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Self-Perceived Stress and Coping Strategies during COVID-19 Pandemic among the Students of Kathmandu Metropolitan City

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Abstract

Introduction: The COVID-19 pandemic emerged as a global threat. Various factors such as social isolation, perception of disease severity and susceptibility, and frequent exposure to the news have been previously associated with increased levels of perceived stress regarding COVID-19. The choice of coping strategies plays a crucial role in mitigating these effects. Thus, this study aims to assess the perceived stress level and coping strategies among 19-24 age group students during COVID-19.

Methods: A cross-sectional study was conducted at the 5 colleges of Kathmandu Metropolitan City, Nepal with 256 students between May 22 to 24, 2022. The Perceived Stress Scale (PSS-10) and BRIEF-COPE were used to measure stress and coping behavior. Significant variable differences in stress scores were assessed via *t*-tests and ANOVA, while the coping-stress relationship was analyzed using Spearman's rank correlation coefficient.

Results: The majority (69.1%, n=177) of participants were aged 19 to 24, with a mean age of 21.35 (±1.49). Among the total sample, all respondents experienced stress, with 26.2% reporting severe stress and only 1.5% reporting low stress. The mean score for approach coping strategies (2.55) was found to be higher than that for avoidant coping strategies (1.89). Coping strategies such as denial (r = -0.191, p = 0.002), positive reframing (r = -0.147, p =.019), and religion (r = -0.175, p = 0.005) showed a negative correlation with perceived stress, implying that if these strategies increase perceived stress decreases and vice-versa.

Conclusion: Based on our data, the majority of participants experienced stress. The negative correlation between coping behavior and stress suggests that effective coping strategies can help reduce stress level and improve well-being.

Keywords: COVID-19, Coping strategies, Perceived stress, Students

Introduction

The novel coronavirus was first reported in China and spread globally, including Nepal, leading to a statewide lockdown on March 24, 2020, in response to the pandemic [1-3]. During an infectious illness outbreak, psychological responses can significantly impact disease transmission and cause emotional distress [4]. The sudden outbreak of a disease poses a threat to the mental health of those affected and their close contacts, and even healthy communities can experience negative psychological impacts [5,6]. The restrictions on daily activities and quarantine during the pandemic had led to psychological symptoms for individuals across society, particularly affecting young people. These symptoms include a sense of threat, negative effects of school closures, reduced levels of recreational and physical activity, and the potential development of post-traumatic stress disorder (PTSD) [7-9]. The World Health Organization (WHO) was concerned about the changes that the pandemic has caused in people's regular behaviors, schedules, and means of subsistence, which could lead to an increase in loneliness, anxiety, depression, insomnia, dangerous alcohol and drug use, and self-harm or a suicidal act [10].

Coping, on the other hand, refers to the cognitive and behavioral efforts a person makes to manage specific conditions that exceed their resources [11]. Coping strategies can have either a positive or negative impact on mental health and influence the nature and impact of psychological responses in stressful situations [12]. Positive coping strategies, such as seeking social support, being compassionate, engaging in exercise, cognitive acceptance, avoiding threatening thoughts, or positive thinking, may be beneficial when people face stressful situations or uncertainties, according to the literature [13]. Studies have shown that the COVID-19 pandemic can have a significant impact on student's mental health [6,14,15]. When someone perceives a situation as threatening or challenging, they experience stress and may adopt coping techniques like problem-focused or emotion-focused strategies [16]. Coping strategies for managing stress involve cognitive and behavioral abilities that are developed in response to the stressful situation [17]. There is a lack of research regarding perceived stress and coping mechanisms among undergraduate students. Understanding people's perceived stress and coping approaches is crucial for assessing the effects of a pandemic on mental health. The study hypothesizes that there is no significant difference between Perceived Stress Scale (PSS) score with socio-demographic characteristics, social media use, infected by COVID-19, opinion towards isolation and quarantine measures taken by the government, and knowledge of COVID. Hence, the aim of the study was to assess the perceived stress level and coping strategies among 19-24 age group students during the COVID-19 pandemic in Kathmandu Metropolitan City, Nepal.

Methods and Materials

Study area and period

We conducted the study at the five Management and Technology Colleges, affiliated with Tribhuvan University located in Kathmandu Metropolitan City, from March to August 2022.

Study design and population

We adopted a cross-sectional study design among undergraduate students majoring in Management.

Characteristics of participants

The study population comprises students enrolled in an undergraduate course in Management. As their curriculum does not include mental health education, their awareness of the subject might be limited, making them relevant to the study. A majority of the study population was over the age of 20 years.

Inclusion and exclusion criteria

Inclusion: We included students present on the day of data collection.

Exclusion: We excluded students who took psychiatric medicine and/or were receiving counselling by asking them prior to questionnaire.

Sample size determination, sampling technique, and procedure

Assuming a prevalence of perceived stress of 80%, which was taken from a previous study conducted in Vietnam [6], the sample size for this study was calculated using a single population proportion formula, $n=z^2pq/d^2$, where z=1.98 (corresponding to a 95% confidence interval [CI]), p=0.8 (prevalence value from previous study), q=1-p, and d=0.05 (margin of error). Using these values, the sample size was calculated to be 256. A lottery-based approach was employed to select five colleges among 9 colleges affiliated with Tribhuvan University from the Kathmandu metropolitan city for the study, using the simple random sampling technique. At the time of the research, all years from bachelor level from undergraduates were included to get the 256 respondents from the college. To ensure adequate representation of undergraduate students, the required number of participants from each selected college was determined based on their respective enrollment figures and program offerings. Subsequently, all the estimated students from each college and program were included by enumerating the students present in a randomly chosen class during data collection. If the number of students in the class exceeded the estimated sample size, the surplus data was also included. We used a self-administered questionnaire technique for data collection. We provided an explanation of the study's purpose and questionnaire to ensure a clear understanding of the questions during the data collection process.

Data collection instruments, Techniques, and data quality control

The PSS and BRIEF-COPE scales have been used globally in a wide range of people and contexts, and their reliability and validity have been demonstrated [18-21].

We used the PSS to assess the level of perceived stress. This scale consisted of a 10-item questionnaire, where each question was assigned a score from 0 to 4. Respondents used a 5-point Likert-type rating scale, ranging from 0 (never) to 4 (very often), to indicate their responses. It was important to note that for items 4, 5, 7, and 8 scores are reversed. Interpreting the scores according to the provided system, a range of 0 to 13 indicates low stress, 14 to 26 suggests moderate stress, and 27 to 40 indicates high perceived stress [22]. Moreover, to measure coping strategies, we used the BRIEF-COPE 28 questionnaire, which was a self-report questionnaire consisting of 28 items that assessed the effectiveness of coping strategies for stressful life events [21,23]. A 4-point Likert scale ranging from

1 (I haven't been doing this at all) to 4 (I have been doing this a lot) is used to rate each item. The BRIEF-COPE features 14 subscales that measure common coping mechanisms and are divided into two primary categories: avoidant coping and approach coping [6].

- *Avoidant Coping:* characterized by subscales of Self-distraction (items 1 and 19), Denial (items 3 and 8), Substance use (items 4 and 11), Behavioral disengagement (6 and 16), Venting (items 9 and 21), and Self-blame (items 13 and 26). Among those with medical issues, avoidant coping is linked to worse physical health [24].
- *Approach Coping:* characterized by the subscales of Active coping (items 2 and 7), Emotional support (items 5 and 15), Use of informational support (items 10 and 23), Positive reframing (items 12 and 17), Planning (items 14 and 25), and Acceptance (items 20 and 24). Approach coping is linked to more beneficial reactions to adversity, such as adaptive practical adjustment, improved physical health outcomes, and more stable emotional reactions [25].
- *Standing one's ground:* characterized by the subscales of humor and religious ways of coping with stress [26]. Humor and religious coping are also known to potentially provide a beneficial result regarding adversity dependent on the type of humor and religiosity [27-29].

The tools used in this study were validated by Mental Health mentor, experts and through literature reviews. For reliability testing, a pre-test was conducted on 10% of the total sample size among 10% of students of bachelor level of another university, and the internal consistency was determined using Cronbach's α coefficient value (PSS=0.826, BRIEF-COPE=0.849). Previous studies have shown that both tools have high validity and reliability. These tools have also been used in previous studies conducted in Nepal [30,31]. For quality control, one of the researchers was self-involved in data collection and another one was supervised. The collected questionnaire was checked and reviewed by a supervisor at the end of each data collection day for completeness and consistency.

Data processing and Statistical analysis

We performed all analyses using Statistical Package for the Social Sciences (SPSS) version 26 chosen for its compatibility with our dataset and prior use in previous study [32]. We employed descriptive statistics, such as frequency, percentages, mean, and standard deviations, to analyze the characteristics of the respondents, the PSS score, and the BRIEF-COPE score. We used *t*-tests and one-way ANOVA tests to compare the PSS score and COPE score with various participant characteristics. The test was used in prior studies done during the pandemic [6,33-35]. We used the Spearman correlation coefficient to measure the strength and direction of the association. Spearman correlation was used in prior studies to determine the association among variables [36-38]. We selected these statistics based on the assumption of a normal distribution of the studied data. A *p*-value of less than 0.05 was considered statistically significant.

Results

Socio-demographic characteristics

Out of the 256 participants in the sample, the majority (69.1%, n=177) were aged 21 to 24, with a mean age of 21.35 (± 1.49). Most of the respondents were male (55.5%, n=142), and belonged to the *Brahmin and Chhetri* ethnic groups (52.3%, n=134). The Government of Nepal has categorized Brahmin and Chhetri as a single ethnicity group. Additionally, the majority were unmarried (91.1%, n=233), living with their family (57.8%, n=148), and had a family income of more than Nrs 40,000 (27.3%) (**Table 1**).

Table 1. Socio-demographic characteristics of the participants.

Variables	Frequency (n)	Percentage (%)
Age, mean ± SD, years	21.35 ± 1.49	
≥ 20	79	30.9
≤ 21	177	69.1
Sex		
Female	114	44.5
Male	142	55.5
Ethnicity		
Brahmin and Chhetri	134	52.3
Janjati	95	37.1
Others*	27	10.6
Marital Status		
Unmarried	233	91.1
Married	17	6.6
Divorced/ Separated	6	2.3
Accommodation		
Family	148	57.8
Alone	79	30.9
Friends	29	11.3
Family income per month (Nepalese Currency)		
< 40 000	186	72.7
Rs 40 000- Rs 70 000	66	25.8
>Rs 70 000	4	1.5
Changes in household income during the COVID-19 outbreak		
Yes	179	69.9
No	77	30.1
* *Madeshi, Dalit, Muslim*		

Social media use, self-rated stress, and knowledge levels during the COVID-19

All respondents (100%, n=256) reported using social media. A majority (87.9%) of the respondents reported feeling stressed due to news of increasing COVID-19 cases and deaths (n=225), 58.2% reported being infected by COVID-19 (n=149), and 27.3% reported feeling frustrated by lockdown and quarantine measures (n=70). In addition, 61.3% of the respondents had basic knowledge of COVID-19 (**Table 2**).

Perceived stress among students during COVID-19 pandemic

Table 3 displays the findings of the PSS, which assesses the extent of stress reported by participants over the past month in relation to the COVID-19 pandemic. The most frequent response option chosen by participants for nearly all the questions in the PSS was "sometimes", accounting for 38.7% of the responses.

Table 2. Social media use, self-rated stress, and knowledge of COVID during the COVID-19 pandemic.

Variables	Frequency	Percentage
Use social medias		
Yes	256	100
The types of COVID-19 news primarily heard/read on social media for the past three months		
Infection rate	117	45.7
Death rate	69	27.0
Preventive measures	70	27.3
Talking/chatting with friends online during the pandemic		
Talked with no one	61	23.8
2 Times	94	36.7
More than 2 times	101	39.5
Felt stressed due to the number of COVID-19 cases/deaths		
Yes	225	87.9
No	31	12.1
Infected with COVID-19		
Yes	107	41.8
No	149	58.2
Perceived stress levels prior to the COVID-19 pandemic*		
Severe	3	1.2
Moderate	84	32.8
Mild	169	66.0
Frustrated by government isolation and quarantine measures		
Yes	70	27.3
No	186	72.7
Knowledge about COVID-19 prevention and protection**		
Everything	99	38.7
Basic	157	61.3

** Self-rated Stress by respondents, ** Self-rated Knowledge of respondents*

Table 3. Perceived stress among students during COVID-19 pandemic

PSS items	Frequency % (n=256)				
	Never	Almost Never	Sometimes	Fairly Often	Often
Been upset because of something that happened unexpectedly	4 (1.6)	4 (1.6)	77 (30.1)	91 (35.5)	80 (31.2)
Felt that you were unable to control the important things in your life	2 (0.8)	15 (5.9)	86 (33.5)	57 (22.3)	96 (37.5)
Felt nervous and "stressed"	5 (2.0)	8 (3.1)	90 (35.2)	78 (30.5)	75 (29.2)
Felt confident about your ability to handle your personal problems	2 (0.8)	23(9.0)	125 (33.6)	93 (36.3)	13 (5.1)
Felt that things were going your way	7 (2.7)	78 (30.5)	134 (52.3)	33 (12.9)	4 (1.6)
Found that you could not cope with all the things that you had to do	7 (2.7)	19 (7.4)	108 (42.2)	118 (46.1)	4 (1.6)
Been able to control irritations in your life	9 (3.5)	34 (13.3)	163 (63.7)	39 (15.2)	11 (4.3)
Felt that you were on top of things	5 (2.0)	36 (14.1)	105 (41.0)	96 (37.5)	14 (5.4)
Been angered because of things that were outside of your control	1 (0.4)	28 (10.9)	109 (42.6)	70 (27.3)	48 (18.8)
Felt difficulties were piling up so high that you could not overcome them	6 (2.3)	18 (7.0)	111 (43.4)	112 (3.8)	9 (3.5)

Level of perceived stress

Most of the respondents (72.3%, n=185) reported experiencing mild stress, while 26.2% reported severe stress, with only 1.5% reporting low stress. The mean score for the 10 items on the PSS was 23.44 (SD= ± 3.62; range: 11-29) (**Table 4**).

Coping strategies

Table 5 represents the mean and standard deviation (SD) scores for the BRIEF COPE subscales. The mean scores for avoidant subscales range from 1.37 to 3.01, and for approach coping subscales it ranges from 2.41 to 2.6. The mean score of Approach Coping Strategies (2.55) was higher than standing one's ground (2.05) and avoidant coping strategies (1.89). Among avoidant coping strategies, the self-distraction strategy was the most common with the highest mean score of 3.01 (SD 0.59). In terms of approach coping strategies, the most common preferences included acceptance (2.75 ± 0.61) and the use of informational support (2.60 ± 0.68). Similarly, in terms of Standing one's ground, Religion was the most commonly used with a mean score of 2.58 (SD ± 0.68).

Association between perceived stress score and selected variables

To determine if there were any significant differences in PSS scores for particular socio-demographic and behaviorally-related personal characteristics between groups, an independent sample *t*-test, and a one-way ANOVA test were used. There were no significant differences in total scores between age group, sex, changes in house income, types of news preferred during the lockdown, frustration due to lockdown, and knowledge of COVID-19. However, there were statistically significant differences in the PSS score (*t*-statistic = -3.776, p <0.001), with respondents with COVID-19 infection having a mean score (M = 24.42, SD= ± 3.41) that was greater than those who were uninfected (M = 22.73, SD = ± 3.614) (**Table 6**).

Table 4. Level of perceived stress among respondents based on the obtained score.

Variables	No. of Items	Range Score	Total Score Mean (SD)	Frequency	%
Level of stress					
Low Stress	10	0-13	23.44 ± 3.62	4	1.5
Mild Stress		14-26		185	72.3
Severe Stress		26-40		67	26.2

Table 5. Mean Scores and Standard Deviations for Coping Strategies in BRIEF-COPE Scale.	
BRIEF-COPE Subscales	**Mean (SD)**
Avoidant coping	1.89
Self-distraction	3.01 ± 0.59
Denial	1.69 ± 0.78
Substance use	1.37 ± 0.61
Behavioral disengagement	1.67 ± 0.64
Venting	2.01 ± 0.56
Self-blame	1.58 ± 0.62
Approach coping	2.55
Active coping	2.41 ± 0.56
Emotional support	2.53 ± 0.54
Use of informational support	2.60 ± 0.68
Positive reframing	2.52 ± 0.64
Planning	2.48 ± 0.54
Acceptance	2.75 ± 0.61
Standing one's ground coping	2.05
Humor	1.52 ± 0.65
Religion	2.58 ± 0.68

Table 6. Comparison of PSS scores between selected variables using t-test and ANOVA test			
Variables	**Mean (SD)**	***F***	***P***
Age			
≤ 20	22.8987 ± 4. 06	-1.488*	0.139
≥ 21	23.678 ± 3.38		
Sex			
Female	23.7193 ± 3. 043	1.150*	0.251
Male	23.21 ± 4.02		
Change in household income			
Yes	23.6257 ± 3.29	-1.146*	0.254
No	23 ± 4.27		
Primarily heard/seen/read about COVID-19 News on Social-media during past three months			
Infectious rate	23.6 ± 3.79	0.484	0.618
Death rate	23.55 ± 2.68		
Preventive measures	23.042 ± 4.1		
Talk/chat with friend on online during pandemic			
Talked with no one	3.29 ± 0.42	0.253	0.777
2 Times	3.18 ± 0.32		
More than 2 times	4.17 ± 0.41		

Infected by COVID-19 (Positive COVID-19 infected test)			
Yes	24.42 ± 3.4	-3.776*	<0.001**
No	22.73 ± 3.61		
Frustrated by the isolation and quarantine measures taken by the government			
Yes	23.07 ± 3.64	0.992*	0.322
No	23.57 ± 3.61		
Knowledge about COVID prevention			
Basic	23.45 ± 3.41	0.082*	0.935
Everything	23.41 ± 3.94		
**t*-statistic value*			

Correlations between coping strategy and perceived stress

The Spearman correlation coefficient was used to measure the association between coping strategies and perceived stress. Avoidant and approach coping (r = 0.328, p<0.001) showed a statistically significant correlation. Similarly, standing one's ground showed a statistically significant correlation with Avoidant and Approach Coping (r=0.532, p<0.001). The PSS score was correlated with denial (r = -0.191, p = 0.002), positive reframing (r = -0.147, p = 0.019), and religion (r = -0.175, p = 0.005). These correlations are weak and negative (**Table 7**).

Table 7. Result of the Spearman rank correlation test measuring the association between coping and perceived stress scores.

Coping strategies	PSS score	P value
Avoidant coping		
Self-distraction	0.056	0.370
Denial	-0.191**	0.002
Substance use	-0.045	0.470
Behavioral disengagement	-0.018	0.770
Venting	-0.004	0.943
Self-blame	0.076	0.228
Approach coping		
Active coping	-0.122	0.05
Use of emotional support	0.045	0.470
Use of informational support	-0.013	0.842
Positive reframing	-0.147*	0.019
Planning	-0.083	0.186
Acceptance	0.055	0.384
Standing one's ground coping		
Humor	-0.088	0.162
Religion	-0.175**	0.005

** Correlation is significant at the 0.05 level (2-tailed)*
** Correlation is significant at the 0.01 level (2-tailed)

Discussion

Overall, the study aimed to provide insights into the psychological impact of the COVID-19 outbreak on young individuals and how they cope with stress during the pandemic. Specifically, the study sought to examine the level of stress experienced by respondents and their coping strategies. Additionally, the study aimed to determine if there were any significant differences in PSS scores based on selected socio-demographic and behaviorally related personal characteristics.

In our study, 72.3% of the respondents had a mild level of stress. This finding was similar to the previous studies [1,35]. However, studies conducted in Vietnam among students of public health and preventive medicine and among nursing students in Nepal reported higher levels of stress [2,6]. It may be due to different settings and populations. In our study, 26.2% of the respondents reported high stress which is consistent with the study in Nepal [39] but lower than the levels reported in a study conducted in Saudi Arabia (30.2%) [40] and in Jimma University, Ethiopia, among undergraduate health science students (35.9%) [26]. These differences in findings may be due to variations in the time of the study and sample size.

Effective coping techniques are crucial during crises like COVID-19 for controlling anxiety and developing resilience, as the type of coping employed may have varying effects on health outcomes [26]. In our study, the mean score for approach coping strategies was higher than for avoidant coping strategies, similar to a study conducted in Vietnam where respondents had a higher mean score for approach coping than for avoidant coping [6]. Similarly, a study conducted in Nepal during COVID-19 using the same tool (BRIEF-COPE

28) found that nursing respondents mostly used approach coping strategies rather than avoidant coping strategies [2]. Our study reported subscale Religion as one of the most used coping mechanisms, which was consistent with the findings of other studies [41,42]. A study done among residents of the UAE reported positive religious coping was inversely related to psychological disorders [43]. However, a study conducted among Public Health and Preventive Medicine Students in Vietnam reported a preference for avoidant coping strategies [6]. In our study, substance use was the least preferred coping strategy, which is consistent with the findings of previous studies [35].

We found that stress scores did not significantly differ by respondents' characteristics, such as age and sex, which is consistent with previous studies [35,44]. Moreover, we observed a significant difference in PSS scores between those who were infected and those who were not infected, similar to the results of a prospective and cross-sectional study conducted among hospital patients [45,46]. In the current study, avoidant and approach coping were significantly correlated, which is similar to the findings reported in previous studies [47]. Our study showed a significant correlation between avoidant and standing one's ground coping mechanism. Furthermore, our study showed religion had a negative correlation with perceived stress which was consistent with other studies [48-50].

Limitations

The study focused on utilizing a questionnaire to examine the stress levels and coping strategies employed by students during the COVID-19 pandemic, nearly one year later. However, it is important to acknowledge the potential presence of recall bias in the study [51,52]. Additionally, since this cross-sectional study was limited to students from colleges of only one university, it is necessary to exercise caution when generalizing the findings to a larger population due to the constraints of the study area and sample size. Moreover, this research was descriptive in nature, therefore, attributions of causation between variables cannot be performed.

Conclusion

Based on our findings, almost all the respondents reported experiencing stress during the COVID-19 pandemic. We observed a significant difference in the Perceived Stress Scale (PSS) score between respondents who were infected with COVID-19 compared to those who were uninfected. However, no significant differences were observed in other variables such as age group, sex, changes in household income, types of news preferred during the lockdown, frustration due to lockdown, and knowledge of COVID-19. Further research with a larger sample size is necessary to investigate this issue more comprehensively. Additionally, we found a negative correlation between coping strategies and stress scores, indicating that effective coping strategies can help reduce stress levels and improve overall well-being. Negative correlations with denial, positive reframing, and religion suggest that people who use these coping strategies might experience lower perceived stress levels, although the associations are not very strong. Therefore, we recommend that concerned authorities raise awareness among students about stress and coping strategies to help them cope with the pandemic-induced stress. Further research with a larger sample size is necessary to investigate this issue more comprehensively.

Conflict of Interest

The authors declared that they have no competing interest.

Data Availability

The data used to generate the findings of this study will be available from the corresponding author with the reasoned requests.

Acknowledgement

We would like to express our sincere gratitude and thanks to all college principals and administration for granting us permission to collect the data. Our sincere thanks also extend to the Yeti Health Science Academy-Institutional Review Committee for providing ethical clearance. Additionally, we would like to thank all the participants for their valuable time.

Ethical Approval

Ethical approval for this study was obtained from Yeti Health Science Academy's Institutional Review Committee (Ref No. 2078-79-97). Permission to conduct the study was also obtained from the college authority. Before data collection, the purpose of the study was explained to the respondents, and written consent was obtained. None of the respondents were forced to participate in the study, and the information they provided was kept confidential.

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Author's Contribution

AT generated the concept, data collection, and preliminary writing of the manuscript. RK supervised the data collection, performed statistical analysis, and reviewed the manuscript. MK aided in reviewing and editing the first draft and finalized the manuscript and all authors contributed to the literature review, the writing of the final version of the manuscript, and the approval of the final manuscript.

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