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An investigation of factors associated with COVID-19 related fear and preventive behaviour among young adults in Bangladesh: a case study

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Abstract: This study aimed to assess young adults' fear, preventive measures and related factors in the context of Bangladesh's COVID-19 pandemic. In February 2020, 270 young Bangladeshi people between 18 and 35 participated in a face-to-face interview for the cross-sectional survey. We employed a semi-structured questionnaire to gather information on the sociodemographic and lifestyle traits of the participants as well as details about COVID-19. The fear and preventive behaviours were measured using the Fear of COVID-19 and Preventive COVID-19 scales. The binary logistic regression model assessed the factors associated with fear and preventive measures. In the Fear of COVID-19 scale, females were found to have greater levels of COVID-19 fear than males. Socioeconomic factors, such as education level and unemployment, were linked to the likelihood of COVID-19 fear. Compared to male participants, female participants had higher odds of fearing COVID-19 (aOR = 2.71, 95% CI: 1.30-5.63). People with tertiary education were more likely to use COVID-19 prevention strategies (aOR = 17.16, 95% CI: 1.78–21.30). According to the study's conclusions, this vulnerable population needed mental health support immediately. The study's findings called for the urgent need for mental health support to target this vulnerable group.

Keywords: fear; preventive measures; COVID-19; healthcare service; young adults; Bangladesh.

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1 Introduction

1.1 Background

The socioeconomic repercussions caused by the COVID-19 pandemic in Bangladesh have been significant (Su et al., 2021). Various sectors of the economy, such as GDP growth, unemployment rates, inflation, interest rates and the tourism industry, have been profoundly affected (Su et al., 2021). As a result, economic growth has declined, leading to increased fiscal deficits and macroeconomic instability (Rathnayaka et al., 2022). Among the sectors hit hardest is the service industry, which has experienced a prolonged period of unemployment (Su et al., 2021). Moreover, trade, travel and tourism have been disrupted, reducing income in these areas (Rathnayaka et al., 2022). Beyond the economy, the COVID-19 pandemic has adversely affected the physical and mental well-being of individuals in Bangladesh. Research has indicated that individuals affected by COVID-19 endure long-term physical and psychological health complications. Consequently, this study aims to examine the long-term consequences of COVID-19 on patients' physical and mental health and explore the connection between patients' sociodemographic characteristics and the manifestation of clinical symptoms related to COVID-19. Understanding these impacts is vital for developing effective plans and strategies to mitigate, treat and prevent further complications (Pooja et al., 2023).

The outbreak of the pandemic has exerted a considerable influence on consumer behaviour in Bangladesh. In particular, there has been a remarkable surge in online shopping as individuals explore alternatives to conventional retail practices. Several key factors, including reasonable pricing, product quality, trustworthiness and user-friendliness, have guided the decision-making process of customers engaged in online shopping during the pandemic. Online shopping companies must prioritise these factors to attract a more extensive customer base (Fatema and Siddiqui, 2021). Furthermore, the

pandemic has had a disproportionately adverse impact on vulnerable segments of the Bangladeshi population, such as rickshaw pullers. The socioeconomic consequences of COVID-19 have been especially severe in developing countries like Bangladesh, where the healthcare system and social support structures may be limited in addressing the crisis adequately (Kurasaki et al., 2022). The pandemic's economic, social and psychological burdens heavily affect lower-middle-income nations like Bangladesh (Islam, 2021).

The impact of the COVID-19 pandemic on young adults has been significant and far-reaching across multiple aspects of their lives. The economy has been heavily affected, with widespread disruptions caused by the pandemic resulting in job losses, reduced incomes and financial instability for many young adults (Goodell, 2020). As a consequence, this has led to heightened financial stress and an increased sense of uncertainty regarding their prospects. Concurrently, the pandemic has profoundly influenced the mental well-being of young adults at a higher risk of experiencing feelings of loneliness, depression and anxiety during this period (Lee et al., 2020). The combination of social isolation and disruptions to daily routines has contributed to a sense of loneliness and escalated mental health problems among this demographic.

Furthermore, the COVID-19 pandemic has posed challenges to young adults regarding accessing healthcare and receiving vaccinations. Compared to older adults, young adults exhibit lower healthcare utilisation rates and are less likely to avail themselves of vaccinations (Adams et al., 2021). Public health initiatives must address the barriers that impede healthcare access and hinder vaccine uptake among young adults to combat this issue effectively. From a clinical perspective, young adults hospitalised with COVID-19 have experienced adverse outcomes, including the need for intensive care, mechanical ventilation and mortality (Cunningham et al., 2021). Certain factors, such as morbid obesity, hypertension, and diabetes, have been associated with a higher risk of adverse outcomes in this population. The pandemic has also influenced other healthcare areas, including oncological care, treatment and research (Joode et al., 2020; Chenneville et al., 2020).

The emergence of the COVID-19 pandemic has shed light on pre-existing inequalities in health and vulnerabilities within marginalised communities, particularly among young adults. Acknowledging and tackling these disparities is imperative to ensure fair and equal healthcare access and support for young adults throughout and beyond the pandemic. The impact of COVID-19 on this demographic has been wide-ranging, encompassing their financial stability, mental well-being, ability to obtain healthcare and overall clinical outcomes. Therefore, it is of utmost importance to continuously monitor and address the specific needs of young adults, aiming to mitigate the long-term consequences of the pandemic on this particular population (Liang et al., 2020; Hawke et al., 2021, 2020).

1.2 Research gap

This study investigates COVID-19 fear and mental health in Bangladeshi adults. While previous research has examined depressive symptoms in older adults (>60 years), few studies have explored COVID-19 fear in adults aged 18 to 35. Limited attention has been given to young adults' mental health issues, particularly fear and mental well-being. Few studies from other countries have discussed the psychological state of older individuals

(>60 years), but there is a lack of research focusing on mental health and fear response in the 18 to 35 age group. Therefore, this study aims to address this research gap by comprehensively analysing COVID-19 fear among Bangladeshi adults aged 18 to 35. By exploring the unique cultural, socioeconomic and psychological aspects of young adults in Bangladesh, this research seeks to provide valuable insights into the determinants of COVID-19 related fear and preventive measures. The findings of this study will contribute to the development of effective strategies to mitigate fear and promote preventive behaviour among young adults in Bangladesh, ultimately aiding in managing and controlling a pandemic similar to COVID-19.

1.3 Research objective

- The primary objective of this research study is to explore and analyse the factors linked to COVID-19-related fear and preventive behaviour among young adults in Bangladesh.

By investigating these factors, the research aims to shed light on the specific elements that influence the levels of fear and the adoption of preventive measures in this population. The study intends to identify and examine various sociodemographic, psychological and contextual factors contributing to fear and preventive behaviour, such as age, gender, educational background, media exposure, perceived susceptibility and trust in health information sources.

1.4 Research questions

- 1 How did the level of COVID-19 related fear among young adults in Bangladesh impact their engagement in preventive behaviours?
- 2 What are the key sociodemographic factors associated with COVID-19 related fear among young adults in Bangladesh?

1.5 Limitations of the study

Despite its limitations, this study in Khulna City Corporation, Bangladesh, has strived to achieve its objectives. The constraints faced include methodological and contextual factors. Firstly, accessing respondents was challenging due to their absence from home and work commitments. This posed difficulties in reaching the desired sample size. Secondly, face-to-face interviews posed risks due to the high COVID-19 infection rate, and participants initially hesitated to disclose their COVID-19 related information. Thirdly, the study took longer than expected due to the heightened transmission of COVID-19. Financial constraints also affected the wages of data enumerators, further impacting time and resources. Nevertheless, the study persevered to provide valuable insights to the field.

2 Literature review

2.1 *Understanding COVID-19*

The global impact of COVID-19 has been far-reaching and has affected various aspects of human life and the global economy. The pandemic has led to unexpected economic activity and stock market reductions (Rupani et al., 2020). The containment measures put in place to reduce the health outcomes of the pandemic have also affected environmental sustainability and economic development (Sarkodie and Owusu, 2020). Healthcare workers have also been significantly impacted by COVID-19, with a significant burden of infections among this group, leading to strain on the health workforce and affecting service delivery (Dzinamarira et al., 2021). The pandemic has also had psychological effects, with individuals experiencing fear and mental health issues due to the ongoing crisis (Abbas, 2021). The impact of COVID-19 on international trade has been analysed, with studies showing adverse effects on exports in selected countries (Baycan and Tuysuz, 2022).

Additionally, the global aquaculture industry has been directly impacted by the pandemic, affecting food security and access to food (Salajegheh et al., 2022). Overall, the global impact of COVID-19 has been extensive, affecting various sectors and populations worldwide. The international scientific community has tried to understand, fight and model the pandemic, highlighting the urgent and continuous response to this worldwide crisis (Cao and Hou, 2022). It is crucial to mitigate the multifaceted impacts of COVID-19 and develop strategies to address the pandemic's economic, environmental and health implications.

2.2 *Fear of COVID-19*

Several studies have explored the correlation between fear of COVID-19 and preventive actions. Ahmed et al. (2020) discovered that fear and anxiety resulting from the pandemic can lead to changes in behaviour, including preventive measures. However, excessive strain can lead to panic and irrational decision-making. Tull et al. (2020) investigated the psychological effects of stay-at-home orders and the perceived impact of COVID-19 on daily life. They observed that being under a stay-at-home order was associated with increased health anxiety, financial concerns and loneliness. The perceived impact of COVID-19 on daily life was positively linked to health anxiety and financial worries but negatively linked to loneliness. Chu and Liu (2021) combined elements from three health behaviour theories to identify factors influencing Americans' willingness to receive a COVID-19 vaccine. They found that the majority of respondents expressed intent to be vaccinated.

Olapegba et al. (2021) investigated the function of psychological distress and post-traumatic stress symptoms as mediators in the association between COVID-19 fear and preventive health behaviour. They discovered that the relationship between COVID-19 fear and preventive health behaviour was mediated by post-traumatic stress disorder symptoms and psychological distress. A thorough assessment was undertaken by Quadros et al. (2021) to determine the level of concern for COVID-19 infection across various demographics. They observed that the emotional, cognitive and behavioural reactions are exacerbated by the dread of sickness. During the COVID-19 pandemic, Knowles and Olatunji (2021) performed a prospective research on contamination anxiety.

During the pandemic, they saw an increase in OCD symptoms, with coronavirus-related worry being more prevalent than flu-related anxiety.

Ahorsu et al. (2020) looked at how COVID-19 anxiety impacts older persons' perceptions of their health status, their sleep patterns, their mental health and their COVID-19 prevention practices. They found that COVID-19 fear strongly modulates the relationships between perceived health status and sleeplessness, mental health and COVID-19 preventative activities. Musche et al. (2020) emphasised the crucial role of health professionals and society in providing COVID-19 information and promoting necessary behavioural changes to prevent psychological distress and anxiety. Mahindaratne (2021) applied the Health Belief Model to identify factors influencing preventive behaviour against COVID-19. They found that perceived benefits, self-efficacy and general health motivation significantly contribute to preventive behaviour. Hosen et al. (2021) reported that individuals in heavily exposed areas experienced increased fear of COVID-19. Additionally, they noticed that psychological discomfort, COVID-19 preventative measures and subjective health status were all mediated by dread of the virus.

2.3 Preventative behaviour against COVID-19

Taghrir et al. (2020) surveyed Iranian medical students to evaluate their knowledge, preventive behaviours and risk perception regarding COVID-19. The participants exhibited extensive knowledge and reported high adherence to preventive measures. In a different study, Liu et al. (2020) provided an overview of therapeutic agents and vaccines for COVID-19, focusing on antiviral strategies targeting molecular interactions involved in coronavirus infection and replication. They also discussed drug repurposing, biologics development and potential treatments such as therapeutic antibodies and nucleic acid-based therapies. Plohl and Musil (2020) stressed the significance of scientific credibility and its contribution to encouraging adherence to COVID-19 preventive recommendations. According to the study, those who believe in science and scientists are more likely to view COVID-19 as a concern and follow advised preventative actions.

The openness to receive the COVID-19 vaccination among Taiwanese healthcare professionals and outpatients was investigated in a research by Kukreti et al. (2021). Participants' compliance with COVID-19 prevention practices, including hand cleanliness and mask use, was assessed using a scale in the study. Anagaw et al. (2023) carried out a thorough analysis to determine how behavioural change theories and models are used all around the world to promote COVID-19 preventative behaviours. According to the analysis, studies on handwashing, wearing face masks, accepting vaccinations, social isolation and self-quarantining frequently used the health belief model and theory of planned behaviour. Talabi et al. (2022) investigated how public health behaviours and attitudes were influenced by media efforts, particularly radio advertisements, during the COVID-19 pandemic. The study emphasised the role of media campaigns in raising awareness and promoting the adoption of preventive measures.

Nanthamongkolchai et al. (2022) stressed the significance of understanding COVID-19, health-risk behaviours, and preventive measures in controlling the transmission of infectious diseases. They emphasised identifying crucial health-risk behaviours and ensuring public policies promote practical COVID-19 preventive actions. Hasyim et al. (2022) focused on Diabetes Mellitus (DM) patients, it was emphasised that preventing DM is crucial to avoid complications resulting from COVID-19 infection. Ipa

et al. (2023) conducted a qualitative study in Indonesia, employing the health belief model to assess adults' perception of risks and compliance with COVID-19 preventive measures. The study revealed a significant association between risk perception and preventive behaviours such as handwashing, physical distancing, avoiding public places and wearing face masks. Ruggeri et al. (2022) evaluated expectations and lessons from social and behavioural science regarding COVID-19 and future pandemics. The study provided evidence supporting various claims related to pandemic behaviours, including the importance of countering misinformation, reducing polarisation and utilising effective communication strategies.

2.4 COVID-19 and the adult population

Young adults' mental health and well-being were greatly impacted by the COVID-19 pandemic, which resulted in increased loneliness, mental health issues and negative consequences. According to a Bu et al. (2020) research, young persons, especially those between the ages of 18 and 30, were more likely to experience loneliness during the pandemic than they were before it. Being a woman, having less education or money, not working, living alone and dwelling in an urban region were risk factors for loneliness. In addition, Lee et al. (2020) discovered that during the pandemic, young adults had greater increases in loneliness than other age groups.

The mental health consequences of the pandemic on young adults have been studied extensively. Research indicates that women experience higher distress levels compared to men, while non-binary individuals, who have a greater prevalence of mental illness, should be a priority for mental health interventions (Alonzi et al., 2020). Another study examined the mental health of young adults during the pandemic and identified several risk factors for poorer mental health, including alcohol and tobacco use, being female, having a lower income and pre-existing mental health conditions (Stroud and Gutman, 2021). Additionally, the physical health of young adults has been impacted by COVID-19. Hospitalised young adults in the 18 to 34 age group faced significant adverse outcomes, such as the need for intensive care, mechanical ventilation, and mortality (Cunningham et al., 2021). Research on the long-term effects of COVID-19 in young adults suggests impaired peripheral vasodilator function in those who have recovered from the virus (Nandadeva et al., 2021).

Nevertheless, not all effects of the pandemic on young adults are adverse. A study revealed that an eight-week online mindfulness program positively reduced anxiety symptoms among university students during the pandemic (Simonsson et al., 2021). This demonstrates the potential of interventions to alleviate the pandemic's detrimental impact on young adults' mental health (Simonsson et al., 2021).

3 Methods

3.1 Study area

The study was carried out within the Khulna City Corporation, specifically focusing on two particular wards, namely Ward No. 24 and 25, out of a total of 31 wards. These wards were conveniently chosen to collect sample data. Khulna City, the third-largest city in Bangladesh, was significantly affected by the coronavirus outbreak, resulting in

psychological problems among many elderly individuals. Situated on the Bank of Bhairab-Rupsha River in the southwestern region of the country, Khulna City Corporation (KCC) serves as a central hub for trade, commerce, industry, administration, health and education in the area (Haque et al., 2022). Over one million people reside in this city, which has witnessed rapid growth and notable industrial development, including mills and a shipyard (Parida et al., 2021). Covering an area of 45.65 square kilometres, Khulna City Corporation has a population of 1.5 million and a high-population density of 32,859 persons per square kilometre (Cookey et al., 2020). Additionally, rooftop gardening has gained popularity in the city, with active participation from women (Nasrin et al., 2019). However, KCC faces challenges in providing municipal services to informal settlements, as many residents are excluded from or unwilling to pay for these services (Doni et al., 2022).

3.2 Sample size determination

Godden's sampling formula was employed to determine the appropriate sample size for the research investigation. The calculation was conducted using the prescribed formula by Godden (2004).

$$S = \frac{z^2 p(1-p)}{M^2} = \frac{1.645^2 * .5(1-0.5)}{0.05^2} = \frac{2.706025 * 0.25}{0.0025} = \frac{0.67650625}{0.0025}$$

The parameters used in the analysis include S , which represents the sample size. Z is the normal standard deviation at a 90% confidence level (1.65). P is the percentage of the population choosing a particular option (expressed as a decimal, with 50% equating to 0.5), and M is the margin of error (set at 5% or 0.05). After collecting the data, it underwent thorough scrutiny and information from 270 respondents was retained for further analysis.

3.3 Sampling technique

A total of 270 people aged 18 to 35 voluntarily participated in a face-to-face interview. The interview lasted about 10 to 20 minutes. Data were collected between the 15th and 25th of February, 2020. Those considered for the survey were

- 1 at least 18-years-old and
- 2 Bengali was their first language.

Participants were recruited using an anonymous face-to-face interview and a simple random sampling strategy. The survey was conducted in Khulna City Corporation's 24th and 25th wards.

3.4 Data collection

A well-developed structured questionnaire was used to collect information from respondents during a face-to-face interview. Data was collected manually by data enumerators with prior experience in data collection. Data enumerators gathered information by taking a random walk. Before collecting data, those who collected it were trained. The researcher translated the English questionnaire into Bengali and then back

into English. To ensure the consistency of the contents, the researcher summarised the questionnaire from English to Bengali and then back to English. To refine the final version, a pilot survey was conducted first among a small group of people ($n=20$) ranging from 18- to 35-years-old.

3.5 Data analysis technique

3.5.1 Measurement scale

Fear of COVID-19 scale: A questionnaire was administered to measure individuals' fear of COVID-19, comprising seven items rated on a five-point Likert scale (ranging from 1=strongly disagree to 5=strongly agree). The aim was to gauge respondents' level of fear concerning COVID-19. The FCV-19S score, with higher values indicating heightened fear, was employed for this assessment. For instance, the statement 'I can't sleep because I'm afraid of getting coronavirus-19' illustrates FCV-19S. Ahorsu et al., 2020 confirmed satisfactory psychometric features of the FCV-19S in a representative Iranian population, with a Cronbach's alpha of 0.88. Hence, a more excellent COVID-19 score correlates with increased fear of COVID-19.

Preventive COVID-19 infection behaviours scale (PCIBS): PCIBS emerged following the World Health Organisation's endorsement of precautionary actions amid the COVID-19 pandemic. To safeguard against Coronavirus transmission, the WHO propagated global adherence to these practices. The PCIBS comprises five crucial elements, gauged through a five-point Likert scale, frequently employed to evaluate individuals' compliance with preventive COVID-19 measures. Using a range from '1=strongly disagree' to '5=strongly agree', the Likert scale served as the assessment tool. An instance of a PCIBS item is, 'How often do you refrain from touching your eyes, nose and mouth?'

3.5.2 Statistical analysis

To assess the distribution of the variables in this study, descriptive analysis was used. For continuous data, the mean values were used; for categorical data, frequencies and percentages were taken into account. The Fear of COVID-19, Belief in COVID-19 and Preventive COVID-19 scales were examined using Cronbach's (>0.7) to determine the internal consistency of the data (Ahorsu et al., 2020). The three COVID-19 scales had their skewness, kurtosis and adjusted item correlation calculated; values over 0.4 were deemed acceptable (Pakpour et al., 2020). Improved dependability and factor loadings were discovered through further research of the item attributes. It was discovered that the COVID-19 instruments were one-dimensional, with just one component being studied. Binary logistic regression was employed to identify the factors associated with Fear and Preventive COVID-19. Additionally, the Spearman coefficient correlation was calculated. All analysis procedures were conducted using SPSS version 25.

3.6 Ethical issues

Ethical considerations are important in research studies, and their absence may lead to consequences or failure. Informants' identities were carefully protected during the interview and reporting phase of the study to ensure utmost confidentiality and

anonymity. This study adhered closely to well-established ethical principles, with a focus on the following major issues:

- 1 *Voluntary participation*: This study strongly encouraged respondents to participate voluntarily, allowing them the freedom to provide answers or skip any questions to protect their privacy.
- 2 *Risk of harm*: The study is committed to safeguarding participants from harm.
- 3 *Anonymity and confidentiality*: The study prioritised the preservation of confidentiality and anonymity.
- 4 *Data acquisition*: The research data must be handled with high confidentiality, avoiding confusing or biased primary data representation.

4 Results and discussion

4.1 Summary statistics (chi-square test)

The association between sociodemographic variables and the probability of fear due to COVID-19 and preventive COVID-19 information behaviours among young adults are summarised in Table 1.

Table 1 illustrates the chi-square test of different demographic variables and their association with feared or did not fear. From Table 1, the gender of the respondents, males are less feared (59.6%), but females are more feared (61.5%) than males due to COVID-19 (p -value <0.001). In terms of Smoking behaviour, those people who replied 'yes' (58.2%) were less feared, but those people who answered 'no' (52.5%) were much feared where (p -value >0.095). In the case of providing care to family members suspected case of COVID-19 (58.5%), people answered 'yes' they were much feared and (57.3%) replied 'no' (p -value <0.001), which means less feared.

Table 1 Summary statistics

Variables	Fear of COVID-19				Preventative Behaviours against COVID-19		
	Sample	No	Yes	P-Value	Not Adopted	Adopted	P-Value
<i>Age of the respondents</i>							
18–25	136	72(52.9)	64(47.1)	0.54	68(50.0)	68(50.0)	0.62
≥25	134	66(49.3)	68(50.7)		71(53.0)	63(47.0)	
<i>Gender of the respondents</i>							
Male	161	96(59.6)	64(40.4)	<0.00	101(62.7)	60(37.3)	<0.00
Female	109	42(38.5)	67(61.5)		38(34.9)	71(65.1)	
<i>Marital status of the respondents</i>							
Married	116	57(49.1)	59(50.9)	0.27	55(47.4)	61(52.6)	0.21
Unmarried	145	79(54.5)	66(45.5)		80(55.2)	65(44.8)	

Table 1 Summary statistics (continued)

Variables	Fear of COVID-19				Preventative Behaviours against COVID-19		
	Sample	No	Yes	P-Value	Not Adopted	Adopted	P-Value
Divorced	5	1(20.0)	4(80.0)		1(20.0)	4(80.0)	
Widow	4	1(25)	3(75)		3(75.0)	1(25.0)	
Education of the respondents							
Primary	9	6(66.7)	3(33.3)	0.73	8(88.9)	1(11.1)	0.05
Secondary	43	20(46.5)	23(53.5)		25(58.1)	18(41.9)	
Higher Secondary	104	54(51.9)	50(48.1)		54(51.9)	50(48.1)	
Tertiary	114	58(50.9)	56(49.1)		52(45.6)	62(54.4)	
Current employment status of the respondents							
Unemployed	149	70(47.0)	79(53.0)	0.47	69(46.3)	80(53.6)	0.15
Employed	87	50(57.5)	37(42.5)		49(56.3)	38(43.7)	
Afraid of Job loss	25	13(52.0)	12(48.0)		17(68.0)	8(32.0)	
Lost Job	9	5(55.6)	4(44.4)		4(44.4)	5(55.6)	
Having Lost job due to COVID-19							
Yes	41	21(51.2)	20(48.8)	0.98	26(63.4)	15(36.6)	0.09
No	229	117(51.1)	112(48.9)		113(49.3)	116(50.7)	
Smoking							
Yes	91	53(58.2)	38(41.8)	0.09	68(74.7)	23(25.3)	<0.00
No	179	85(47.5)	94(52.5)		71(39.7)	108(60.3)	
Use of tobacco increasing after COVID-19							
Yes	38	21(55.3)	17(44.7)	0.58	23(60.5)	15(39.5)	0.22
No	232	117(50.4)	115(49.6)		116(50)	116(50)	
Provide care to family member suspected case of COVID-19							
Yes	106	44(41.5)	62(58.5)	0.01	55(51.9)	51(48.1)	0.91
No	164	94(57.3)	70(42.7)		84(51.2)	80(48.8)	
Own experience related to COVID-19 pandemic							
Self-isolating before negative	61	16(26.2)	45(73.8)		28(45.9)	33(54.1)	
Recent travel history and quarantine	66	33(50.0)	33(50.0)	<0.00	30(45.5)	36(54.5)	0.19
No known exposure to COVID-19	143	89(62.2)	54(37.8)		81(56.6)	62(43.4)	

Table 1 Summary statistics (continued)

Variables	Fear of COVID-19			Preventative Behaviours against COVID-19			
	Sample	No	Yes	P-Value	Not Adopted	Adopted	P-Value
<i>In the last 4 weeks used healthcare service</i>							
Visited healthcare provider	63	26(41.3)	37(58.7)		42(66.7)	21(33.3)	
Telehealth communication	56	19(33.9)	37(66.1)	<0.00	18(32.1)	38(67.9)	0.00
Registered Physician	16	7(43.8)	9(56.2)		8(50.0)	8(50.0)	
No	135	86(63.7)	49(36.3)		71(52.6)	64(47.4)	
<i>In the last 4 weeks, healthcare services have alleviated COVID-19-related stress</i>							
Yes	133	50(37.6)	83(62.4)	<0.00	67(50.4)	66(49.6)	0.72
No	137	88(64.2)	49(35.8)		72(52.6)	65(47.4)	
<i>Types of healthcare services used in the last 4 weeks to alleviate COVID-19-related stress</i>							
General Physician	51	21(41.2)	30(58.8)		30(58.8)	21(41.2)	
Psychologist	19	7(36.8)	12(63.2)		7(36.8)	12(63.2)	
Psychiatrist	7	2(28.6)	5(71.4)		2(28.6)	5(71.4)	
Specialised mental care	22	13(59.1)	9(40.9)	<0.00	14(63.6)	8(36.4)	0.32
Mental Health Resources	5	4(80.0)	1(20.0)		2(40.0)	3(60.0)	
Used (MHR) through Media	33	6(18.2)	27(81.8)		14(42.4)	19(57.6)	
Quack Doctor	133	85(63.9)	48(36.1)		70(52.6)	63(47.4)	

Source: Authors' compilation (2021).

Individuals' experience related to the COVID-19 pandemic, mostly 'Self-isolating before negative' (73.8%), was much feared due to COVID-19. On the other hand, the feared and not feared percentage is (50%). Besides, no known exposure found (62.2%) people showing did not fear responses (p -value <0.001) is highly significant. 'Healthcare service use in the last 4 weeks' people who Visited medical professionals (58.7 %) are very concerned. Because of the COVID-19 pandemic, people using telehealth communication (66.1 %) are much more fearful; people using registered physicians (56.2%) are also much feared. On the other hand, people who did not receive any healthcare in the last 4 weeks are less feared (63.7%) where (p -value<0.001). 'Healthcare service to overcome COVID-19 related stress in the previous 4 weeks the majority (64.2%) is less concerned', but the minority (62.4%) is more concerned (p -value<0.001). 'Types of healthcare

services used to alleviate COVID-19-related stress in the last 4 weeks' general practitioner (58.8%), consulting psychiatrist (71.4%), used mental health resources (81.8%) people are much feared. But going quack doctors (63.9%) are found to be less feared due to the COVID-19 pandemic, where (p -value<0.001) was enormously significant.

Table 1 also portrays the Chi-Square test of different demographic variables and their association with preventing adoption or not adopting. From Table 1, males (62.7%) did not adopt much preventive COVID-19 information behaviour, but females (65.1%), where (P -Value<0.001) adopted much preventive COVID-19 information behaviour and regarding the education of the respondents people who have tertiary education (54.4%) followed prevention adoption. In contrast, people with primary and secondary education are less likely to adopt preventive behaviour due to COVID-19 cases (P -Value=0.050).

Having lost a job due to COVID-19, people who responded 'yes' (63.4%) did not adopt the preventive measure, but people who said no (50.7%) adopted preventive measures where (P -Value<0.097). People who smoked and responded no (60.3%) adopted preventive behaviours; on the other hand, those people who said yes (74.7%) did not adopt preventive measures for COVID-19 information behaviours purposes (P -Value<0.001). In the last 4 weeks, healthcare services were used; telehealth communication (67.9%) found prevention adopted; people who Visited medical professionals (66.7%) did not adopt preventive COVID-19 information measures. People using registered physicians (50%) did not adopt prevention, (50%) were found to prevention adopted in the study area where (P -Value<0.003).

4.2 Item and scale properties

Table 2 lists the FCV-19S's items and scale properties. The preceding Table 2 focuses on the FCV-19S items and scale, where FCV-19 instruments had very good to excellent internal consistency (= 0.851) and KMO value (0.824). FCV-19S (skewness = -0.183 to 0.397; kurtosis = -0.680 to -1.064) and factor loadings (FCV-19S = 0.650 to 0.790) were found to be nearly normally distributed. In addition to the strong factor loadings, the FCV-19S supports the single factor structure, and the FCV-19S's psychometric property was confirmed to be satisfactory.

Table 2 Fear of COVID-19 item and preventive COVID-19 infection behaviour scale properties

Item	Mean	SD	Skewness	Kurtosis	Factor loading	KMO	Cronbach's α
FCV-19							
Item 1	3.32	1.19	-.372	-.680	0.650	0.824	0.851
Item 2	3.21	1.13	-.183	-.693	0.790		
Item 3	2.68	1.23	.261	-.965	0.720		
Item 4	3.15	1.23	-.244	-.945	0.720		
Item 5	3.26	1.16	-.235	-.763	0.730		
Item 6	2.41	1.24	.397	-.985	0.730		
Item 7	2.51	1.27	.316	-1.064	0.760		

Table 2 Fear of COVID-19 item and preventive COVID-19 infection behaviour scale properties (continued)

Item	Mean	SD	Skewness	Kurtosis	Factor loading	KMO	Cronbach's α
PCIBS-19							
Item 1	3.75	1.03	-.490	-.468	0.750	0.794	0.747
Item 2	3.48	1.03	-.215	-.844	0.780		
Item 3	3.52	1.13	-.451	-.573	0.770		
Item 4	2.88	1.16	.045	-.858	0.710		
Item 5	3.38	1.13	-.119	-.830	0.520		

Notes: FCV-19 = Fear of COVID-19, PCIBS-19 = Preventive COVID-19 Infection Behaviour Scale; Authors' Compilation (2021).

The above Table 2 depicts the PCIBS-19S items and scale, where PCIBS-19S instruments had a very good to excellent internal consistency ($\alpha=0.747$) and KMO value (0.794). The PCIBS-19S (skewness= -0.490 to 0.045; kurtosis= -0.858 to -0.468) and factor loadings (PCIBS-19S= 0.520 to 0.780) were found to be nearly normally distributed. In addition to the strong factor loadings, PCIBS-19S supports the single-factor structure and the preventive COVID-19 infection behaviour item was found to be satisfactory and significantly associated with psychological distress.

4.3 Factors associated with fear of COVID-19

The factors associated with fear of COVID-19 among the adult population in the study area are depicted in the above Table 2. We found that females are more likely to fear COVID-19 than their male counterparts (aOR: 2.71, 95% CI: 1.30-5.63, $P=0.008$). During COVID-19, care to family members suspected of COVID-19 people are found more likely to be feared (aOR: 1.29, 95% CI: 0.68-2.42, $P=0.042$) due to COVID-19. Healthcare service use in the last 4 weeks; the young adults are getting more feared. So they are visiting the healthcare service provider (aOR: 2.07, 95% CI: 0.95-4.5, $P=0.047$) because both the male and female counterparts are likely to be feared due to COVID-19.

Table 3 Factors associated with COVID-19 fear among participants

Variables	aOR (95% CI)	P
<i>Gender of the respondents</i>		
Male (Ref)		
Female	2.71(1.30–5.63)	0.008
Smoking		
Yes	1.05(0.50–2.21)	0.905
No (Ref)		
<i>Care to family member suspected case of COVID-19</i>		
Yes	1.29(0.68–2.42)	0.042
No (Ref)		

Table 3 Factors associated with COVID-19 fear among participants (continued)

<i>Variables</i>	<i>aOR (95% CI)</i>	<i>P</i>
<i>Own experience related to COVID-19 pandemic</i>		
Self-isolating before negative		
Recent Travel history and quarantine	0.73(0.33–1.59)	0.423
No known exposure to COVID-19 (Ref)		
In the last 4 weeks, used healthcare services		
Visited healthcare provider	2.07(0.95–4.5)	0.047
Telehealth communication	2.03(0.84–4.9)	0.117
Registered physician	1.01(0.28–3.58)	0.992
Not Utilised (Ref)		
<i>COVID-19-related stress alleviated with healthcare services</i>		
Yes	2.54(0.20–32.19)	0.473
No (Ref)		
<i>Types of healthcare services used in the last 4 weeks to alleviate COVID-19-related stress</i>		
General physician		
Psychologist	0.65(0.05–7.92)	0.736
Psychiatrist	0.64(0.04–10.08)	0.748
Specialised mental care	2.22(0.14–35.70)	0.537
Mental health resources (MHR)	0.22(0.02–3.6)	0.278
Used MHR through Media	0.14(0.00–4.73)	0.270
Quack Doctor (Ref)		

Source: Authors' compilation (2021).

4.4 Factors associated with preventive COVID-19 infection behaviour scale

The factors associated with preventive COVID-19 infection behaviour among adult participants in the study area are shown in Table 4. We found that people with tertiary education (aOR = 17.16, 95% CI: 1.78–21.30, $P=0.014$), higher education (aOR = 10.99, 95% CI: 1.15–11.73, $P=0.037$) and secondary education (aOR = 11.84, 95% CI: 1.16–12.70, $P=0.037$) were more likely to adopt preventive COVID-19 measures than those having primary education. In terms of 'current employment status', those employed (aOR = 0.10, 95% CI: 0.01–0.80, $P=0.030$) were less likely to use the COVID-19 preventive behaviour measures.

Table 4 Factors related to preventive COVID-19 infection behaviour (PCIBS-19) among the participants

<i>Characteristics</i>	<i>aOR (95% CI)</i>	<i>P</i>
<i>Gender of the respondents</i>		
Male (Ref)		
Female	1.95(0.99-3.86)	0.054
<i>Education of the respondents</i>		
Primary (Ref)		
Secondary	11.84(1.16-12.70)	0.037
Higher Secondary	10.99(1.15-11.73)	0.037
Tertiary	17.16(1.78-21.30)	0.014
<i>Current employment status</i>		
Unemployed		
Employed	0.10(0.01-0.80)	0.030
Afraid of job loss	0.15(0.02-1.16)	0.069
Lost job (Ref)		
<i>Having lost job due to COVID-19</i>		
Yes	0.98(0.38-2.52)	0.967
No (Ref)		
<i>Smoking</i>		
Yes	0.26(0.12-0.57)	0.001
No (Ref)		
<i>In the last 4 weeks, using a healthcare service</i>		
Visited medical professionals		
Telehealth communication	0.59(0.29-1.17)	0.131
Registered physician	2.62(1.27-5.42)	0.009
Not utilised (Ref)		

Source: Authors' compilation (2021).

People who have used to smoking behaviour during COVID-19 (aOR = 0.26, 95% CI: 0.12–0.57, $P=0.001$) were less likely to adopt the COVID-19 infection behaviour measure. People who used healthcare services in the previous 4 weeks (aOR = 2.62, 95% CI: 1.27–5.42, $P=0.009$) while conducting this study were more likely to adopt preventive COVID-19 behaviours as a remedy for COVID-19 fear (aOR = 2.62, 95% CI: 1.27–5.42, $P=0.009$).

4.5 Discussion

The current study found that the three newly developed COVID-19-related scales (FCV-19S and PCIBS) had good psychometric properties in a sample of people with mental illnesses. Their single-factor structures were confirmed, and their item properties were promising in normal distribution, high factor loadings and satisfactory to good reliability. The general public is suffering from various levels of psychological disorder

due to the virus's spread and restrictions, and young adults are particularly affected (Rossi et al., 2020). The study aims to measure and identify COVID-19-related fear, beliefs and preventive measures among young adults. Compared to previous studies conducted by Sakib et al. (2020), the current research shows that females are more likely to fear COVID-19 than males. Because women hold a higher proportion of caregiving roles in the formal and informal sectors, they also serve as primary caregivers in a household more frequently, increasing their anxiety and stress during a pandemic (Langer et al., 2015). The present study shows respondents who 'provide care to a family member suspected of having COVID-19' were more likely to be afraid. However, Qiu et al. (2020) found no link between participants' fear and increased healthcare utilisation. There was no association between fear and providing care to a family with known or suspected COVID-19 symptoms. One possible explanation is that the pandemic's genetic types and affected regions differed.

According to the present study, young adult respondents with secondary, higher secondary, and tertiary education were more likely to take preventive measures than those with primary schooling. People who used healthcare services in the previous 4 weeks of COVID-19 were more likely to use COVID-19 preventive measures. A previous study by Olatunji et al. (2005) shown less likely coping strategies in the last 4 weeks of the COVID-19 pandemic. This is because people are still unaware of the deadly COVID-19 infection outbreak. The findings of our study show that considering responses, more people are found young adults aged 18 to 25 years (50.4%) in the study area. Secondly, females were found to have a higher fear of COVID-19 than males. Third, people between 18-years-old and 25-years-old were more likely to believe COVID-19 information obtained from social media sites such as Facebook. Fourthly, adult people with higher and tertiary education adopted proper COVID-19 information behaviours than those with primary schooling. Finally, people who used healthcare services in the last 4 weeks due to COVID-19-related symptoms adopted higher preventive COVID-19 infection behaviours than those who did not visit healthcare providers. The current study found acceptable to good reliability (α 's) and good factor loadings, which were similar to the results obtained from the survey of Psychometric validation of the fear of COVID-19 conducted by Sakib et al. (2020). All three validation scales revealed statistically significant positive associations.

The study is the most extensive cross-sectional study to measure and identify adults' COVID-19-related fear, and preventive behaviours. There are some limitations to the recent research. To begin with, chi-square and binary logistic regression analysis may not fully capture the concept of fear, belief and preventive scale. As a result, additional psychometric testing of the three instruments is required. Secondly, the 'random walk' interview technique and simple random sampling were used to collect data. As a result, data found after lockdown and quarantine may differ from location to location and from person to person. Finally, this study used a cross-sectional design to determine no causal relationships. Future researchers should investigate the relationship between the variables and how fear of COVID-19 affects how people practice social distancing and public health measures in the context of COVID-19.

5 Conclusion

This study found that COVID-19-related instruments had good psychometric properties. The FCV-19 and PCIBS, in particular, were found to have a single factor and high internal consistency. The research also found a high prevalence of fear of COVID-19 among young adults between 18 and 25 during the pandemic. Furthermore, our study found that females feared COVID-19 and its socioeconomic context more than their male counterparts. According to this study, believing more in COVID-19 information from social media (e.g., Facebook) leads to greater fear of COVID-19 and fewer COVID-19 preventive measures. So, it is important to refrain from judging and believing any news that does not come from credible sources. If any psychological distress is discovered, people should seek the advice of a qualified psychiatrist or registered physician to remain mentally calm during the pandemic.

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