**Original Research Paper** 



# AN EVALUATION OF THE PSYCHOLOGICAL IMPACT OF COVID 19 ON UNDERGRADUATE MEDICAL STUDENTS IN WEST BENGAL, INDIA.

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# ABSTRACT

BACKGROUND: The COVID 19 pandemic has wreaked havoc in the lives of people all over the world. Due to the sudden change in the way of life mental health problems have been rising across the globe. Medical students have been no exception to this.

AIMS AND OBJECTIVES: This study aims to assess whether the pandemic has adversely affected the mental health of undergraduate medical students of West Bengal, India.

MATERIALS AND METHODS: An online survey was conducted using standardized questionnaires, namely Perceived Stress Scale and Beck Depression Inventory, to assess the levels of stress and depression among the students. Specific stressors affecting the students were also studied.

**RESULTS:** Moderate or severe levels of stress and/or depression were reported by 83.87% out of the 465 students who participated in the study. However only 21.08% of them have sought professional help. The most stressful factor for first year students was the online mode of education, while that for the second and third year students was uncertainty about future, and that for final year students was the impact on internship rotations and clinical experience.

CONCLUSIONS: COVID 19 pandemic has significantly affected the mental health of medical undergraduate students in India. The treatment gap has to be reduced to ensure a better quality of life for the individual, and thus benefit the entire society at large.

## **KEYWORDS** : COVID 19, stress, anxiety, depression, treatment gap

## INTRODUCTION:

"COVID-19" refers to a disease occurring due to infection by a virus named "SARS-Cov-2" which stands for Severe Acute Respiratory Syndrome Corona Virus 2.<sup>[1]</sup> In December 2019, COVID-19 was reported for the first time in Wuhan, Hubei Province, China. Subsequently, the virus started spreading rapidly, culminating in an outbreak across China and then the rest of the world. On March 11, 2020, the World Health Organization declared it as a pandemic.<sup>[2]</sup> In most of the cases, persons affected with COVID-19 experience mild flulike symptoms characterized by fever, cough, headache, sore throat etc. and get better within weeks. However some of them may fall severely or critically ill and develop acute respiratory distress syndrome (ARDS). Besides respiratory system there may be numerous extra pulmonary manifestations associated with it.<sup>[3]</sup> A few persons experience a plethora of persisting, recurring and ongoing health problems even after being cleared of viral load as evidenced by a negative RT-PCR result for COVID 19, collectively termed as post COVID conditions.<sup>[4]</sup> The SARS-COV-2 virus is highly contagious.<sup>[5]</sup> The ever increasing tally of morbidity and mortality of COVID 19 has disrupted the socio-economic foundation all over the world.<sup>[6]</sup>

In order to bring the situation under control, administrative bodies have imposed preventive measures such as lockdown, identifying containment zones, restricting non-essential travel, partial or complete ban on domestic and international travel, prohibiting social and public gatherings, and requirement of wearing masks and observing physical distancing.<sup>171</sup> Educational institutions were shut down for indefinite periods to safeguard the health of employees and students. Medical colleges were no exception to this, and thus, medical education which is based on live lectures and demonstration classes was profoundly disrupted. Since the virus is air-borne, the lectures as well as the demonstrations could not be conducted in the traditional way in which a large number of students congregate in a confined space in the lecture halls. Bed side clinical teaching was also put on hold as it involves close physical contact between the students, doctors and patients. In short, the situation presented an unforeseen and seemingly insurmountable challenge with regards to effective implementation of medical education.<sup>[8]</sup>

In these trying times, online mode of teaching cropped up as the only feasible solution. The recently introduced Competency Based Medical Education (CBME) also endorses this modality of teaching. Nevertheless, this very online mode of education posed a new set of challenges for both the instructors as well as the students, who were expected to adapt to the new method efficiently, and within a very short span of time. This paradigm shift to new normal profoundly affected the mental health of the undergraduate medical students.[8]

Medical students are usually more vulnerable to psychological problems as compared to their non-medical counterparts as a result of the highly stressful and competitive environment in which they study and operate. In the backdrop of this pre-existing maladaptive environment, COVID-19 has paved the way in for additional stressors like unpredictability of the nature and course of infection, sudden restriction in freedom of movement and socializing, uncertainty about the future, concern related to health of self and family members, financial loss and most importantly, lack of opportunity of hands on training.<sup>[9]</sup> Currently in the undergraduate curriculum in India, medical students have to clear preclinical subjects first, followed by the paraclinical ones and finally the clinical subjects. Different academic years have different demands and requirements and hence, the predominant stressor also varies from one year to another.[10]

This study was undertaken to evaluate the detrimental influence of COVID-19 on the mental health of undergraduate medical students in India.

#### MATERIALS AND METHODS:

The study was conducted between May and September 2020. 465 undergraduate medical students registered with the West Bengal University of Health Sciences participated in an online survey. The students responded to the questionnaires circulated as google form links via email or other social media groups. The help of Class Representatives was sought to facilitate wider circulation among the students. Anonymity was maintained with regard to the identity of the responders and participation in the survey was completely voluntary.

#### Questionnaires used in the study:

1. Perceived Stress Scale (PSS) 10 item version: This is a self rating instrument, comprising of 10 questions, to assess the levels of stress in an individual. The tool helps us to understand how different situations affect our feelings, and our perceived stress. A 5 point Likert scale (0 to 4) is used to record the answers to each question. Total scores range from 0 to 40. Scores of 0 to 13 indicate low stress, 14 to 26 imply moderate stress and 27 to 40 indicate high perceived stress.

2. Beck Depression Inventory (Self rated version): This questionnaire comprises of 21 items which are to be responded on a 4 point Likert scale (0 to 3). Total scores range from 0 to 63. Scores of 1 to 10 indicate normal mood variations, 11 to 16 imply mild mood disturbances or subclinical depression, 17 to 20 stand for mild depression, 21 to 30 indicate moderate depression, 31 to 40 imply severe depression and 41 to 63 indicate extremely severe depression.

In order to find out the exact stressors impacting the students, pertaining to the ongoing COVID 19 pandemic, feedback was sought from the medical students regarding their levels of stress with respect to certain social, academic and health parameters on a visual analogue scale, with scores ranging from 0 (indicating not stressful) to 10 (indicating extremely stressful). Some of these stressors included fear of getting ill with COVID 19, uncertainty regarding the future and sudden and unexpected transition to remote online learning.

Respondents were also asked to report whether they have experienced an increase in their levels of stress and anxiety during the COVID situation with that during the pre COVID era. Information was collected as to whether the respondents sought professional help with regards to their mental health problems. Respondents were further requested to report if they were undergoing any psychiatric treatment or facing any mental health issues before the onset of COVID 19 pandemic. Data so obtained was tabulated using Microsoft Excel Spreadsheet. Students were grouped as experiencing low, moderate and high levels of stress as per the total scores obtained on the Perceived Stress Scale. Likewise, they were grouped as being euthymic or experiencing mild or subclinical depression, moderate depression and severe or extremely severe depression as per the total scores obtained on the Beck Depression Inventory. Statistical analysis was done using statistical functions of MS Excel and Statcalc software. Chi-square test was applied to calculate p-values, with significance level being set at p < 0.05.

#### **RESULTS:**

128 first year, 117 second year, 109 third year and 111 final year students participated in the study. The study population comprised of 76.56% males and 23.44% female students. 38.28% of the students were day scholars, while 61.72% were hostelites.

As deciphered from the total PSS score, low stress levels were reported by 21 first year students, 33 second year students, 23 third year students and 11 final year students. Moderate levels of stress were reported by 38 first year students, 52 second year students, 34 third year students and 36 final year students. High levels of stress was reported by 69 first year students, 32 second year students, 52 third year students and 64 final year students. On comparing the levels of stress among the different academic years, p value was obtained as <0.0001, which indicates that stress levels vary significantly in between the different academic years. First year students reported the highest percentage of students experiencing high levels of stress, followed by that in the final year students. Total percentage of the students reporting mild, moderate and high levels of stress (including all academic years) was found to be 18.92%, 34.41% and 46.67% respectively.

Table 1: Distribution of stress levels in the various academic years of MBBS course as rated by the Perceived Stress Scale. (Depicted As Percentage Of Students In A Particular Academic Year)

Levels of stress	lst year	2nd year	3rd year	4th year
Low	16.41	28.21	21.10	9.91
Moderate	29.69	44.44	31.19	32.43
High	53.90	27.35	47.71	57.66

As inferred from the total BDI score, mild or subclinical depression was reported by 37, 38, 39 and 36, first, second, third and final year students respectively. Moderate depression was reported by 32, 27, 29 and 23, first, second, third and final year students respectively. Severe and extremely severe depression was reported by 7, 8, 6 and 10, first, second, third and final year students respectively. Severe the various academic years (p = 0.886). 37.2% students reported no mood disturbance. 32.26% students reported mild or subclinical depression was reported by 23.87% and 6.67% students respectively.

## Table 2: Distribution of severity of depression in the various academic years of MBBS course as rated by the Beck Depression Inventory. (depicted as percentage of students in a particular academic year)

Severity of depression	lst year	2nd year	3rd year	4th year
Mild or subclinical	28.91	32.48	35.78	32.43
Moderate	25	23.08	26.61	20.72
Severe and extremely	5.47	6.84	5.50	9.01
severe				

In this study, moderate or severe levels of stress and/or depression were reported by 390 students (83.87%), out of whom, only 98 students (21.08%) have sought professional help (either virtual or physical mode). This implies that only 25.13% of the students affected by moderate or severe stress and/or depression have sought professional help. 16 students (3.44%) have disclosed that they have been undergoing treatment pertaining to mental health before the onset of COVID pandemic. Thus there has been a six-fold increase in the number of students undergoing treatment for psychological problems during the COVID era, as compared to pre COVID times. 95.91% of the students reported an increase in their stress and anxiety levels during the pandemic as compared to previous periods.'

The impact of various stressors was studied among the different academic years, as reported by the students on the Visual Analogue Scale of 0 to 10. As observed in Table 3, the most stressful factor was the online mode of education in case of first year students, uncertainty about future in case of second and third year students, and impact on internship rotations and clinical experience in case of the final year students.

Table 3:	Co	omparison	of mean	1 score	e on `	Vis	ual Anc	logue	Scale
of vario	us	stressors	among	stude	ents	of	differen	nt aca	demic
years (Figures in brackets denote standard deviation)									

Stressor	First	Second	Third	Final
	year	year	year	year
Online mode of education	6.7±	$5.9 \pm 1.8$	$5.1\pm$	6.1±
	2.1		2.6	2.3
Delay in examinations and	6.2±	$5.4 \pm 2.3$	5.8±	6.8±
potential loss of academic year.	1.9		2.2	1.7
Impact on internship rotations	$3.2\pm$	$4.5 \pm 1.6$	$6.5\pm$	7.8±
and clinical experience	1.1		2.7	2.1
Potential of contracting COVID in	5.7±	$5.9 \pm 2.1$	$6.1\pm$	6.9±
self or family	2.3		1.9	2.4
Death or disability in family	$5.4\pm$	$5.2 \pm 1.8$	5.9±	$5.1\pm$
	16		2.5	17

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Stressor	First	Second	Third	Final
	year	year	year	year
Inadequate supply of Personal	$4.3\pm$	$4.9 \pm 1.8$	6.5±	6.8±
Protective Equipments	2.2		2.3	2.7
Isolation from friends and family	$5.4\pm$	$5.7 \pm 1.8$	5.3±	5.3±
	2.1		2.4	2.2
Uncertainty about the future	$6.4\pm$	$6.8 \pm 1.7$	6.9±	$7.1\pm$
	1.5		2.1	1.8
Adapting to the new normal	$5.2\pm$	$5.4 \pm 2.3$	5.2±	5.1±
	1.9		1.7	2.4

## DISCUSSIONS:

In April 2020, 24 experts from across the globe, from various disciplines of study formed a group and proclaimed that there was an urgent requirement to collect data pertaining to the effects of the COVID-19 pandemic on the mental health of varied populations.<sup>[11]</sup> This study partly answers this question with regard to a specific population group, namely the undergraduate medical students in West Bengal, India. Medical students in general suffer from mental health problems, irrespective of the pandemic, and the prevalence of depression and anxiety is higher in medical students as compared to the general population.<sup>[12]</sup> Both depression and anxiety are fairly common among medical students all over the world.[13-16] The global prevalence of anxiety in medical students was estimated as being 33.8% as per a previous meta-analysis.<sup>[17]</sup>An Indian study during pre COVID era on 425 medical students concluded that 13.9% were suffering from moderately severe or severe depression and 20.2% suffered from anxiety disorders.<sup>[18]</sup> Another systematic review on Indian medical students revealed the prevalence of depression and anxiety as being 39.2%, and 34.5% respectively.

In this study, the prevalence of moderate depression and severe or extremely severe depression was found to be 23.87% and 6.67% respectively. The prevalence of moderate and high levels of stress was found to be 34.41% and 46.67% respectively. Moderate or severe levels of stress and/or depression were reported by 83.87% of the students. These figures are substantially higher than the statistics obtained in the pre COVID era which indicates that the pandemic has had a heavy toll on the mental health of medical undergraduate students. These findings are in accordance with various other studies conducted across the world during the ongoing pandemic.

The Association of American Medical Colleges issued an advisory early on in the pandemic stating that all clinical rotations would be withheld, and all teaching sessions switched over to the virtual mode. Medical students started reporting higher levels of stress and anxiety as they were worried about lack of practical training and the lack of scope to acquire the requisite clinical skill to become a successful doctor. Female students reported higher levels of stress as compared to their male counterparts.<sup>[20]</sup>

A study in the US comprising 852 student, reported that 66.1% suffered from anxiety. Students who were suffering from mental health issues even before the onset of the pandemic were reported to have significantly higher stress and anxiety. The main important stressor for third year students was the delay in examinations, while impact on rotations or residencies was the most stressful factor for fourth year students.<sup>101</sup>

A study at Jordan recruited 553 medical students comprising 40.1% males and 59.9% females. Almost 50% suffered from severe mental disorders, while only 13.2% were absolutely well. It was reported that the domains of physical fitness (73.1%), academics (68.4%), and social relationships (65.6%) were mostly impacted by the pandemic. As regarding the stressor, 66% of the students were affected by social isolation and 58.4% were worried about missing out on hands on training and clinical exposure.<sup>[21]</sup>

A Turkish study with 275 students concluded that students suffering from some form of chronic disease, and those from the lower socio economic strata were more vulnerable to experience anxiety during the pandemic. Stress levels were found to be higher in females than their male counterparts. Fear of getting infected with COVID-19 was the predominant stressor in the medical students, and this fear was higher in the preclinical students as compared to the clinical students.<sup>[22]</sup>

Taking into consideration the Indian perspective, a study reported that 46.4% students lost interest in the medical course after the switch to the virtual mode of training. 69.38% reported that they felt less academically sound during the pandemic. 74% students felt decreased energy and motivation to study. More than two third of the students felt that they would be less competent doctors as compared to those who graduated in the pre COVID era as they have missed out a lot on clinical training. 84.69% even wished that their sessions should be postponed so that they get a better opportunity of learning with hands on training.<sup>[23]</sup>Few other Indian studies have been conducted on Indian students to assess the detrimental impact of COVID 19 on the mental health of Indian medical students.<sup>[24,25]</sup>

As indicated in this study, only 25.13% of students affected by moderate or severe levels of anxiety or depression have sought professional help, while the larger majority is suffering silently. This implies the wide treatment gap that is prevalent in respect of mental health problems. The National Mental Health Survey conducted in India in 2016 concluded that the overall treatment gap with regard to mental health morbidity stands at 84.5%.<sup>[26]</sup> Though medical students face much higher prevalence of depression and anxiety than the general population, most of them do not seek professional help in time.<sup>[27]</sup>Studies have indicated that the commonest barriers to seeking help with regard to mental health issues among medical students were confidentiality concerns, preferring informal consultations, tendency of self-diagnosis, time constraints, accessibility issues, stigma, lack of awareness and fear of unwanted interventions.  $^{\rm (181,(22,23)}$  There is an urgent need to raise awareness and mitigate the barriers so that this treatment gap can be reduced, thus enabling more number of individuals to experience compete recovery from mental health problems.

LIMITATIONS OF THE STUDY: The sample size was small as compared to an online survey, and students from a single University were taken into the study, where there was not much scope for demographic variation. Self-rated questionnaires were used and participants may have either under-rated or over-rated the severity of their symptoms. Also, only those students who have been experiencing mental health problems might have tended to participate in the study, thus confounding the results and the sample may not have been representative of the entire community of undergraduate medical students. Students may not have accurately reported whether they have been undergoing any treatment for mental health issues before the onset of COVID pandemic due to the stigma associated with mental health disorders. Only those students with ample access to the internet have been able to participate in this study. Presence of any other comorbid illness was not ruled out in this study, which might have resulted in the development of secondary depression or stress in the study participants, unrelated to the pandemic. Further research on a larger population size, with varied demographic characteristics, and on a more representative sample is required for better understanding of the mental health impact of COVID 19 on undergraduate medical students.

## CONCLUSION:

It can be concluded that COVID 19 has adversely impacted the mental health of undergraduate medical students in India, in terms of the increased prevalence of stress and depression during the pandemic. This may have far fetched consequences pertaining to the overall quality of life. Moreover, it is of vital importance that the future doctors should experience mental well being themselves, in order to be able to serve the nation. An important area which needs to be addressed is to raise awareness and minimize the treatment gap with regards to mental health problems, which will be beneficial both at the individual level, and the society at large.

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## **REFERENCES:**

- https://www.cdc.gov 1 Zhu H, Wei L, Niu P. The novel coronavirus outbreak in Wuhan, China. Glob 2. Health Res Policy. 2020;5:6. Published 2020 Mar 2. doi:10.1186/s41256-020-
- 00135-6 Cascella M, Rajnik M, Aleem A, et al. Features, Evaluation, and Treatment of 3. Coronavirus (COVID-19) [Updated 2021 Jul 30]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from:
- https://www.ncbi.nlm.nih.gov/books/NBK554776/ Mahmud R, Rahman MM, Rassel MA, Monayem FB, Sayeed SKJB, Islam MS, 4. et al. (2021) Post-COVID-19 syndrome among symptomatic COVID-19 patients: A prospective cohort study in a tertiary care center of Bangladesh. PLoS ONE 16(4): e0249644. https://doi.org/10.1371/journal.pone.0249644
- Hu, B., Guo, H., Zhou, P. et al. Characteristics of SARS-CoV-2 and COVID-19. Nat Rev Microbiol 19, 141-154 (2021). https://doi.org/10.1038/s41579-020-00459-7
- Nicola M, Alsafi Z, Sohrabi C, et al. The socio-economic implications of the 6. coronavirus pandemic (COVID-19): A review. Int J Surg. 2020;78:185-193. doi:10.1016/j.ijsu.2020.04.018
- Lahiri A, Jha SS, Bhattacharya S, Ray S, Chakraborty A. Effectiveness of 7 preventive measures against COVID-19: A systematic review of In Silico modeling studies in indian context. Indian J Public Health. 2020;64(Supplement):S156-S167. doi:10.4103/ijph.IJPH\_464\_20
- Nimavat N, Singh S, Fichadiya N, et al. Online Medical Education in India -8. Different Challenges and Probable Solutions in the Age of COVID-19. Adv Med Educ Pract. 2021;12:237-243. Published 2021 Mar 4. doi:10.2147/AMEP.S295728
- 9. Seetan K, Al-Zubi M, Rubbai Y, Athamneh M, Khamees A, Radaideh T. Impact of COVID-19 on medical students' mental wellbeing in Jordan. PLoS One. 2021;16(6):e0253295. Published 2021 Jun 17. doi: 10.1371/journal.pone.0253295
- Guo, A.A.; Crum, M.A.; Fowler, L.A. Assessing the Psychological Impacts of 10.
- COVID-19 in Undergraduate Medical Students. Int. J. Environ. Res. Public Health 2021, 18, 2952. https://doi:10.3390/ijerph18062952 Holmes, E.A.; O'Connor, R.C.; Perry, V.H.; Tracey, I.; Wessely, S.; Arseneault, L.; Ballard, C.; Christensen, H.; Silver, R.C.; Everall, I.; et al. Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. Lancet Psychiatry 2020, 7, 547–560. [CrossRef] 11.
- Menon, V, Sarkar, S. Barriers to service utilization among medical students. 12. Int J Adv Med Health Res, 2014; 1(2): 104–105.
- Hope, V, Henderson, M. Medical student depression, anxiety and distress outside North America: A systematic review. Med Educ, 2014; 48(10): 963–979. 13.
- Dyrbye, LN, Thomas, MR, Shanafelt, TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med J Assoc Am Med Coll, 2006; 81(4): 354-373
- Ngasa, SN, Sama, C-B, Dzekem, BS, . Prevalence and factors associated with 15. depression among medical students in Cameroon: A cross-sectional study. BMC Psychiatry [Internet], 2017 [cited 2019 Nov 30]; 17, https:// www. ncbi. nlm.nih.gov/pmc/articles/PMC5466797
- Mao, Y, Zhang, N, Liu, J, Zhu, B, He, R, Wang, X. A systematic review of depression and anxiety in medical students in China. BMC Med Educ, 2019; 16. 19(1): 327.
- Quek, T.T.-C.; Tam, W.W.-S.; Tran, B.X.; Zhang, Z.; Ho, R.C.-M. The Global 17. Prevalence of Anxiety Among Medical Students: A Meta-Analysis. Int. J. Environ. Res. Public Health 2019, 16, 2735. [CrossRef] [PubMed]
- Arun P, Ramamurthy P, Thilakan P.Indian Medical Students with Depression, 18. Anxiety, and Suicidal Behavior: Why Do They Not Seek Treatment?. Indian Journal of Psychological Medicine 2021; 16th Feb. https://doi.org/10.1177% 2F0253717620982326
- Sarkar, S, Gupta, R, Menon, V. A systematic review of depression, anxiety, and stress among medical students in India. J Ment Health Hum Behav, 2017; 19. 22(2): 88-96.
- Rea Mittal, Lilly Su & Rohit Jain (2021) COVID-19 mental health consequences 20. on medical students worldwide, Journal of Community Hospital Internal Medicine Perspectives, 11:3, 296-298, DOI: 10.1080/20009666.2021.1918475
- Seetan K, Al-Zubi M, Rubbai Y, Athamneh M, Khamees A, Radaideh T (2021) 21. Impact of COVID-19 on medical students' mental wellbeing in Jordan. PLoS ONE 16(6): e0253295. https://doi.org/10.1371/journal.pone.0253295 Torun F, Torun SD. The psychological impact of the COVID-19 pandemic on
- 22. medical students in Turkey. Pak J Med Sci. 2020;36(6):1355-1359. doi: https://doi.org/10.12669/pjms.36.6.2985
- 23 Syal A, Arya Y, Gupta M. Impact of COVID-19 on medical undergraduate students' academics and its ramifications. Indian J Med Sci 2021;73(1):26-9.
- Giliyaru S, Hegde G, Gajjala S, Vemuri O, Azzopardi C, Hurley P, et al. COVID-19 pandemic and medical education. Indian J Med Sci 2021;73(1):64-5. 24.
- Patil P, Chakraborty S. Where Does Indian Medical Education Stand Amidst a 25. Pandemic? J Med Educ Curric Dev. 2020 Aug 26;7:2382120520951606. doi: 10.1177/2382120520951606. PMID: 32923671; PMCID: PMC7453450.
- Gautham MS, Gururaj G, Varghese M, Benegal V, Rao GN, Kokane A, Chavan 26. BS, Dalal PK, Ram D, Pathak K, Lenin Singh RK, Singh LK, Sharma P, Saha PK, Ramasubramanian C, Mehta RY, Shibukumar TM; NMHS Collaborators

Group\*. The National Mental Health Survey of India (2016): Prevalence, socio-demographic correlates and treatment gap of mental morbidity. Int J Soc Psychiatry. 2020 Jun;66(4):361-372. doi: 10.1177/0020764020907941. Epub 2020 Mar 4, PMID: 32126902.

- Gold, JA, Johnson, B, Leydon, G, Rohrbaugh, RM, Wilkins, KM. Mental health self-care in medical students: A comprehensive look at help-seeking. Acad Psychiatry, 2015; 39(1): 37-46.
- 28. Guille, C, Speller, H, Laff, R, Epperson, CN, Sen, S. Utilization and barriers to mental health services among depressed medical interns: A prospective multisite study. J Grad Med Educ, 2010; 2(2): 210–214.
- Menon, V, Sarkar, S, Kumar, S. Barriers to healthcare seeking among medical 29 students: A cross sectional study from South India. Postgrad Med J, 2015; 91(1079): 477-482.