

ORIGINAL RESEARCH ARTICLE

DEPRESSION, ANXIETY, STRESS AND BEHAVIORAL RESPONSE RELATED TO COVID-19 PANDEMIC AMONG GENERAL POPULATION

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ABSTRACT

Background: Since the December 2019, a novel corona virus disease (COVID-19) first identified in China, spreading around the world and infected millions of people. This pandemic has severely affected the socio-economic and mental health status of people due to lockdown and great uncertainty of elimination of the virus. This study aim to identify the depression, anxiety, stress and behavioral response related to COVID-19 pandemic among general population of Kathmandu Valley.

Methods: A descriptive cross sectional study carried out using convenient sampling during COVID-19 Pandemic. Data was collected by using structured standard DASS 21 scale. The SPSS version 22 was used to analyze data.

Results: There were total 411 general people participated, among them 25.3%, 22.9%, and 11.9% had mild to extreme severe level of depression, anxiety and stress respectively were prevalent. There is a statistical significant association between marital status, educational level and level of depression at 95% confidence level (p value < 0.05). Majority of respondents had change their behavior as maintaining hand hygiene, wore a mask and had limited physical contact with people. There is a statistical significant between age, gender and level of education with recently avoiding smoking and drinking related behavior.

Conclusions: This study concludes that the general population had depression, anxiety and stress because of the fear of getting infection; people were more likely change their behavior to prevent the risk of infection. This study suggests addressing the need of mental health services such as counseling, hotline services and desk by the stakeholders to promote mental wellbeing of people.

INTRODUCTION

COVID-19 has been declared pandemic by the World Health Organization (WHO) and the potential risk of corona virus disease is spreading rapidly. The global challenge for the treatment of this disease till date may generate stress and anxiety among the people.¹ Stress during the outbreak of contagious diseases may include fear and worry about health of individual and family.²

The significant increase in mental health issues and suicides has been noticed even in lockdown.^{3,4} A pandemic emergencies observed various psychological problems among the public.⁵ The numbers of cases are growing rapidly and people from all provinces are infected with COVID-19.⁶ Most of those who have tested positive are returnees from abroad. At present, investigations and contact tracing is ongoing and there is widespread community transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) within Nepal.⁷

The primary objective was to assess depression, anxiety, stress and behavioral response and its association with variables

related to COVID-19 pandemic.

METHODS

A quantitative, cross-sectional descriptive study was conducted among the general people of Kathmandu valley from 14th June to 27th June 2020. A temporary and permanent resident of Kathmandu valley was included in the study. All the general people more than 18 years; those who have access to the internet were included in the study. Healthcare professionals were excluded from the study. The sample size was 411 calculated at 95% confidence interval taking 5% allowable error and 10% non-response rate based on 57.7% used in similar study conducted in Pakistan during COVID-19 pandemic.⁸ The non-probability convenient sampling technique was used to collect data.

The online self-administered questionnaire was based on standard validated Depression, Anxiety and Stress Scale (DASS 21) tool to measure depression, anxiety and stress.⁹ The DASS-21- 21 Items is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of three items consists 7 items

and in total 21 items were assessed. Scores for depression, anxiety and stress were calculated by summing the scores for the relevant items. 4 points rating scale was used for depression, anxiety and stress related statement, where 0 score for did not apply, 1 score for applied to some degree, 2 score for applied to a considerable degree and 3 score for applied much. Scores on the DASS-21 was multiplied by 2 to calculate the final score.

In regard to behavioral responses, self-constructed questionnaire were based on reviewing literature.^{1,8,10,11,12} Pretesting was done among the 10% of total sample size and those who were included in pretesting were excluded in actual study. Internal consistency of instrument was established by Cronbach's alpha. A value of Cronbach's alpha of Depression, anxiety and stress was 0.9.

Data was collected by researcher herself using structured, online self-administered questionnaire in Nepali version. The questionnaires were made available online through Google forms. The link of the questionnaire was sent through social media (Facebook, messenger and viber) to the contacts from the investigators. A consent form was attached before our questionnaire. A written approval was taken before data collection and the participants were directed to the socio-demographic information, then information related to depression, anxiety, stress and behavioral changes questionnaire respectively. The period of data collection was 2 weeks.

The data were processed using Statistical package for social science (SPSS version 22). The data were analyzed using descriptive statistics such as frequency, percentage, mean and standard deviation. The inferential statistics, chi square was used to test association between socio-demographic variables with depression, anxiety and stress. Ethical approval was obtained from ethical review board (ERB), Nepal Health research Council (NHRC) before data collection. The objective of the study was explained to respondents through online method due to lockdown all over the country and written consent was taken from each respondent before data collection. Confidentiality of all the data was maintained. Anonymity was maintained by not including the name and not mentioning any other identification of respondents in questionnaire forms. Even a researcher has not taken any email or any contact number from the settings of Google forms.

RESULTS

There were 411 respondents included in the study, 321 (78.1%) belongs to less than 35 years of age, mean age 30.42±7.86, range 19-66 years, 208 (50.6%) were male, 206 (50.1%) were married and 327 (79.6%) were graduates (Table 1).

Most of the respondents 307 (74.7%) were normal and 3 (0.7%) had extremely severe level of depression. A few respondents 7(1.7%) had extremely severe level of anxiety and 362(88.1%)

were normal and only 1 (0.2%) had extremely severe level of stress (Table 2).

Table 1: Demographic characteristics of respondents (n=411)

Variables	Number (%)
Age groups	
<35 years	321 (78.1)
≥35 years	90 (21.9)
Mean±S.D: 30.42±7.86	
Gender	
Male	208 (50.6)
Female	203 (49.4)
Marital Status	
Married	206 (50.1)
Unmarried	202 (49.1)
Divorced	3 (.7)
Level of Education	
Graduates	327 (79.6)
Undergraduates	84 (20.4)

Table 2: Level of depression, anxiety and stress (n=411)

Level	Number (%)
level of depression	
Normal	307 (74.7)
Mild	60 (14.6)
Moderate	31 (7.6)
Severe	10 (2.4)
Extremely severe	3 (0.7)
level of Anxiety	
Normal	317 (77.1)
Mild	25 (6.1)
Moderate	51 (12.4)
Severe	11 (2.7)
Extremely severe	7 (1.7)
Level of Stress	
Normal	362 (88.1)
Mild	28 (6.8)
Moderate	16 (3.9)
Severe	4 (1)
Extremely severe	1 (0.2)

In reference to level of depression there is a significant association between marital status (where p value 0.044) and educational level (where p value 0.041). Regarding the level of anxiety and stress there is no any significant association with socio-demographic variables (Table 3).

Table 3: Association of independent variables with level of depression, anxiety and stress (n=411)

Variables	Level of Depression		P value	level of Anxiety		P value	Level of Stress		P value
	Normal	Mild to Extreme Severe		Normal	Mild to Extreme Severe		Normal	Mild to Extreme Severe	
Age groups									
<35	236 (73.5)	85 (26.5)	0.301	244 (76.0)	77 (24.0)	0.309	281 (87.5)	40 (12.5)	0.524
≥35	71 (78.9)	19 (21.1)		73 (81.1)	17 (18.9)		81 (90.0)	9 (10.0)	
Gender									
Male	149 (71.6)	59 (28.4)	0.148	157 (75.5)	51 (24.5)	0.421	177 (85.1)	31 (14.9)	0.059
Female	158 (77.8)	45 (22.2)		160 (78.8)	43 (21.2)		185 (91.1)	18 (8.9)	
Marital status									
Married	165 (78.9)	44 (21.1)	0.044	168 (80.4)	41 (19.6)	0.110	187 (89.5)	22 (10.5)	0.374
Unmarried	142 (70.3)	60 (29.7)		149 (73.8)	53 (26.2)		175 (86.6)	27 (13.4)	
Education level									
Graduates	237 (72.5)	90 (27.5)	0.041	247 (75.5)	80 (24.5)	0.129	284 (86.9)	43 (13.1)	0.130
Undergraduates	70 (83.3)	14 (16.7)		70 (83.3)	14 (16.7)		78 (92.9)	6 (7.1)	

Chi square test used, P- Value <0.05

There is a statistical significant association between socio-demographic variables such as gender and behavioral response as hand washing with soap and water or using sanitizer. Likewise, there is significant association between age and recently avoiding smoking. Similarly there is an association between

gender and limited physical contact with people, avoiding social media that made anxious, maintaining social distancing, avoid touching eyes, nose and mouth and recently avoiding alcohol (Table 4).

Table 4: Association between age, gender and behavioral response (n=411)

Behavioral response	Age		p-value	Gender		p-value
	<35	≥35		Male	Female	
Hand hygiene	307 (77.7)	88 (22.3)	0.536*	205 (51.9)	190 (48.1)	0.019*
Wearing mask	314(77.7)	90 (22.3)	1.000*	207 (51.2)	197 (48.8)	0.119*
Limited physical contact	291 (77.2)	86 (22.8)	0.202*	198 (52.5)	179 (47.5)	0.010
Avoiding social media	190 (78.5)	52 (21.5)	0.812	149 (61.6)	93 (38.4)	.000
Social Distancing	292 (77.7)	84 (22.3)	0.477	197 (52.4)	179 (47.6)	0.018
Avoid touching eyes, nose	296 (78.3)	82 (21.7)	0.734	197(52.10)	181 (47.90)	0.040
Adopted healthy lifestyle	276 (77.3)	81 (22.7)	0.319	186 (52.1)	171 (47.9)	0.120
Recently avoiding Smoking	51 (67.1)	25 (32.9)	0.027	28 (36.8)	48 (63.2)	0.000
Recently avoiding Alcohol	87 (70.7)	36 (29.3)	0.061	52 (42.3)	71 (57.7)	0.000

Note: Number indicates yes response, chi-square used where p value is significant <0.05, *continuity correction

Table 5: Association between marital status, educational level and Behavioral response (n=411)

Behavioral response	Marital status		p-value	Education level		p-value
	Married	Unmarried		Graduate	Undergraduate	
Hand hygiene	209 (50.9)	202 (49.1)	0.141	314 (96.00)	13 (4.00)	1.000*
Wearing mask	205 (50.7)	199 (49.3)	0.739**	321 (79.40)	83 (20.50)	1.000*
Limited physical contact	194 (51.5)	183 (48.5)	0.412*	296 (78.5)	81 (21.5)	0.126*
Avoiding social media	122 (50.4)	120 (49.6)	0.832	187 (77.3)	55 (22.7)	0.168
Social Distancing	191 (50.8)	185 (49.2)	0.943	297 (79.0)	79 (21.0)	0.351
Avoid touching eyes, nose	193 (51.1)	185 (48.9)	0.784	302 (79.9)	76 (20.1)	0.571
Adopted healthy lifestyle	182 (51.0)	175 (49.0)	0.893	171 (47.9)	186 (52.1)	0.120
Recently avoiding Smoking	39 (51.3)	37 (48.7)	0.572	49 (64.5)	27 (35.5)	0.001
Recently avoiding Alcohol	65 (52.8)	58 (47.2)	0.435	90 (73.2)	33 (26.8)	0.104

Note: Number indicates yes response, chi-square used where p value is significant <0.05, *continuity correction,

****likelihood ratio**

Moreover, there is a statistical significant association between levels of education with recently avoiding smoking related behavior (Table 5).

DISCUSSION

A present study reported that nearly one fourth of the respondents had sometimes worried about situations in which they might panic and they were almost always close to panic. The findings is similar to the study conducted in Pakistan where nearly half of the respondents were panic and worried about the situations.⁸ Most of the respondents being worried for themselves and their close ones and worried about their family to get infected which contradicts the finding of recent study.^{8,13} The present study shows that more than one fourth respondents (28.7%) felt scared without any good reason, this is in contrast to the findings of the study conducted in India reported that 41 % respondents reported feeling scared when some near people became sick.¹⁴

The current study shows one fourth respondents 104 (25.3%) had mild to extremely severe level of depression. Similar findings of one-fourth of the respondents were moderate to extremely severe depressed¹⁵ likewise, finding of the study conducted in china reported moderate to severe depression.¹⁶ The recent findings are consistent with another similar finding of the study as 15.02% had depression.¹⁷ The other study shows depressions were found to be mild which is inconsistent with present study.¹⁸

The present study shows mild to extreme severe level of anxiety were common among general people. Similar findings have been reported moderate to severe anxiety.^{15,16} In contrast to this study, high level of anxiety were reported due to the COVID-19.¹⁴ A study conducted in Pakistan shows that the two third respondents feel anxious which is inconsistent with the results of present study.⁸ The present study revealed mild to extreme severe level of stress was prevailing among the general people. Similarly findings have been reported as 41 (11.6%) were stressed.¹⁵ Likewise the findings of another study also support that 8.1 % had moderate-to-severe stress among general population related to COVID-19.¹⁶ In contrast to the study stress level were found to be mild only.¹⁸

In current study it is evident that there is a statistical significant association between marital status, educational level and level of depression at 95% confidence level (p value < 0.05) where unmarried and highly graduates had mild to extreme severe level of depression. The finding may also be supported to evidence in the international literature as unmarried is consistently found an association with high level of depression.¹⁹ In contrast to the present study, a study from India evident that both male and female were found to be associated mild depression.¹⁸ similarly, female gender had high level of depression and a study from Italy reported that undergraduates, female and unmarried were associated with higher level of depression which is also not consistent with current study.^{13, 19, 20}

The current study identified that there is no statistically significant association between age, gender, marital status,

educational level and level of anxiety and stress. The finding of similar literature shows gender, young age, undergraduates are associated with moderate level of anxiety and mild stress which is inconsistent with the result of present study.^{13,15,18, 19,20} Similarly a study conclude that >35 years of age, Male, graduates felt more anxiety level. This finding is contrary to our research which established age, gender and educational level are not association.⁸

The findings of current study also shed light on behavioral change to protect from spreading the transmission of infection related to COVID-19. A recent study conclude that 113 (27.5%) of the respondents perceived that they were highly susceptible for having COVID-19. A similar finding has reported 17.8% respondents think that they were more susceptible of getting new influenza.²¹

The present study yield the majority of respondents wash their hands with soap and water frequently or use sanitizer, started to wear a mask while going outside and limited with the physical contact of people, reduced to go to health facilities, social distancing, more than half respondents were avoiding social media due to the fear of COVID -19 Pandemic. Like ours, several literatures reported the similar findings. Similarly a study from Pakistan reported majority wash hands more often and use hand sanitizer, wore a mask, reduced physical contact with people, avoided to visit to healthcare facilities and one-third started to avoid social media. Majority had used a protective measure.^{8,11,12, 21, 22} In this study the larger number of respondents adopted healthy lifestyle (physical activity, eating healthy foods, and regular exercises, using preventive measures to control stress and proper rest and sleep), avoiding touching eyes, nose and mouth while coughing, avoid touching face and mouth, had never smoked and recently avoiding smoking and consumption of alcohol because of COVID-19. These finding were very similar to research conducted in Bangladesh and Spain, which observed increase in physical activity, rest and sleep, avoided alcohol and smoking consumption.^{22,23}

Our study revealed statistical significant association between socio-demographic variables such as gender and behavioral response as hand washing with soap and water or using sanitizer, limited physical contact with people, avoiding social media that made anxious, maintaining social distancing, avoid touching eyes, nose and mouth and recently avoiding alcohol because of corona virus disease. A study from Pakistan reported that there is a significant association between age, gender with avoiding social media and hand hygiene respectively.⁸

The recent study highlighted that a statistical significant between age, gender and level of education with recently avoiding smoking related behavior. The findings are similar to the study conducted in Malaysia during the outbreak of Influenza, indicates the significant association between age and health protective behavior.^{11,22} However, age, gender and educational levels had no any association with use of face mask and cancelled all the plans. The findings linked to the evidence with the literature of Malaysia and Pakistan.^{8,11}

The possible implication of the outcomes of present study could contribute in planning the policies to the Nepal government. The results of the study have implications for future COVID-19 communication, educational activities and online psychological intervention services and to conduct further studies.

The possible limitation of the study includes firstly, the results may depend on the truthfulness and accuracy of participant's response. Secondly, only Kathmandu valley has been undertaken in this study thus the findings of research study may not be generalized to the entire population. Thirdly, the study participants included those who have only internet access.

CONCLUSION

The findings of the study show that one fourth general people

had mild to extreme severe level of depression and anxiety and half of one fourth had mild to extreme severe level of stress. Similarly, socio-demographic characteristics such as marital status, educational level had significant association with level of depression. Higher use of health protective measure was observed to prevent from corona virus diseases.

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