



Article

The Impact of COVID-19 on Health and Well-Being: Foreign Medical Students in Eastern Europe

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Abstract: Approximately 350,000 foreign students, mostly from India, study medicine in Eastern Europe (EE). However, there is a dearth of information about the COVID-19 impact on this population who study at universities in Eastern Europe (e.g., Russia, Ukraine and Belarus). The aim of this study was to examine the pandemic impact on such students and to generate useful information that may be applied to their health, well-being and learning experience. A cross-sectional survey of Indian students at a Russian medical university was conducted. The data collection instrument included questions about background characteristics, fear of COVID-19, burnout, mental distress, eating behavior, substance use, resilience and adherence to World Health Organization prevention recommendations. Male and female students were compared to determine the COVID-19 impact based on gender status. A total of 497 students participated in this study. Among the survey participants, 92.3% reported being vaccinated. No significant difference was found among male and female respondents regarding fear and burnout associated with COVID-19. Approximately 40% of the students reported a deterioration in psycho-emotional well-being due to COVID-19, and such students had higher levels of COVID-19-related fear, burnout, substance use and lower resilience. Nearly half of the respondents reported unhealthy eating behavior (49.7%) and weight gain (46.3%) associated with COVID-19. In addition, students who adhered to prevention measures of mask wearing and social distancing had less COVID-19 fear and burnout, as well as more resilience. This study promotes an understanding of the impact of COVID-19 on the psycho-emotional conditions of male and female medical students from India studying abroad.

Keywords: foreign medical students; COVID-19; fear; resilience; burnout; substance use; eating behavior; WHO COVID-10 prevention methods



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1. Introduction

Originating in Wuhan (China), the coronavirus (COVID-19) has rapidly spread around the world, starting at the end of 2019. The pandemic continues in “waves” of infection and suffering with new variants of the virus (Thakur et al. 2022). Not only has the pandemic affected the health and wellbeing of people worldwide (Aburto et al. 2022; Champion et al. 2020; Lange 2021), but it has also seriously caused a deterioration in economic conditions that serve as a bedrock for human survival.

The COVID-19 pandemic and the measures taken to control its spread posed unprecedented challenges to higher education (Grubic et al. 2020). As a result of various restrictions, including lockdown and social distancing, institutions of higher education were forced to abruptly transition to online learning.

Studies from various countries show that the COVID-19 pandemic, combined with the move to online learning and various pandemic-induced restrictions, is associated with

a decline in student psycho-emotional well-being, increased fear and stress, higher than usual substance use and unhealthy eating behaviour (Eloff 2021; González-Monroy et al. 2021; Pavlenko et al. 2022; Roberts et al. 2021; Sveinsdóttir et al. 2021; Zolotov et al. 2020).

Pandemic-related travel restrictions have been a formidable challenge to address, especially for students studying abroad (Karing 2021; Lukács 2021). Outside of their motherland, away from family and friends, many foreign students have been subject to limited support for coping with rules and regulations imposed to control the spread of COVID-19. Studies evidence the pandemic's impact on student anxiety and stress, concerns about academic delay and personal and family health, as well as the ability to manage daily living conditions, including personal needs (Cao et al. 2020; Son et al. 2020). Such conditions have been found particularly relevant for students studying medicine exposed to pandemic health consequences, its burden on the healthcare system and its impact on clinical training (Natalia and Syakurah 2021; Servin-Rojas et al. 2022).

Nearly half a million young adults from developing countries, including India, are studying high education at Eastern European universities in Russia, Belarus and Ukraine (Gromov 2017; Erudera 2022; Study in Belarus 2022; Zinchenko et al. 2021). Approximately 25% of such students study medicine that is considered to be high quality and reasonably priced with scholarships and a learning curricula in English and French (Erudera 2022; Study in Belarus 2022; UniPage 2022).

Given pandemic consequences, as well as the dearth of information about the psycho-emotional conditions of Indian students studying abroad, this study examined male and female student fear of COVID-19 and its impact on their resilience, burnout, substance use and eating behavior.

2. Methods

2.1. Design, Participants and Procedures

Established in 1996, the Ben Gurion University of the Negev, Regional Alcohol and Drug Abuse Research (RADAR) Center has received recognition and awards from the US National Institute on Drug Abuse for its contributions to scientific diplomacy through efforts in international collaborative research with colleagues worldwide, including Eastern Europe. For this study, the RADAR Center partnered with a Russian university to survey medical students from India during the fourth wave of the COVID-19 pandemic, which occurred from September to November 2021.

The Qualtrics software platform was used, and data collection included three scales. The first was the seven-item Fear of COVID-19 Scale (FCV-19S) (Ahorsu et al. 2020; Reznik et al. 2021). The levels of agreement with FCV-19S statements were evaluated by a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher total scores correspond to greater COVID-19 fear. Two questions were added to the scale to determine COVID-19 impact on university student studies, social life and family relations.

The second scale was the six-item Brief Resilience Scale (BRS) (Smith et al. 2008), which determines the level of psychological resilience by assessing respondents' ability to bounce back or recover from stress. The levels of agreement with BRS statements were evaluated by a 5-point Likert scale, with higher total scores corresponding to a higher level of resilience. The third scale was the ten-item Short Burnout Measure (SBM) (Malach-Pines 2005). The SBM items assess the essence of a person's level of physical, emotional, and mental exhaustion. The levels of agreement with SBM statements were evaluated by a 5-point Likert scale. Higher total scores correspond to a higher level of burnout. For this survey, the data collection instruments were prepared in English.

COVID-19 impact on student fear, burnout, psycho-emotional well-being (i.e., depression, exhaustion, loneliness, nervousness and anger), substance use, including tobacco, alcohol, cannabis and prescription drugs, eating behavior and WHO recommendations of mask use and social distancing were examined. The Cronbach's reliability of the FCV-19S with two additional questions is 0.886, 0.775 for the BRS, and 0.924 for SBM. To ensure that the methods proposed for this research were ethical, the investigators received approval

from the ethics committees of the university involved. No external grant funding was received for the study. Students were informed about the online survey and its aims by student group curators. In addition, they were advised that the survey was compliant with all ethical standards, that responses were confidential and that their survey responses constituted consent to participate.

2.2. Statistical Analysis

All statistical analyses were conducted using SPSS, version 25. The Pearson's chi-squared and Fisher exact tests for dichotomous variables such as gender, substance use and psycho-emotional well-being were used. Two-side *t*-test and two-way ANOVA were used for continuous variables, such as results of fear, resilience and burnout scales.

2.3. Participants

A total of 497 Indian medical students, 60.4% ($n = 300$) male and 39.6% ($n = 197$) female, completed the online survey during COVID-19 pandemic from September to November 2021.

3. Results

The mean FCV-19S (fear) score for all respondents was 22.2 (SD = 8.1). No significant difference was found for male and female respondents ($t(440) = 0.530$; $p = 0.596$). Studies of COVID-19 fear scores among native born Russian, Ukrainian and Belarussian medical students during earlier waves of infection evidence a range of 21.0 to 21.2 (Gritsenko et al. 2021; Pavlenko et al. 2021). Two-way ANOVA showed that COVID-19 fear was associated with student gender and COVID-19 vaccination (yes/no): $F(1,437) = 4.825$; $p = 0.029$ (Figure 1).

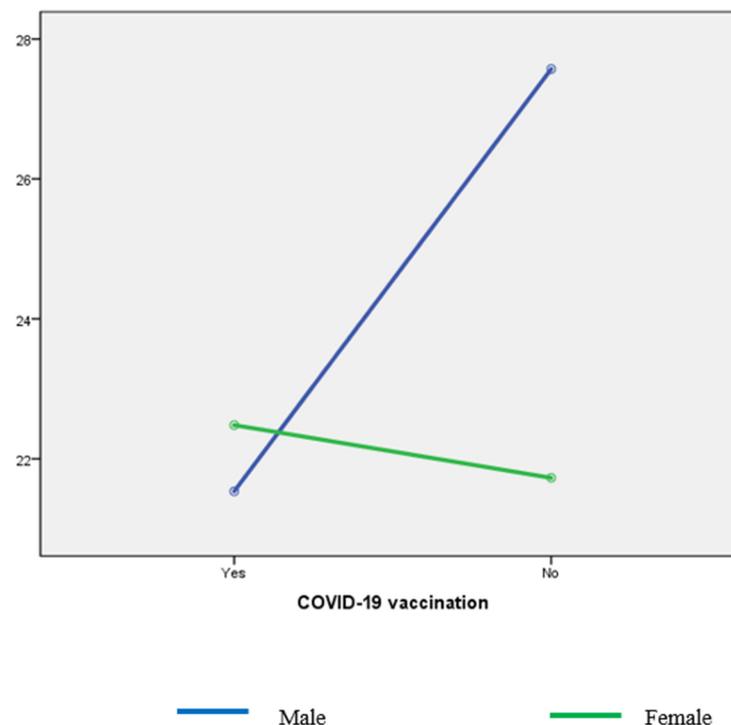


Figure 1. Fear of COVID-19 by gender and COVID-19 vaccination status.

The mean BRS (resilience) scores were 19.5 (SD = 2.8) and 18.8 (SD = 2.6) for the male and female students, respectively ($t(431) = 2.401$; $p = 0.017$). The average resilience value for all students was 19.2 (SD = 2.8). Two-way ANOVA showed that resilience scores were associated with gender and COVID-19 vaccination: $F(1,429) = 4.671$; $p = 0.031$ (Figure 2).

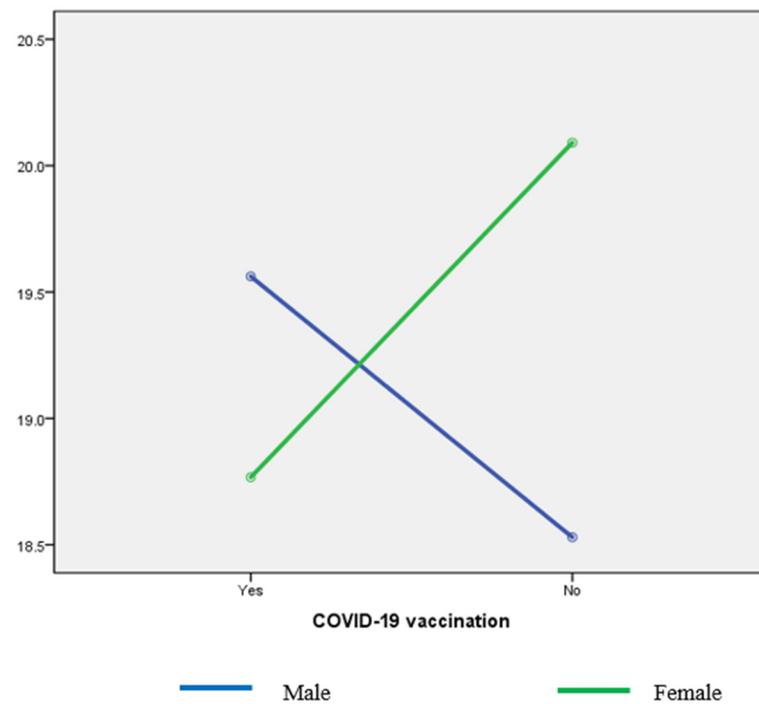


Figure 2. Resilience by gender and COVID-19 vaccination status.

The mean SBM (burnout) scores were 19.5 (SD = 9.2) and 20.8 (SD = 8.7) for the male and female students ($t(427) = 1.491$; $p = 0.137$). The average burnout value score for all students was 20.1 (SD = 9.0). Two-way ANOVA showed that burnout was not associated with gender and COVID-19 vaccination: $F(1,425) = 0.001$; $p = 0.974$.

Only 10.0% of the Indian students surveyed ($n = 44$) reported substance use in the previous month (e.g., cigarettes, alcohol, cannabis and prescription drugs such as pain relievers and sedatives). Of this group, 31.8% ($n = 14$) reported an increase in substance use associated with COVID-19.

Among all respondents, 39.1% ($n = 173$) reported a deterioration in psycho-emotional well-being caused by the pandemic, including depression (12.9%), exhaustion (19.9%), loneliness (25.2%), nervousness (20.0%) and anger (23.3%). No significant difference was found for student psycho-emotional well-being based on gender status ($\chi^2(1) = 0.214$; $p = 0.643$). Students who reported a deterioration in psycho-emotional well-being had higher levels of COVID-19 fear ($t(412) = 9.500$; $p < 0.001$), burnout ($t(416) = 11.754$; $p < 0.001$) and lower resilience ($t(425) = 4.931$; $p < 0.001$), and an increased substance use in the previous month ($\chi^2(1) = 5.234$; $p = 0.039$).

In terms of the COVID-19 impact on eating behavior, 49.7% of the Indian students reported a higher consumption of food with salt (e.g., chips, pretzels, crackers and processed fish and meat) and/or sugar (e.g., cookies, cake and chocolate). Additionally, 46.3% of the respondents reported weight gain during the pandemic, 52.6% male and 37.20% female ($\chi^2(1) = 12.276$; $p = 0.001$). Regardless of gender, students who reported eating food with more salt and/or sugar during the pandemic had higher scores of COVID-19 fear ($t(409) = 2.265$; $p = 0.024$) and burnout ($t(425) = 3.086$; $p = 0.002$), as well as lower resilience ($t(421) = 4.091$; $p < 0.001$). Students with weight gain had higher scores of COVID-19 fear ($t(412) = 2.069$; $p = 0.039$). Problem food intake and weight gain were found to be associated with a deterioration in psycho-emotional well-being ($\chi^2(1) = 22.848$; $p < 0.001$; $\chi^2(1) = 12.276$; $p < 0.001$, respectively).

In response to COVID-19 prevention behavior, 92.9% of males and 92.3% of females reported that they always or often used a mask ($\chi^2(1) = 0.046$; $p = 0.831$); and 90.5% of males and 90.6% of females reported that they always or often maintained social distance ($\chi^2(1) = 0.000$; $p = 0.983$). Students who reported always/often mask use had a lower level

of COVID-19 fear ($t(414) = 2.261; p = 0.024$) and burnout ($t(420) = 4.047; p < 0.001$) and a higher level of resilience ($t(430) = 3.243; p = 0.001$) than those who never/rarely used a mask. Students who maintained social distance (always/often) had a lower level of COVID-19 fear ($t(410) = 3.304; p = 0.001$) and burnout ($t(420) = 5.642; p < 0.001$) and a higher level of resilience ($t(427) = 2.169; p = 0.031$) than those who did not practice this behavior.

Two-way ANOVA for the gender and mask use (always/often vs. rarely/never) interaction evidenced no significant differences in fear ($F(1,412) = 0.623; p = 0.430$), resilience ($F(1,428) = 1.142; p = 0.286$) and burnout ($F(1,418) = 0.404; p = 0.525$) values. In addition, two-way ANOVA for gender and maintaining social distance (always/often vs. rarely/never) interactions evidenced no significant differences in fear ($F(1,408) = 0.788; p = 0.375$), resilience ($F(1, 425) = 0.306; p = 0.580$) and burnout ($F(1,418) = 1.013; p = 0.315$) values.

4. Discussion

The COVID-19 pandemic has affected universities around the world. University campuses have been closed and teaching has moved online. Indian students studying at Eastern Europe universities found themselves trying to cope with difficult conditions. Compared to their native-born counterparts, foreign students were deprived of social support from families or friends. Furthermore, travel restrictions caused by the pandemic prevented a significant proportion of foreign students from spending holidays in their home country or returning to their place of study.

This study examined the impact of the pandemic on Indian students at Eastern Europe universities based on the results of an online survey conducted during the fourth wave of the COVID-19 pandemic (September–November 2021). In most cases, no significant differences were found based on gender status. Based on earlier research of native-born Eastern Europe medical students (Gritsenko et al. 2021; Pavlenko et al. 2021), Indian student COVID-19 fear levels and deterioration in psycho-emotional well-being due to COVID-19, including depression, exhaustion, loneliness, nervousness and anger, tend to be higher than their native-born counterparts. These results may be attributed to the lack of support available to them when being in a foreign country during a disaster condition. (Pavlenko et al. 2021).

Present findings, significant and non-significant, tend to be consistent with those of other studies on the mental health and well-being of international students during the COVID-19 pandemic (Pappa et al. 2020; Wang et al. 2020; Yassin et al. 2021).

Study findings evidence a low level of substance use among Indian students (e.g., alcohol (5.4%) and tobacco (4.8%)). Among native-born medical students, it has been found that 58.2% use alcohol on a monthly basis (Gritsenko et al. 2021). It appears that tobacco and alcohol use is more common among native-born Eastern Europe students who use such substances to cope with fears and stress (Pavlenko et al. 2021). In addition to substance use, another common way to cope with the fear and stress caused by the COVID-19 pandemic is eating behavior, particularly the unhealthy consumption of foods with salt and sugar (Mattioli et al. 2020). Such behavior was reported by 49.7% of Indian students, and males more than females, with a corresponding weight gain.

Foreign students who report COVID-19 vaccination and prevention behavior (e.g., masks and social distancing) evidence less COVID-19 fear than those who have not taken measures to prevent infection. Among native-born students, the condition is reversed—those who do not use masks nor practice social distancing report lower fear scores (Gritsenko et al. 2022).

This study is limited by its cross-sectional design and by the limited number of participants. The study used a convenience sample of foreign medical students from one country (India), which is not representative of those from other countries. This restricts a generalization of the findings. Furthermore, present findings are based on an online survey limited to students who use the Internet. Such sampling weakens the generalizability of the findings and does not enable survey participants to ask clarifying questions.

Additional research is needed to confirm the study findings over time and across locations for different populations of foreign medical students. This study is the first to be conducted on Indian medical students in Eastern Europe during the pandemic. From an applied perspective, the present study should be considered for planning and intervention purposes to promote the health and well-being of such students who will, in time, be responsible for addressing the pandemic-related health care needs that will continue to occur as predicted by the [World Health Organization \(2022\)](#). Another research issue to consider is that of the needs to be given to issues of racism and xenophobia toward international students. This is a serious problem, leading to a deterioration in the psycho-emotional state of international students and a decrease in their sense of safety while on campus ([Koo et al. 2021](#)).

In conclusion, the present study findings have relevance for researchers, educators and university administrators where international students study and live. Given the large number of international students studying in Eastern European countries, there is a need to develop relevant policies that enable and promote the ability of such students to cope with and contribute to addressing disaster conditions.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to local restrictions.

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Conflicts of Interest: The authors declare no conflict of interest.

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