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## Article

# Community Coping Strategies for COVID-19 in Bangladesh: A Nationwide Cross-Sectional Survey

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**Abstract:** It is important to know the community coping strategies during the rapid uprise of a pandemic, as this helps to predict the consequences, especially in the mental health spectrum. This study aims to explore coping strategies used by Bangladeshi citizens during the major wave of the COVID-19 pandemic. Design: Prospective, cross-sectional survey of adults living in Bangladesh. Methods: Participants were interviewed for socio-demographic data and completed the Bengali-translated Brief-COPE Inventory. COPING indicators were categorized in four ways, such as approach, avoidant, humor, and religion. Results: Participants (N = 2001), aged 18 to 86 years, were recruited from eight administrative divisions within Bangladesh (mean age  $31.85 \pm 14.2$  years). The male-to-female participant ratio was 53.4% (n = 1074) to 46.6% (n = 927). Higher scores were reported for approach coping styles ( $29.83 \pm 8.9$ ), with lower scores reported for avoidant coping styles ( $20.83 \pm 6.05$ ). Humor coping scores were reported at  $2.68 \pm 1.3$ , and religion coping scores at  $5.64 \pm 1.8$ . Both men and women showed similar coping styles. Multivariate analysis found a significant relationship between male gender and both humor and avoidant coping ( $p < 0.01$ ). Male gender was found to be inversely related to both religion and approach coping ( $p < 0.01$ ). Marital status and education were significantly related to all coping style domains ( $p < 0.01$ ). The occupation was related to approach coping ( $p < 0.01$ ). Rural and urban locations differed in participants' coping styles ( $p < 0.01$ ). Exploratory factor analysis revealed two cluster groups (factors 1 and 2) of mixed styles of coping. Conclusions: Participants in this study coped with the COVID-19 pandemic by utilizing mixed coping strategies. This study finds female gender, the married, elderly, and rural populations were adaptive to positive approaches to coping, whereas the male and educated population had the avoidant approach to coping.

**Keywords:** Bangladesh; coping; mental health; resilience; SARS-CoV-2



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## 1. Introduction

The arrival of the COVID-19 pandemic in Bangladesh in March 2020 adversely impacted the health and everyday lives of Bangladeshi citizens in a variety of stressful ways [1]. The World Health Organization (WHO) dashboard shows a spike in cases from May to

October 2020 (first wave); from December 2020 to January 2021 (beginning of the second wave) [2]; and in March 2021, a rise in the number of newly diagnosed cases, where treatment within an intensive care unit has been required and reported [3]. A cross-sectional sample survey of the general population from March 2020 to December 2020 examined the knowledge, attitudes, and behaviors toward COVID-19 across all provinces in Bangladesh and reported a high prevalence of positive, preventive health behaviors, including the wearing of face masks in public places [4]. It was also evident that “fear” and “knowledge of COVID-19” were strongly associated with the practice of such preventive health behaviors. Since then, it is possible that a considerable change in coping strategies related to the pandemic may have taken place in Bangladesh. A variety of resource-related challenges and health-related issues, including mental health for frontline healthcare workers and the general population in Bangladesh during the lockdown periods, continue to create further complications in an already overburdened healthcare system [5]. Before the COVID-19 pandemic, Bangladesh had already reported a severe burden on its healthcare sector, including issues related to inefficiency, scarcity of human resources, and mismanagement [6]. The COVID-19 pandemic increased the burden on an already overburdened healthcare system [6], and it became apparent that it was precipitating an acute mental health crisis with profound impacts on people of all age groups [5]. During the first wave, COVID-19 increased fear [4], which necessitated multiple approaches to coping. Many people experienced considerable stress because of fear and anxiety arising from the threat of COVID-19 disease during the first wave [7]. In Bangladesh, the prevalence of COVID-19-related depression and suicidal ideation during the first wave was reported to be 33% and 5%, respectively [8]. The risk factors for depression and suicidal ideation have been identified as being young, female, smoking, and/or having a comorbid disease [8]. The imposed lockdown intervention, self-isolation, and quarantine measures intensified mental health challenges across the country, as the majority of people were placed in survival mode without any form of societal and/or financial support [9]. This resulted in an increased report of loneliness, boredom, and anger during the lockdown, which may have contributed toward the adoption of negative approach coping styles.

Historically, humans have developed a variety of coping strategies to survive disasters [10]. However, the more prolonged the exposure to stress over time, the more difficult it becomes for many people to cope well with “positive” coping strategies [11]. Coping strategies are defined as “the activities one does to tolerate or decrease mental strain” [12]. The Brief-COPE [13] is a primary outcome measurement tool for measuring effective and ineffective ways of coping with stressful situations. It describes four key coping styles, including (1) approach coping strategy (APC), (2) avoidant coping strategy (AVC), (3) humor (H), and (4) religion (R). Concerning disease in general terms, coping strategies are understood to be either “positive”, “negative”, or a combination of both. Positive coping, as seen in the APC strategy, is associated with a higher adaptation to adversity, better health outcomes, and a more stable emotional response to disease. In contrast, negative coping, as seen in the AVC strategy, is associated with negative attitudes toward disease, poor physical health, and less effective mental health management [13]. Other categories, such as humor and religion, may include both positive and negative coping approach attributes and are independent of either approach.

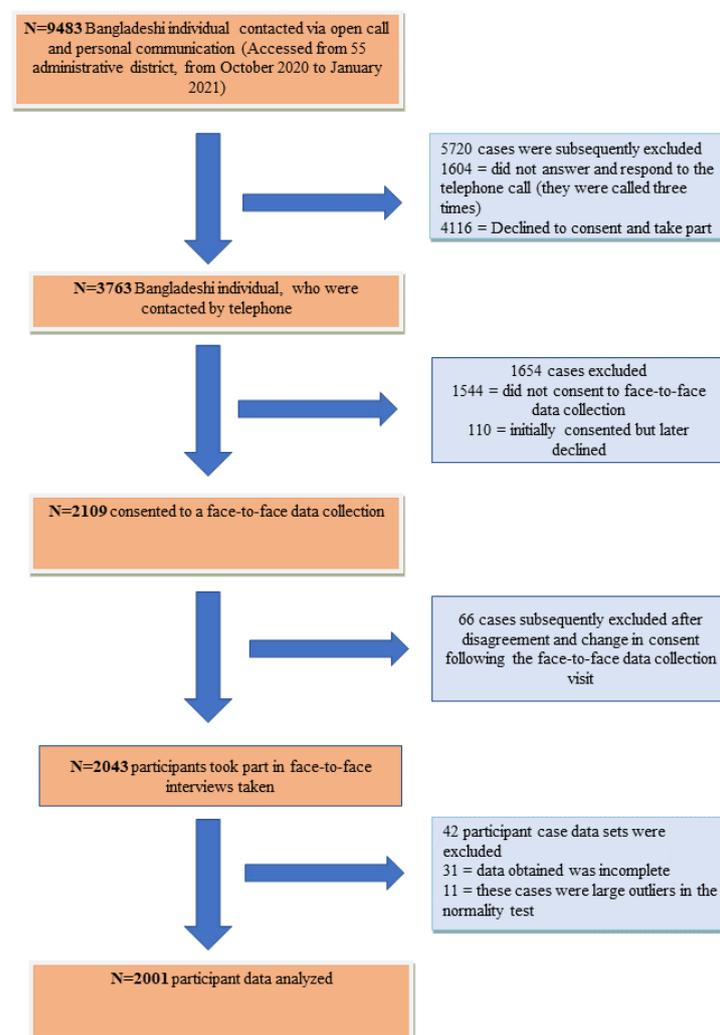
The World Health Organization (WHO) has prioritized positive coping to deal with fear, anxiety, sadness, worry, depression, insomnia, physical illness, substance use, and other mental health issues [14]. Coping strategies that are associated with better mental health include humor, acceptance, and positive reframing [15]. Encouraging the adoption of these strategies during the pandemic may provide one mechanism for facilitating the mental health of individuals and families. The widespread societal behavioral change across the world in response to the pandemic has shown an ongoing, pervasive shift in mental health response mechanisms to COVID-19 [16]. While mental health may not be a priority on the political agenda, nor a central focus for funding, in developing countries like Bangladesh, gaining insight and understanding of mental health coping strategies may

enable greater awareness. Therefore, this research aimed to explore the coping strategies used by Bangladeshi citizens during the first wave of the COVID-19 pandemic. We anticipate that this research knowledge may gain support and enable the future planning of educational initiatives, health policies, and the promotion of better mental health for Bangladeshi men and women. This knowledge will also provide a foundation for future research into resilience and physical and mental health.

## 2. Materials and Methods

### 2.1. Study Design

This was a prospective, cross-sectional study of adult men and women across 8 regions in Bangladesh. To adhere to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommended quality standards [17], a clear flow diagram of the study procedure has been created in Figure 1.



**Figure 1.** Flow diagram of the population distribution of this study.

### 2.2. Participants

Adult participants, ages 18 and above, were invited to take part in the “Brief-COPE Inventory” [13] from October 2020 to January 2021. Participants were recruited via open call and personal communication and were approached for informed consent for face-to-face interviews with face-to-face completion of the Brief-COPE [18], in addition to providing basic demographic information for this study.

Respondent cluster estimates were divided into 8 administrative divisions of the country, and the sample size was calculated using “EPI INFO” version 7.4.2.0 developed by the CDC in the US. The sample size calculation was estimated to be 1088, with a 99.9% confidence interval, 50% of expected frequency, 5% margin of error, and 1.0 design effect. For 8 geographical clusters, the sample size of 136 for each cluster.

### 2.3. Ethical Permission

Ethical permission was obtained from the Institutional Review Board (IRB). All participants were given verbal briefs on the study objectives, and voluntary written consent was obtained before data collection. Participants were assured of confidentiality, ethics, and privacy issues and were maintained throughout the study, according to the principles of the Helsinki Declaration [19].

### 2.4. Study Procedure

Data collection was undertaken voluntarily by 138 undergraduate students from Bangladesh Health Professions Institute (BHPI). After gaining ethical permission, the data collectors were trained online regarding the study objectives, ethics, Brief-COPE, and the process of data collection. After training, feedback and evaluation from the data collectors were used to refine the process. The data collectors reside in 55 of the 64 districts (Figure 2) within the 8 administrative divisions of Bangladesh that were selected. Data collection was conducted through face-to-face interviews within these 8 regions, with all data collectors adhering to COVID-19 preventive precautions using personal protective equipment (PPE) and social distancing measures. The respondents completed the Bengali-translated version of the Brief-COPE questionnaire, with support from the data collectors as requested by the respondents. A hard paper copy of each completed consent form and questionnaire was scanned to a password-protected email for trial record-keeping by the primary investigator. A small-scale pilot study was conducted to examine the applicability and feasibility of the larger-scale study before implementation. All relevant safety and preventive health measures were implemented and maintained by the data collection team throughout the study.

### 2.5. Questionnaire

The questionnaire consisted of two parts. The first aimed to gather the socio-demographic characteristics of the participants with six questions related to gender, age, marital status, education, occupation, and place of residence. This part also included four questions related to COVID-19 presence or absence of symptoms, as per the Ministry of Health and Family Welfare in Bangladesh [20]; COVID-19 positive status, per an RT-PCR test; and COVID-19 positive status of anyone close to them. Reported symptoms included fever, dyspnea (shortness of breath), pneumonia, cough, sore throat, muscle weakness, rhinitis, abdominal pain, vomiting, diarrhea, muscle pain, anosmia, ageusia, sicca syndrome, and fatigue. The second part of the questionnaire focused on coping strategies, as identified in the Brief-COPE questionnaire [18] (Supplementary File S1). The Brief-COPE Inventory is a 28-item questionnaire [18] developed from the original 60 items in the Coping to Orientation of Problems Experienced (COPE) Inventory scale [21]. Each item on the Brief-COPE has 4 possible response categories, ranging from 1 to 4. In the inventory, “1” corresponds to I have not been doing this at all; “2”, a little bit; “3”, a medium amount; and “4”, I have been doing this a lot. All items except for humor and religion are mapped onto the 2 theoretical constructs of avoidant coping (AVC) and approach coping (APC), and results are calculated using the raw scores for participants in these domains [21]. In addition, the instrument identifies 14 subscales described in Table 1. Thus, the Brief-COPE questionnaire enables individuals to express hypothetical responses in terms of coping styles to a potential natural disaster event, such as the COVID-19 pandemic [21]. In a spectrum profile, the 2 constructs of AVC and APC can be obtained, along with gaining insight and understanding of the mixture of strategies employed by individuals when confronted by a stressful life event. Regarding interpretation, AVC is associated with a

worse physical health status for those with medical conditions and has also been shown to be less effective at controlling anxiety when compared to APC [21], whereas APC is associated with a person being able to consciously make a more constructive response to adversity, which includes positive adaptive practical adjustments that can promote better health and emotional responses. Humor (H) and religious (R) coping strategies have not been categorized in either APC or AVC strategies and can be considered either positive or negative coping strategies, depending on the perspective of the individual.

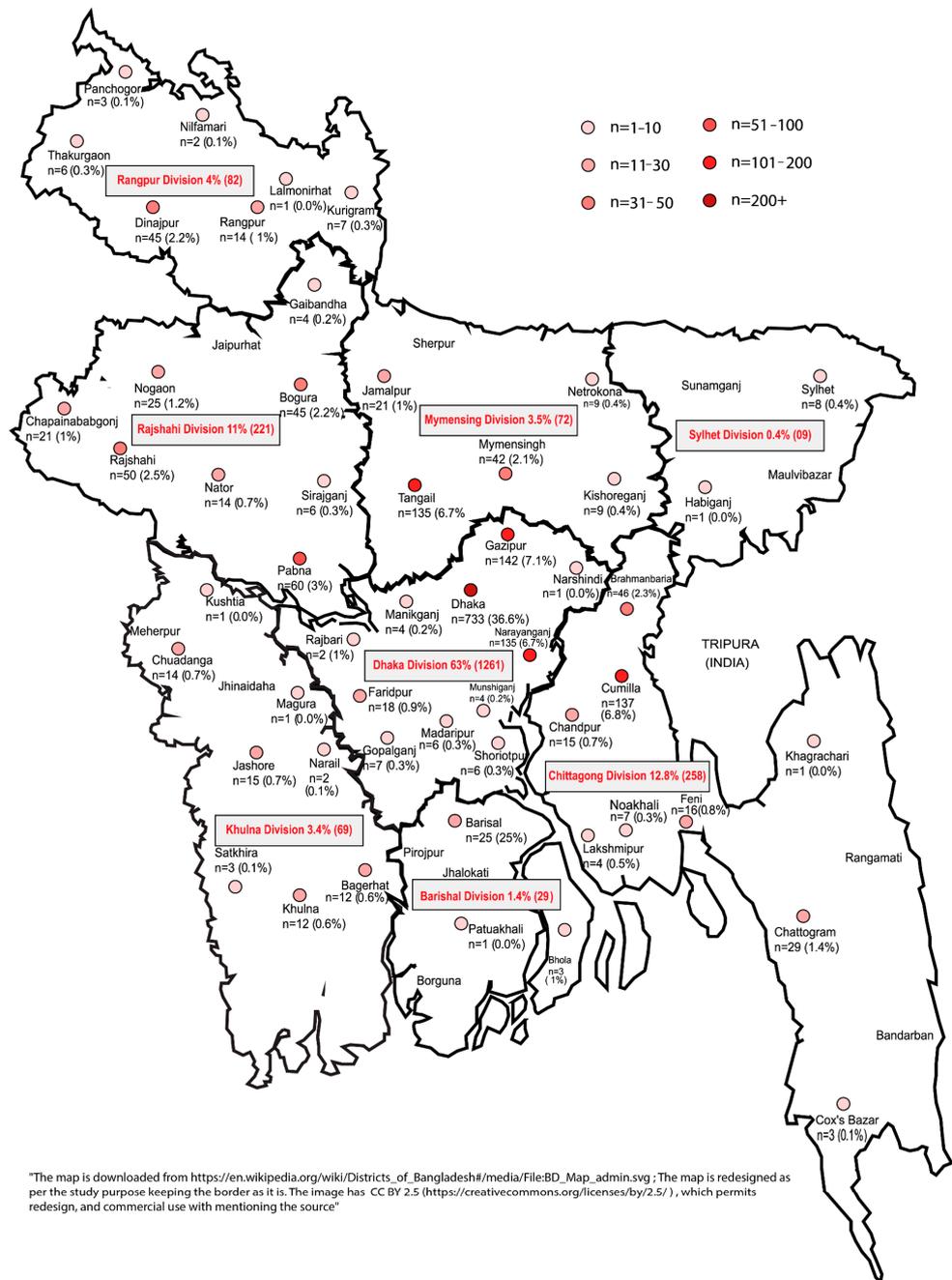


Figure 2. The population distribution of the respondents. Downloaded from [https://en.wikipedia.org/wiki/Districts\\_of\\_Bangladesh#/media/File:BD\\_Map\\_admin.svg](https://en.wikipedia.org/wiki/Districts_of_Bangladesh#/media/File:BD_Map_admin.svg) (accessed on 1 January 2020) and redesigned as per the study purpose keeping the border as it is. The image has CC BY 2.5 (<https://creativecommons.org/licenses/by/2.5/> (accessed on 1 January 2023)), which permits redesign and commercial use with mentioning the [https://en.wikipedia.org/wiki/Districts\\_of\\_Bangladesh#/media/File:BD\\_Map\\_admin](https://en.wikipedia.org/wiki/Districts_of_Bangladesh#/media/File:BD_Map_admin) (accessed on 1 January 2023).

**Table 1.** Abbreviations for coping styles and domains.

Coping Domains	Coping Styles	Indicators
Avoidance coping (AVC)	Denial (D)	Question items 3 and 8
	Substance use (SU)	Question items 4 and 11
	Venting (V)	Question items 9 and 21
	Behavioral disengagement (BD)	Question items 6 and 16
	Self-distraction (SD)	Question items 1 and 19
	Self-blame (SB)	Question items 13 and 26
Approach coping (APC)	Active coping (AC)	Question items 2 and 7
	Positive reframing (PR)	Question items 12 and 17
	Planning (P)	Question items 14 and 25
	Acceptance (A)	Question items 20 and 24
	Seeking emotional support (SES)	Question items 5 and 15
	Seeking informational support (SIS)	Question items 10 and 23
Humor (H)	Humor (H)	Question items 18 and 28
Religion (R)	Religion (R)	Question items 22 and 27

### 2.6. Reliability and Validity of the Brief-COPE

This questionnaire has been used in several sample population studies related to the experience of stressors in a health-related context [22–27]. Within these studies, the scale has demonstrated an acceptable level of internal consistency ( $\alpha = 0.70$ ) and good convergent validity regarding use with depression, with marginal test–retest reliability (test–retest = 0.6). Confirmatory factor analysis (CFA) also demonstrated a good model fit and acceptable reliability (Cronbach alpha reliability coefficient = 0.61) of the adapted scale. For this research, the Brief-COPE was translated forward into Bengali and then back-translated into English by two bilingual British and Bangladeshi researchers. Content validity was later reviewed and determined by a bilingual epidemiologist and a psychiatrist. In this study, the Cronbach alpha reliability coefficient of the Bangladeshi translated version of the Brief-COPE was determined to be 0.91.

### 2.7. Statistical Testing

All data were analyzed using Statistical Package software for Social Science, SPSS Version 20.0. Normal distribution, skewness, and kurtosis value of all the numerical variables in this dataset were evaluated using the Kolmogorov–Smirnov test and Shapiro–Wilk test. The average and standard deviation values for the numerical values with a normal distribution and interval data were calculated (parametric data). The categorical variables related to socio-demographics were considered utilizing non-parametric statistics and represented through frequency or percentage (Table 2).

In Table 3, Relationships between the categorical non-parametric socio-demographic data and the parametric Brief-COPE score data were examined using an independent *t*-test for two variables and a one-way ANOVA test for more than 2 variables. In Table 4, binary logistic regression was performed for categorical data (dependent variable) with alternating respondents and covariates.

**Table 2.** Socio-demographic distribution and health-related information of the respondents (n = 2001).

Socio-Demographic Characteristics	Number of Participants, n (%)
<b>Gender</b>	
Male	1068 (53.4)
Female	933 (46.6)
<b>Age</b>	
Less than equal 25 years	994 (49.7)
26–37 years	451 (22.5)
38–49 years	296 (14.8)
50–61 years	162 (8.1)
More than 61 years	98 (4.9)
<b>Marital status</b>	
Unmarried	1043 (52.1)
Married	889(44.4)
Widowed and divorced	69 (3.4)
<b>Educational status</b>	
No formal education	81 (4)
Primary education	190(9.5)
Secondary education	325(16.2)
Higher secondary	713 (35.6)
Bachelor's degree	508(25.4)
Master's or above degree	184 (9.2)
<b>Occupation</b>	
<b>Government job</b>	117 (5.8)
Private job	199 (9.9)
Farmer	40 (2)
Business	175 (8.7)
Student	966(48.3)
Retired	52(2.6)
Housewife	359 (17.9)
Unemployed	34 (1.7)
Others	59 (2.9)
<b>Living area</b>	
Rural	636 (31.8)
Urban	1365 (68.2)
<b>Tested COVID-19</b>	
Yes	70 (3.5)
No	1931 (96.5)
<b>COVID-19-like symptoms</b>	
Symptoms Present	185 (9.2)
Symptoms Absent	1816 (92.8)
<b>COVID-19-positive among anyone around</b>	
Yes	387 (19.3)
No	1614 (80.7)

**Table 3.** Relationship of socio-demographic distribution and coping domains (n = 2001).

Variables	Avoidance Mean ± SD	t/F	p-Value (2tailed)	Approach	t/Chi	p-Value (2tailed)	Humor	t/F	p-Value (2tailed)	Religion	t/F	p-Value (2tailed)
<b>Gender</b>												
Male	21.39 ± 6.0			30.13 ± 8.7			2.82 ± 1.4			5.58 ± 1.9		
Female	20.18 ± 5.9	4.80 <sup>a</sup>	0.001 **	29.49 ± 9.1	1.579 <sup>a</sup>	0.114	2.53 ± 1.9	4.7 <sup>a</sup>	0.001 **	5.70 ± 1.8	-1.36 <sup>a</sup>	0.174
<b>Age</b>												
≤25	21.04 ± 6.42			29.44 ± 8.99			2.80 ± 1.49			5.55 ± 1.91		
26–37	0.52 ± 5.69			29.77 ± 9.07			2.57 ± 1.84			5.51 ± 1.90		
38–49	20.29 ± 5.61	1.397 <sup>b</sup>	0.232	30.59 ± 9.15	1.835 <sup>b</sup>	0.119	2.58 ± 1.22	3.41 <sup>b</sup>	0.009	5.75 ± 1.88	5.21 <sup>b</sup>	0.001 **
50–61	21.00 ± 5.30			31.10 ± 7.78			2.59 ± 1.77			5.92 ± 1.78		
>61	21.34 ± 5.80			29.66 ± 8.99			2.54 ± 1.24			6.30 ± 1.76		
<b>Marital status</b>												
Unmarried	20.94 ± 6.3			29.43 ± 8.9			2.77 ± 1.4			5.51 ± 1.9		
Married	20.51 ± 5.4	6.83 <sup>b</sup>	0.001 **	30.34 ± 8.9	2.531 <sup>b</sup>	0.080	2.54 ± 1.1	11.89 <sup>b</sup>	0.001 **	5.76 ± 1.8	5.00 <sup>b</sup>	0.007 **
Widowed and divorced	23.22 ± 8.1			29.42 ± 8.2			3.17 ± 1.8			5.90 ± 1.6		
<b>Education</b>												
No formal education	22.02 ± 7.9			28.62 ± 10.9			3.25 ± 1.7			5.01 ± 2.2		
Primary education	19.75 ± 5.7			28.45 ± 10.4			2.47 ± 1.0			5.26 ± 2.1		
Secondary education	20.56 ± 5.9	4.22 <sup>b</sup>	0.001 **	28.45 ± 8.7	4.23 <sup>b</sup>	0.001 **	2.58 ± 1.1	8.07 <sup>b</sup>	0.001 **	5.38 ± 1.8	6.40 <sup>b</sup>	0.001 **
Higher secondary	21.42 ± 6.3			30.19 ± 8.3			2.84 ± 1.5			5.75 ± 1.8		
Bachelor’s degree	20.29 ± 5.4			30.47 ± 9.1			2.50 ± 1.1			5.80 ± 1.8		
Master’s and above degree	21.04 ± 5.76			31.07 ± 8.3			2.72 ± 1.4			5.88 ± 1.7		
<b>Occupation</b>												
Government job	20.42 ± 5.7			30.91 ± 9.1			2.53 ± 1.2			5.94 ± 1.8		
Private job	20.31 ± 5.5			30.65 ± 8.7			2.50 ± 1.1			5.80 ± 1.9		
Farmer	24.50 ± 6.3			31.20 ± 9.3			3.68 ± 1.6			5.53 ± 1.8		
Business	20.90 ± 5.17			30.07 ± 8.9			2.58 ± 1.1			5.45 ± 1.9		
Student	21.13 ± 6.3	3.67 <sup>b</sup>	0.001 **	29.54 ± 8.8	1.42 <sup>b</sup>	0.180	2.78 ± 1.4	5.21 <sup>b</sup>	0.001 **	5.55 ± 1.9	4.40 <sup>b</sup>	0.001 **
Retired	21.85 ± 5.8			31.15 ± 7.6			2.50 ± 1.2			6.29 ± 1.7		
Housewife	20.06 ± 5.74			29.84 ± 9.2			2.50 ± 1.2			5.88 ± 1.8		
Unemployed	20.62 ± 5.86			28.88 ± 8.04			2.74 ± 1.3			5.24 ± 2.01		
Others	19.54 ± 5.8			27.37 ± 9.6			2.90 ± 1.7			4.76 ± 1.8		
<b>Living area</b>												
Rural	21.37 ± 6	2.732 <sup>a</sup>	0.006 **	30.98 ± 8.2	-3.944 <sup>a</sup>	0.001 **	2.78 ± 1.43	-2.271 <sup>a</sup>	0.023 *	5.77 ± 1.85	-2.148 <sup>a</sup>	0.032 *
Urban	20.57 ± 6			29.30 ± 9.2			2.64 ± 1.31			5.58 ± 1.91		

Table 3. Cont.

Variables	Avoidance Mean ± SD	t/F	p-Value (2tailed)	Approach	t/Chi	p-Value (2tailed)	Humor	t/F	p-Value (2tailed)	Religion	t/F	p-Value (2tailed)
<b>Tested COVID</b>												
Yes	21.93 ± 5.33	1.562 <sup>a</sup>	0.121	33.64 ± 7.13	2.678 <sup>a</sup>	0.007 <sup>**</sup>	2.76 ± 1.45	0.461 <sup>a</sup>	0.645	6.17 ± 1.45	2.403 <sup>a</sup>	0.016 <sup>*</sup>
No	20.79 ± 6.07			29.72 ± 8.98			2.68 ± 1.35			5.62 ± 1.90		
<b>COVID</b>												
Symptoms Present	22.23 ± 4.52	3.314 <sup>a</sup>	0.001 <sup>**</sup>	34.15 ± 6.42	6.962 <sup>a</sup>	0.001 <sup>**</sup>	2.63 ± 1.23	−0.595 <sup>a</sup>	0.552	6.23 ± 1.54	5.168 <sup>a</sup>	0.001 <sup>**</sup>
No	20.68 ± 6.17			29.39 ± 9.05			2.69 ± 1.37			5.57 ± 1.91		
<b>COVID anyone around</b>												
Yes	20.59 ± 4.20	−0.856 <sup>a</sup>	0.392	22.97 ± 7.25	7.796 <sup>a</sup>	0.001 <sup>**</sup>	2.37 ± 0.96	−5.097 <sup>a</sup>	0.001 <sup>**</sup>	6.12 ± 1.62	5.669 <sup>a</sup>	0.001 <sup>**</sup>
No	20.88 ± 6.41			29.08 ± 9.15			2.76 ± 1.42			5.52 ± 1.93		

<sup>a</sup> Independent *t*-test. <sup>b</sup> One-way ANOVA test. \* Significant with <0.05, \*\* Significant with <0.01.

Table 4. Binary logistic regression of socio-demographics and coping strategy.

Variables	Avoidance				Approach				Humor				Religion			
	$\chi^2$	<i>B</i>	OR	<i>p</i>	$\chi^2$	<i>B</i>	OR	<i>p</i>	$\chi^2$	<i>B</i>	OR	<i>p</i>	$\chi^2$	<i>B</i>	OR	<i>p</i>
<b>Male vs. Female</b>	67.93	0.135	0.874	0.003 <sup>**</sup>	31.9	−0.135	0.874	0.003 <sup>**</sup>	25.49	0.135	0.874	0.003 <sup>**</sup>	3.335	−0.135	0.874	0.003 <sup>**</sup>
<b>18–35 vs. other age categories</b>	32.0	−0.860	0.423	0.001 <sup>**</sup>	50.804	0.860	0.423	0.001 <sup>**</sup>	15.37	−0.860	0.423	0.001 <sup>**</sup>	20.676	−0.860	0.423	0.001 <sup>**</sup>
<b>Unmarried vs. others</b>	45.86	−0.085	0.919	0.057	80.579	−0.085	0.919	0.057	13.5	−0.085	0.919	0.05	18.492	−0.085	0.919	0.05
<b>Higher secondary and Bachelor vs. Other educational status</b>	61.0	−0.448	0.639	0.001 <sup>**</sup>	67.403	0.448	0.639	0.001 <sup>**</sup>	13.47	0.448	0.639	0.001 <sup>**</sup>	5.62	−0.448	0.639	0.001 <sup>**</sup>
<b>Student vs. Other occupation</b>	53.7	0.067	1.0	0.123	76.127	0.069	1.07	0.123	14.37	0.069	1.07	0.123	8.91	0.069	1.07	0.123
<b>Rural vs. Urban</b>	83.4	−0.764	0.46	0.001 <sup>**</sup>	99.99	−0.764	0.466	0.001 <sup>**</sup>	11.354	−0.764	0.466	0.001 <sup>**</sup>	22.84	−0.764	0.466	0.001 <sup>**</sup>
<b>Symptoms present vs. absent</b>	99.5	2.2	0.8	0.001 <sup>**</sup>	135.60	2.28	0.81	0.001 <sup>**</sup>	7.713	2.28	0.816	0.001 <sup>**</sup>	40.96	2.28	0.81	0.001 <sup>**</sup>

Reference variables are the first variables and are bolded.  $\chi^2$ —Wald  $\chi^2$  statistic for the individual predictor variable. *B*—unstandardized regression weight. OR—odds ratio, the measurement of likelihood. \*\* Significant with <0.01.

An exploratory factor analysis was completed for all the categorical domains in the Brief-COPE Inventory. We conducted a principal component analysis with a varimax rotation to extract the maximum variance from the data set with each component. The correlation matrix was determined by using the Kaiser–Meyer–Olkin (KMO) test for sampling adequacy, and further analysis was undertaken if the value obtained was >0.50 and Bartlett’s test of sphericity tested for significance. Any individual variables of Brief-COPE domains with a matrix score > 0.40 were determined to be contributing factors during the calculation process of the correlation matrix and considered to be associated with the exploratory factor(s) if the matrix figure obtained was more than or equal to 0.80. In addition, the minimal percentile eigenvalue cut-off rule was determined to be 1.104 (Figure 3). The alpha value was set as  $p < 0.05$ .

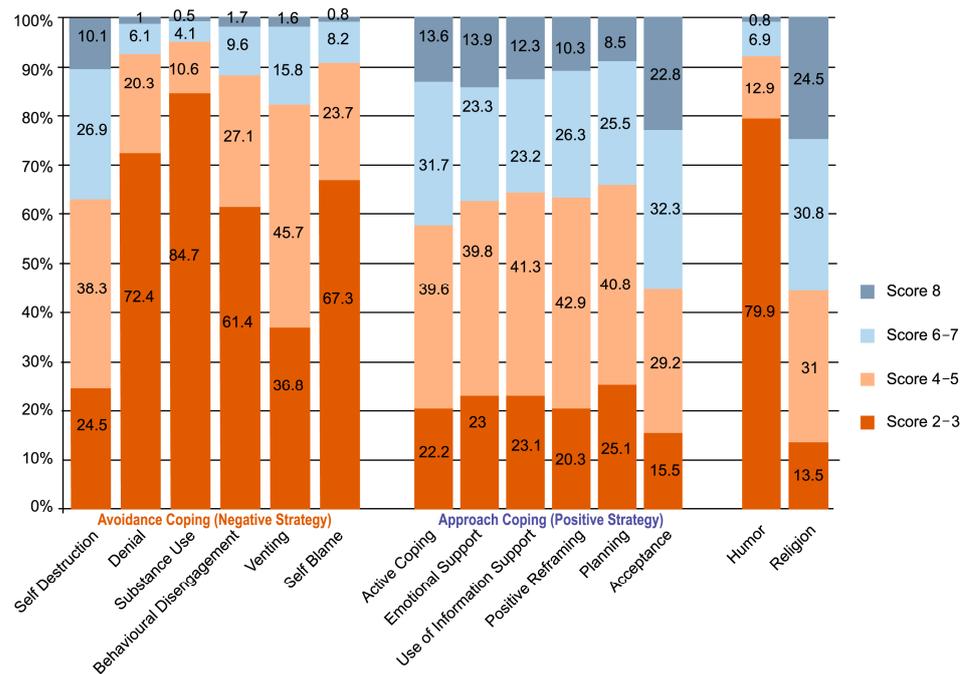


Figure 3. Population scoring distribution of coping styles.

### 3. Results

#### 3.1. Distribution of Responses

A total of 2001 participants aged 18 years to 86 years of age ( $31.85 \pm 14.2$  years) responded to the survey. Male participants comprised 53.4% ( $n = 1068$ ), and female participants were 46.6% ( $n = 933$ ). Respondents represented all eight of the administrative divisions within Bangladesh, including (1) Dhaka, 63% ( $n = 1261$ ); (2) Chittagong, 12.8% ( $n = 258$ ); (3) Rajshahi, 11% ( $n = 221$ ); (4) Sylhet, 04% ( $n = 9$ ); (5) Rangpur, 4% ( $n = 82$ ); (6) Barisal, 1.4% ( $n = 29$ ); (7) Khulna, 3.4% ( $n = 69$ ); and (8) Mymensingh, 3.5% ( $n = 72$ ). They also represent 55 out of 64 districts of Bangladesh.

#### 3.2. Socio-Demography of Respondents Socio-Demographic Profile of the Respondents

The majority of the responses came from the younger population (18–35 years), 70.3% ( $n = 1406$ ), followed by middle-aged adults (36–60 years) at 24.8% ( $n = 496$ ). More than half (52.1%) were single or divorced, and 44.4% were married. A total of 66.2% of responses came from young adults (up to 37 years old), whereas 22.9% of responses came from middle-aged people (aged 38 to 61 years old). The educational status varied from no formal education to Ph.D.; the highest responses were from “higher secondary education” at 35.6% ( $n = 713$ ) and bachelor’s degree holders at 25.4% ( $n = 508$ ). Educational status varied from no formal education to a master’s degree or above; the highest responses (35.6%) were from the “Higher secondary education” group, followed by 25.4% of responses from

the “bachelor’s degree” group. In occupational variants, a major part of the respondents reported were students 48.3% (n = 966); however, 17.9% (n = 359) reported were housewives, and the “other jobs” reported were related mostly to daily work. Approximately 68% (n = 1365) of the respondents lived in the urban area, mostly near the district or sub-district region, and others were respondents from remote villages.

### 3.3. Health-Related Information

In addition, 9.2% of respondents (n = 182) reported COVID-like symptoms once or more. COVID-19-like symptoms were reported at 5.1% (n = 103) for a fever with common cold; fever, sore throat, and cough with sputum were reported at 2.1% (n = 42); viral symptoms with pneumonia were reported at 1% (n = 20); viral symptoms with anosmia and sicca syndrome at 0.7% (n = 14); and viral symptoms with diarrhea at 0.1% (n = 3). A total of 4.3% (n = 87) were COVID-positive in the RT-PCR test, and 19.3% of respondents (n = 387) reported being exposed to someone close to them with a positive COVID-19 test. No known COVID-19-positive cases were interviewed during the data collection phase in the maintenance of the study protocol. The detailed socio-demographics are presented in Table 2.

### 3.4. Coping Strategies

The Bangladeshi respondents showed a mixed coping strategy during the first wave of COVID-19. Higher scores were reported for approach coping strategies (APC) ( $29.83 \pm 8.9$ ; Range: 12–48); avoidance coping strategies (AVC) was reported at lower levels overall ( $20.83 \pm 6.05$ ; Range: 12–48). Humor (HU) scores were reported at  $2.68 \pm 1.3$  (2–8 scoring scale), and religion (RE) scores were reported at  $5.64 \pm 1.8$  (2 to 8 scoring scale). Figure 2 demonstrates that, among the respondents having the AVC style, 84.7% had a 2–3 score related specifically to mild to moderate substance use. The same group also reported similar scores for denial (72.4%), behavioral disengagement (61.4%), and self-blames (67.3%). Respondents with APC style had more scores of 6 to 8 (medium amount to all-time) related to inactive coping (45.3%), emotional support (37.2%), use of information support (35.5%), positive reframing (36.6%), planning (34%) and acceptance (55.1%). From the cluster sample, 24.5% of Bangladeshi respondents coped with the COVID-19 pandemic “all the time”, and 30.8% coped “the majority of the time” based on religious belief (RE) during the pandemic time frame for this study (Figure 3).

### 3.5. Relationship between Socio-Demographics and Coping Strategy

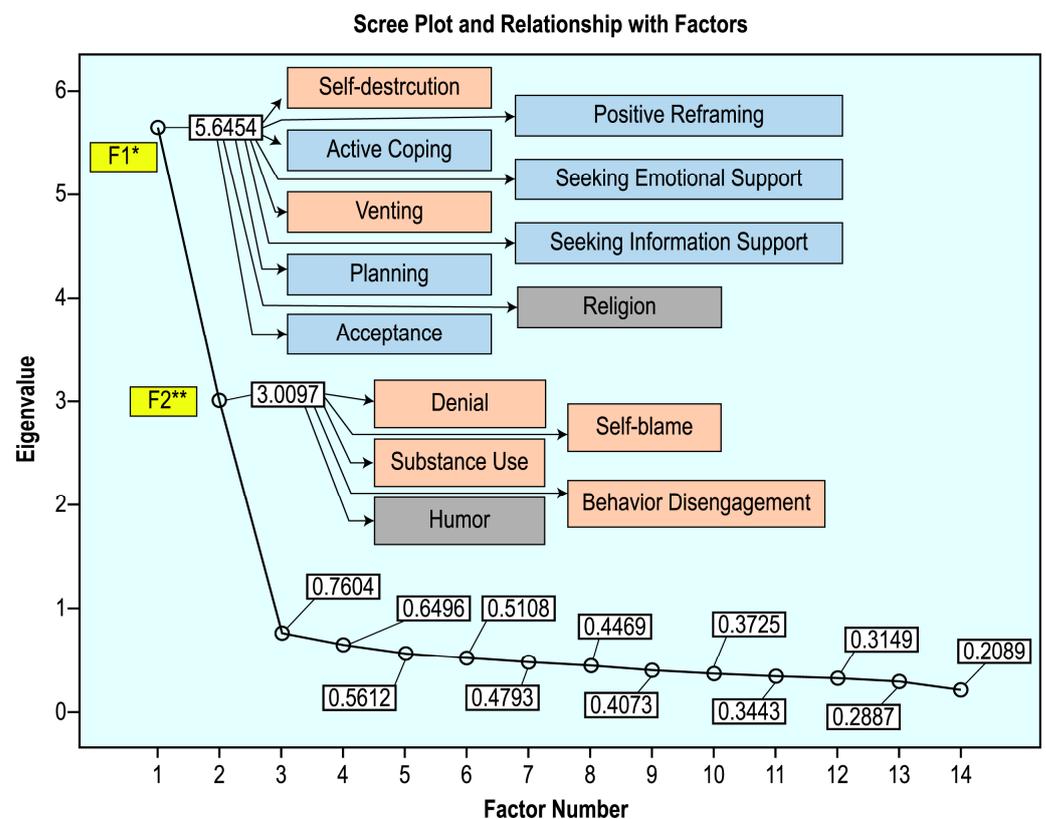
Males and females showed similar coping strategies, but male respondents reported higher score means compared to female respondents for AVC ( $21.39 \pm 6.0$ ,  $20.18 \pm 5.9$ ) and APC ( $30.13 \pm 8.7$ ,  $29.49 \pm 9.1$ ) style in 12–48 scales (Table 3). Male gender was associated with AVC ( $p < 0.01$ ) and humor ( $p < 0.01$ ), whereas no association was found between gender and APC style. Further multivariate analysis found a significant positive relationship between the male gender and AVC style ( $p < 0.01$ ) and humor (HU) coping style ( $p < 0.01$ ); inverse relationships were found between the male gender and APC style ( $p < 0.01$ ) and religion (RE) coping style ( $p < 0.01$ ) (Table 4). Categorization of age group also found no statistically significant relationships with coping categories (Table 3). However, respondents aged 18–35 years reported significantly higher scores related to AVC styles ( $p < 0.01$ ), ACP styles ( $p < 0.01$ ), HU coping styles ( $p < 0.01$ ), and RE coping styles ( $p < 0.01$ ) (Table 4).

Marital status was associated with AVC styles ( $p < 0.01$ ), HU ( $p < 0.01$ ), and RE ( $p < 0.01$ ), where widowed and divorced respondents had the highest scores to AVC styles ( $23.22 \pm 8.1$ ), HU ( $3.17 \pm 1.8$ ), and RE ( $5.90 \pm 1.6$ ) (Table 3). Similarly, education had a statistically significant relationship ( $p < 0.01$ ) with all categories of coping strategy. In the binary logistic regression, higher secondary and bachelor’s education groups reported an inverse relationship with AVC style ( $p < 0.01$ ) and RE ( $p < 0.01$ ) but exhibited a significant linear relationship with APC style ( $p < 0.01$ ) related to other education sub-categories

(Table 4). Occupation had a significant positive relationship with AVC style ( $p < 0.01$ ), HU ( $p < 0.01$ ), and RE ( $p < 0.01$ ), where the farmer had the highest scores in three COPING styles except in RE styles; retired respondents had the highest scores (Table 3). Rural respondents had significantly different scores compared to urban respondents in AVC style ( $p < 0.01$ ), APC style ( $p < 0.01$ ), HU ( $p < 0.01$ ), and RE ( $p < 0.01$ ) (Table 4). The respondents who had COVID-19-like symptoms had a relationship with AVC ( $p < 0.01$ ), APC ( $p < 0.01$ ), and RE ( $p < 0.05$ ) (Table 3). Respondents who experienced COVID-19-like symptoms also showed a significant difference from asymptomatic respondents concerning AVC ( $p < 0.01$ ) (Table 4). Details are provided in Tables 3 and 4.

3.6. Exploratory Factor Analysis

In Figure 4, the explanatory factor analysis revealed two major factors that were strongly associated with the coping items. Factor 1 was defined as approach coping and found an eigenvalue of 5.645 ( $>1.14$ ), and factor 2 was defined as avoidant coping and found an eigenvalue of 3.010 ( $>1.14$ ); other factors were not found eligible. In the principal component analysis, the coping items found two clusters with a significant positive correlation (Figure 3). Factor 1, which means approach coping styles (eigenvalue 5.645  $> 1.14$ ), was associated with self-distraction (0.739), venting (0.670), active coping (0.771), seeking emotional support (0.800), seeking information support (0.833), positive reframing (0.753), planning (0.759), acceptance (0.556), and religion (0.635). Factor 2, avoidant coping (eigenvalue 3.010  $> 1.14$ ), was associated with denial (0.659), substance use (0.716), behavior disengagement (0.580), self-blame (0.616), and humor (0.752). In both factors, there were mixed coping strategies of AVC, APC, H, and R.



**Figure 4.** Exploratory factor analysis of categories of coping strategy. \* F1, Factor 1 as 1st cluster of adopted coping strategies; \*\* F2, Factor 2 as 2nd cluster of adopted coping strategies; orange colored rectangles, negative coping approaches; blue colored rectangles, positive coping approaches; violet colored rectangles, neither positive nor negative approaches.

#### 4. Discussion

This study aimed to determine the community coping strategies of coping during the massive upraise of cases during the COVID-19 pandemic. This community-based population study found a significantly higher prevalence of the approach coping strategy (APC) compared to the avoidance coping strategy (AVC) overall. In addition, the overall reliance on religion (R) as a coping strategy was moderately strong compared to humor (H). This study finds female gender, the married, elderly, and rural populations were adaptive to positive approaches to coping, whereas the male and educated population had the avoidant approach to coping. To our best knowledge, this is a groundbreaking population-based survey on coping strategies utilized during the COVID-19 pandemic in Bangladesh. The results of this study reflect a mixed-approach coping style, with two major factors showing significant association with individual Brief-COPE domains.

In the population, higher scores (8 out of 8) were found to be more prevalent in APC, and R and lower scores (2–3 out of 8) were more prevalent in AVC and H (Figure 3). As mentioned, population means scores showed a higher positive coping strategy, significant mean scores were also observed for negative coping strategies related to AVC, such as struggling with poor health status (Figure 3). Higher scores on the APC were also related to greater scores overall on self-acceptance, active coping, emotional support, positive reframing, information support, and planning. Furthermore, higher mean scores on APC strategies were positively associated with higher education levels, rural location, and having COVID-like symptoms (Table 4). AVC was associated with marital status, higher in the widowed and divorced group, as well as for the no formal education group, and rural geographical location. AVC was also associated with having positive COVID-19 symptoms and was significantly higher in males compared to females (Table 3), showing higher dysfunctional coping strategies in Bangladeshi men. Bangladeshi respondents, both male and female, reported a significantly high score for R coping. Moreover, there were no significant differences by gender in reported scores by R or APC styles.

Significantly higher mean scores were reported for the age group 18–35 compared to all age categories concerning AVC, APC, H, and R. With AVC, H, and R. Religious coping is the most frequently utilized coping strategy for building resiliency in the face of life and health stress in Bangladesh [28,29]. It is not surprising, therefore, to find a similar high report of reliance on religion as one of the major coping strategies during the COVID-19 pandemic for both men and women living in various regions throughout Bangladesh. Though this study did not focus on the specific positivity or negativity of religious coping strategies, there is evidence that religious coping strategies in Bangladesh are considered positive support and are often mixed with traditional healing practices for over 80% of the population [30]. Older adults in our study who showed significant association with APC, similar to other studies, maybe rely on resilience and coping mechanisms from previous life experiences [25]. Previous studies suggest that greater education [26] is linked to positive coping approaches. Similarly, in this study, we also found more educated respondents had reported higher scores on APC styles among the education group, whereas female gender and single or separated people reported more negative coping strategies resulting in poor health outcomes [27]. In our study, we found a high prevalence of alcohol (mild to moderate) use in male respondents as a means to cope for men compared to a very low prevalence of alcohol use in women for those who identified in the AVC style. A high prevalence of alcohol utilization for coping in our study is surprising, given that other studies have indicated 94.4% abstinence and only 5.6% lifetime prevalence in studies across Bangladesh [31]. In addition, women are much less likely to consume alcohol in Bangladesh because of socio-cultural norms, legal prohibition, and religious adherence expectations, and when they do consume it, they may be much less likely to report use because of gendered norm expectations [32]. Humor, though a significantly higher coping strategy in males compared to females, was indirectly related to a decrease in stress about the COVID-19 pandemic [33]. The contributing factors behind higher scores in APC have not yet been examined. From our previous population-based survey [4], higher knowledge, education,

and female gender were correlated with positive attitudes and practices toward COVID-19. The AVC approach was presumed to be higher, as one other study reported the seriousness of the mental health crisis during the COVID-19 pandemic in Bangladesh. However, the results of our study show, overall, the APC style had higher overall scores among all participants [5]. AVC style was significantly higher in males compared to females in our study and is directly linked to fear [4], stress [19], physical illness, insomnia [14], misleading information, or spreading of unreliable information [21–23], that was not examined in this study. Differences, by gender, in coping styles may need further exploration to further evaluate all related variables.

Exploratory factor analysis found a higher score of eigenvalues associated with two factors. The components of factor 1 and factor 2 were associated with a mixture of AVC and APC styles. In a comparison study of a low-income nation, caregivers helping HIV-positive patients found two factors associated with APC and another three factors associated with mixed coping (APC, AVC, R, and H) in an exploratory factor analysis also using the Brief-COPE [34].

One limitation of our study is that the Brief-COPE is a self-report measurement tool, and though highly valid and reliable for major domain areas such as APC, AVC, H, and R, some of the individual subscales show lower internal consistency when considered in separate analyses. However, for this study, the validity of the instrument is considered reasonable and acceptable. Another limitation of this study is the lack of pre-pandemic coping strategy data to compare the overall effect of COVID-19 on coping strategy changes over time.

We postulate that our study has an adequate representation of the overall population, and the results may be externally generalized to all of Bangladesh. This study also overcame the barriers to extensive data collection within a short period by online training for skilled rehabilitation data collectors living in the local regions to conduct face-to-face interviews for all participating respondents. Our study also contributes to the understanding of predominant coping strategies utilized by the Bangladeshi people during the COVID-19 pandemic and may potentially contribute to positive health policies related to the promotion of mental health for Bangladeshi citizens in the future. This research could also include the role of traditional and local healing medicine as they relate to religious coping strategies in different regions.

In addition, analysis of specific, detailed coping methods, particularly those connected to religious coping, would further elucidate the significance of both positive and negative coping strategies in the setting of a pandemic situation. Future research would be improved by gaining more understanding of the concept of resilience while including consideration of how people with disability [35], refugees [36], migrant workers, and other marginalized populations cope with adversities caused by the pandemic.

## 5. Conclusions

During the first wave of the pandemic, Bangladeshi people adopted a mixture of coping strategies, with approach coping and coping through religious activities being the most prominent. Males reported using more coping techniques in each category compared to the female respondents, except for religion. Concerning the different coping strategies, alcohol utilization and denial showed higher-than-expected prevalence rates in men. Reliable sources of information, professional advocacy and counseling, adequate healthcare support, and reducing the uncertainty of livelihood might help further utilization of positive coping approaches, especially in urban dwellers, educated people, and occupationally engaged males.

**Supplementary Materials:** The following supporting information can be downloaded at <https://www.mdpi.com/article/10.3390/covid3030024/s1>. File S1: English and Bangla Questionnaire

**Author Contributions:** All authors provided equal contributions in conceptualization, methodology, software, validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review and editing, visualization, supervision, project administration, and funding acquisition. All authors have read and agreed to the published version of the manuscript.

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**Informed Consent Statement:** All participants were given verbal briefs on the study objectives, and voluntary written consent was obtained before data collection. Participants were assured of confidentiality, ethics, and privacy issues and were maintained throughout the study, according to the principles of the Helsinki Declaration [19].

**Data Availability Statement:** The data available regarding this study can be viewed at <https://www.kaggle.com/kmamranhossain/population-cope> (accessed on 1 January 2023).

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**Conflicts of Interest:** The authors declare that there are no conflict of interest regarding the publication of this article.

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