Original Research

THE SILENT STRUGGLE: DEPRESSION AND ITS DETERMINANTS AMONG ADULTS IN THE WAKE OF THE COVID-19 PANDEMIC IN DELHI

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ABSTRACT

Introduction: The beginning of 2020 flooded with news of coronavirus disease 2019 (COVID-19) throughout the world. Many countries have shown higher rates of depression, anxiety, hazardous and harmful alcohol use, and lower mental well-being than usual ratio. Hence, this study was planned to assess the prevalence of depression and its determinants among adults living in Delhi during the COVID-19 pandemic. **Methods:** A cross-sectional study was conducted during May and June 2020 on adults more than 18 years of age living in Delhi. A total of 267 respondent's data were collected and analyzed. Data were collected using a pre-tested, semi-structured questionnaire, and the Patient Health Questionnaire-9 (PHQ) scale was used to assess depression. Mann Whitney and Kruskal Wallis tests were used to check the association of depression with socio-demographic, behavioral, and COVID-19-related factors. **Results:** Out of 267 subjects around 61% were males, 61.8% were above 30 years of age and around 88% were living in urban areas. The prevalence of depression among the general population was found to be significantly high at 79.8%. Depression score was significantly higher among females (p=0.024), in the younger age (<30 years) (p <0.001), in the unmarried group (p<0.001), and among non-smokers (p=0.006). Respondents who had undergone COVID-19 testing (p =0.018), been quarantined (p =0.009), come into contact with COVID-19-positive patients (p =0.030) and who were scared of working during the pandemic (p<0.001) reported high levels of depression. **Conclusion:** The study showed high depression among the adult population during the COVID-19 pandemic. Improving mental health screening, counselling sessions, and rehabilitation could be pivotal in addressing this challenging period.

Keywords: Depression, COVID-19, Mental health, Delhi.

Introduction:

The beginning of 2020 flooded with news of coronavirus disease 2019 (COVID-19) worldwide. In December 2019, an outbreak of what initially appeared to be a common case of pneumonia was documented in Wuhan, China. Subsequent investigations revealed it to be caused by a novel virus known as Coronavirus. This new illness was officially designated as COVID-19 by the World Health Organization (WHO) on February 11, 2020 (Wu et al., 2020). Between January 2020 and March 2020, in just three months, the disease rapidly extended its reach, affecting over 110 countries and reaching virtually all Western nations (WHO, 2019). Consequently, the World Health Organization (WHO) proclaimed COVID-19 as a pandemic on March 11, 2020 (Cucinotta & Vanelli, 2020; Dhama et al., 2020). By March 8, 2021, the global tally stood at more than 117 million confirmed cases and over 2.5 million fatalities, as reported by the Johns Hopkins Coronavirus Resource Center (Johns Hopkins University, 2020).

The high transmission capability, high mobility, and mortality of the virus raised concern worldwide (Huang et al., 2019; Chen et al., 2019; Phelan et al., 2020; Li et al., 2020)). To limit its transmission speed, many countries enforced rules and laws to constraint public life, including international and local travel bans, suspension of public transport, bans on large gatherings, shutdown of schools and universities, termination of businesses, social distancing, curfews and stay-at-home orders (Khatatbeh M., 2020).The overall result of these restrictions paralyzed the social interactions among people and immobilized the educational and economic sectors; on the other hand, the healthcare systems were flooded by an increasing number of new cases day by day (Armitage & Nellums, 2020; Gupta et al., 2020).

It is also a well-known fact from history that pandemics pose a threat to mental health (The Lancet, 2020; Liang et al., 2020).The unpredictability and terror associated with the virus outbreak, along with mass lockdowns, limited social interactions and economic crunch, are predicted to cause increases in mental disorders as well as suicide. One of the studies by McIntyre and Lee (2020) reported a projected increase in suicide from 418 to 2114 in Canadians associated with joblessness; the rising course of suicide was also reported in the USA, Pakistan, and India, France, Germany, and Italy (Mamun & Ullah, 2020; Armstrong et al.). Few other independent studies also proclaimed an increase in psychological distress among the general population, persons with pre-existing mental disorders, as well as in healthcare workers (Hao et al., 2020; Tan et al., 2020; Wang et al., 2021; Qiu et al., 2020; Wang et al., 2020).

Many countries have shown that pandemics caused an increase in anxiety, depression, hazardous and harmful alcohol use, and lower mental well-being than usual (Zhou et al., 2020; Rajkumar, 2020; Chen et al., 2020).The first evidence indicates that women, younger people, and those with poor sleep quality are at an increased risk for mental health problems (Wang et al., 2021; Qiu et al., 2020; Wang et al., 2020; Zhou et al., 2020; Rajkumar, 2020; Chen et al., 2020, Vindegaard & Benros, 2020; Liu et al., 2020; Casagrande et al., 2020; Eskin et al., 2016).Therefore, this study was planned to assess the prevalence of depression among adults living in Delhi during the COVID-19 pandemic and to determine the factors associated with depression among the study subjects.

Methods:

A cross-sectional study was conducted during May and June 2020 on adults more than 18 years of age living in Delhi. The sample size was calculated using the formula $4pq/l^2$, Where, p = Prevalence, q = 100 – p, l = Error. To assess the extent of depression among adults, the sample size was determined based on a presumed depression prevalence of 28% among adults (Rajkumar, 2020), with a 95% confidence level and a margin of error of 6%. The resulting calculated sample size was 216. However, data from 267 subjects have been collected and analyzed.

Data collection

Data were collected using a pre-tested, semi-structured questionnaire prepared in English and translated to Hindi that includes demographic details like age, gender, religion, residence, education, occupation, marital status and type of family, the effect of COVID-19 lockdown on other activities like difficulty in managing food or other essential items was recorded. The effect of Covid-19 pandemic on other activities like health-related activities, number of meals, smoking, drinking, alcohol, substance use, physical activity, fear due to Covid-19, relationship with family members changed during lockdown, faced problems while accessing everyday essentials and services, was taken. The Patient Health Questionnaire-9 (PHQ) serves as a versatile tool for screening, diagnosing, monitoring, and measuring the severity of depression. Within the PHQ-9, which constitutes the depression module, each of the nine criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), is assigned a score ranging from "0" (not at all) to "3" (nearly every day). This instrument has been rigorously validated for use in primary care settings and was developed by medical professionals in the United Kingdom, drawing on substantial research evidence. Total scores of 5, 10, 15, and 20 on the PHQ-9 correspond to thresholds for identifying mild, moderate, moderately severe, and severe depression, respectively (Seby et al., 2011; Kroenke et al., 2003).

Data collection technique **-** The data was gathered via an online questionnaire created using Google Forms, and the link was circulated through various media. The subjects were contacted in person through their respective emails by sending them the link to the form. Those who do not have email addresses were contacted personally on their phone numbers by sending them the link through messages. Adults more than 18 years of age living in Delhi were eligible for the study. Respondents were included in the study if they had accepted the Google form link and agreed to participate in the online survey, after which a detailed questionnaire was opened. Individuals were again contacted through their emails or phone numbers to confirm if they had filled out the form. Subjects already diagnosed with depression or any other psychiatric disorder before the COVID-19 pandemic were excluded from the study.

Data Analysis- The data was recorded within Microsoft Excel, and statistical analysis was conducted using a trial version of the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL), version 27.0. Categorical data were assessed using proportions and percentages, while continuous data were summarized in terms of mean and standard deviation (SD). Normality has been checked by applying the Kolmogorov Smirnov test. Independent sample Mann-Whitney test was applied to check the distribution of depression levels among respondents across various socio-demographic, behavioural and Covid-19 related factors. Kruskal Wallis test was applied to check the distribution of depression

with change in the relationship during the COVID-19 pandemic among the respondents. A p-value less than 0.05 were considered statistically significant for all analyses.

Results

Data of total 267 subjects were analyzed, more than three-fifths of the respondents who participated in the survey were male and above 30 years of age. The mean age of the respondents was 34.51± 11.08 years. 89% of the respondents belong to the Hindu religion. More than three-fifths of the respondents live in a nuclear family. A total of 88% of the respondents live in urban areas. Around 65% of the respondents have ever married. More than 90% of the respondents had education graduates & above. The prevalence of depression among the general population was found to be significantly high at 79.8% [Table 1].

Table 1: Socio-demographic and background characteristics of the respondents (N=267).

Variables	**N (%)**
Gender	
Male	164 (61.4)
Female	103 (38.6)
	Mean ±SD
Age	34.51±11.08
Up to 30 years	102 (38.2)
30+ years	165 (61.8)
Religion	
Hindu	238 (89.1)
Others	29 (10.9)
Resident	
Rural	32 (12.0)
Urban	235 (88.0)
Type of Family	
Nuclear	164 (61.4)
Joint	103 (38.6)
Marital Status	
Ever Married	173 (64.8)
Never Married	94 (35.2)
Educational Status	
Below Graduation	26 (9.7)
Graduation & above	241 (90.3)
Occupation	
Unemployed	47 (17.6)
Skilled & clerical	29 (10.9)
Semi-profession	43 (16.1)
Profession	148 (55.4)
Have lockdown affected your source of Income?	
Yes	112 (41.9)
No	155 (58.1)
Prevalence of depression	213 (79.8%)

This study showed no significant difference in depression scores among religion, residence, type of family, educational status, and occupation. Depression score was significantly higher among females (p=0.024), in the younger age (<30 years) (p<0.001), and in the unmarried group (p<0.001) [Table 2].

Table 2: Association between socio-demographic factors and depression among respondents (N=267).

Variables	Depression Score Mean± S.D.	p-value
Gender		
Male	4.90± 5.19	0.024
Female	6.78± 6.28	
Age		
Up to 30 years	7.33 ± 5.83	<0.001
30+ years	4.57 ± 5.37	
Religion		
Hindu	5.63 ± 5.72	0.942
Others	5.55 ± 5.63	
Resident		
Rural	6.09 ± 6.88	0.712
Urban	5.56 ± 5.54	
Type of Family		
Nuclear	5.78 ± 5.71	0.466
Joint	5.38 ± 5.70	
Marital Status		
Ever Married	4.72 ± 5.34	<0.001
Never Married	7.29 ± 6.00	
Educational Status		
Below Graduation	6.77 ± 5.44	0.141
Graduation & above	5.50 ± 5.73	
Occupation		
Unemployed	6.68 ± 5.84	0.087
Skilled &clerical	3.41 ± 3.78	
Semi-profession	5.63 ± 6.48	
Profession	5.72 ± 5.67	
Have lockdown affected your source of Income?		
Yes	6.63 ± 6.20	0.035
No	4.90 ± 5.22	

There is no significant difference in depression score among alcohol Intake, substance use, proper meal intake, and physical activity. However, depression scores among non-smokers were significantly higher than smokers (p value=0.006) [Table 3].

Table 3: Association between behavioral factors and depression among respondents (N=267).

Variables	Depression Score	p-value

	Mean± S.D.	
Smoking Status		
Yes (118)	4.62 ± 5.28	0.006
No (149)	6.42 ± 5.91	
Alcohol Intake		
Yes (150)	5.21 ± 5.53	0.230
No (117)	6.15 ± 5.90	
Substance Use		
Yes (141)	5.19 ± 5.65	0.146
No (126)	6.11 ± 5.75	
Taking proper meal		
< 3 proper meals (124)	5.64 ± 6.01	0.612
3 proper meals (143)	5.62 ± 5.44	
Physical activity		
Active (253)	5.74 ± 5.71	0.060
Sedentary (14)	3.64 ± 5.46	

Respondents who had undergone COVID-19 testing (p =0.018), been quarantined (p =0.009), and come into contact with COVID-19-positive patients (p =0.030) reported high levels of depression. Respondents staying alone or away from home were more depressed than respondents staying with their families, although the difference was not significant [Table 4].

Table 4: Association of depression with various Covid-19-related factors among the respondents (N=267).

Variables		Depression Score Mean± S.D.	p-value
Do you feel risky working during Covid-19 pandemic?			
Yes (206)		6.26 ± 5.92	<0.001
No (61)		3.48 ± 4.29	
Have you ever come in contact with Covid19 patient?			
Yes (10)		10.00 ± 7.85	0.030
No (191)		4.71 ± 4.98	
Have you ever been tested for Covid19?			
Yes (14)		9.07 ± 6.63	0.018
No (253)		5.43 ± 5.60	
Have you ever been tested positive for Covid 19 Pandemic?			
Yes (1)		-	0.037
No (266)		5.57 ± 5.63	
Have you ever been quarantined during Covid 19 pandemic?			
Yes (28)		8.71 ± 6.90	0.009
No (239)		5.26 ± 5.45	
Where are you staying during Covid 19 pandemic?			
Alone/Outside Home (41)		6.97 ± 6.51	0.173
With Family (226)		5.38 ± 5.52	
Are you able to meet your family during Covid-19 pandemic?			
Yes (202)		5.38 ± 5.55	0.225
No (65)		6.40 ± 6.13	
What are your fears due to Covid-19?			
Fear of Infection	Yes (159)	5.42 ± 5.63	0.373
	No (108)	5.93 ± 5.82	
Fear of Death	Yes (68)	7.43 ± 5.91	0.001
	No (199)	5.01 ± 5.51	
Fear of infecting family members	Yes (166)	6.33 ± 5.37	<0.001
	No (101)	4.48 ± 6.06	

Fear of isolation/quarantine	Yes (48)	8.02 ± 7.05	0.007
	No (219)	5.10 ± 5.24	
Fear of facing disrespect/rejection from neighborhood or non-medicos	Yes (44)	10.02 ± 7.57	<0.001
	No (223)	4.76 ± 4.82	

Respondents who felt that their relationship with their spouse/partner worsened during the COVID-19 pandemic were more depressed than those who had no change or improvement in their relationship, although the difference was not statistically significant. Respondents who feel that their relationship with their parents ($p<0.001$), friends ($p=0.001$), and colleagues ($p=0.001$) worsened during the Covid-19 pandemic were significantly more depressed than those who had improved or no change in their relationship [Figure 1].

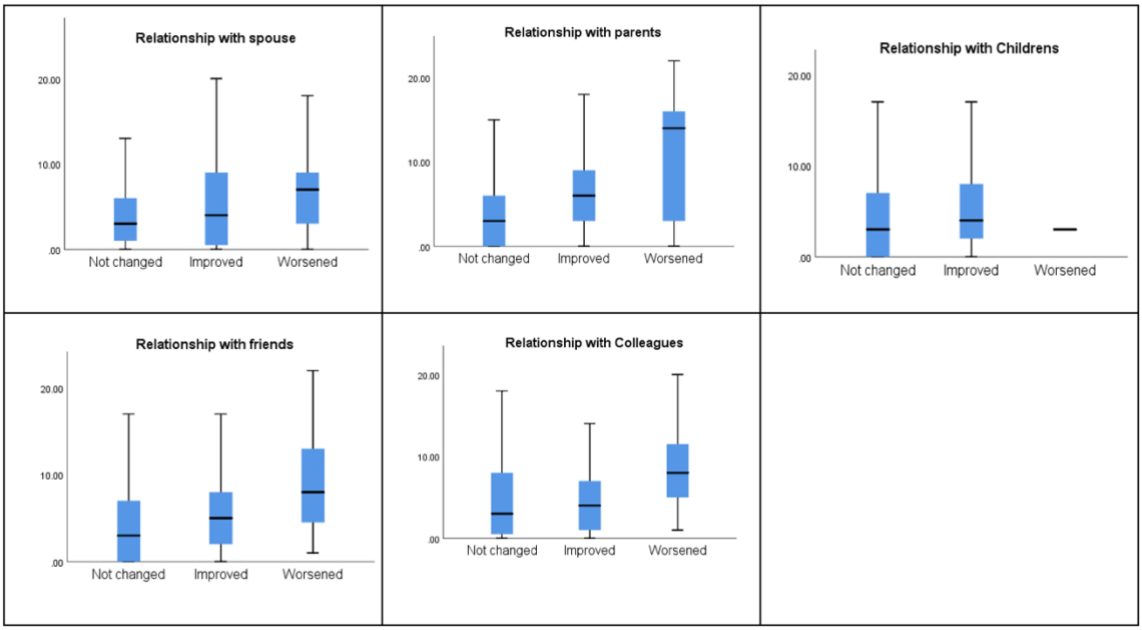

Figure 1: Association between depression and change in the relationship during the Covid-19 pandemic among the respondents

Problems faced during the COVID-19 pandemic: most of the respondents have faced problems while accessing plumber, carpenter, electrician, or barber services (82%). Seventy percent of the respondents have encountered an issue related to transport services accessibility. More than half (58%) of the respondents faced problems in visiting a doctor; however, 44.3%, 31.2%, 21.2%, and 17.4% of the respondents have faced difficulties in accessing other food items, vegetables and fruits, milk and dairy products and liquefied petroleum gas (LPG), respectively.

Discussion

A cross-sectional study was conducted to identify depression using the PHQ-9 scale among adult populations affected by the COVID-19 pandemic. A total of 267 participants responded and completed

the questionnaires. Similar to other studies conducted by Qiu et al., and Zhang et al., an increased magnitude of depression (79.8%) was found among the general population (Qiu et al., 2020; Zhang et al., 2020). High PHQ score was associated with gender, age, and the effect of lockdown on income. There was a significantly higher depression among the females compared to males, which is similar to the results found by other researchers who concluded that females are notably more susceptible to stress and have a higher likelihood of experiencing post-traumatic stress disorder (Qiu et al., 2020; Zhang et al., 2020; Sareen et al., 2013). Individuals under 30 years of age were significantly more depressed than older ones, as seen in other studies in China (Qiu et al., 2020; Cheng et al., 2014). Higher scores among the younger age group confirm evidence from previous research that young people obtain quite a lot of information from social media that can certainly trigger stress (Qiu et al., 2020; Cheng et al., 2014). A significantly high score was found among the unmarried group, which might be possible as they are comparatively less involved in household activities when compared with the married ones. About academic qualifications, those who have not graduated accounted for high PHQ scores. Some studies also have similar findings showing that people's psychological symptoms decrease with the increase in academic qualifications (Assari, 2018; Erickson et al., 2016). Compared to other occupations, the intensity of depression was found more among the unemployed strata, probably due to loss of income or low educational level. Consequently, when confronted with such an epidemic, they are at a greater risk of developing adverse psychological symptoms. Lockdown itself affects the loss of wages daily, leading to significantly high depression scores in this group.

This study showed no significant difference in depression scores among alcohol Intake, substance use, proper meal intake, and physical activity. However, we found a significant difference in the distribution of depression scores in the case of smoking status. Depression scores among non-smokers were significantly higher than among smokers. Although the difference is not statistically significant, respondents who consumed alcohol were less depressed than respondents who did not consume alcohol. Depression was high among the non-smokers/non-alcoholics, maybe because smoking/alcohol intake may be a psychological stress buster among these groups. Though the difference is not significant, those involved in active physical activity were comparatively more depressed than those with sedentary habits.

Respondents who felt risky working during the COVID-19 pandemic were significantly more depressed. Few other studies also showed that during the outbreak of infectious diseases, medical staff or other frontline workers working even in lockdown tend to show more intense anxiety, fear, and stigma than ordinary citizens (Tian et al., 2020; Curto et al., 2018; Kamara et al., 2017). Also, significantly high depression was found among the ones with a contact history with the positive patients indicating the fear of infection, and those who themselves tested positive indicating the fear of getting seriously ill or dying, and also among the quarantine group, which is consistent with other studies (Zhang et al., 2020). Although the difference was not significant, respondents staying alone or away from home were more depressed than respondents staying with their family, indicating that getting psychological and mental support from the family might decrease depression.

Nearly all the study subjects fear something or the other, which directly or indirectly affects their mental health. Fear of infecting other family members, fear of isolation/quarantine, and fear of facing disrespect/rejection from the neighborhood or non-medicos significantly affect mental health leading to a high PHQ score. Meanwhile, mental health is also impacted by the accessibility of local healthcare resources, the effectiveness of the regional public health infrastructure, and the preventive and control measures enacted in response to the epidemic, as demonstrated in previous research (Wind & Komproe, 2012; Lowe et al., 2015; Qiu et al., 2020).

Due to the complete lockdown majority of the population faces difficulties in managing daily living, which might adversely affect their mental health leading to high PHQ scores. More than 50% of the study subjects face difficulties in getting household help like electrical, plumber, carpentry, transport, visiting a doctor, etc. While getting the LPG/gas cylinder, medicines were among the minor ones.

Our study has some limitations; First, it's an online survey; hence the population reach is restricted to the people using the internet; moreover, usage of the internet or internet devices might be limited to the better socio-economic status of the population. Second, this study is subject to some recall bias. Third, this study could not establish a cause-and-effect relationship as it's a cross-sectional study; a longitudinal study would be recommended for the same.

Conclusion

The study showed high depression among the adult population during the COVID-19 pandemic. Particularly, unmarried women below 30 years experienced higher levels of depression. Respondents who had undergone COVID-19 testing, been quarantined, come into contact with COVID-19-positive patients, or felt at risk while working during the pandemic also reported high levels of depression. Mental health screening, counseling sessions, and rehabilitation could be pivotal in addressing this challenging period.

Conflicts of Interest

The authors declare no conflicts of interest.

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