

Social Media Infodemic And Mental Wellbeing In Pakistan During Covid 19

Sarwet Rasul , Sajida Naz , Tahira Ezra Raza , Akifa Imtiaz , Saima Hamid , Fazal ur Rehman , Sobia Khateeb , Faran Emmanuel

ABSTRACT

Background: During all waves of COVID 19 pandemic, the most worrying concern has been the various forms of infodemic about COVID 19 that have heightened the symptoms of fear and anxiety in the general population thus causing it to be a major public health concern.

Objectives: Objectives of the current study were to identify impact of social media infodemic on mental wellbeing during COVID 19 among University students

Design: An online Cross Sectional Survey Design was used in the current study

Participants: Social media users (university students), aged 18 years and above from the university campuses of Rawalpindi and Islamabad (7+23 campuses / 35 main and sub-campuses).

Measures: To measure social media infodemic, a self-developed questionnaire was used comprising of three subscale relating to different myths and conspiracies about COVID 19. Mental wellbeing measures included standardized scales i.e., Patient Health Questionnaire (PHQ) containing 9 items relating to depression and Generalized Anxiety Disorder scale (GAD) with 7 items measuring anxiety during COVID 19.

Procedure: Responsive driven sampling was used to approach participants from various public sector universities in Rawalpindi and Islamabad. An anonymous google form link was disbursed to the participants for their consent and response. Ethical standards given by the American Psychological Association were followed throughout the study.

Key Results: Greater use of social media may contribute towards social media infodemic. Social media infodemic may be related with exceeding levels of anxiety and depression.

Conclusion: In order to control the psychological effects of social media infodemic, general health reforms are needed.

1. Introduction

Ever since the Novel Corona Virus outbreak, there have been multiple perspectives about its existence and non-existence across the globe. Rumours, hoaxes, conspiracy theories and a flood of information and misinformation came, especially on the Social Media Networks, regarding the outcome, prevention and cure of COVID-19. As far as the case of Pakistan is concerned, the total number of active social media users in Pakistan is 37 million, and this number has increased by 2.4 million in the year 2020. Social Media networks in Pakistan have played the role of a catalyst in constructing various narratives regarding COVID19.

The outbreak of COVID-19 has flooded the social media with “infodemic” which is defined by Merriam-Webster dictionary as “a blend of "information" and "epidemic" that typically refers to a rapid and far-reaching spread of both accurate and inaccurate information about something, such as a disease”. In the COVID 19 context whereas the positive impact of social media can be seen in the provision and “exchange of corrected and balanced information and positioning of the public in a proper environment” (Radwan & Radwan, 2020), the negative influence is far enormous and far-reaching. This misinformation has taken different forms including conspiracy theories, misleading rumours, unproven treatments and racism. In fact, during the last few months “the social media panic travelled faster than the COVID-19 spread” (Wilson & Chen, 2020), and the fight against the virus has turned into a “fight against ‘trolls and conspiracy theories’” (Editorial Journal of Travel Medicine, 2020).

Apart from the obvious physical health-related impact, COVID 19 and the consequent infodemic have posed a serious threat to the emotional and psychological well-being of individuals. The sharing of misinformation has an influence beyond the harm of the coronavirus itself (Khan, Ullah, Usman, Malik, Khan, 2020; Radwan & Radwan, 2020). People are facing significant behavioral changes as the spread of the virus has led to the development of confusion, fears and anxiety on a daily basis. Globally, a lot of research is directed towards the treatment and cure of physical illness. However, there is still a need to identify the risks to psychological and behavioral health.

In this context, in Pakistan too, only a few studies related to the impact of social media on the well-being of people are carried out. To fill in the gap in research the current study explores psychological, behavioural and social aspects of the impact of social media on Pakistani users.

The dark side of social media was exhibited in a tsunami of fake and unreliable news that ranged from selling fake cures to using social media as a platform to launch cyber-attacks on critical information systems. The continuous spread of the disease, conspiracy theories, myths and blame games, sensational media reporting of COVID-19, frustration and boredom, implementation of social lockdown with classmates, friends, and teachers, lack of personal space at home, and family financial loss due to lockdown are some of the main risk factors significantly influencing the mental health of university students. There have been reports on the psychological impact of the epidemic on the general public, healthcare workers and college students (Wang et al., 2020; Cao et al., 2020; Chew et al., 2020; Li et al., 2020).

The sudden onset of the coronavirus pandemic has been accompanied by an explosion of misinformation about the disease. As the COVID19 pandemic spread, social media outlets emerged as an important means of socializing, as well as a way of seeking and sharing information about the disease. In the process, this enabled an explosion of unchecked

information and the spread of misinformation. Social media use increased by 20 to 87% around the globe during the crisis. In Italy alone every day in March 2020, an average of 46 000 news posts on Twitter were inaccurate and linked to miss (dis) information about the crisis (Bruno & Kessler, 2020). The misleading information about the disease is coming from diverse sources including politicians, world leaders, celebrities, prominent public figures, conspiracy theorists and even the general public. As a result, the World Health Organization has declared an 'infodemic' of misleading information about the COVID-19, which poses a serious risk for public health (World Health Organization, 2020).

The effects of this pandemic are unique in the history of public health crises, whose detrimental effects include inflicting long-lasting emotional trauma on people. Appropriate research is vital for a better understanding of the evolving COVID-19 effects, especially the toll on mental health (Zhong et al., 2020). Therefore the purpose of our study was to determine if there are any relationship between social media consumption, social media infodemic and standardized survey based indicators of mental wellbeing such as anxiety and depression among the University Students in Pakistan. Along with this objective, we sought to assess attitudes of participants towards various beliefs and myths regarding COVID 19. We hypothesized that the COVID 19 related infodemic may increase anxiety and depression, as measured through a cross-sectional survey among social media users.

2. Literature Review

Lately, a number of studies about social media and the information it presents have emerged. Cinelli et al (2020) had conducted a study on the COVID-19 social media infodemic. They address the diffusion of information about the COVID-19 with massive data analysis on Twitter, Instagram, YouTube, Reddit and Gab. The researchers identified information spreading from questionable sources by finding different volumes of misinformation in each platform. The researchers proved that information from both reliable and questionable sources do not present different spreading patterns. Mourad et al (2020) had investigated that news creation and consumption has been changing since the advent of social media. According to WHO, uncontrolled conspiracy theories and propaganda are spreading faster than the COVID-19 pandemic itself, creating an infodemic and thus causing psychological panic, misleading medical advice, and economic disruption. This paper presents a large-scale study based on data mined from Twitter. Extensive analysis has been performed on approximately 1 million COVID-19 related tweets collected over a period of two months. Furthermore, the profiles of 288, 000 users were analyzed including unique users' profiles, meta-data and tweets' context. The study noted various interesting conclusions including the critical impact of the (1) exploitation of the COVID-19 crisis to redirect readers to irrelevant topics and (2) widespread unauthentic medical precautions and information.

In another study, Chen et al (2020) say that at the time of the present research, the coronavirus disease (COVID-19) pandemic outbreak has already put tremendous strain on many countries, cities, resources, and economies around the world. Social distancing measures travel bans, self-quarantine, and business closures are changing the very fabric of societies worldwide. With people forced out of public spaces, much of the conversation about these

phenomena now occurs online on social media platforms like Twitter. The data set could also help track COVID-19 related misinformation and unverified rumors or enable the understanding of fear and panic and undoubtedly more.

In a similar study, Pennycook et al (2020) had examined across two studies with more than 1,700 U.S. adults online, the researchers' present evidence that people share false claims about COVID-19 partly because they simply fail to think sufficiently about whether or not the content is accurate when deciding what to share. The results were found previously for political fake news, suggesting that pushing people to think about accuracy is a simple way to improve choices about what to share on social media.

In yet another study, exploring the social media infodemic, Naeem et al (2020) had explored that recent statistics show that almost 1/4 of a million people have died and four million people are affected either with mild or serious health problems caused by Coronavirus (COVID-19). These numbers are rapidly increasing (World Health Organization, 2020). There is much concern during this pandemic about the spread of misleading or inaccurate information. The present research reports on a small study that attempted to identify the types and sources of COVID-19 misinformation. The researchers identified and analyzed 1225 pieces of COVID-19 fake news stories taken from fact-checkers, myth-busters and COVID-19 dashboards. The study is significant given the concern raised by the WHO Director-General that 'we are not just fighting the pandemic, we are also fighting the infodemic'. The study concludes that the COVID-19 infodemic is full of false claims, half-baked conspiracy theories and pseudoscientific therapies, regarding the diagnosis, treatment, prevention, origin and spread of the virus. Fake news is pervasive in social media, putting public health at risk.

With the help of five parameters Al- Zaman (2020) has investigated COVID- 19 fake news in Social Media. These five parameters of the analysis are themes, content types, sources, coverage, and intentions. First, the six major themes of fake news are health, religion, politics, crime, entertainment and miscellaneous. The findings show that health-related fake news (67.2%) dominates all the others. Second, more fake news takes the forms of text and video (47.2%), while the main types of content are less popular. Third, the two main sources of fake news are online media and mainstream media, where online-produced fake news (94.4%) prevails. Fourth, the main two types of coverage are international and national, and more fake news has an international connection (54.4%). Fifth, the intention of fake news has three types: positive, negative, and unknown. Most of the COVID-19-related fake news is negative (63.2%).

Studying the impact of social media on panic, Ahmad and Murad (2020) determined how social media affects self-reported mental health and the spread of panic about COVID-19 in the Kurdistan Region of Iraq. Participants reported that social media has a significant impact on spreading fear and panic related to the COVID-19 outbreak in Iraqi Kurdistan, potentially negatively influencing people's mental health and psychological well-being. Facebook was the most used social media network for spreading panic about the COVID-19 outbreak in Iraq. The results showed that the majority of youth aged 18-35 years are facing psychological anxiety. During the lockdown, people are using social media platforms to gain information about COVID-19. The study concludes that social media has played a key role in spreading anxiety about the COVID-19 outbreak in Iraqi Kurdistan.

Islam et al (2020) had conducted a study on COVID-19 related Infodemic and Its Impact on Public Health. Therefore, researchers followed and examined COVID-19 related rumors, stigma, and conspiracy theories circulating on online platforms, including fact-checking agency websites, Facebook, Twitter, and online newspapers, and their impacts on public health. The researchers found that social media content often included rumors, stigma, and conspiracy theories, which have been common during the COVID-19 pandemic.

Mental Wellbeing

Working with a group of students, Salman et al. (2020) came to the conclusion that COVID-19 has a significant adverse impact on students' mental health. The most frequent coping strategy adopted by them is religious/spiritual coping, acceptance, self-distraction and active coping. It is suggested that the mental health of students should not be neglected during epidemics. Similarly, Cheema et al. (2020) found out that the COVID-19 pandemic has created a lot of stress in all sets of life. University students are facing psycho-social changes during home quarantine. A large number of students suffer from depression and anxiety during quarantine. Interestingly, the study found out that female students are affected the most by this pandemic.

A study conducted by Majeed & Ashraf (2020) indicates that adolescents are experiencing the symptoms of depression, anxiety and irritability during the lockdown and social distancing in Pakistan. In a similar study on Pakistani students, Aqeel et al. (2020) reveal that the present critical situation due to the COVID-19 pandemic could lead to possible mental health issues in Pakistani students. The study also found the prevalence of anxiety and depression disorder among students. It also found that perception, illness, anxiety, or depression disorders were associated with lower levels of mental health of students. Moreover, findings of the study revealed that illness perception was associated with a lower level of mental health, whereas depression and anxiety with a higher level in students during the COVID-19 outbreak lockdown.

2.3. Research Objectives

On the basis of the literature reviewed above, the objectives of the present study are to:

1. Determine proportion of individuals using specific source of information and social media platforms for COVID 19
2. Determine the social media usage during COVID 19.
3. Assess the type and nature of social media infodemic among individuals using social media and individuals not using social media
4. Determine relationship between social media usage and levels of anxiety and depression among social media users (university students)

3. Method

Study Design

It is a cross sectional study in which online survey was used. The questionnaires used in the

survey were derived from evidence from past literature and existing validated scales so as to achieve research objectives. Furthermore, responsive driven sampling technique was followed to invite participants to this study.

Sample

Sample of the study was social media users (university students), aged 18 years and above from the university campuses of Rawalpindi and Islamabad (i.e., 7+23 campuses / 35 main and sub-campuses).

Sample Size and Sampling Strategy

The sample size was calculated according to the sample size calculation formula for infinite population (i.e., $n = Z^2P(1-P) / d^2$). Dependent variables include Anxiety, Depression and Quality of Life (Mental Wellbeing) whereas covariates i.e., age, gender, locale, medical history and domestic stress were added to the formula. As per the calculations, domestic stress was identified as a variable with the highest prevalence (i.e., 72%) hence sample size of 668 considering design effect of 0.5, the effect size of 0.5 and power estimate of 0.9 was estimated for the current study. Participants will be randomly selected from the universities by using lottery method i.e., every 10th individual fulfilling study criteria will be approached for consent and participation. All protocols are interviewer administered.

Inclusion Criteria

Individuals (all genders) who are social media users, 18 years of above and are able to comprehend and complete questionnaires in English were included in the study after consent.

Exclusion Criteria

Those with adverse physical or mental conditions were not included.

Operational Definitions

1. Infodemic

An excessive amount of information concerning a problem (in this case, COVID19) such that the solution is made more difficult. We can also call it a wide and rapid spread of misinformation. In the current study, COVID 19 related social media infodemic was measured by self developed questions based on nature of social media infodemic, type of social media infodemic and duration of social media usage.

2. Mental wellbeing

Mental wellbeing is about one's thoughts and feelings and how one copes with the ups and downs of everyday life. It is not the same thing as mental health, although the two can influence each other. In the current study, mental wellbeing was measured in terms of anxiety and depression.

3. Social Media as Source of Information during COVID 19: In order to compare whether those individuals who prefer to use social media platforms to gain information related to COVID 19 experience more infodemic than the group preferring platforms other than social media. To get a proportion of Individual

using difference sources of information for seeking COVID 19 related knowledge, the items number 19 and 20 of the self developed questionnaire (Social Media Infodemic) were categorized on the basis of item ratings. The item number 19 and 20 were rated from 0 (least preferred) to 6 (most preferred). Individuals who rated 0, 1, 2, and 3 on items 19 and 20 each were categorized as no preference group (group seeking information from sources other than social media). Those individuals who rated 4, 5 and 6 were categorized in the preference group (group seeking social media as a preferred source of information for COVID 19).

Measures

Demographic sheet: Information related to age, gender, education and geographic location will be collected using self-devised structured questions. Covariates included age, gender, income in PKR, educational level, family system, domestic stress, psychiatric and physical illness history.

Questionnaires: The online survey questionnaire comprise of following scales:

1. **MENTAL WELLBEING** In the current study, mental wellbeing is operationally defined as “”. The following scales will be used to measure the construct:

1. **Patient Health Questionnaires (PHQ 9).** The Patient Health Questionnaire (PHQ-9) is a multipurpose instrument used for diagnosis, screening, monitoring and measuring the severity of depression. Participants rate each item in accordance with the frequency of symptoms over the past 2 weeks on a 4-point scale from 0 (not at all) to 3 (nearly every day). Total scores range from 0 to 27, with highest scores indicating greater severity of depressive symptoms [Kroenke, Spitzer, Williams, & Löwe, 2010]. The PHQ-9 has been widely used in Pakistan and good reliability and validity of both English and Urdu version of PHQ-9 has been demonstrated [Naveed et al, 2019]. The total score serves as a marker of severity and distress. Specifically, a score in range of 1-9 shows minimal depressive symptoms, 10-14 as mild depressive symptoms, 15-19 as moderate depressive symptoms and 20-27 severe depressive symptoms.

2. **Generalized Anxiety Scale (GAD – 7 items)**

The GAD-7 is a 7-item self-report scale, also based on DSM-V criteria, used to measure the severity of generalized anxiety disorders, and was also shown to be a reliable screening tool for panic, social anxiety and post-traumatic stress disorder (Kroenke et al., 2010, Kroenke et al., 2007). The GAD-7 exhibits excellent internal consistency (Chronbach's alpha between .89 and.92) (Löwe et al., 2008, Kertz et al., 2012, Spitzer et al., 2006), good convergent validity. It has been widely used in Pakistan and good reliability and validity of both English and Urdu version of GAD -7 has been demonstrated [Iqbal, 2017]. The total score serves as a marker of severity and anxiety. Specifically, Total Score Anxiety Severity 1-4 minimal symptoms 5-9 mild symptoms 10-14 moderate

symptoms 15-21 severe symptoms of anxiety. <https://med.dartmouth-hitchcock.org/documents/GAD-7-anxiety-screen.pdf>

2. **SOCIAL MEDIA INFODEMIC**: 27 item Social Media Infodemic Scale (Islam et al, 2020) was adapted to be used in the current study. The scale has three dimensions comprising of one's beliefs in domains namely a) Rumors, b) Rumors towards treatment, prevention and control and c) conspiracies. Respondents are required to respond to each statement in Yes (coded as 1) and No (coded as 0) format. High scores in each scale suggest high tendency of negative social media infodemic.

Additionally, we also included self-developed items looking at the Nature, Type and Duration of Social Media in order to measure social media infodemic. This includes following items: (1) What type of social media websites do you use in terms of preference? (2) How long do you use your preferred social media website in a week? (3) What kind of information do you explore through social media websites? All items are categorized based on themes identified through literature. An additional option of any other is also added to allow variation in responses.

4. Results

The present study aimed to examine the proportion of individuals using Social media networks for getting information about COVID-19. It explored the type and nature of infodemic and the duration of use of Social media networks by the respondents during COVID-19. It further examined the relationship between Social media infodemic and mental well-being among these users during COVID19. And lastly, the impact of Social media infodemic about COVID19 on the mental well-being of these users was also examined.

Table 1: Demographic distribution of study participants (n = 668)

Socio-demographic Characteristics	Total	Using Social Media as Source of Information	Not using Social Media as Source of Information
	Total n (%)	Total n (%)	Total n (%)
Q4. Gender			
Male	208 (31.1)	109 (32.2)	99 (30)
Female	460 (68.9)	229 (67.8)	231 (70)
Q5a. Age			
Less than 20 years	204 (30.5)	102 (30.2)	102 (30.9)

20 to 24 years	360 (53.9)	184 (54.4)	176 (53.3)
25 to 30 years	70 (10.5)	39 (11.5)	31 (9.4)
More than 30 years	34 (5.1)	13 (3.8)	21 (6.4)
Mean \pm Std	21.7 (4.5)	21.5 (4.0)	21.8 (4.9)
Q5b. Degree Program rolled in			
Undergraduate	511 (76.5)	258 (76.3)	253 (76.7)
Masters	62 (9.3)	25 (7.4)	37 (11.2)
M.Phil / MS	81 (12.1)	49 (14.5)	32 (9.7)
Ph.D	14 (2.1)	6 (1.8)	8 (2.4)
Q10. Family System			
Nuclear	477 (71.4)	248 (73.4)	229 (69.4)
Joint	191 (28.6)	90 (26.6)	101 (30.6)
Q11. Number of earning family members			
One member	374 (56)	182 (53.8)	192 (58.2)
More then one member	294 (44)	156 (46.2)	138 (41.8)
Q9. Total family members living in the house			
5 or less members	283 (42.4)	145 (42.9)	138 (41.8)
6 or more members	385 (57.6)	193 (57.1)	192 (58.2)
Mean \pm Std	6.6 (3.3)	6.6 (3.2)	6.6 (3.4)
Q13. Household monthly income			
Median (PKR)	60000	67499.5	55500
Q6. Area of residence			
Rawalpindi	348 (52.1)	188 (55.6)	160 (48.5)
Islamabad	149 (22.3)	60 (17.8)	89 (27)
Taxila	39 (5.8)	21 (6.2)	18 (5.5)
Other cities*	132 (19.8)	69 (20.4)	63 (19.1)
Q8. Neighborhood Locked during COVID-19			
Yes	285 (42.7)	165 (48.8)	120 (36.4)

No	383 (57.3)	173 (51.2)	210 (63.6)
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*Cities included; Gujjar Khan, Wah, Chakwal, Jhelum, Karachi, Sialkot, Sargodha etc.

Covid-19 Information	Total	Using Social Media as Source of Information	Not using Social Media as Source of Information
	Total n (%)	Total n (%)	Total n (%)
Q14. Participants medical history/behavior* of for increased risk for COVID-19			
Yes	91 (13.6)	42 (12.4)	49 (14.8)
No	577 (86.4)	296 (87.6)	281 (85.2)
Q15. Family members medical history/behavior* of for increased risk for COVID-19			
Yes	308 (46.1)	173 (51.2)	135 (40.9)
No	360 (53.9)	165 (48.8)	195 (59.1)
Q16. History of diagnosed Psychiatric illness of respondent			
Yes	117 (17.5)	57 (16.9)	60 (18.2)
No	551 (82.5)	281 (83.1)	270 (81.8)
Q17. Participated in any physical exercise specifically during lock down in past 6 months			
3 to 4 times per week	119 (17.8)	60 (17.8)	59 (17.9)
1 to 2 times per week	128 (19.2)	63 (18.6)	65 (19.7)
1 to 2 times per month	184 (27.5)	106 (31.4)	78 (23.6)
Not at all	237 (35.5)	109 (32.2)	128 (38.8)
Q18. Experienced domestic stress during COVID 19 in past 06 months			
Always	37 (5.5)	18 (5.3)	19 (5.8)

Often	116 (17.4)	67 (19.8)	49 (14.8)
Sometimes	233 (34.9)	121 (35.8)	112 (33.9)
Rarely	116 (17.4)	59 (17.5)	57 (17.3)
Never	166 (24.9)	73 (21.6)	93 (28.2)

Table 1 presents the demographic profile of 668 respondents who participated in an online survey. 53.8% of the entire sample was below 24 years of age. The majority of the respondents were females (i.e., 68.9%) where males comprised 31% proportion of the overall sample. The majority of them belonged to the areas of Rawalpindi and Islamabad (65% and 34% respectively) however a few of them (i.e., 1%) belonged to the adjacent areas of Punjab. 71% of the respondents rated them as belonging to the nuclear family system. The respondents were also asked to rate whether their neighborhood was locked during COVID 19. In response to this, approximately 43% of them reported having experienced and observed locked down.

Certain questions related to medical history were also asked to identify any potential risk factors prevailing in the participants or their families which might be associated with current mental wellbeing. According to the descriptive analysis, it appeared that there were at least two medical risk factors reported by the majority of the participants whereas a minimum of two symptoms was also reported in the families of the respondents. The presence of medical symptoms was higher in the respondent families than noted in them. Additionally, a few of the respondents also reported seeking psychiatric help for mental health problems. Amongst various factors impacting the mental wellbeing during COVID19, two questions that were asked in the survey were related to experiencing any domestic stress and the nature of the physical activity. Approximately 75% of the overall sample reported domestic stress, whereas 35% reported having been largely sedentary during the COVID 19 time period.

PROPORTION OF INDIVIDUALS USING SPECIFIC SOURCE OF INFORMATION AND SOCIAL MEDIA PLATFORMS FOR COVID 19 INFORMATION.

Study objective one referred to finding the proportion of individuals (males and females) using a specific source of information and social media platforms for COVID 19. The following table shows the descriptive analysis across the preferences in terms of source of information.

Table 2 The proportion of Individuals preferring specific sources of Information and social media platforms about COVID-19(n=668)

Social Media Networks Users	Total	Using Social Media as	Not using Social Media as
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		Source of Information	Source of Information
Q19. Preferred other sources of information regarding COVID-19			
TV	187 (28)	145 (42.9)	42 (12.7)
Radio	14 (2.1)	13 (3.8)	1 (0.3)
Books	76 (11.4)	53 (15.7)	23 (7)
Scientific Reports	76 (11.4)	59 (17.5)	17 (5.2)
Government Websites	126 (18.9)	98 (29)	28 (8.5)

Table 2 presents the distribution of the responses in terms of the sources of information preferred during COVID 19, and social media network or websites used for obtaining COVID 19 specific information. The descriptive analysis shows that the majority of the respondents preferred social media platforms (56.8%) and Television as popular sources of information for COVID 19. Within the social media platforms, 68% of the respondents preferred to use Whatsapp, whereas, 58.8% preferred using Youtube and Instagram (50%). The proportion of the respondents using the rest of the social media websites ranged from 18% - 37%.

SOCIAL MEDIA USAGE DURING COVID-19

The second objective of the current study was to determine the extent of social media usage during COVID-19. On the basis of evidence from literature, the average use of social media platforms a day i.e., 3 days in one week and 3 hours per day was noted as a reference. Participants were asked to rate their social media platforms usage both before and during COVID-19 in three categories i.e., less than 3 days per week OR more than 3 days per week. They were also asked to rate their usage of social media platforms in terms of the number of hours per day. This response was recorded as less than 3 hours a day vs. more than 3 hours a day both before and during COVID-19. Following is the descriptive analyses of the responses obtained.

Q21. Social media use in a week (in days)	Total n (%)	Using Social Media as Source of Information	Not using Social Media as Source of Information
Average number of days before COVID-19 pandemic (days)	5.1	5.4	4.6
Average number of days during COVID-19 pandemic (days)	5.7	6.1	5.3
Q22. Social media use in a day (in hours)			
Average number of hours in a day before COVID-19 pandemic (hours)	5.4	4.9	5.8

Average number of hours in a day during COVID-19 pandemic (hours)	7.8	8.2	7.3
Q23. Reasons for use of social media			
To keep updated about local news and events	231 (34.6)	168 (49.7)	63 (19.1)
For Business	64 (9.6)	41 (12.1)	23 (7)
To share photos or videos	129 (19.3)	98 (29)	31 (9.4)
To get /give information about COVID in Pakistan	193 (28.9)	143 (42.3)	50 (15.2)
For entertainment (games, movies)	299 (44.8)	216 (63.9)	83 (25.2)
Q24. During COVID 19 outbreak, thinking specifically about your most preferred social media: please tell us what are the different types of content you post''	Total n (%)	Using Social Media as Source of Information	Not using Social Media as Source of Information
None	107 (16)	43 (12.7)	64 (19.4)
Number of new cases of COVID patients and spread	212 (31.7)	120 (35.5)	92 (27.9)
How to prevent COVID 19	209 (31.3)	117 (34.6)	92 (27.9)
To learn about how COVID 19 spreads	136 (20.4)	71 (21)	65 (19.7)
COVID 19 related conspiracies	62 (9.3)	31 (9.2)	31 (9.4)
COVID 19 related jokes and trolling	162 (24.3)	96 (28.4)	66 (20)
Home remedies to cure COVID 19	94 (14.1)	50 (14.8)	44 (13.3)
Current research on COVID 19	111 (16.6)	65 (19.2)	46 (13.9)
Measures taken by government	122 (18.3)	71 (21)	51 (15.5)

In terms of differences before and during COVID-19, those who reported preferring social media as a source of information appeared to have a significant increase in social media platforms usage (ie., from 9% individuals before COVID-19 to 22% during COVID-19). As seen in the figures reported in Table 3b, the duration of social media usage increased more than 6 to 10 hours and above as reported by 22% to 40% of the study participants.

TYPE AND NATURE OF INFODEMIC

Thirdly, we sought to assess the type and nature of social media information that lead towards depression and anxiety. Social Media Infodemic during COVID-19 was operationally defined

as any source of COVID-19 related information which was likely to cause a negative impact. This includes misinformation of COVID-19 origin, remedies used to treat COVID-19 and the belief in conspiracy theories. In response to the question “Do you believe in the following information related to COVID-19” that main reason to develop depression and anxiety.

Table 4

Table 4a

Descriptive statistics of participants Misinformation, Home Remedies and Conspiracies that lead towards Depression and Anxiety during COVID-19 (n = 668)

Believe in information about COVID19 as true by respondent	Total (n%)	Depression (n%)	No Depression (n%)	Anxiety (n%)	No Anxiety (n%)
Eating bat soup is the source of the (COVID-19) outbreak	282(42.2)	123 (48)	159 (38.6)	84 (45.4)	198 (41)
Common cold had been renamed as coronavirus	200 (29.9)	84 (32.8)	116 (28.2)	59 (31.9)	141 (29.2)
Doctors inject poison into COVID-19 Patients at the hospitals	199 (29.8)	94 (36.7)	105 (25.5)	64 (34.6)	135 (28)
COVID-19 is a hoax-it does not exist	89 (13.3)	42 (16.4)	47 (11.4)	27 (14.6)	62 (12.8)
Coronavirus outbreak in the livestock	263 (39.4)	106 (41.4)	157 (38.1)	88 (47.6)	175 (36.2)
Poultry eggs are contaminated with coronavirus	112 (16.8)	63 (24.6)	49 (11.9)	40 (21.6)	72 (14.9)
Chinese dietary habit caused COVID-19	387 (57.9)	148 (57.8)	239 (58)	113 (61.1)	274 (56.7)
90% Pakistanis became coronavirus patients	172 (25.7)	82 (32)	90 (21.8)	59 (31.9)	113 (23.4)
Govt. is giving money to doctors against each death	165 (24.7)	77 (30.1)	88 (21.4)	47 (25.4)	118 (24.4)

Home remedies do you believe can be helpful for a COVID-19 patient	Total (n%)	Depression (n%)	No Depression (n%)	Anxiety (n%)	No Anxiety (n%)
Eating garlic can cure coronavirus	342 (51.2)	136 (53.1)	206 (50)	109 (58.9)	233 (48.2)

Drinking bleach may kill the virus	64 (9.6)	30 (11.7)	34 (8.3)	18 (9.7)	46 (9.5)
Gargling vinegar and rose water or vinegar and salt may kill the virus in throat	219 (32.8)	90 (35.2)	129 (31.3)	63 (34.1)	156 (32.3)
Keeping throat moist, avoid spicy food and taking vitamin C may prevent the disease	461 (69)	182 (71.1)	279 (67.7)	134 (72.4)	327 (67.7)
Avoiding cold or preserved food and drinks, such as ice cream and milkshakes may prevent infection	381 (57)	140 (54.7)	241 (58.5)	104 (56.2)	277 (57.3)
Spraying Dettol all over your body can prevent coronavirus infection	405 (60.6)	151 (59)	254 (61.7)	110 (59.5)	295 (61.1)
Vitamin-C intake can prevent coronavirus infection	458 (68.6)	167 (65.2)	291 (70.6)	129 (69.7)	329 (68.1)
Vitamin-D can prevent coronavirus infection	380 (56.9)	142 (55.5)	238 (57.8)	104 (56.2)	276 (57.1)
Eating a spoonful of Kalonji (black seeds) daily can help prevent coronavirus	423 (63.3)	161 (62.9)	262 (63.6)	118 (63.8)	305 (63.1)
Drinking "Sanna Maki" qehwa can help prevent coronavirus	351 (52.5)	143 (55.9)	208 (50.5)	96 (51.9)	255 (52.8)

Conspiracy about COVID 19 do you or did you believe to be true	Total (n%)	Depression (n%)	No Depression (n%)	Anxiety (n%)	No Anxiety (n%)
Pakistan Govt. is showing fake inflated statistics of corona virus patients to get international aid	260 (38.9)	129 (50.4)	131 (31.8)	85 (45.9)	175 (36.2)
Novel coronavirus is engineered, laboratory-generated virus either accidentally or deliberately released in the area of the	321 (48.1)	132 (51.6)	189 (45.9)	91 (49.2)	230 (47.6)

Wuhan seafood and animal market					
COVID-19 outbreak was planned	297 (44.5)	130 (50.8)	167 (40.5)	87 (47)	210 (43.5)
It's a bio-weapon funded by the Bill & Melinda Gates foundation to further vaccine sales	212 (31.7)	100 (39.1)	112 (27.2)	63 (34.1)	149 (30.8)
United States and Israel of being behind the creation and spread of the deadly corona virus as part of an economic and psychological war against China	292 (43.7)	131 (51.2)	161 (39.1)	81 (43.8)	211 (43.7)
This outbreak is a population control scheme	242 (36.2)	114 (44.5)	128 (31.1)	70 (37.8)	172 (35.6)
New corona virus vaccines already exist	279 (41.8)	127 (49.6)	152 (36.9)	86 (46.5)	193 (40)
COVID-19 spread because of 5G towers	124 (18.6)	59 (23)	65 (15.8)	38 (20.5)	86 (17.8)

The above table was indicated, that majority of respondents reported depression and anxiety due to covid-19 related misinformation, home remedies and conspiracies.

LEVELS OF ANXIETY AND DEPRESSION

Given the objective four of this study about assessing the levels of anxiety or depression.

Table 5 Frequency and Percentages of Depression and Anxiety during COVID-19 (n=668)

Mental Well Being Information	Total	Depression	
		Yes	No
Depression Level using PHQ-9 scoring			
No depression	59 (8.8)	0 (0)	59 (14.3)
Minimal depression	154(23.1)	0 (0)	154 (37.4)
Mild depression	199 (29.8)	0 (0)	199 (48.3)
Moderate depression	155 (23.2)	155 (60.5)	0 (0)
Moderate severe depression	76 (11.4)	76 (29.7)	0 (0)

Severe depression	25 (3.7)	25 (9.8)	0 (0)
Anxiety Level using GAD-7 scoring		Anxiety	
Minimal anxiety	233 (34.9)	0 (0)	233(48.2)
Mild anxiety	250 (37.4)	0 (0)	250 (51.8)
Moderate anxiety	118 (17.7)	118(63.8)	0 (0)
Severe anxiety	67 (10)	67 (36.2)	0 (0)

As it can be observed, moderate to severe levels of depression was reported by the participants of the study. 60.5% of the participants reported the moderate level of depression. 39.5% of the participants was reported moderate to severe level of depression during COVID-19. The table was indicated that moderate to severe level of Anxiety was present in the study participants during COVID-19. Moderate Anxiety was reported in 63.8% of the individuals and 36.2% individuals was reported the severe anxiety.

5. Discussion and Conclusion

As formerly coined by the World Health Organization, the term ‘infodemic,’ refers to emotional imbalance resulting from difficulty of finding authentic sources of information (Baines & Elliott, 2020). Social media has been a platform for ‘fake news’ during the pandemic, which may have negative impacts on an individual’s mental wellbeing. The mental health issue is an important phenomenon, globally, after the outbreak of COVID-19. The current study was carried out to identify proportion of individuals using social media and preferring it as their primary source of COVID 19 related information and then to determine the impact of social media infodemic on Mental wellbeing. Anxiety and Depression was found in approximately 75% of the current study sample. In a study conducted by Cheng and colleagues (2020) on 1270 participants from UK and US, clinically relevant anxiety was prevalent in 61% of the participants where as more than half of the participants in the anxiety group also reported mild to severe sleep disturbance.

Findings of the present study also showed that for those individuals who identified themselves as preferring social media were likely to report concerning levels of anxiety and depression. Furthermore, we also found a fair distribution of the sample across a number of myths that they or their families believed in. According to the study findings, one of the primary reasons for depression is the excessive use of social media among university students during COVID-19. These results show that the use of social media platforms among university students has increased manifolds during the COVID-19 period which could have increased their emotional vulnerability. Similar studies from previous literature has also reported adverse mental health impacts of those using social media platforms for information retrieval during the pandemic (Patwa et al, 2020; Islam et al, 2020; Bunker 2020). According to Patel (2020), it has now become even more important to mitigate infodemics and its implications at the social front while formulating strategic plans to contain the ongoing pandemics.

Social media infodemic in the shape of rumours, conspiracy theories, erroneous statistics and fake remedies is spreading a panic-like situation among its users which not only inculcate fear but also eventually leads them to various mental health issues. The reason why exposure to social media infodemic might trigger more depression and anxiety as compared to the traditional media is the ready and quick availability of information (or misinformation) in the form of pictures, statistics, vlogs and text messages etc (Al-Dmour, Salman, Abuhashesh, & Al-Dmour, 2020). Despite the positive role social media has been playing during COVID-19 (Abbas, Wang, Su, & Ziapour, (2021), the diverse psychological consequences leading to depression and anxiety among its users are out-weighting. As it is not possible to harness the flood of information (or misinformation) on social media, the young respondents of our study need to distance themselves from the frequent use of various social media platforms to ensure a healthy mind that is less anxious and less depressed.

6. Limitations

This study has few limitations. Firstly, the data was gathered during second wave of COVID 19, therefore the death rates during this time might be different from present time. Therefore future studies may consider assessing the study variables in different waves of COVID 19. Furthermore, impact of different covariates (such as domestic stress, or existing psychiatric history) may influence wellbeing, This was not reported in the current study. Additionally, data was gathered from Rawalpindi and Islamabad based universities, therefore to gain generalisability of these results, data from nation wide is required to be collected and compared.

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