0.37	4.86	2.35	10.03	<0.01
5-8	229	0.24	0.92	0.57	1.48	0.73
8-Above [a]	109	-	-	-	-	-
Level of Food Habit Change						
Less	191	0.53	0.27	0.10	0.75	0.01
Moderate	140	0.45	0.19	0.08	0.46	<0.01
Heavily [a]	81	-	-	-	-	-
Online Exposure						
Less	164	0.49	0.01	0.00	0.03	<0.01
Moderate	191	0.48	0.02	0.00	0.05	<0.01
Frequent [a]	57	-	-	-	-	-
Outdoor Activities Before Pandemic						
Less	187	0.49	0.31	0.12	0.81	0.02
Moderate	143	0.43	0.63	0.27	1.44	0.27
Heavily [a]	82	-	-	-	-	-
Physical Activity						
Inactive	92	0.38	0.03	0.01	0.06	<0.01
Some Activity	226	0.27	0.20	0.12	0.34	<0.01
Moderate or More [a]	94	-	-	-	-	-

[a] Reference, SE= Standard Error, OR= Odds Ratio

Correlation between Anxiety and Participant's daily life factors

The result of correlation analysis is shown in Table 3. Food habit change ($r = 0.43$, $P < 0.01$) and physical activity ($r = 0.30$, $P < 0.01$) had a significant positive correlation with the development of anxiety, however, sleeping hours had negative correlation ($r = -0.27$, $P < 0.01$). Online exposures ($r = 0.50$, $P < 0.01$) as well as outdoor activities before the pandemic ($r = 0.41$, $P < 0.01$) were positively correlated with anxiety among the participants.

Table 3. Correlation between Anxiety and different daily life factors

Daily life factors	Anxiety Level	
	r	***P***
Sleeping Hours	-0.27	<0.01
Level of Food Habit Change	0.43	<0.01
Online Exposure	0.50	<0.01
Outdoor Activities Before Pandemic	0.41	<0.01
Physical Activity	0.30	<0.01

r = Spearman Correlation Coefficient

Discussion

As per a WHO study in 2017, the incidence rate of severe Generalized Anxiety Disorder (GAD) in Bangladesh stood at 4.4% (World Health Organization, 2017). However, a recent study conducted amid the COVID-19 pandemic unveiled a notably higher prevalence of severe anxiety, recorded at 11.89%. These findings align with prior research conducted during various public health crises such as SARS, MERS, Ebola, and Avian influenza, which have been linked to heightened mental health challenges (Chen *et al.*, 2006; Yamazaki and Kikkawa, 2010; Blakey *et al.*, 2015; Al-Rabiaah *et al.*, 2020). Considerable factors were identified, as causing stress among people during the pandemic, including fear of infection, disruption of daily routines and plans, financial difficulties, food shortages, and more (Ahorsu *et al.*, 2020; Islam *et al.*, 2020; Liebrenz *et al.*, 2020; Torales *et al.*, 2020; Zhang and Ma, 2020). Furthermore, the escalating count of suspected, confirmed, and fatal cases has contributed to a mounting sense of panic and fear among the populace, amplifying levels of anxiety (Sun *et al.*, 2020).

Mental strain can precipitate a spectrum of outcomes, encompassing heightened apprehension regarding personal health and that of loved ones, disturbances in sleep and eating patterns, challenges in maintaining focus, augmented consumption of tobacco, alcohol, and substances, exacerbation of chronic ailments, among other implications (CDC, 2022). Excessive worry, fear, agitation, guilt, a sense of helplessness, and isolation can potentially culminate in contemplation of suicide and its attempts (Banerjee, 2020). The extent of psychological distress endured by individuals during the pandemic has been influenced by diverse factors, including the availability of local medical resources, the efficacy of community healthcare systems, and the implementation of preventive and control measures (Wind and Komproe, 2012). It is plausible that anxiety levels within the Bangladeshi population were exacerbated by deficiencies in intensive care units, ventilation support, medical practitioners, and nursing personnel (El-Saharty *et al.*, 2015; Mostafa, 2018). Furthermore, the dissemination of false news, sensationalized headlines, and concerns regarding the scarcity of masks and disinfectants have collectively contributed to escalated anxiety levels (Ayittey *et al.*, 2020).

According to the study's findings, people's worry during the epidemic is linked to their regular routines. Contrary to earlier findings on sex and age, no differences in the onset of anxiety were found (P=0.26 and P=0.40, respectively). This discrepancy suggests that the pandemic has caused tension and unpleasant feelings in people of all ages and genders. Based on the multivariate logistic regression analysis, individuals with shorter sleeping hours were more likely to experience anxiety during the COVID-19 pandemic analyzed to the adequate sleeping group. This data was supported by a negative correlation ($r = -0.27$, $P < 0.01$) between anxiety and sleeping hours, suggesting to maintain a sufficient sleep duration is crucial for controlling anxiety during this crisis. These findings are consistent with earlier reports befriend in India and China that also found a correlation between sleep duration and restlessness during the pandemic (Huang and Zhao, 2020; Roy *et al.*, 2020). We also found that individuals who had a less drastic change in their food habits were less likely to experience anxiety correlated to those who experienced a significant modification in their eating habits. A positive correlation ($r = 0.43$, $P < 0.01$) between food habit change and severe anxiety, which is steady with the results of an earlier study accompanied in China (Sun *et al.*, 2020). Also, our study found that frequent exposure to online COVID-19 information was associated with severe anxiety, consistent with a preceding report (Neria and Sullivan, 2011). That could be due to the increasing number of speculative and misleading records about the pandemic that flood online platforms and stoke groundless fears among many people (Banerjee, 2020; Gao *et al.*, 2020). Furthermore, we found that individuals who had changed their outdoor activity significantly before the pandemic and their current physical activity status experienced fluctuating anxiety levels. Anxiety had a positive correlation with previous outdoor activity ($r = 0.41$, $P < 0.01$) as well as current physical activity ($r = 0.30$, $P < 0.01$), indicating that the measures taken by the government, such as travel restriction, isolation, and holidays extension to control the epidemic, certainly perturbed regular life (Wang, Tang and Wei, 2020) and leading to anxiety.

Nonetheless, there are probably some limitations to this study. Despite the breadth of the sample, there may be minor responder subgroups in the online survey, such as senior citizens. More advanced research also requires long-term analysis, such as cohort studies or nested case studies. Finally, we cannot rule out any residual confounding brought on by unmeasured aspects of anxiety and daily living.

Conclusion

This study suggested an increased level of GAD occurrence among the Bangladeshi population during the COVID-19 pandemic is positively associated with their current daily life

activities, such as altered food habits, increased online exposure, and changes in physical and outdoor activities before the implementation of restrictive measures. In addition, the increased level of anxiety correlated to reduced sleeping hours. These findings suggest that the Bangladeshi government should prioritize mental health services for the general population during the COVID-19 pandemic. Fortunately, the government is taking initiatives to provide various mental health services through different channels, such as telephone hotlines, online consultations, courses, and outpatient services. However, there is a need for more attention to managing anxiety levels, which are widely affecting people's daily life activities.

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