COVID-19 fear, stress, sleep quality and coping activities during lockdown, and personality traits: A person-centered approach analysis

Oli Ahmed [a,*], Kazi Nur Hossain [b], Rumana Ferdousi Siddique [c], Mary C. Jobe [d]

[a] *Department of Psychology, University of Chittagong, Chattogram - 4331, Bangladesh*
[b] *Department of Psychology, Jagannath University, Dhaka - 1100, Bangladesh*
[c] *Department of Psychology, University of Dhaka, Dhaka - 1000, Bangladesh*
[d] *Department of Psychological and Brain Sciences, The George Washington University, Washington, D.C., USA*

ARTICLE INFO

ABSTRACT

COVID-19 has impacted the world on a psychological level. With cases continuing to rise, understanding mental health and vulnerability factors are vital for researchers and mental health professionals to address. This study examines personality factors—using a person-centered approach compared to the majority of studies that use a variable-centered approach—to investigate the psychological impacts of COVID-19 on people's fear, stress, sleep quality and activities during lockdown. The study, conducted among a Bangladeshi sample from April 17 to 20, 2020, contained $n = 521$ participants. Latent profile analysis identified three personality profiles – maladaptive, adaptive, and highly adaptive. Results indicated that participants with a highly adaptive personality profile exhibited lower COVID-19 fear and perceived stress as well as better sleep quality compared to the other personality profiles. Our findings yield support for person-centered approaches to personality in relation to COVID-19 experiences, which can be beneficial for researchers and mental health professionals alike in understanding these psychological interworkings.

1. Introduction

The SARS-Cov-2 virus has spread to almost every part of the world, affecting around 218 countries and territories since December 31, 2019 (Worldometer, 2020). The World Health Organization declared the outbreak of the COVID-19 disease—which stems from the SARS-Cov-2 virus—as a pandemic on March 11, 2020 (Cucinotta & Vanelli, 2020). At the time of writing, there have been a total of 80,194,841 people who have been affected by COVID-19 and 1,756,947 who have died by the virus (Worldometer, 2020, December 25). Due to rapid transmission, countries have taken different measures like spatial distancing, quarantining, partial lockdown, full lockdown, etc., to prevent COVID-19's transmission.

During this pandemic, lives have become more stagnant, due to these sudden confinement measures. This stagnant condition has adversely affected human lives and increased psychological distress (Brooks et al., 2020). These lockdown measures, especially quarantine, have been found to have a strong association with cognitive functions, cardiovascular, and neuroendocrine systems that lead to sleep disturbance and psychological problems, like depression (Bhatti & Haq, 2017). Studies

have also suggested a higher prevalence rate of COVID-19 contagion fears (Ahorsu et al., 2020), stress (Ahmed, Ahmed, Aibao, et al., 2020), as well as anxiety and depression symptoms (Ahmed, Ahmed, Alim, et al., 2020).

Due to confinement measures, like stay-at-home orders, daily life has changed. One example of this has been how lockdown has affected sleep patterns. Cellini et al. (2020) found sleep schedule changes due to these new lockdown protocols among Italians. Participants were found to be going to bed and waking up later than usual, and having poor sleep quality (Cellini et al., 2020). Moreover, Li et al. (2020) have suggested sleeping issues, finding a higher prevalence rate of insomnia during the COVID-19 outbreak, in China. Additionally, Marelli et al. (2020) have reported an increasing rate of poor sleep quality and insomnia during the lockdown, in Italy. However, the pandemic's impact on sleep is inconclusive as some studies have reported no association between the pandemic and sleep (Gao & Scullin, 2020; Kocevska et al., 2020).

Relatedly, due to lockdown, people adjusted their activity-—increasing the frequency of engaging in social media, watching TV shows and movies, playing games, reading books, engaging in household activities, and more—to pass the time during stay-at-home orders

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(Hall, 2020; Statista, 2020; Watson, 2020); a response of coping to the lockdown. However, the COVID-19 pandemic might not affect everyon equally. Responses to the pandemic and measures issued by the government differ from person to person. For example, some people adopt preventive measures to reduce the risk of affecting COVID-19 (Wang et al., 2020) while others feel heightened fear of contagion, anxiety, stress (Rajkumar, 2020), or increased alcohol use (Ahmed, Ahmed, Alim, et al., 2020). In these varied responses to the current pandemic, personality may play an important role.

Personality is the unique behavioral and mental processes that characterizes an individual and their interaction with the surrounding environment (Crider et al., 1983). Among several approaches of personality, the five-factor model (extraversion, agreeableness, conscientiousness, neuroticism, and openness; McCrae & Costa Jr., 2003) is one of the most recognized personality trait models. Past literature has found that people with lower extraversion, agreeableness, and openness are comparatively more inclined to avoid infectious diseases than people who are higher in these traits (Mortensen et al., 2010). Abdelrahman (2020) revealed conscientiousness and neuroticism as significant predictors of maintaining social distancing during the current pandemic. Neuroticism has also found to be associated with worry, stress and stockpiling goods during COVID-19 (Garbe et al., 2020; Somma et al., 2020). Liu et al. (2021) also investigated the association between personality traits and perceived stress during the COVID-19 pandemic and suggested lower extraversion and higher neuroticism were associated with higher stress. The findings of Zhao et al. (2020) revealed a significant association between higher stress and higher anxiety levels that, in turn, were associated with poorer sleep quality during COVID-19. Moreover, studies examining personality have suggested that neuroticism is a significant predictor of COVID-19 fear (Caci et al., 2020). Not only has neuroticism showed significance in COVID-19 research, but it has also been noted to be linked to psychological distress in previous pandemics (Taylor, 2019). Overall, all big five personality traits have been connected to COVID-19 literature with varying effects.

To the best of our knowledge, all studies investigating the role of personality traits on pandemic responses have utilized the variable-centered approach. In variable-centered approaches, homogeneity of the whole population is considered and heterogeneity is ignored. In this approach, the estimated relationship's results between traits and other variables are averaged to the whole population. Although it is not a wrong way to assess the relationship between personality traits and other variables, it overlooks the mutual relationship among traits. Personality traits are not exited in isolation in real life, but are viewed as a dynamic system of traits that define a person (Donnellan & Robins, 2010). The person-centered approach assumes heterogeneity in the population and seeks to identify homogeneous subgroups. This approach describes the organization of different dimensions within a person and how meaningfully subgroups can be defined (Robins et al., 1998). This approach could provide a "greater insight into the underlying mechanisms that produce both within-person variation and between-person differences across the observed dimensions" (Isler et al., 2017, p. 257). In this study, the person-centered approach (using latent profile analysis; LPA) was applied to assess individual differences in pandemic responses. The present study aimed to assess the differences in responses to the pandemic (i.e., COVID-19 fear, stress, sleep quality, and coping activities at home during lockdown) among Bangladeshi people. This study's objectives were:

  i) to identify homogeneous subgroups (using latent profiles) in terms of personality traits; and
  ii) to assess the differences in COVID-19 fear, stress, sleep quality, and coping activities among identified homogenous groups or latent profiles.

2. Material and methods

2.1. Participants

The present study's data were collected through an online survey using a Google Form. This survey link was shared through email and social media (e.g., Facebook, WhatsApp). The study's two inclusion criteria to participate were – i) participants had to be at least 18 years old, and ii) live in Bangladesh currently. This study was carried out between April 17, 2020 and April 20, 2020. A total of 531 (50.1% male) people responded to the study link; ten people declined participating in this study. Of the remaining participants ($n = 521$), they ranged in age from 18 to 80 years ($M = 24.78$ years, $SD = 7.004$ years). Among participants, 13.4% had completed higher secondary education, 60.7% had an undergraduate degree, 23.8% had a graduate degree, 15% were married, and 84.6% were unmarried.

2.2. Measures

2.2.1. Big Five Personality Inventory-10 (BFPI-10)

The BFPI-10 is a ten-item tool for quick assessment of the 'Big Five' personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness). Participants rated their responses on a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Participants were asked how well each statement described their personality. Total scores ranged from 2 to 10 in each subscale. The authors reported good reliability and validity of this inventory (Ahmed & Hossain, in press; Rammstedt & John, 2007). In the present study, each subscale's inter-item correlations ranged from 0.25 to 0.35 (recommended 0.2 to 0.4; Pallant, 2016). Confirmatory factor analysis (CFA) suggested an acceptable model fit of this scale ($\chi^2/df = 4.142$, GFI = 0.969, CFI = 0.918, SRMR = 0.047, RMSEA = 0.078).

2.2.2. Fear of COVID-19 scale (FCV-19S)

The FCV-19S is a seven-item measure for assessing fear regarding the COVID-19 pandemic. The authors reported good reliability as well as good construct and concurrent validity (Ahorsu et al., 2020). Participants are asked to give their level of agreement to the statements. Participants rated their responses on a five-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Total scores ranged from 7 to 35; the higher the score, the greater the COVID-19 fear. The FCV-19S was translated into Bangla with permission from one of the corresponding authors to assess COVID-19 fear in this study. The psychometric results (Supplementary Tables 1–3 and Supplementary Fig. 1) suggested soundness of this scale in both CTT and IRT approaches. This scale has good internal consistency reliabilities (alpha = 0.871, omega = 0.872). Categorical CFA suggested good model fit ($\chi^2/df = 2.539$, GFI = 0.997, CFI = 0.997, TLI = 0.996, SRMR = 0.037, RMSEA = 0.054).

2.2.3. Perceived Stress Scale-10 (PSS-10)

The Perceived Stress Scale (PSS) is a valid tool for assessing perceived stress. Although the original scale (Cohen et al., 1983) comprises 14 items, Cohen and Williamson (1988) examined 4-item and 10-item versions and suggested relative superiority of the 10-item version, in terms of internal consistency and factor structure. In this study, the PSS-10 was used to assess stress perception. Participants rated their responses to the questions based on their previous one-month experience, using a five-point Likert-type scale from 0 (*never*) to 4 (*very often*). Total scores ranged from 0 to 40, and the higher the score, the higher the stress perception. The PSS-10 Bangla version is also a reliable and valid measure for assessing stress perception among Bangladeshi people (Islam, 2020). The PSS-10 Bangla version has good internal consistency reliabilities in the present study ($\omega = 0.857$; $\alpha = 0.856$). CFA suggested good model fit of the scale ($\chi^2/df = 2.997$, GFI = 0.964, CFI = 0.963, SRMR = 0.037, RMSEA = 0.062).

2.2.4. Sleep quality

Participants were asked about their subjective sleep quality through the item "How would you rate your sleep quality overall?" from the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989). Particpants rated the quality of their sleep based on the past 14 days, using a four-point Likert-type scale, ranging from 0 (*very good*) to 3 (*very bad*).

2.2.5. Activities during lockdown

Lastly, participants were asked to rate six statements about how they passed their time during lockdown on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Statements were – i) I am using social media more than usual during lockdown; ii) I am watching TV programs more than usual during lockdown; iii) I am watching movies more than usual during lockdown; iv) I am playing games (on smartphone or computer) more than usual during lockdown; v) I am reading books more than usual during lockdown; and vi) I am doing household activities more than usual during lockdown.

2.3. Data analysis

The LPA was run for the 'Big Five' personality traits forming two to five solutions. Several indices were needed to examine and identify the number of latent groups. These indices include: the Akaike information criterion (AIC), the Bayesian information criterion (BIC), and the sample-size-adjusted Bayesian information criterion (SSABIC), and the Lo-Mendell-Rubin adjusted likelihood ratio test (LMRT). Relatively lower AIC, BIC, and SSABIC values suggest a more parsimonious model. The LMRT compares an estimated model (for example, three classes) with another model that has one less class. The significant *p* value (*p* < .05) suggests that the tested model fit better than the model with the one less class (Muthén & Muthén, 2012).

Finally, one-way ANOVAs were performed to assess differences in COVID-19 fear, perceived stress, subjective sleep quality, and coping activities during lockdown among latent profiles. As ANOVA statistics provide overall differences among groups, a post-hoc (i.e., Fisher's Least Significance Difference) analysis was performed to estimate the significant group differences in these variables.

2.4. Ethics

This study was carried out following the Declaration of Helsinki and its later amendments or comparable ethical standards. Ethical approval of this study was granted by the Ethical Review Board, Faculty of Biological Sciences, University of Dhaka, Bangladesh (103/biol.scs.2020-21). There were no exposed risks (physical, psychological, social, and legal) for the participants.

3. Results

3.1. Latent profiles

The LPA's fit statistics, class sizes, and probabilities are presented in Table 1. The AIC, BIC, and SSABIC values were not conclusive to identify the number of latent profiles. The AIC and SSABIC values gradually decreased as the number of solutions increased. On the other hand, BIC values decreased it to four class solutions, while the AIC and SSABIC decreased it to five class solutions. The BIC values rejected five class solutions, while the AIC and SSABIC suggested five class solutions. Entropy values were also inconclusive to determine the number of classes. Therefore, LMRT values were considered to determine the number of classes. The LMRT values for the two-class and three-class solutions were significant (*p* < .001) rather than the four and five class solutions (*p* > .05). Therefore, three.

class solutions are preferable based on the LMRT. Moreover, the three-class solution's average class probabilities were over 0.80 and the smallest class of the three-class solutions had more than 5% observations. Thus, the three-class solution (three latent profiles) were taken into consideration based on these LPA fit statistics and existing theoretical support.

3.2. Profile description

Table 2 shows the descriptive statistics (means and standard deviations) of the three identified latent profiles. The first profile is the smallest group that comprises 30 (5.76%) of the total sample and the second profile is the largest group that comprises 328 (62.9%) of the total sample. Finally, the third profile, larger than the first profile and smaller than the second, consists of 163 (31.3%) of the total sample. The first profile sample had lower extraversion, agreeableness, conscientiousness, and openness traits and higher neuroticism traits. The third profile sample had higher extraversion, agreeableness, conscientiousness, and openness traits, but lower neuroticism traits. For profile 2, the largest group's sample, had a moderately higher agreeableness score and average extraversion, conscientiousness, neuroticism, and openness traits. Based on existing literature (Fisher & Robie, 2019), profile 1 could be labeled as maladaptive, profile 2 as adaptive, and profile 3 as highly adaptive. Fig. 1 shows a comparison among latent profiles in personality traits.

3.3. Comparison among latent profiles in COVID-19 fear, stress, sleep quality and activities in lockdown

ANOVA results (Table 3) show significant mean differences among

Table 1
Model fit indices, class size and average class probabilities for most likely latent class membership by latent class.

Solutions	AIC	BIC	SSABIC	Entropy	LMRT (*p*-value)	Class size	Average class probabilities for most likely latent class membership by latent class				
							1	2	3	4	5
2	10,482.72	10,550.81	10,500.02	0.63	302.35 (<0.001)	270 (51.8%)	0.884	0.116			
						251 (48.2%)	0.115	0.885			
3	10,382.73	10,476.35	10,406.52	0.77	109.09 (<0.001)	30 (5.76%)	0.904	0.096	0.000		
						328 (62.9%)	0.015	0.901	0.084		
						163 (31.3%)	0.000	0.116	0.884		
4	10,343.07	10,462.24	10,373.36	0.72	50.31 (0.052)	152 (29.2%)	0.891	0.013	0.000	0.097	
						130 (25.0%)	0.015	0.817	0.034	0.134	
						34 (6.5%)	0.000	0.067	0.912	0.021	
						205 (39.3%)	0.085	0.097	0.005	0.813	
5	10,319.55	10,464.25	10,356.32	0.78	34.60 (0.391)	26 (5.0%)	0.883	0.006	0.000	0.084	0.027
						199 (38.2%)	0.001	0.844	0.092	0.064	0.000
						143 (27.4%)	0.000	0.090	0.902	0.008	0.000
						142 (27.3%)	0.032	0.103	0.004	0.853	0.008
						11 (2.1%)	0.069	0.000	0.000	0.032	0.899

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; SSABIC = Sample Size Adjusted Bayesian Information Criterion; LRMT = Lo-Mendell-Rubin adjusted likelihood ratio test.

Table 2

Profiles' mean and standard deviations of the Big Five personality traits.

Profiles	n	Extraversion M (SD)	Agreeableness M (SD)	Conscientiousness M (SD)	Neuroticism M (SD)	Openness M (SD)
Maladaptive	30	4.87 (2.45)	4.90 (1.40)	3.70 (1.32)	8.10 (1.84)	4.33 (1.75)
Adptive	328	6.73 (1.99)	7.68 (1.39)	5.84 (1.51)	5.82 (1.76)	6.84 (1.34)
Highly adaptive	163	7.97 (1.99)	9.20 (1.06)	8.26 (1.37)	3.93 (1.55)	9.04 (1.10)

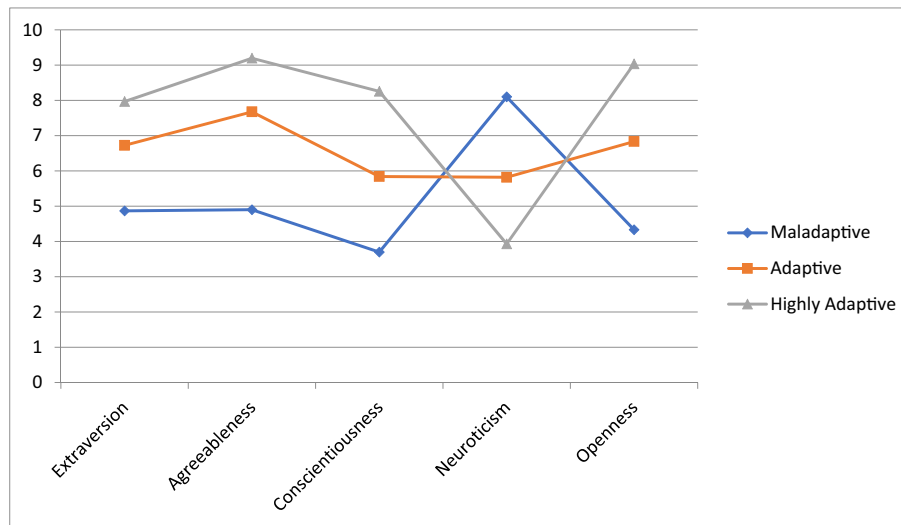*Note. M* = mean; *SD* = standard deviation.

Fig. 1. Mean comparisons of the three identified latent profiles.

latent profiles in COVID-19 fear ($F_{(2, 518)} = 13.08$, $p < .001$, partial eta-squared = 0.048, $f = 0.22$), perceived stress ($F_{(2, 518)} = 79.41$, $p < .001$, partial eta-squared = 0.235, $f = 0.55$), sleep quality ($F_{(2, 518)} = 5.73$, $p = .003$, partial eta-squared = 0.022, $f = 0.15$), and doing more household activities in lockdown ($F_{(2, 518)} = 4.41$, $p = .013$, partial eta-squared = 0.017, $f = 0.13$). Post-hoc analyses (Table 4) showed individuals with a highly adaptive profile significantly differed from individuals with a maladaptive profile (Mean differences = 4.49, $p = .001$) and individuals with an adaptive profile (Mean differences = 2.97, $p < .001$) for COVID-19 infection fears. For perceived stress, all profiles differed from each other. However, individuals with a maladaptive profile had higher stress perception than individuals with an adaptive profile (Mean differences = 6.97, $p < .001$) and highly adaptive profile (Mean differences = 13.25, $p < .001$). Individuals with an adaptive profile had also significantly higher stress perception than individuals with a highly adaptive profile (Mean differences = 6.28, $p < .001$). For subjective sleep quality, participants having a highly adaptive personality profile had better sleep quality than participants with an adaptive profile (Mean differences =

0.26, $p = .001$). Finally, similar to COVID-19 infection fears, individuals with a highly adaptive profile were more involved in household activities during lockdown than individuals with a maladaptive (Mean differences = −0.61, $p = .010$) and adaptive profiles (Mean differences = 0.25, $p = .028$).

4. Discussion

Responses to the current pandemic (e.g., perceived COVID-19 fear, stress, sleep quality, and coping activities during homestay in lockdown) are not experienced in the same manner for all. Personality is an important factor to consider for these response differences to the pandemic. However, the majority of studies that have reported personality's impact utilized variable-centered approaches. This study was undertaken to assess the role of personality traits on these response differences to the pandemic, utilizing a person-centered approach.

The LPA explored three latent personality profiles among Bangladeshis. Previous studies have also reported three latent personality

Table 3

Mean differences among latent personality profiles in COVID-19 fear, perceived stress, sleep quality, and coping activities during lockdown.

	Maladaptive M (SD)	Adaptive M (SD)	Highly adaptive M (SD)	F-value (sig.)	Partial eta squared	Effect size f
COVID-19 fear	21.33 (7.77)	19.81 (6.57)	16.84 (6.41)	13.08 (<0.001)	0.048	0.22
Perceived stress	27.47 (6.24)	20.50 (6.21)	14.22 (6.95)	79.41 (<0.001)	0.235	0.55
Sleep quality	1.07 (1.05)	1.04 (0.82)	0.78 (0.79)	5.73 (0.003)	0.022	0.15
Coping activities						
Social media use	4.37 (1.07)	3.99 (1.25)	4.00 (1.31)	1.26 (0.285)	0.005	0.07
Watching TV shows	2.60 (1.71)	2.82 (1.52)	2.93 (1.57)	0.65 (0.525)	0.002	0.05
Watching movies	3.53 (1.61)	3.32 (1.45)	3.09 (1.57)	1.79 (0.168)	0.007	0.08
Playing games	3.23 (1.63)	2.86 (1.57)	2.80 (1.64)	0.95 (0.389)	0.004	0.06
Reading books	2.63 (1.47)	2.94 (1.39)	3.05 (1.54)	1.12 (0.328)	0.004	0.07
Household activities	3.57 (1.41)	3.92 (1.16)	4.17 (1.16)	4.41 (0.013)	0.017	0.13

Note. M = mean; *SD* = standard deviation.

Table 4
Post hoc test among latent profiles in COVID-19 fear, perceived stress, sleep quality, and doing household activities during the lockdown.

Dependent variable	(I) Latent profiles	(J) Latent profiles	Mean difference (I-J) (SE)	Sig.	95% Confidence interval	
					Lower bound	Upper bound
COVID-19 fear	Maladaptive	Adaptive	1.53 (1.26)	0.226	−0.95	3.99
		Highly adaptive	4.49 (1.31)	0.001	1.92	7.07
	Adaptive	Highly adaptive	2.97 (0.63)	<0.001	1.73	4.21
Perceived stress	Maladaptive	Adaptive	6.97 (1.23)	<0.001	4.55	9.38
		Highly adaptive	13.25 (1.28)	<0.001	10.73	15.76
	Adaptive	Highly adaptive	6.28 (0.62)	<0.001	5.06	7.49
Sleep quality	Maladaptive	Adaptive	0.03 (0.16)	0.863	−0.28	0.34
		Highly adaptive	0.29 (0.16)	0.079	−0.03	0.61
	Adaptive	Highly adaptive	0.26 (0.08)	0.001	0.11	0.42
Household activities	Maladaptive	Adaptive	−0.36 (0.22)	0.111	−0.80	0.08
		Highly adaptive	−0.61 (0.23)	0.010	−1.06	−0.15
	Adaptive	Highly adaptive	−0.25 (0.11)	0.028	−0.47	−0.03

Note. SE = standard error.

profiles of the Big Five personality traits (e.g., Asendorpf et al., 2001; Avdeyeva & Church, 2005; Fisher & Robie, 2019; Merz & Roesch, 2011). However, the profiles' scores on personality traits in this study are inconsistent with most of these studies. This is because, most of the studies have explored three latent profiles, similar to Caspi's (1998) suggestion of using three-cluster profiles (resilient, undercontroller, and overcontroller) (e.g., Asendorpf et al., 2001; Avdeyeva & Church, 2005). In the present study, the profiles' scores on each trait are the most consistent with the findings reported by Fisher and Robie (2019) [maladaptive, adaptive, and highly adaptive]. This study's profile scores are also supported by the more nascent theory of the general factor of the personality (GFP; Musek, 2007). This nascent theory suggests that a GFP underlies the Big Five traits as higher-order factor (Musek, 2007). As the scores on each trait varied from each other, the explored profiles in this study differed only quantitatively, not qualitatively. These quantitative differences lend support to the GFP.

Results showed differences in responses to the COVID-19 pandemic (i.e., COVID-19 fear, stress, sleep quality, and engagement in household activities during lockdown as a coping strategy) between explored profiles. Individuals with a highly adaptive personality profile (i.e., a higher GFP) had the lowest COVID-19 fear and perceived stress, better subjective sleep quality, and were more engaged in household activities compared to the those in the remaing personality profiles. This highly adaptive profile is much similar to the 'resilient' personality profile. On the other hand, individuals with a maladaptive personality profile (i.e., a lower GFP) had the highest COVID-19 fear and perceived stress, poorer subjective sleep quality, and showed less engagement in household activities compared to the other personality profiles examined. This maladaptive personality profile is much similar to the 'overcontrolled' personality profile.

Our results indicate that having a highly adapted personality may enable someone to cope well with stress induced by the pandemic, than those in the maladaptive personality profile. Merz and Roesch (2011) suggested that people having a well-adjusted personality profile (similar to a resilient personality profile) had higher confidence and beliefs to manage stress. These people also had lower anxiety and depression symptoms (Merz & Roesch, 2011). Our findings were consistent with this, as people in the highly adaptive personality profile exhibited lower COVID-19 fear and perceived stress as well as better sleep quality. Fisher and Robie (2019) have suggested that individuals with a higher GFP had higher life satisfaction, passion toward works, and job self-efficacy compared to those with a lower GFP. Overall, results of this study suggest that the GFP is an important factor regarding how one has responded to this COVID-19 pandemic. Musek (2007, 2017) also suggest that this higher order factor of personality is associated with social desirability, emotionality, life satisfaction, happiness, quality of life, and mental health; therefore, yielding support for its relevance to COVID-19. However differences in dependent variables (i.e., stress and sleep quality) among identified latent profiles might be pre-existing and show stable differences. Thus, the COVID-19 pandemic might not affect these differences; though, the pandemic might trigger these pre-existing differences between latent personality profiles.

4.1. Limitations and future directions

In this study, LPA statistics were not conclusive enough. Entropy values were not high to classify latent profiles. The maladaptive profile sample size ($n = 30$) was smaller than the other two groups. This might be underpowered to estimate the true group differences and not be generalizable to the population level. This data-driven approach itself has some limitations. The number of latent profiles identified from the data is not always stable and replicable for other samples in the same population. The number of profiles is identified in LPA based on the analyst's subjective assessment, rather than data. Moreover, limitations of this study include self-report data, snow-ball sampling techniques, the shorter version of the Big Five personality traits scale (BFPI-10), and the single item question for assessing sleep quality. Self-report data might be subjected to social desirability bias. Shorter/single item measure(s) are always incapable of covering broad aspects of the underlying construct. A limited items measure poses a limitation to generalizability. In this study, most of the participants were well-educated (college level or above) and unmarried. Uneducated, married, and older groups were not well-represented in this study. Therefore, potential users should be cautious about these limitations. Future research should aim to address these limitations and expand upon using a person-centered approach to personality in relation to pandemic or COVID-19 related responses and distress.

5. Conclusion

The person-centered approach provides researchers and other potential users a more holistic view of personality than a variable-centered approach. In this study, three homogenous personality profiles were explored: maladaptive, adaptive, and highly adaptive. People with a highly adaptive profile had lower COVID-19 fear, perceived stress, and better sleep quality than people in the other two profiles. Individuals with a highly adaptive profile also spent more time than usual on household activities during the lockdown. These significant differences in response to the pandemic suggest a higher-order personality factor (i. e., GFP) as an important contributor. The present study's results would be helpful for mental health professionals when working with patentis suffering from mental health problems induced by the current pandemic. Moreover, these findings would also be helpful for researchers to explain mental health and personality during this pandemic.

Ethical statement

This study was carried out following the Declaration of Helsinki and its later amendments or comparable ethical standards. Ethical approval of this study was granted by the Ethical Review Board, Faculty of Biological Sciences, University of Dhaka (103/biol.scs.2020-21). There were no exposed risks (physical, psychological, social, and legal) for the participants. The confidentiality of their responses was assured and they had the right to withdraw from the study at any stage. After reading the study's purposes, its nature, and potential risks and benefits, participants gave their consent to participate by clicking either "Yes" (I agree) or "No" (I don't agree). Only the participants who agreed to participate were able to view the survey questionnaire and take part.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data and codes availability statement

Data and analysis code files are shared via the Open Science Framework at https://osf.io/qut94/.

CRediT authorship contribution statement

Oli Ahmed: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft. **Kazi Nur Hossain:** Conceptualization, Investigation, Project administration, Writing – review & editing. **Rumana Ferdousi Siddique:** Project administration, Investigation, Writing – original draft. **Mary C. Jobe:** Writing – original draft, Writing – review & editing.

Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2021.110873.

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