

A Moderating Role of Indian Rural and Urban Environment on the Relationship Between Various Social Networking Sites and Anxiety and Depression during Covid-19

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ABSTRACT

Introduction: Since the outbreak of the COVID-19 disease, there is a remarkable escalation in anxiety and depression. The current study investigated the association between the usage of different social networking sites with anxiety as well as depression during COVID-19 pandemic in the context of India.

Methods: The research also assessed the moderating role of an urban and rural environment in the connection between the use of social networking sites with depression and anxiety. The depression and anxiety were associated with the usage of social networking sites, although the role of the urban and rural environment in the relationship between social media usage and mental well-being during COVID 19 is unclear. The sample of 691 Indian young adults ages 19 -30 and above was surveyed in the current study. Ordinal logistic regression models and hierarchical regression analysis were used.

Results: The result revealed that during COVID 19, the respondents who were located in the urban environment had significantly higher depression and anxiety symptoms as compared to the rural environment.

Conclusion: The environment has significantly moderated the relationship between the usage of social networking sites, time spent on social networking sites and anxiety and depression. These affiliations are found to be strong enough to be valuable for medical practitioners to ask people who are showing significant depression and anxiety symptoms about their environment and usage of different social networking sites and to counsel them concerning this component.

Keywords

Anxiety, Social networking sites, Depression, Facebook, Environment

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Introduction

COVID-19 is one of the deadly infectious disease erupted in December, 2019 in China (COVID-19 Situation Report – 94, 2020). At present, COVID-19 has infected more than 14 million people and 597,583 confirmed deaths worldwide (WHO, 2020). Currently, 1090545 people in India have been infected and 27497 deaths confirmed from the COVID-19 (Ministry of Health and Family Welfare, 2020). Government of India have given emphasis on physical distancing and wearing mask due to COVID-19 long incubation period and no curable medicines available (Linton et al. 2020). The current pandemic situation (COVID-19) has changed the lifestyle of the people throughout the globe. Till July, No vaccine has been developed, but there are 24 vaccine under the way in which some of them are in the clinical trial phase –I (COVID-19 vaccine development pipeline, 2020).

In this pandemic situation, social media is crucial to spread awareness about COVID-19 and safety measures to protect from this deadly virus. Apprehension and fear regarding a new disease and uncertainty of future can be devastating and can cause strong emotions. Nevertheless, the usage of social media has its own consequences. Ample amount of media information may increase the risk perception for messages creating panic by social media might have negative effect on digital users. This kind of information can influence the population's wellbeing and mental health.

Active Indian Facebook users have crossed 240-million, becoming the largest audience country in social networking sites, according to a media report (Next web report, 2017).

During the COVID-19 outbreak, youthful adults have been extensively using social networking sites. A study reported that more than 80% respondents were exposed to social networking sites in the COVID-19 situation in which social media exposure was positively related to elevated probability of anxiety (Gao et al., 2020).

Generally, the debate is going ahead on whether the usage of social networking sites aggravates or diminishes psychological disorders like anxiety and depression. Some studies have also revealed that social networking sites facilitate people to connect with potential stigmatizing mental health like anxiety and depression (Evans, 2008; Merolli et al., 2014). Nevertheless, COVID-19 outbreak had flooded the different health related information on the digital media which includes the fake news as well. Social media can fuel the misinformation and rumors due to underlying factors like fear, stigma and anxiety (WHO, 2019). Hence messages about COVID-19 may aggravate the depression and anxiety among population.

One important characteristic of development is urbanization. Approximately, 31% of the population in India is living in the urban environment and this is anticipated to rise from 410 million in 2014 to 814 million by 2050 (United Nations, Department of Economic and Social Affairs, Population Division, 2014). Environment matters to Indian population, specifically in terms of mental health status. Previous studies found that features of the urban environment are significant determinants of mental health (Dohrenwend & Dohrenwend, 1974; Faris & Dunham, 1939). Nonetheless, the latest study results reveal the higher chances of depression among urban dwellers than rural dwellers

(Romans et al., 2011). Even, similar results were found in other studies with reference to India (Prina et al, 2011; Prabha et al., 2017). Even, it becomes more crucial to study the influence of the environment with social media usage during COVID-19 pandemic. As a result, understanding the various factors like rural-urban environment where these enormous social networking sites were used by the population which influences the mental health as an individual and societal level are of immense importance.

Due to the mixed findings and the role of rural-urban environment regarding relationship of social networking sites usage with psychological health like depression and anxiety is still missing in the literature. Therefore, the current research observed the impact of the urban-rural environment on relationship between the usage of different social networking sites (DSNS) on self-reported depression and anxiety among the Indian youthful adults during the COVID-19 outbreak. This study concentrated on young adults due to the increased suicidal tendencies, especially an increased amount of time spent and the use of numerous social networking sites (EY report, 2016). We expected to decide these affiliations while controlling for an entire arrangement of covariates. As a result following hypotheses were formulated;

Hypothesis 1: Extended usage of different social networking sites (DSNS) is related to depression.

Hypothesis 2: Extended usage of different social networking sites (DSNS) is related to anxiety.

Hypothesis 3: The urban environment is associated with depression and anxiety.

Hypothesis 4: The rural environment is associated with depression and anxiety.

Hypothesis 5: The urban and rural environment moderates the relationship between DSNS usage, TSSNS with depression and anxiety.

Methods

Design, sample, and setting

The quantitative research design was adopted for the current study using online questionnaire survey method. The current study recorded the demographics characteristics of the respondents, initially, cross-tabulations (sex, urban/rural habitation, age, education, family income, relationship status) were completed for distinguishing critical affiliations (Pearson chi-squared with 95 % confidence intervals), and then multiple regression was applied to review which characteristics were independently associated and their effect on mental health outcomes. A suitable statistical weight was assigned for every investigation. The data analysis was performed on SPSS Version 21. This study was approved by Humanities and Social Science department of the university.

Recruitment and procedure

The respondents selected were students studying in various Indian universities and institutions. The students were selected randomly. However it was ensured that respondents from both rural environments as well as urban environment were included in the sample. The respondents were selected

in the study with the different inclusion criterion for example respondents should be familiar with English Language and usage of internet. Designed questionnaire was sent to the respondents through e-mails, where all the information regarding the purpose of the study and questions for the survey was mentioned. In concise, Indian young adults aged 19 to 30 were surveyed for the questions related to different social networking sites (DSNS) use, environment, depression, and anxiety. A total of 721 mails were sent for survey and 691 respondents participated in the survey. Data collection was conducted during April-July 2020.

Measures

Respondents have filled a survey questionnaire in which dependent variables were anxiety and depression, usage in different social networking sites (DSNS), time spent on social networking sites (TSSNS) along with independent variable which was environment

Depression

To assess the depression, the Patient-Reported Outcomes Measurement Information System (PROMIS) scale was employed which consist of four-items. The PROMIS depression scale was prepared by item response theory for encouraging superior accuracy along with reduced load (Cella et al., 2007). In this scale of 4 items, we asked the respondents regarding how frequently they had encountered sensing sadness, useless, defenseless, or depressed in the last 7 days. The items of the PROMIS depression measure was recorded using Likert scale of 5-points starting from 1 to 5. Considering the non-normal distribution of data, the total scores were classified into severe, mild, and moderate categories for the analysis. The chief goal of the depression scale was to review depression seriousness, rather than only classified according to the cut-off point used for clinical purpose. The overall score (by summing all the scores from PROMIS questionnaire) of the respondents who did not show the symptoms of depression categorized in the "mild" category (total score=4), that characterized 5.2% of the total respondents. Subsequently, the total score in the vicinity of 5 and 8 were categorized as "moderate" and encompassed 14.5% of the populace. Lastly, the total score in the range of 9 or more (out of 20) will correspond to a T-score of 57.7, categorized as a "severe" group, as it exceeds the threshold value of 55 set by American Psychiatric Association (2013). "Severe" category corresponds to 80.3% populace. Scale demonstrated exceptional internal reliability (Cronbach's $\alpha = .92$).

Anxiety

This was measured by four-item PROMIS anxiety scale (Pilkonis et al., 2011). This scale has been associated and corroborated with regularly used anxiety measures. The items were recorded using Likert scale of 5-points. Therefore, whole potential raw total was in the range 4-20. Considering distribution of data which was not normal, the raw scores were categorized into severe, moderate and mild groups for the investigation. This was feasible because, the

PROMIS anxiety scale intended to assess the anxiety seriousness. The total score (same as anxiety score calculated) was categorized in the mild group whose raw score was 4, that corresponds to 5.6% populace. The total score fell in the vicinity of 5 and 8 were categorized as "moderate" and the total score were classified into the "severe" group having a raw score of 9 or more (out of 20), that matches to 57.7 T-score (Johnston et al., 2016). Severe category corresponds to 81.6% of the populace. The participants with the raw scores range from 5 to 8 were categorized moderate and contained 12.7% of the populace. The scale showed astounding reliability (Cronbach's $\alpha = .90$).

Use of different social networking sites and time spent on social networking sites

Respondents were requested to state their usage from every one of 11 broadly social networking sites, like Twitter, Facebook, Google+ etc. (Pew Research Center, 2015). There are 7 response choices which were given to the respondents. Similarly, these items were constructed concerning the measures utilized by Pew Research Center (2015). For employing the variable, quantity of various social networking sites has been checked that respondents used with any frequency other than none. In this manner, the figure of social networking sites was measured as 7-11 sites, 5-6 sites, 3-4 sites, or 0-2 sites.

Additionally, respondents were asked to report their TSSNS in 24 hours. The TSSNS was classified into four quartiles as 121-above minutes, 61-120 minutes, 31-60 minutes, and 0-30 minutes. Respondents were measured in numerical fields.

Environments

The rural territories are the smallest territory, viz., and the village, for the most part, follows the confinement of an income of the village by the district administration. According to Census of India, 2011, the meaning of urban zone is as per the following;

(I) Every place with a Notified Town Area, Cantonment, Corporation, or Municipality.

(II) Every other place which satisfied the following criteria:

- (A bare minimum population of 5,000.
- No less than 75% of the male working population was non-agricultural.

Other variables

Sample was classified into three age groups (19-24; 25-30; 31 and above) for further investigation. Similarly, individual personal factors were evaluated so that these variables may influence societal disengagement and social networking use (Kessler et al., 2005; Pew Research Center, 2015). The demographic variables consisted of relationship status (single or married), family income (under INR 0.25 million; INR 0.25-1.0 million; and INR 1 million or more) along with learning rank (high school or less; higher Secondary; or higher). Moreover, to enhance the interpretability and generalization of findings, we crumbled every single independent factor into quartiles for principal investigations.

Nevertheless, to guarantee the strength of findings, likewise, all investigations were led with this covariate as continuous.

Findings

Respondents

A total of 721 respondents were contacted for survey in which 30 (4.34%) respondents were denied for the survey due to non-interest. Therefore, 691 respondents were given their consent for interview and filled the survey form. The weighted sample was 43.8% female, 56.2% male. For gross income, 40.2% were in the "low" category (less than INR 0.25 million) and 5.2% were in the "high" category (INR 1 million and above). About 7.8% of respondents had a less high school, 60.8% had graduation and post-graduation (13.5%). All these figures are highlighted in Tables I and II.

Table I
Whole sample characteristics and bivariable associations between use of different social networking sites, covariates, and depressive symptoms.

Independent Variable and Covariates	Whole Sample (N = 691) Column % ^b (Unweighted %)	Depression			p Value ^c
		Low (N=36)	Medium (N=100)	High (N=555)	
Use of SNS					<0.0001
Q1 (0-2)	39.4	44.4	56.0	32.4	
Q2 (3-4)	44.1	27.8	29.0	47.0	
Q3 (5-6)	13.2	22.2	10.0	16.4	
Q4 (7-11)	3.3	5.6	4.0	4.1	
Covariates					
TSSNS, minutes					0.0001
Q1 (0-30)	15.5	38.9	21.0	12.8	
Q2 (31-60)	20.4	38.9	23.0	18.7	
Q3 (61-120)	22.1	13.9	27.0	21.8	
Q4 (121-above)	42.0	8.3	29.0	46.5	
Age, y					0.0001
19-24	49.9	55.6	46.0	50.3	
25-30	29.1	22.2	19.0	31.4	
31-above	21.0	22.2	35.0	18.2	
Sex					0.002
Female	43.8	33.3	56.0	38.0	
Male	56.2	66.7	44.0	62.0	
Relationship Status					0.01
Single ^d	65.1	44.4	56.0	45.8	
Married	34.9	52.8	44.0	54.2	
Yearly Household Income					0.0001
Low (less than Rs 2.5 lakhs)	40.2	33.3	17.0	45.0	
Medium (Rs 2.5 lakhs -10 lakhs)	54.6	47.2	67.0	52.8	
High (Rs 10 lakhs and above)	5.2	22.2	16.0	2.2	
Education Level					0.005
High school or less	7.8	16.7	11.0	13.3	
Higher secondary	17.9	13.9	12.0	43.8	
Bachelor's degree	60.8	47.2	63.0	50.6	
Post graduate or higher	13.7	22.2	14.0	16.8	
Environment					0.03
Rural	48.9	41.7	56.0	42.2	
Urban	51.1	58.3	44.0	57.7	

a P value derived using Chi-square analyses comparing proportion of users in each category.

b Values may not total 100 due to rounding. Percentages were calculated using survey-specific weights unless otherwise specified.

c Includes Facebook, Twitter, Google+, YouTube, LinkedIn, Instagram, Pinterest, Tumblr, Vine, Snapchat, and Reddit.

d Includes widowed, divorced, and separated.

Table II

Whole sample characteristics and bivariable associations between use of different social networking sites, covariates, and anxiety symptoms.

Independent Variable and Covariates	Whole Sample (N = 691)	Anxiety			p Value ^a
		Low (N=39)	Medium (N=88)	High (N=364)	
Use of DSNS					<0.0001
Q1 (0-2)	39.4	100	47.7	33.9	
Q2 (3-4)	44.1	0	52.3	45.9	
Q3 (5-6)	13.2	0	0	16.1	
Q4 (7-11)	3.3	0	0	4.1	
Covariates					
TSSNS, minutes					0.0001
Q1 (0-30)	15.5	0	15.9	16.5	
Q2 (31-60)	20.4	0	20.5	21.8	
Q3 (61-120)	22.1	0	45.5	20.0	
Q4 (121-above)	42.0	100	18.2	41.7	
Age, y					0.0001
19-24	49.9	100	81.8	41.5	
25-30	29.1	0	13.6	33.5	
31-above	21.0	0	4.5	25.0	
Sex					0.003
Female	43.8	100	39.8	40.6	
Male	56.2	0	60.2	59.4	
Relationship Status					0.001
Single ^d	65.1	100	94.3	58.2	
Married	34.9	0	5.7	41.8	
Yearly Household Income					0.003
Low (less than Rs 2.5 lakhs)	40.2	79.4	52.2	35.6	
Medium (Rs 2.5 lakhs -10 lakhs)	54.6	20.6	43.1	58.7	
High (Rs 10 lakhs and above)	5.2	0	4.7	5.7	
Education Level					0.001
High school or less	7.8	0	0	9.6	
Higher secondary	17.9	0	37.5	16.1	
Bachelor's degree	60.8	100	44.3	60.6	
Post graduate or higher	13.7	0	18.2	13.7	
Environment					0.001
Rural	48.9	0	43.2	53.2	
Urban	51.1	100	56.8	46.8	

P value derived using Chi-square analyses comparing proportion of users in each category. Values may not total 100 due to rounding. Percentages were calculated using survey-specific weights unless otherwise specified. Includes Facebook, Twitter, Google+, YouTube, LinkedIn, Instagram, Pinterest, Tumblr, Vine, Snapchat, and Reddit.

Usage of different social networking sites and time spent on social networking sites

Respondents were reported using at least 1 of the 11 social networking sites, and 23 (3.3%) detailed utilizing every one of them. As mentioned above, this variable was crumbled into quartiles for main investigations for enhancing the understanding and generalization of results. Along these lines, the usage of different social networking sites (DSNS) was categorized as 0-2 (39.4%), 3-4 (44.1%), 5-6 (13.2%), or 7-11 (3.3%). TSSNS were measured for various quartiles from respondents as 0-30 minutes (15.5%), 31-60 minutes (20.4%), 61-120 minutes (22.1%) and 120- above minutes (42%).

Environments

According to the survey, 48.9% and 51.1 % of respondents were surveyed from rural and urban environments respectively.

Bivariable investigations

The unadjusted bivariable odd ratio for results is introduced in the first column of Tables III and IV, individually. Large utilization of numerous social networking sites ($p < 0.001$), higher aggregate TSSNS ($p < 0.001$) and distinctive areas

were related to increased self-reported depression (Table III). Additionally, large utilization of various SNS ($p < 0.001$), larger aggregate TSSNS ($p < 0.001$) and diverse areas related to increased self-reported anxiety (Table IV).

Multivariable Investigations

Depression

A completely-adjusted multivariate model controls each covariate & TSSNS, contrasted with individuals who utilized 0-2 networking sites, the individuals who utilized 7-11 networking sites had around six times the odd of reporting severe symptoms of depression (OR = 6.26, 95%CI = 3.4,11.4) (Table III). Relationship is linear of usage of different DSNS and depression in the investigation; for increased quartiles of multiple social networking sites utilize, the odd ratio for the amplified level of depressive symptoms were 1.0 (reference), 1.2, 1.2, and 6.2 separately ($p < 0.001$ for general direct affiliation) (Table III). Consequently, Hypothesis I was rejected.

Table III
Bivariable and multivariable associations between use of different social networking sites, covariates, and depressive symptoms.

Independent Variable and Covariates	Depressive Symptoms ^a			
	OR (95% CI)	p ^b	AOR (95% CI)	p ^b
Use of different social networking sites ^c		<0.001		<0.001
Q1 (0-2)	1.0 [Reference]		1.0 [Reference]	
Q2 (3-4)	1.19 (1.13-1.27)		1.15 (1.08-1.22)	
Q3 (5-6)	1.19 (1.09-1.30)		1.10 (1.01-1.20)	
Q4 (7-11)	6.26 (3.41-11.49)		4.99 (2.89-8.62)	
Covariates				
Time Spent on Social networking sites (TSSNS), minutes		<0.001		<0.001
Q1 (0-30)	1.0 [Reference]		1.0 [Reference]	
Q2 (31-60)	.956 (.882-1.03)		1.34 (1.03-1.73)	
Q3 (61-120)	.916 (.846-.991)		3.62 (2.57-5.11)	
Q4 (121-above)	1.12 (1.04-1.21)		1.82 (1.41-2.35)	
Age, y		0.188		<0.001
19-24	1.0 [Reference]		1.0 [Reference]	
25-30	1.35 (1.26-1.45)		1.24 (1.00-1.54)	
31-above	1.13 (1.05-1.20)		1.24 (0.95-1.61)	
Sex		0.038		0.566
Female	1.0 [Reference]		1.0 [Reference]	
Male	1.19 (1.13-1.26)		1.07 (0.96-1.20)	
Relationship Status		0.002		0.434
Single ^d	1.0 [Reference]		1.0 [Reference]	
Married	1.21 (1.14-1.28)		0.25 (0.83-0.75)	
Yearly Household Income		<0.001		0.005
Low (less than Rs 2.5 lakhs)	1.0 [Reference]		1.0 [Reference]	
Medium (Rs 2.5 lakhs -10 lakhs)	.907 (.866-.956)		0.98 (0.91-1.07)	
High (Rs 10 lakhs and above)	.719 (.644-.804)		0.94 (0.51-1.75)	
Education Level		<0.001		<0.001
High school or less	1.0 [Reference]		1.0 [Reference]	
Higher secondary	.737 (.645-.843)		0.91 (0.64-1.30)	
Bachelor's degree	.675 (.596-.766)		0.64 (0.52-0.79)	
Post graduate or higher	.652 (.568-.749)		0.82 (0.62-1.08)	
Environment		<0.001		0.19
Rural	1.0 [Reference]		1.0 [Reference]	
Urban	1.12 (1.07-1.18)		1.04 (0.87-1.24)	

Abbreviations: OR, odds ratio; CI, confidence interval; AOR, adjusted odds ratio.

^a Depressive symptoms are divided into low, medium, and high tertiles.

^b Significance level determined by tests for overall linear trend of the ordered categorical independent variable.

^c Adjusted for all independent variables and covariates listed in the table.

^d Includes Facebook, Twitter, Google+, YouTube, LinkedIn, Instagram, Pinterest, Tumblr, Vine, Snapchat, and Reddit.

^e Includes widowed, divorced, and separated.

Table IV
Bivariable and multivariable associations between use of different social networking sites, covariates, and anxiety symptoms.

Independent Variable and Covariates	Anxiety Symptoms ^a			
	OR (95% CI)	p ^b	AOR ^c (95% CI)	p ^b
Use of different social networking sites (DSNS) ^d		<0.001		<0.001
Q1 (0-2)	1.0 [Reference]		1.0 [Reference]	
Q2 (3-4)	1.31 (1.25-1.38)		1.38 (1.12-1.69)	
Q3 (5-6)	1.06 (1.00-1.13)		1.03 (0.80-1.32)	
Q4 (7-11)	2.17 (1.63-2.88)		2.08 (1.05-2.97)	
Covariates		<0.001		<0.001
Time Spent on Social networking sites (TSSNS), minutes				
Q1 (0-30)	1.0 [Reference]		1.0 [Reference]	
Q2 (31-60)	.915 (.852-.984)		1.04 (0.79-1.36)	
Q3 (61-120)	.746 (.564-.802)		1.34 (1.03-1.74)	
Q4 (121-above)	.757 (.708-.809)		0.48 (0.35-0.65)	
Age, y		<0.001		<0.001
19-24	1.0 [Reference]		1.0 [Reference]	
25-30	1.57 (1.46-1.69)		1.35 (1.15-1.59)	
31-above	1.61 (1.49-1.75)		1.80 (1.27-2.54)	
Sex		<0.001		0.286
Female	1.0 [Reference]		1.0 [Reference]	
Male	1.13 (1.09-1.18)		0.91 (0.81-1.03)	
Relationship Status		.002		<0.001
Single ^e	1.0 [Reference]		1.0 [Reference]	
Married	1.14 (1.09-1.18)		0.94 (0.93-1.51)	
Yearly Household Income		.001		0.005
Low (less than Rs 2.5 lakhs)	1.0 [Reference]		1.0 [Reference]	
Medium (Rs 2.5 lakhs -10 lakhs lakhs)	1.05 (1.01-1.09)		1.24 (1.14-1.35)	
High (Rs 10 lakhs and above)	1.20 (1.09-1.32)		8.61 (2.82-26.34)	
Education Level		<0.001		<0.001
High school or less	1.0 [Reference]		1.0 [Reference]	
Higher secondary	.788 (.719-.864)		2.57 (1.34-4.94)	
Bachelor's degree	.811 (.746-.883)		0.57 (0.44-0.72)	
Post graduate or higher	.764 (.695-.840)		1.05 (0.89-1.40)	
Environment		.011		<0.001
Rural	1.0 [Reference]		1.0 [Reference]	
Urban	.956 (.924-.990)		0.467 (0.33-0.64)	

Abbreviations: OR, odds ratio; CI, confidence interval; AOR, adjusted odds ratio.

a Anxiety symptoms are divided into low, medium, and high tertiles.

b Significance level determined by tests for overall linear trend of the ordered categorical independent variable.

c Adjusted for all independent variables and covariates listed in the table.

d Includes Facebook, Twitter, Google+, YouTube, LinkedIn, Instagram, Pinterest, Tumblr, Vine, Snapchat, and Reddit.

e Includes widowed, divorced, and separated.

Anxiety

A completely-adjusted multivariate model controls each covariate & time spent on social networking sites (TSSNS), in comparison to the individuals using 0-2 networking sites, those who utilized 7-11 networking sites had more than two times the odd of presenting large level of anxiety symptoms (OR = 2.1, 95% CI= 1.6, 2.8) (Table IV). Similarly, a direct relationship was found between the usage of numerous social networking sites and anxiety in this multivariable investigation; for growing quartiles of various social networking sites use odd ratio for an large level of anxiety symptomology were 1.0 (reference), 1.3, 1.0, and 2.0 separately ($p < 0.001$ for general linear correlation) (Table IV). Subsequently, Hypothesis II was rejected.

Environment

A completely-adjusted multivariate model controls each covariate and time spent on social networking sites (TSSNS), contrasted with the individuals who are situated in rural, the individuals who are situated in urban had more probability of revealing the higher levels of depression. Environment and depression were related and with the rural environment as reference (1.0), urban environment odd ratio (OR) was 1.1 (95% CI= 1.0, 1.1). In this manner, Hypothesis 3 was maintained. Notwithstanding, in the model TSSNS, female, and being single was never again autonomously correlated to depression (Table III), lower pay, and less education were found to be considerably correlated with depression. Balanced multivariable model that controlled for all covariates and time spent on social networking sites (TSSNS), contrasted with the individuals

who are situated in rural, the individuals who are situated in urban had more probability of reporting the higher levels of anxiety symptoms. Environment and anxiety were related and with the rural environment as reference (1.0), urban area odd ratio (OR) was 0.95 (95% CI= 0.92, 0.99). Hence, Hypothesis 4 was maintained.

Hierarchical Regression Analysis

Hierarchical regression analysis was conducted for examining interaction effect between environment and i) different social networking sites (DSNS), and ii) time spent on social networking sites (TSSNS) on anxiety and depression. Previous studies revealed that age, income, education, sex, and relationship status were related to the usage of social networking sites and human wellbeing (Nabi et al., 2013). Therefore, the current study included these variables in the regression model.

Respondent's age, sex, relationship status, income, and education were entered in model-1, subsequently use of DSNS and TSSNS were entered in model-2, followed by the environment in model-3, environment*different social networking sites (DSNS) in model-4 and environment*TSSNS in model-5 (Table V & Table VI). All the variables were dummy coded. Environment, DSNS and TSSNS were mean-centred before they were multiplied to form the interaction variable. The overall model explains 66% of the total variance in anxiety and 33% in depression. Result revealed that environment significantly interacts with the usage of DSNS in predicting anxiety, $\beta = 0.189$, $t(691) = 5.128$, $p < 0.001$ and in depression $\beta = -0.430$, $t(691) = -8.583$, $p < 0.001$. Additionally, environment also significantly interacted with TSSNS in predicting anxiety, $\beta = -0.332$, $t(691) = -11.468$, $p < 0.001$ and in depression $\beta = 0.327$, $t(691) = 7.937$, $p < 0.001$ (Table V & Table VI). Therefore, hypothesis 5 was maintained. It was quite interesting found from the result that the location alone significantly predicted the anxiety rather than depression. A simple slope analysis (Aiken & West, 1991) suggested that the relationship between environment and anxiety were significant at low level (1 S.D. below mean) $\beta = 0.143$, $t(691) = 2.819$, $p < 0.05$ and high (1S.D. above mean) $\beta = 0.347$, $t(691) = 12.26$, $p < 0.001$ both and the relationship between environment and depression were significant at low level (1 S.D. below mean) $\beta = 0.407$, $t(691) = 7.44$, $p < 0.001$ but not at the high level (1 S.D. above mean) $\beta = 0.044$, $t(691) = 1.468$, $p > 0.05$. However, the independent main effect of sex was found insignificant in predicting anxiety $\beta = -0.082$, $t(691) = -1.858$, $p > 0.05$ and age $\beta = 0.007$, $t(691) = 0.177$, $p > 0.05$; sex $\beta = 0.015$, $t(691) = 0.319$, $p > 0.05$ and environment $\beta = -0.004$, $t(691) = -0.068$, $p > 0.05$ were found insignificant in predicting depression.

Table-V
Summary of Hierarchical Regression Analysis for predicting Anxiety (N = 691)

Independent Variable	B	SE B	β	R ²	F change in R ²
Model-1				0.232	41.45**
Age	0.184	0.026	0.268**		
Sex	-0.089	0.048	-0.082		
Relationship Status	0.374	0.048	0.328**		
Yearly Household Income	0.232	0.036	0.246**		
Education Level	-0.157	0.026	-0.221**		
Model-2				0.281	22.96**
Use of DSNS	0.137	0.28	0.198**		
TSSNS	-0.092	0.024	-0.189**		
Model-3				0.588	509.52**
Environment ^a	-0.999	0.044	-0.919**		
Model-4				0.604	26.30**
Environment*DSNS	0.111	0.022	0.189**		
Model-5				0.668	131.51**
Environment*TSSNS	-0.211	0.018	-0.332**		

*-p< 0.05; ** p< 0.001

^a Rural and urban environment

DSNS- Different Social Networking Sites

TSSNS - Time Spent on Social networking sites

Table-VI
Summary of Hierarchical Regression Analysis for predicting Depression (N = 691)

Independent Variable	B	SE B	β	R ²	F change in R ²
Model-1				0.095	14.37**
Age	0.005	0.028	0.007		
Sex	0.017	0.052	0.015		
Relationship Status	0.119	0.052	0.105*		
Yearly Household Income	-0.168	0.039	-0.180**		
Education Level	-0.116	0.028	-0.164**		
Model-2				0.187	38.78**
Use of DSNS	0.184	0.029	0.269**		
TSSNS	0.181	0.026	0.373**		
Model-3				0.187	0.005
Environment ^a	-0.004	0.062	-0.004		
Model-4				0.267	73.63**
Environment*DSNS	-0.251	0.029	-0.430**		
Model-5				0.329	62.99**
Environment*TSSNS	0.206	0.026	0.327**		

*-p< 0.05; ** p< 0.001

^a Rural and urban environment

DSNS- Different Social Networking Sites

TSSNS - Time Spent on Social networking sites

Discussion

Among broadly illustrative sample ages from 19-30 and above, we discovered a vigorous linear relationship between the increased usage of DSNS and the environment with self-reported anxiety and depression, following regulating of an all-inclusive covariates covering TSSNS during the COVID-19 outbreak. Even though, in multivariable models, there was a significant relationship found amongst TSSNS and depressive and anxiety symptoms. Although, our findings supports the previous findings but the scores between overall TSSNS and both depression and anxiety were far higher and divulging that public health emergency can cause the mental health problems for example Ebola (Shultz et. al, 2016; Ji et. al, 2017), SARS (Mak et. al, 2009)

The current investigation makes a critical contribution to the literature in two perspectives. Firstly, the findings disclosed that the rural-urban environment is an important determinant to interact between social networking sites usage and symptoms of anxiety and depression during the COVID-19 outbreak. Secondly, findings are from the Indian perspective. There was a disturbing circumstance found through this investigation that a large number of the respondents lie in severe depression (80.3%) and anxiety

(81.3%) categories. It is because of a few possible reasons, firstly the raw score for the severe group is at least 9 (out of 20) around 45%, which relates perfectly score 57.7, which is very low for the Indian environment, secondly, the impact of COVID-19 was enormous. Therefore, this investigation gives the direction to the future psychiatric practitioners around the globe to think about the variables which are comparable with findings from European, American and Asian nations.

The present study extends the literature of social networking by investigating the moderating role of the rural and urban environment during the COVID-19 outbreak. The current findings revealed that the association between usages of social networking sites, TSSNS with anxiety and depression were dependent on the rural and urban environment. From the simple slope analysis, it was found that respondents from the urban environment are more vulnerable to anxiety and depression as compared to rural respondents related to both social networking sites usage and TSSNS. An interesting finding found in the study that rural and urban respondents behaved differently for depression related to DSNS and TSSNS. A declining trend was found for the depression among rural respondents concerning the usage of DSNS whereas incremental trend was found among the rural respondents in the depression related to TSNNS. In other words, rural respondents showed low depression symptoms when they were using fewer social networking sites during the COVID-19 outbreak, but the depression score has raised when they increased the usage time of social networking sites.

The result revealed that during COVID 19, the respondents who were located in the urban environment had significantly higher depression and anxiety symptoms as compared to the rural environment. This might be because of the reason that respondent's exposure to social media is more in urban environment than respondents in rural environment. Also the frequency of accessing social media is more for respondents from urban environment than respondents from rural environment. In the process they happen to read a lot about messages related to due to prevailing COVID-19 situation which may create fear and panic.

Since the present information is cross-sectional, the bearing of this affiliation is misty. This might happen that people experiencing the ill effects of depressive manifestations or potentially anxiety indications due to fear of COVID-19 have a tendency to use more social networking sites. This might be because the users searching more social networking sites for health related information to prevent from COVID-19 virus. In the present study, it was found that the environment of the respondents increased the probability of inducing depression and anxiety symptoms during the COVID-19 outbreak.

Limitations And Future Research

The current research is cross-sectional in nature. Consequently, longitudinal studies might be helpful to investigate further insights going ahead. It is worth mentioning again that the response was taken from youthful adults ages 19-30 and above; hence, the findings of this study are not generalizable to other populations. Associated with this, current research did not inspect a more tinged

usage prototype. For example, several users tend to inertly use social networking sites content whereas others involve in dynamic communication. Therefore, persons using just two social networking sites could be more powerful to employ in vigorous social networking sites communications, which might decrease their chances of getting into depression (Ellison et al., 2007).

Nevertheless, active users are vulnerable to feeling negative experiences like arguments, which eventually might be harmful. The current research was restricted in its ability as well to completely confine the degree, dynamic ways of social networking sites usage, alone and jointly. So, this is important for further research in this field.

Conclusion

Despite the constraints mentioned above, it is significant that we observed enlarged usage of various social networking sites and environments are robustly related to depression and anxiety for an Indian sample comprising youthful adults notwithstanding during the COVID-19 outbreak. Ultimately, the usage of different social networking sites (DSNS) and the environment were found to be highly related in the Indian context during the COVID-19 outbreak. The above results are very vital, because usages of numerous social networking sites are growing day by day. Future evaluations having all the more detailed and specific estimations may assist to properly aim and expand interventions.

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