Infodemics and its Effect on Mental Health of Medical Students of IMDC during COVID-19 Pandemic

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Abstract

Introduction: Globally rising the number of daily COVID-19 cases has triggered the incredible surge in the information (and misinformation) regarding COVID-19. This misinformation was about the number of cases, inaccurate guidelines, advertisement of unapproved treatments, and remedies as cures. The increasing prevalence of depression and anxiety was found to be linked directly to the misinformation catered from social media. The study aims to explore the mental health of medical students due to a surge in information and misinformation regarding COVID-19.

Materials and Methods: This cross-sectional study was conducted online from August 2020 to January 2021. 227 MBBS students of IMDC (1st year to final year with age range 19-25 years) were invited to participate in an online survey through Google docs. Those who were on medication for anxiety and depression were excluded from the study. A Chi-square test was applied to calculate the significance of qualitative variables and determine the prevalence of mental health.

Results: The total number of students who participated in this survey was 227 (28.2% males and 71.8% females).. A significant association was found between gender (Both males and females) and feelings of fear and worry (*p-value* 0.004**), feeling socially isolated (p= 0.005**), difficulty in communicating with people (*p* = 0.021*), feeling confused in decision making as time progressed (0.008**), lack of interest in studying or difficulty in concentration during this time (*p* 0.037*) and effect on memorizing ability (0.000)**. MBBS students who were regularly using Info-media showed a significant disturbance in mental health problems including stress-related and behavioral changes and somatic symptoms. They were found to be significantly fearful and worried (p-value 0.010*), had difficulty in communicating with people regarding COVID-19 (*p-value* 0.021*), and also felt a change in appetite-valuable 0.030*). No serious mental health problem was found related to cognitive functioning.

Conclusion: In conclusion, our findings show that there is a high prevalence of mental health problems, which were positively associated with the frequent use of info-media during the COVID-19 outbreak.

Keywords: Infodemics, Medical students, Mental health.

Introduction

On March 11, 2020, the Director-General of the World Health Organization (WHO) declared the overwhelming increasing spread of the novel COVID-19 viral infection as a pandemic.[1] Probably it is the first time that the whole world progressed towards a standstill, countries shut down, borders sealed, traveling especially international flights halted, offices and educational institutes put on hold, the public looked towards social media as their beacon of comfort, guidance, and inevitably the primary source of information regarding this viral contagion.

World Health Organization (WHO) Director-General Tedros Adhanom Ghebreyesus's statement depicts that we are not just fighting an epidemic; we're fighting an infodemic.[2] and rightly so. First time in the 2002-2003 SARS outbreak the term 'infodemic' was originally coined.[3,4] It is a blend of 'information' and 'epidemic' and now WHO explains it as an excessive amount of information about a problem making it difficult to identify a solution.[2] Now the infodemics are recognized as a global public health threat by Heidi J. Larson and predicted it to be an emotional contagion, digitally enabled.[5]

Globally rising number of daily COVID-19 cases has triggered the incredible surge in the information (and misinformation) regarding COVID-19. Studies identified three waves of infodemics between January 21, 2020, and April 5, 2020.[6] This was misinformation of incorrect numbers of cases and invalid self-created guidelines treatments and remedies to cure a viral infection.[5] All the herbs and grass has been tried in kahwahs. So far, studies conducted in this field have highlighted the sources of information overload and the mental health implications of such an overload. The increasing prevalence of depression and anxiety was found to be linked directly to the misinformation catered from social media, in a cross-sectional study in China. It is found in another research that the health-seeking behaviour of the public has been influenced grievously by false theories and fear linked with COVID-19 throughout the world.[7] Studies conducted in Pakistan have revealed similar results – a cross-sectional analysis of 303 participants showed the prevalence of generalized anxiety disorder (GAD) to be the greatest among university-going students. However, no study shows the effects of infodemics on medical students in Pakistan.[6] Studies elsewhere have revealed how it can be challenging for even medical professionals, to be able to differentiate between the influx of information and misinformation.[7,8]

This tsunami of information is particularly challenging for medical students who, apart from being overwhelmed by this pandemic themselves are expected to rationally and professionally tackle the infodemics.

This paper aims to explore the effects of infodemics on medical students of IMDC, the relationship of sociodemographic factors with mental health, and shed light on the approach and response of medical students towards infodemics.

Materials and Methods

Study design: This cross-sectional study was conducted online from August 2020 to January 2021. MBBS students of IMDC (1st year to final year, age range from 19-25 years) were invited to participate in an online survey through google docs.

Inclusion and Exclusion criteria: All MBBS students ages ranging from 19-25 years were included in the sample size. Those who were on medication for anxiety and depression were excluded from the study.

Study Sample: A sample of 218 was calculated keeping the level of significance 0.05, 95% Confidence Interval, and margin of error. The sample size was calculated from www.raosoft.com. Sample selection was based on non-random convenient sampling.

Ethical considerations: The use of the data for research purposes was explained and written consent in the first section of the online survey was given to all participants before filling the questionnaire. The Questionnaire was divided into 3 sections. The first part was about Demographic information. The second part consisted of 5 questions about info-media use and the third part consisted of 12 questions about mental health including stress-related and behavioural changes, somatic symptoms, emotional disturbance, and cognitive functioning during the COVID-19 pandemic. Ethical Approval was taken from the Institutional Review Board of IMDC.

Assessment

Info-media exposure: Info media exposure was assessed by asking which info-media platforms were used most frequently during the past four months regarding news and information about COVID-19, such as WhatsApp, Facebook, Instagram, Snapchat, Television, newspapers. They were also inquired about finding any news from info-media which later proved wrong.

Mental health problems: Impact on Mental health was assessed in the current study by asking stress-related questions "Did you feel any change in your sleep

pattern", Behaviour related changes "Did you have difficulty in communicating with people regarding", Cognitive functioning like "Did you experience any lack of interest in studying or difficulty in concentration during this time" somatic symptoms "Did you feel any change in appetite" Students were asked to report the presence or absence of these feelings in the last 4 months during the time of the pandemic. Questions were derived from the GAD scale[10] and the Centre for Epidemiology Scale for depression (CES-D.[11]

Covariates: The following covariates were included in this study: gender, age (19-25 years), educational level (1st year to final year MBBS), and area (urban and rural).

Data Analysis: SPSS Version 23 was used to categorize and test the results. Chi-square test was applied to calculate the significance of qualitative variables and determine the prevalence of mental health problems among MBBS students (stress related to the pandemic, behavior-related changes, somatic symptoms, cognitive functioning, by categorical variables including info-media exposure and covariates) and association of age with mental health problems was calculated during the COVID-19 pandemic. . P<0.05 was considered statistically significant. For descriptive variables like age, gender, frequency, and percentages were calculated.

Results

Study population: This cross-sectional study was conducted online from August 2020 to January 2021. MBBS students of IMDC aged 19-25 years (1st year to final year) were invited to participate in an online survey through Google docs.

Demographic characteristics of participants: The total number of students who participated in this survey was 227, out of these 64(28.2%) were male and 163(71.8%) were females.

The total number of first-year MBBS students were 42(18.5%), a second-year MBBS 27(11.9%), Third Year MBBS 22(9.7%), Fourth Year 84(37%), and Final Year MBBS were 52(22.9%) as shown in Figure 1.Out of these 29(12.8%) belonged to Rural Areas while 198(87.2%) belonged to Urban Areas. Among types of info-media, WhatsApp was used most frequently by all MBBS students as shown in Figure 2.

Relationship of gender and mental health: Different questions were asked regarding Info-media usage and mental health. A significant association was found between gender (Both males and females) and feelings

of fear and worry due to the circulating information regarding COVID-19 (*p-value*=0.004) There was also a significant association between gender and feeling socially isolated (*p-value*=0.005**), with difficulty in communicating with people regarding COVID-19, (*p-value*=0.021*), feeling confused in decision making as time progressed (p-value=0.008**), with experience of any lack of interest in studying or difficulty in concentration during this time (*p-value*=0.037*) and effect on memorizing ability due to regular irritating or inaccurate information (p-value=0.000)** as given in Table 2.

Regular users of Infomedia and mental health: MBBS students who were regularly using Info-media showed a significant disturbance in mental health problems including stress-related and behavioural changes and somatic symptoms. They were found to be significantly fearful and worried (*p-value*=0.010*), had difficulty in communicating with people regarding COVID-19 (*p-value*=0.021*), and also felt a change in appetite (p-value=0.030*). No serious mental health problem was found related to cognitive functioning. as given in Table 3.
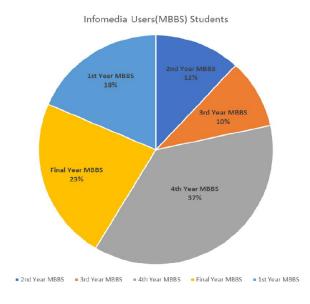

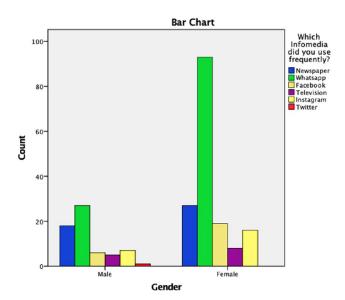**Figure 1: Distribution of MBBS Students using Info-media**

Figure 2: Gender and Type of info-media used frequently

Table 1: Association of gender with Info-media use and mental health among MBBS students

Gender	Yes N (%)	No N (%)	Total N (%)	P-value
1. Do you regularly use info-media platforms				
Male	55(85.9)	9(14.1)	64(100)	0.32
Female	134(82.2)	29(17.8)	163(100)	
Total	189(83.3)	38(16.7)	227(100)	
2. Did you find any news from info-media which later proved wrong				
Male	11(17.2)	53(82.8)	64(100)	0.234
Female	37(22.7)	126(77.3)	163(100)	
Total	48(21.1)	179(78.9)	227(100)	
3. Did you feel fearful and worried because of the circulating information				
Male	37(57.8)	27(42.2)	64(100)	0.004*
Female	125(76.7)	38(23.3)	163(100)	
Total	162(71.4)	65(28.6)	227(100)	
4. Did you feel socially isolated				
Male	22(34.4)	42(65.6)	64(100)	0.005*
Female	89(54.6)	74(45.4)	163(100)	
Total	111(48.9)	116(51.1)	227(100)	
5. Did you feel any change in your sleep pattern				
Male	39(60.9)	25(39.1)	64(100)	0.399
Female	104(63.8)	59(36.2)	163(100)	
Total	143(63)	84(37)	227(100)	
6. Did you feel irritable or angry every time you received new information				
Male	27(42.2)	37 (58.8)	64(100)	0.303
Female	82 (50.3)	81 (49.7)	163(100)	
Total	109 (48)	118 (52)	227(100)	
7. Did this irritable or angry attitude made you want to be alone				
Male	20(31.3)	44(68.8)	64(100)	0.099
Female	71(43.6)	92(56.4)	163(100)	
Total	91(40.1)	136(50.9)	227(100)	
8. Have you felt amusement and liveliness during the past few months				
Male	37(57.8)	27(42.2)	64(100)	0.651
Female	101(62.0)	62(38.0)	163(100)	
Total	138(60.8)	89(39.2)	227(100)	
9. Did you have difficulty in communicating with people regarding COVID-19				
Male	15(23.4)	49(76.6)	64(100)	0.021*
Female	65(39.9)	98(60.1)	163(100)	
Total	80(35.2)	147(64.8)	227(100)	
10. Did you feel any change in appetite				
Male	31(48.4)	19(29.7)	64(100)	0.170
Female	57(35)	59(36.2)	163(100)	
Total	88(38.8)	78(34.4)	227(100)	
11. Did you feel tremors or sweating in hand				
Male	8(12.5)	56(87.5)	64(100)	0.469
Female	15(9.2)	148(90.8)	163(100)	
Total	23(10.1)	204(89.9)	227(100)	
12. Did you feel confused in decision making as time progressed				
Male	22(34.4)	42(65.6)	64(100)	0.008*
Female	89(54.6)	74(45.4)	163(100)	
Total	111(48.9)	116(51.1)	227(100)	
13. Did you experience any lack of interest in studying or difficulty in concentration				
Male	49(76.6)	15(23.4)	64(100)	0.037*
Female	144(88.3)	19(11.7)	163(100)	
Total	193(85.0)	34(25.0)	227(100)	
14. Do you believe your memorizing ability was affected				
Male	22(34.4)	42(65.6)	64(100)	0.000**
Female	103(63.2)	60(36.8)	163(100)	
Total	125(55.1)	102(44.9)	227(100)	

P-value <0.05 is significant

Table 2: Association of Info-media usage with Mental health in MBBS students

Regular use of Info-media	Yes N (%)	No N (%)	Total N (%)	P-value
1. Did you feel fearful and worried because of circulating information				
Yes	142(75.1)	47(24.9)	189(100)	0.010*
No	20(2.6)	18(47.4)	38(100)	
Total	162(71.4)	65(28.6)	227(100)	
2. Did you feel socially isolated				

Yes	94(49.7)	95(50.3)	189(100)	0.598
No	17(44.7)	21(55.3)	38(100)	
Total	111(48.9)	116(51.1)	227(100)	

3. Did you feel any change in your sleep pattern

Yes	122(64.6)	67(35.4)	189(100)	0.357
No	21(55.3)	17(44.7)	38(100)	
Total	143(63.0)	84(37.0)	227(100)	

4. Did you feel irritable or angry every time you received new information

Yes	92(48.7)	97(51.3)	189(100)	0.724
No	17(44.7)	21(55.3)	38(100)	
Total	109(48.0)	118(52)	227(100)	

5. Did this irritable or angry attitude made you want to be alone

Yes	77(40.7)	112(59.3)	189(100)	0.719
No	14(36.8)	24(63.2)	38(100)	
Total	91(40.1)	136(59.9)	227(100)	

6. Have you felt amusement and liveliness during the past few months

Yes	118(62.4)	71(37.6)	189(100)	0.303
No	20(52.6)	18(47.4)	38(100)	
Total	138(60.8)	89(39.2)	227(100)	

7. Did you feel a change in your appetite

Yes	20(31.3)	44(68.8)	189(100)	0.278
No	71(43.6)	92(56.4)	38(100)	
Total	91(40.1)	136(50.9)	227(100)	

8. Did you have difficulty in communicating with people regarding COVID-19

Yes	15(23.4)	49(76.6)	189(100)	0.021*
No	65(39.9)	98(60.1)	38(100)	
Total	80(35.2)	147(64.8)	227(100)	

10. Did you feel sweating or tremors in your hand

Yes	80(42.3)	59(31.2)	189(100)	0.030*
No	8(21.1)	19(50.0)	38(100)	
Total	88(38.8)	78(34.4)	227(100)	
No	5(13.2)	33(86.8)	38(100)	
Total	23(10.1)	204(89.9)	227(100)	

11. Did you feel confused in decision making as time progressed

Yes	92(48.7)	97(51.3)	189(100)	1.000
No	19(50.0)	19(50.0)	38(100)	
Total	111(48.9)	116(51.1)	227(100)	

12. Did you experience any lack of interest in studying or difficulty in concentration

Yes	160(84.7)	29(15.3)	189(100)	1.000
No	33(26.8)	5(13.2)	38(100)	
Total	193(85)	34(15)	227(100)	

13. Do you believe your memorizing ability was affected because of regular irritating or inaccurate information

Yes	107(56.6)	82(43.4)	189(100)	0.372
No	18(47.4)	20(52.6)	38(100)	

Total	125(55.1)	12(44.9)	227(100)

P-value <0.05 is significant*

Discussion

In this study, the total number of MBBS Students of IMDC was 227, 19-25 years of age. Male 64 (28.2%) and 163 (71.8%) were the females. The total number of first-year MBBS students was 42 (18.5%), second-year MBBS 27 (11.9%) while third-year students were 22 (9.7%). Students of MBBS fourth year were 84 (37%) and 52 (22.9%) were the final year students. Out of the total 227 students, 29 (12.8%) belonged to the rural background and 198 (87.2%) were from urban areas.

WhatsApp came out on top among all info-medias, in our study. More than half of our medical students (52.9%) were using WhatsApp. Other infomedia used were Newspaper (19.8%), Facebook (11%), Instagram (10.1%) and Television was (5.7%) the least popular media.

These results correspond to the previous study[12] where over-uses of Facebook, Netflix, and *television* were significantly associated with the degree of psychological and mental stress inflicted by the COVID-19 pandemic. The individuals found "very stressed" had higher use of these specific media. But in our study, WhatsApp was the most frequently used infodemic platform and should be our first tier to tackle this tenacious scenario. Alarmingly only 21% of these highly dynamic educated individuals could found that their information was false. But 71% still feared COVID-19 even though 68.12% of young individuals could identify that their information was partially or completely inaccurate.[13] It identifies infodemics (misinformation) from uncontrolled social media was more of a cause than the pandemic itself, inflicting immense fear and mental stress in our participants. Comparatively, females were found to have higher stress on their mental health than males in our study, and these findings are congruent with another Pakistani study.[14] Our study showed that concentrating and focusing on studies was the major aspect being affected by this tsunami of misinformation flooding in through smartphones. In a previous Pakistani study only 6.9% of people 20-50 years of age, reported having sleep disturbances. But our study concluded that 63% of 19-25 years of age, very young dynamic individuals were found to have changes in their sleep pattern indicating it affected the younger population more. Probably because this segment of our population is constantly

linked to the internet and infodemics much more profoundly as compare to the older age group.

A significant association was found in both genders. Anxiety fears and worry due to the circulating flood of information regarding COVID-19 (*p*-value=0.004***). There was also a significant association between gender and feeling socially isolated (*p-value*=0.005), with difficulty in communicating with people regarding COVID-19, (*p-value* 0.021*), feeling confused in decision making as time progressed(0.008), with experience of any lack of interest in studying or difficulty in concentration during this time (*p-value*=0.037*) and effect on memorizing ability due to regular irritating or inaccurate information (0.000)** MBBS students who were regularly using Info-media showed a significant disturbance in mental health problems including stress-related and behavioural changes and somatic symptoms. They were found to be significantly fearful and worried (*p-value*=0.010*), had difficulty in communicating with people regarding COVID-19 (p-*value*=0.0218), and also felt a change in appetite (p-value=0.030*). No serious mental health problem was found related to cognitive functioning.

Social media is one of the main channels updating the COVID-19 information.[15] In other studies, 82.0% of participants frequently expose to social media, and frequently SMEs (stress-mediated anxieties) associated high odds of anxiety and CDA, which is consistent with previous studies there may be two reasons explaining the association between frequent Infomedia and mental health. During the COVID-19 outbreak, disinformation and false reports about the COVID-19 have bombarded social media and stoked unfounded fears among many netizens, which may confuse people and harm people's mental health. Besides, many citizens expressed their negative feelings, such as fear, worry, nervousness, anxiety et al. on social media, which are contagious social networks. So, WHO's 'infodemics' team is working hand in glove with the countries' communications department to deliver information to a broader public audience.[16]

Some potential limitations should be noted in this study. First, this is a cross-sectional study, so it is difficult to accurately elucidate causal relationships between infomedia and mental health. Additional longitudinal studies, such as cohort studies or nested case-control studies are essential in the future. Although adequate sample size, the survey was conducted online only in MBBS Students, and there was an unequal number of students of different years of MBBS, which is suitable for rapid assessment, there

may be some respondent bias which might have affected the results.

Finally, although we did control for many covariates, we cannot exclude the possibility of some residual confounding caused by unmeasured factors.

Conclusion

In conclusion, our findings show there is a high prevalence of mental health problems, which is positively associated with the frequent use of info-media during the COVID-19 outbreak. These findings implicate that the government needs to pay more attention to the mental health of the young population while combating COVID-19. More attention should be paid to depression and anxiety. The next implication is to combat infodemics by monitoring and filtering out false information and promoting accurate information through cross-section collaborations. The psychiatry department and Counselling cell of IMDC should actively participate to help ailing Students with mental health problems and stress due to academic overburden during this Pandemic.

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