ORIGINAL ARTICLE

FRUSTRATION INTOLERANCE, SELF-EFFICACY AND SLEEP QUALITY IN MEDICAL STUDENTS DURING PANDEMIC OF COVID-19

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ABSTRACT

OBJECTIVE
To find out the relationship between frustration intolerance, self-efficacy, and sleep quality in medical students and to determine the moderating role of self-efficacy in relationship between frustration intolerance and sleep quality in Medical Students.

STUDY DESIGN
Correlational study.

PLACE AND DURATION OF STUDY
The study was conducted from November 2020 to January 2021 and the data was collected from different medical colleges of Lahore and Faisalabad.

SUBJECTS AND METHODS
The sample comprised of 150 MBBS (Bachelor of Medicine and Bachelor of Surgery)students from different medical colleges, 126 (84%) were females and 24 (16%) were males. The participants' age range was between 18-26 years and their mean age was 21.79 ± 1.74 years. Self-constructed demographic form, Frustration discomfort scale, Generalized Self efficacy Scale and Sleep quality scales were also used to assess the sample. Data were collected online by employing a non-probability convenient sampling strategy.

RESULTS
Frustration intolerance is positively related with poor sleep quality indicating higher frustration linked with acute sleep problems, while self-efficacy showed a negative relationship with poor sleep quality indicating higher self-efficacy decreased the sleep problems. The results also showed that self-efficacy moderates the effect of frustration intolerance on sleep problems in medical students.

CONCLUSION
This study identified a high prevalence of frustration intolerance and poor sleep quality in medical students during the pandemic of Covid-19 and highlighted the role of self-efficacy in dealing with frustration intolerance and sleep problems among medical students.

KEYWORDS
Frustration intolerance, Self-efficacy, Sleep quality, Sleep problems, Medical students

INTRODUCTION

The pandemic of COVID-19 not only affected the mental health of the general population but also put the undergraduate medical students in great stress. In the battle against coronavirus disease, the medical students faced multiple challenges in dealing with stressors related to closing of their academic institutions, transition of learning mode from physical to online and adjustment problems related to that change, changes in assessments and resulting study pressure, sudden termination of clinical placements, and less social and academic support by friends and colleagues due to lockdown that results in increased level of depression and anxiety.[1] This situation can also lead them to increased frustration intolerance, and hence related sleep issues. It was studied that approximately half of the medical students reported to have poor quality of sleep, and about one third of the medical students reported unnecessary daytime sleepiness, that may result in poor quality of sleep and less sleep duration.[2] Sleep is important for restoration of the body and maintaining energy affecting health, daily functioning and quality of life.[3]Further, poor sleep is also linked with higher levels of intolerance to uncertainty, COVID-19 related worry, and frustration related with feelings of isolation and may disturb contact with others e.g. due to abnormal sleep-wake schedule.[4] Frustration refers to state when someone experiences unresolved problems and conflicts related to situational or psychological barriers, and this hinders to fulfill the goals, desires, or needs.[5] In low frustration tolerance or intolerance, a person gets irritated easily and cannot tolerate miserable stressful situations. Individual has refusal or helpless to tolerate difficulties in short term distress that is sometimes necessary for long term gain.[6] In this scenario, their self-efficacy can play its role, which refers to a one's belief that he or she can organize and execute necessary actions in achieving any goal, and hence can face the challenges of life, and can master the challenging situations easily.[7] Knowing the above mentioned facts, the current research aims to study:

1) The level of frustration intolerance, self-efficacy, and sleep quality in medical students,

2) The relationship of frustration intolerance and self-efficacy with sleep quality in medical students, and

3) The moderating role of self-efficacy in determining the effect of frustration intolerance on sleep quality in medical students.

SUBJECTS AND METHODS

Participants
A total of 150 MBBS (Bachelor of Medicine and Bachelor of Surgery) students from different medical colleges were approached,

Instruments
Self-constructed demographic form
It comprised of information related to age, gender, job status, relationship status, Family monthly income, family system, years in medicine and estimated sleep time. Further the following measures were used for assessment.

Frustration Discomfort Scale[8]
It is a 28 items scale which was used to determine the level of frustration intolerance in medical students. It is five-point Likert scale ranging from 1 to 5 with 1= Absent, 2= Mild, 3= Moderate, 4= Strong, and 5= Very strong. It covers four dimensions including emotional intolerance, discomfort intolerance, entitlement, and achievement. The items are summed up to give a frustration score, with a higher score indicating higher frustration intolerance. This scale has a good internal reliability (α=0.84).

Generalized Self-Efficacy Scale[9]
It is a ten items scale used to determine the level of self-efficacy in medical students. It is a 4-point rating scale ranging from 1 to 4 with 1 = not at all true, 2 = hardly true, 3 = moderately true, and 4 = exactly true. The items are summed up to give self-efficacy score, with a higher score indicating higher self-efficacy. This scale has good alpha reliability (α= .87).

Sleep Quality Scale[10]
This is a 28 items scale which was used to assess sleep quality of medical students. It determines six domains of sleep quality such as daytime dysfunction, recovery after sleep, difficulty in falling asleep, difficulty in maintaining sleep, difficulty in getting up, and satisfaction with sleep among university students. It is a 4-point, Likert-type scale ranging from 0 to 3 with 0 = few, 1 = sometimes, 2 = often, and 3 = almost always. The items are added to get composite score of the overall scale and all its subscales. The higher scores indicate more acute sleep problems. The reliability of the scale is (α = .92).

Procedure
This study was conducted at the Department of Psychiatry and Behavioral Sciences, King Edward Medical University, Lahore after the approval from the Ethical Review Board of the institution. The participants were approached for data collection using a Google form. The informed consent was taken from the participants. With this consent form, they were briefed about the nature and purpose of the study. Voluntary participation was ensured and the right to withdraw from the participation at any time was also given. Further, the confidentiality of their information they provided was also assured to them. Data was entered in SPSS 20.0 version and

RESULTS
Data were analysed by using the SPSS 20.0 version. Demographic variables were assessed through descriptive statistics using frequency and percentages for categorical, mean and standard deviation for continuous/ quantitative variables. Further reliability analyses were run to see the alpha values and descriptive statistics of all the scales, Pearson product moment correlation was computed to find out the relationship among study variables. In the next step, moderation through hierarchical regression was run to see the moderating role of self-efficacy in determining the effect of frustration intolerance on sleep quality in medical students.

126 (84%) were females and 24 (16%) were males. The participants' age range was 18-26 years) with mean age 21.79 $\pm$ 1.74 years. The participants were accessed by employing convenient sampling technique. 130 (86.7%) participants had nuclear family system and 136 (90.7%) were single in relationship status. The average estimated sleep time of the participants was 8.63 $\pm$ 1.83 hours.

Table 1 shows the descriptive statistics (mean and standard deviation) of the study variables. The results also showed that all scales have good alpha coefficients with the values above .70. The mean scores of the said measures indicate the high level of frustration intolerance, self-efficacy, and acute sleep problems. Further the values of skewness reveal that data are normally distributed.

The results of correlation show frustration intolerance positively relates with overall sleep quality and its subscales indicating that higher the frustration intolerance among medical students, higher the sleep problems such as daytime dysfunction, restoration after sleep, difficulty falling asleep, difficulty getting up and less satisfaction with sleep. Further self-efficacy of the medical students negatively relates with sleep quality and its domains indicating that higher self-efficacy is related with less sleep problems in them.

Table 3 shows that overall variance explained by the model is 35% with F (3, 146) = 25.58, p<.001. Results indicate significant interaction between self-efficacy and frustration intolerance determining acute sleep problems in medical students (β = 1.24, p < .01). Results also determine that frustration intolerance positively (β = .46, p < .001) and self-efficacy negatively (β = -.31, p < .001) predicts sleep problems in medical students.

Table 1
Descriptive Statistics and Psychometric properties of the Scales (N= 150)

Measures	k	a	M(SD)	Range Potential	Actual	Skew
Frustration Discomfort Scale	28	.92	87.60(18.35)	28-140	37-129	-.27
Generalize Self-efficacy Scale	10	.86	28.15(5.40)	10-40	12-39	-.35
Sleep Quality Scale	28	.91	36.71(14.38)	0-84	3-75	.12

a=Cronbach's Alpha; Skew = Skewness.

Table 2
Relationship between Frustration intolerance, Self-Efficacy and Sleep Quality in Medical Students (N=150)

| Measures	2	3	4	5	6	7	8	9
Frustration intolerance	-.28	.46**	.44**	.26**	.19**	.48**	.32**	.14
Self-efficacy		-.42**	-.31**	-.39**	-.24**	-.31**	-.39**	-.22**
Sleep Quality			.88**	.64**	.71**	.61**	.70**	.58**
Daytime Dysfunction				.35**	.43**	.51**	.44**	.35**
Restoration after sleep					.40**	.32**	.60**	.23**
Difficulty falling a sleep						.39**	.52**	.67**
Difficulty getting up							.25**	.22**
Satisfaction with sleep								
Difficulty maintaining sleep								.43**

*Higher score on sleep quality and its subscales shows acute sleep problems.
*$p < .05$. **$p < .01$.

Table 3
Multiple Hierarchical Regression Analysis determining the moderating role of self-efficacy in relationship between frustration intolerance and sleep quality of medical students (N=150)

	Sleep Quality	
Predictors	ΔR^2	β
Step I	.21	.46***
Frustration intolerance		
Step II	.09	-31***
Self efficacy		
Step III	.05	1.24**
Frustration intolerance x Self-efficacy		
R^2	.35	
F (3,146)		25.58***

Higher score on sleep quality shows acute sleep problems;
**$p < .01$, ***$p < .001$

Figure 1
Mod-graph with Moderating effect of Self-efficacy between Frustration intolerance and Sleep Problems
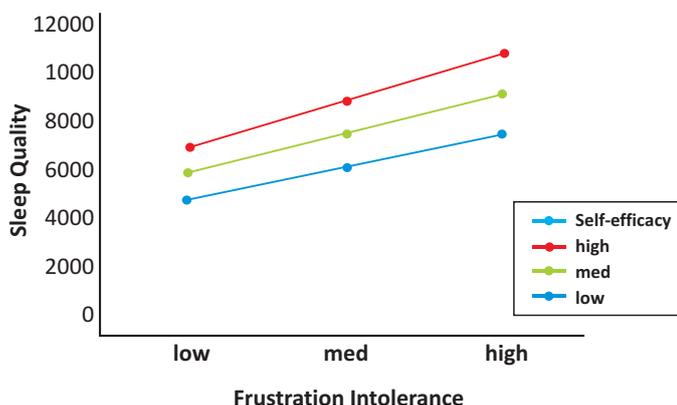
DISCUSSION

The COVID-19 pandemic has significantly affected medical education throughout the world causing mental suffering in medical students.[11] These students have to take a series of assessment and evaluations to prove their competency in the field, but COVID-19 has resulted in multiple delays of these things.[12] The physical mode of education was suddenly shifted to virtual mode causing other education related issues for the students as well as teachers. The jump into online systems was associated with a decrease in motivation, self-efficacy, and cognitive engagement.[13] Previously, a survey was conducted on 2661 medical students and found that about 59.9% of the students wanted a delay in terminal exams due to frustration related to ongoing pressure and loss of confidence in their ability to become a competent doctor in the future.[14] Sleep problems are also associated with stressful events such as examinations, academic overload, relationship problems, rumination and worry causing frustration in medical students. So, the present study goes in line with our finding showing a statistically significant positive relationship between frustration intolerance and acute sleep problems among medical students. Also high levels of frustration intolerance and its prediction for acute sleep problems support these findings. Further, Balter et al., found that poor sleep health predicts frustration, and it has a considerable negative impact on health and wellbeing.[15-16]

Results of the present study highlight that self-efficacy of the medical students negatively relates with frustration intolerance and sleep problems. Caldwell et al proposed that higher self-efficacy is linked with lower sleep problems.[17] In a study moderating role of self-efficacy was also found, suggesting the negative relationship of low self-efficacy with sleep quality and fatigue in students focusing on higher self-efficacy leading decrease in sleep related problems and fatigue.[18] Bandura proposed that self-efficacy can affect the perception of external demands and mediates the relation between external stressors and psychological stress.[19] In a study conducted among more than 30,000 students from 62 countries concluded that students were mostly worried about the problems associated with their future professional careers and studies, and also experienced boredom, anxiety, and frustration[20], so present study also highlights that medical students with higher self-efficacy can deal with these stressful and challenging situations effectively.

Future studies should focus more to delineate the odds of developing psychiatric issues in students who face high frustration and sleep problems during their educational years. It would be informative for the field to understand predictors of mental illness, and the ways to prevent them beforehand. Moreover, it is necessary to understand if the high frustration intolerance is related to burnout in medical colleges. This can provide invaluable information to understand and manage socially nurturing environments in various medical and other educational institutes.

Limitation of the study

The convenient sample of MBBS students was taken from few medical colleges, for future research it is recommended to take sample from the students of other specialties and colleges to improve generalizability. The present study did not investigate the gender differences in terms of study variables, so the future researcher must consider this for a better addition in literature.

CONCLUSION

The results showed high frustration intolerance and sleep problems in medical students. It was found that during pandemic, frustration intolerance positively and self-efficacy negatively relates with the sleep problems in medical students. Further moderating role of self-efficacy was also found in relationship frustration intolerance and poor sleep quality in medical students.

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None

Conflict of interest

The author declares no conflict of interest.

REFERENCES

1. Bandyopadhyay S, Georgiou I, Baykeens B, Gillespie CS, de Andres Crespo M, Bashir MT, Handa A, Saunders KE. Medical students' mood adversely affected by COVID-19 pandemic: An interim analysis from the SPICE-19 prospective cohort study of 2075 medical students and interim foundation doctors. Research Square. 2020; 1-18.
2. Jahrami H, Dewald-Kaufmann J, Faris ME, AlAnsari A, Taha M, AlAnsari N. Prevalence of sleep problems among medical students: a systematic review and meta-analysis. J Public Health. 2020; 28(5):605-22.
3. Shapiro, C. and Flanigan, M. Function of sleep. BMJ, 1993, 306: 383–385.
4. Voitsidis P, Gliatas I, Bairachtari V, Papadopoulou K, Papageorgiou G, Parlapani E, Syngelakis M, Holeva V, Diakogiannis I. Insomnia during the COVID-19 pandemic in a Greek population. Psychiatry research. 2020 Jul 1; 289:113076.
5. Yu R, Mobbs D, Seymour B, Rowe JB, Calder AJ. The neural signature of escalating frustration in humans. Cortex. 2014; 54:165-78.
6. Main TF. The ailment. British Journal of Medical Psychology. 1957 Sep; 30(3):129-45.
7. Bandura A. Social cognitive theory of self-efficacy. Organizational Behavior and Human Decision Processes.1991; 50:248-87.
8. Harrington N. The frustration discomfort scale: Development and psychometric properties. Clinical Psychology & Psychotherapy: An International Journal of Theory & Practice.2005; 12(5):374-87.
9. Schwarzer R, Jerusalem M. Generalized self-efficacy scale. Measures in health psychology: A user's portfolio. Causal and control beliefs. 1995; 1(1):35-7.
10. Yi H, Shin K, Shin C. Development of the sleep quality scale. Journal of sleep research. 2006; 15(3):309-16.
11. Dhahri AA, Arain SY, Memon AM, et al. Medical Education Pakistan (MEP) collaborator group, Mian MA. "The psychological impact of COVID-19 on medical education of final year students in Pakistan: a cross-sectional study". Ann Med Surg. 2020; 60:445–450.
12. Lund HG, Reider BD, Whiting AB, Prichard JR. Sleep patterns and predictors of disturbed sleep in a large population of college students. J Adolesc Health. 2010 Feb; 46(2):124-32.
13. Franzen PL, Buysse DJ. Sleep in psychiatric disorders. In Sleep disorders medicine 2017 (pp. 977-996). Springer, New York, NY.
14. Mittal R, Su L, Jain R. COVID-19 mental health consequences on medical students worldwide. Journal of Community Hospital Internal Medicine Perspectives. 2021; 11(3):296-8.
15. Balter LJ, Sundelin T, Axelsson J. Sickness and sleep health predict frustration and affective responses to a frustrating trigger. Scientific reports. 2021 Jan 15;11(1):1-1.
16. Chow CM. Sleep and Wellbeing, Now and in the Future. Int. J. Environ. Res. Public Health 2020; 17: 2883.
17. Caldwell K, Harrison M, Adams M, Triplett NT. Effect of Pilates and taijiquan training on self-efficacy, sleep quality, mood, and physical performance of college students. Journal of bodywork and movement therapies. 2009; 13(2):155-63.
18. Park Y, Sprung JM. Weekly work–school conflict, sleep quality, and fatigue: Recovery self-efficacy as a cross-level moderator. Journal of Organizational Behavior. 2015; 36(1):112-27.
19. Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychology Review. 1977; 84(2): 191–215.
20. Aristovnik A, Keržič D, Ravšelj D, Tomaževič N, Umek L. Impacts of the COVID-19 pandemic on life of higher education students: a global perspective. Sustainability. 2020; 12: 843-8.

Undertaking

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