Is coronavirus lockdown taking a toll on mental health of medical students? A study using WHOQOL-BREF questionnaire

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ABSTRACT

Introduction: The Quality of life is a broad-ranging concept affected in a complex way by the person’s physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship to salient features of their environment. The ongoing COVID-19 pandemic has resulted in many quarantine and isolation measures and lockdown of the nation for the foreseeable future. Although these initiatives are necessary to prevent the spread of coronavirus they may be causing adverse mental health effects. Medical students are backbone and future of the health system and the general public always looks up to them as a role model of society. With this background, this study aims to assess the quality of life among medical students during the lockdown period amid the COVID-19 pandemic. Material and Methods: A self-administered, pretested, questionnaire based on World Health Organization Quality of Life: Brief Version (WHOQOL-BREF) standard quality of life was used. For internal reliability and structural validity, Cronbach's alpha coefficient and confirmatory factor analysis (CFA) were calculated, respectively. t-test, one way ANOVA, and Pearson Chi-square test were used. Results: The mean scores of domains of the present study were highest for the environmental domain (72.10 ± 13.0) followed by physical (67.23 ± 13.74), social (57.13 ± 20.1), and lowest for the psychological domain (52.10 ± 17.45). The level of internal consistency was found to be 0.883, which is considered as sufficiently reliable. One-third of the medical students were spending >6 h on-screen, and merely 15.6% were doing physical activity >1 h. Conclusion: It was found that during this time of crisis medical students were weaker in the psychological domain of Quality of Life among all the four domains. Physical activity and screen time was an important factor to the QOL of students, and it is likely that students would benefit from increased physical activity and minimizing screen time.

Keywords: Coronavirus, COVID-19, lockdown, medical students, quality of life

Introduction

WHO defines Quality of Life as individuals’ perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns. It is a broad-ranging concept affected in a complex way by the person’s physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship to salient features of their environment.[1]

In 2019–2020, one of the strangest pandemic recorded in history, struck our mother earth. On March 11, 2020 the WHO declared the novel coronavirus a pandemic. As of on 27th April there are around 3 million confirmed cases all around the world and more than 0.2 million deaths.[2] In India, the first case was confirmed on 30th January 2020 from Kerala and as of 27th April 2020 there nearly 30,000 confirmed cases and 900 deaths.[3] The

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ongoing COVID-19 pandemic has resulted in many quarantine and isolation measures, and Lockdown of the nation for the foreseeable future. Although these initiatives are necessary to prevent the spread of coronavirus they may be causing the adverse quality of life of individuals. India is under Lockdown since 25th March, 2020. It is one of the biggest restrictions on human movement in history.

The daily routine is important to everyone, but particularly to students in their psychological and emotional development. Medical students are the backbone and future of the health system and the general public always looks up to them as the role model of society. During the times of COVID-19 crisis and lockdown of the country, there might be additional stress or rebound relaxation on medical students. All the aspects of health status, lifestyle, life satisfaction, mental state, or well-being together reflect the multidimensional nature of Quality of Life in an individual. Mental health problems with respect to the quality of life often remain neglected in medical students. The WHOQOL-BREF is being developed as a short version of the WHOQOL-100 for use in situations where time is restricted; where respondent burden must be minimized, and where facet-level detail is unnecessary. This tool was used to evaluate the quality of life among medical students in Himachal Pradesh, India during the lockdown period of the COVID-19 crisis.

**Material and Methods**

**Study design and sample**

An online cross-sectional questionnaire-based survey was carried out among medical students of Pt. Jawahar Lal Nehru Government Medical College (JLNMGMC), Chamba, H.P (India) Date of approval 1/5/2020. There are total of 3 batches of medical students at present in this medical college. Each batch has a capacity of 100 students making a total of 300 Medical students. All the students during this study are staying at their respective native places due to the lockdown of the nation amid the COVID crisis. Out of 300 students, 231 participated in the study, and the rest were excluded either because of nonrespondent (hard/difficult areas with lack of internet facilities) or nonconsenting participants.

**Study tool**

A self-administered, pretested, questionnaire-based on WHOQOL-BREF standard quality of life was designed by the faculty members from the Department of Community Medicine, and permission to use the WHOQOL-BREF questionnaire was sought from WHO permissions team via email. The study tool was distributed to nearly 10 doctors from various departments for validity testing. It consisted of three main sections: 1) Demographic characteristics 2) WHO BREF (26 questions including 4 domains) 3) Activities during the lockdown. A pilot study was conducted on 20 subjects to test the understanding of the questionnaire and to ensure that any changes if required can be done at this stage only before proceeding further. A Google survey form was prepared and sent to the participants through social medial platforms. Before beginning, the survey participant was asked for consent and assured full confidentiality. After obtaining informed consent as the primary question of the survey, the data was collected from the medical students between 15th and 18th April.

World Health Organization's Quality of Life BREF questionnaire (WHO QOL-BREF) is a cross-culturally comparable quality of life measure. A self-report questionnaire that contains four domains of quality of life (QOL): Physical health (7 items i.e., Q3, Q4, Q10, Q15, Q16, Q17, Q18), psychological health (6 items i.e., Q5, Q6, Q7, Q11, Q19, Q26), social relationships (3 items i.e., Q20, Q21, Q22), and environment (8 items i.e., Q8, Q9, Q12, Q13, Q14, Q23, Q24, Q25). Two other items (Q1, Q2) measure overall QOL and general health. Items are rated on a 5-point Likert scale, and each raw domain score is then transformed to a scale ranging from 0 to 100 (in order to make domain scores comparable with the scores used in the WHOQOL-100), with a higher score indicating a higher quality of life.

**Data analysis**

The analysis was carried out using Epi Info version 7.0 and SPSS version 23.0. For internal reliability and structural validity, Cronbach’s alpha coefficient and confirmatory factor analysis (CFA) were calculated, respectively. Domain scores were compared via t-test and one-way ANOVA according to family type, place of residence, gender, father’s occupation, total family income, physical activity time, and screen time, which may have an impact on QOL. Pearson’s Chi-square/Fisher exact test was used to evaluate differences among various groups for overall quality of life and general health. A P value of < 0.05 was considered significant.

**Results**

The level of internal consistency for the items of the WHOQOL-BREF instrument was measured using the Cronbach’s α coefficient, which was 0.883 for the questionnaire as a whole, 0.760 for the physical health domain, 0.833 for the psychological health domain, 0.788 for the social relationships domain, and 0.798 for the environment domain. Cronbach’s alpha ranges from r = 0 to 1, with r = 0.7 or greater considered as sufficiently reliable.

The construct validity was evaluated through factor analysis using the Kaiser–Meyer–Olkin (KMO) test. Structural validity was evaluated by means of factor analysis according to the degree of similarity between the hypothetical structure of the questionnaire conceived by researchers and the actual observed data. The result of the KMO test was 0.705, indicating that data was appropriate. Moreover, Bartlett’s Test of Sphericity yielded a Chi-square result of 269.81, with a significant P value (< 0.001).

Items of a WHOqLBREF questionnaire were rated on a 5-point Likert scale, and each raw domain score is then transformed to a scale ranging from 0 to 100 (in order to
make domain scores comparable with the scores used in the WHOQOL-100, with a higher score indicating a higher quality of life. The mean scores of domains of the present study were highest for the environmental domain (72.10 ± 13.0) followed by physical (67.23 ± 13.74), social (57.13 ± 20.1), and lowest for the psychological domain (52.10 ± 17.45).

Individual domain scores were compared with sociodemographic variables in Table 1. Social domain scores among female medical students (60.66 ± 18.14) were statistically significant ($P$ < 0.05) higher than males (52.35 ± 21.64), whereas physical domain scores were higher for males (69.14 ± 13.04) than females (65.83 ± 14.10). Among the family type, nuclear families (73.17 ± 12.95) had statistically significant higher scores in the environment domain than joint families (69.25 ± 12.82). Comparing the domains as per the area of residence of medical students all the domain scores were found higher for rural areas than urban except environmental domain. Father’s occupation of most of the subjects (68%) was government servants and they had better environmental domain scores than others. There was no statistically significant difference between family income and domain scores, but it was evident that environmental domain scores were on the higher side (74.59 ± 13.12) for respondents with higher family income.

During the lockdown period of COVID-19, we analyzed time spent on-screen and physical activity (recreational activities) with QoL domains. One-third of the medical students (33.3%) were spending >6 h on screen, and merely 15.6% were doing physical activity >1 h. Higher screen time (> 6 h) was associated with lower psychological (48.39 ± 17.29) and social (53.32 ± 23.07) domain score and was found to be statistically significant ($P$ < 0.05) when compared to lower screen times (<6 hrs). Whereas, >1 h of physical activity was associated with statistically significant higher physical (72.83 ± 12.12) and psychological (59.28 ± 16.44) domain scores than physical activity of <1 h.

Two Items (Q1, Q2) from the WHOQOLBREF questionnaire represent Overall quality of life and general health. Figure 1 illustrates nearly half (49.7%) of the students with the perception of overall QoL as good and above while more than two-thirds (68.8%) were satisfied with their health during lockdown amid COVID-19 pandemic.

Table 3 depicts the perception of overall Quality of life with different variables among medical students. The students with >6 h of screen time were having extremes perception regarding

![Figure 1: Perception of overall QoL and Satisfaction with Health among medical students during LOCKDOWN](image)

### Table 1: Comparison of individual domain score by sociodemographic variables (n=231)

| Variables                  | Physical   | Psychological | Social    | Environmental |
|----------------------------|------------|---------------|-----------|---------------|
| Gender                     |            |               |           |               |
| Male                       | 98 (42.4)  | 69.14±13.04   | 53.34±18.13 | 52.35±21.64   | 71.96±13.85   |
| Female                     | 133 (57.6) | 65.83±14.10   | 51.19±16.93 | 60.66±18.14   | 72.20±12.40   |
| $P$                        | 0.067      | 0.361         | 0.002*    | 0.890         |
| Family Type                |            |               |           |               |
| Nuclear                    | 168 (72.7) | 67.72±13.35   | 52.39±18.25 | 57.24±20.73   | 73.17±12.95   |
| Joint                      | 63 (27.3)  | 65.94±14.73   | 51.33±15.18 | 56.84±18.39   | 69.25±12.82   |
| $P$                        | 0.403      | 0.658         | 0.042*    | 0.900         |
| Place of residence         |            |               |           |               |
| Rural                      | 128 (55.4) | 67.73±13.01   | 52.36±17.84 | 57.66±20.37   | 71.02±12.83   |
| Urban                      | 103 (44.6) | 66.75±14.63   | 51.78±17.03 | 56.48±19.79   | 73.45±13.16   |
| $P$                        | 0.635      | 0.800         | 0.655     | 0.160         |
| Father occupation          |            |               |           |               |
| Agriculture                | 17 (7.4)   | 68.82±10.89   | 56.35±13.43 | 58.41±20.14   | 68.12±9.99    |
| Business                   | 25 (10.8)  | 65.68±15.79   | 48.80±16.74 | 62.04±14.58   | 69.84±12.87   |
| Government                 | 157 (68)   | 67.01±14.00   | 52.87±18.04 | 56.16±21.37   | 73.16±13.22   |
| Private Job                | 28 (12.1)  | 68.21±12.65   | 48.71±17.06 | 56.25±17.42   | 71.96±13.01   |
| Unemployed                 | 4 (1.7)    | 72.25±10.87   | 48.25±15.50 | 65.50±14.84   | 62.50±13.421  |
| $P$                        | 0.869      | 0.488         | 0.616     | 0.234         |
| Total Family income        |            |               |           |               |
| < 50000                    | 102 (44.2) | 68.36±12.86   | 53.35±16.87 | 58.02±17.51   | 69.88±13.56   |
| 50000-100000               | 78 (33.8)  | 65.87±14.62   | 52.40±19.21 | 56.87±24.01   | 73.37±11.84   |
| ≥ 100000                   | 51 (22.0)  | 67.06±14.11   | 49.14±15.64 | 55.76±18.54   | 74.59±13.12   |
| $P$                        | 0.483      | 0.366         | 0.800     | 0.061         |

*Statistically significant


QoL with very poor and very good perception as 6.5% and 15.6%, respectively. The corresponding figures for students with <6 h screen time were 0% and 6.5%, and this difference was found statistically significant. When the perception of QoL was compared by physical activity, gender, place of residence, and the family type was found statistically not significant.

Table 4 reveals the perception of satisfaction with health by different variables among medical students. The students with <6 h of screen time, >1 h of physical activity, and male gender were found to be more satisfied with their health when compared with the students with >6 h of screen time, <1 h of physical activity, and female gender. This difference was found statistically significant. No significant difference in perception of satisfaction with health was found by place of residence and family type.

**Discussion**

The mean score in the present study was highest for environmental (57.13 ± 20.1), social (55.67 ± 23.95), and the physical domain (46.94 ± 14.24). Henning et al. (Newzealand, 2012)[8] reported highest score for the physical domain (71.74 ± 15.12) followed by social (68.95 ± 20.28), environmental (68.66 ± 14.53), and lowest for the psychological domain (65.20 ± 16.41). Awasthi et al.[7] (Uttar Pradesh, India, 2012) conducted a study to assess QOL among adolescents and found the highest score for the social domain (73.70 ± 22.4) followed by physical (71.20 ± 16.2), psychological (69.4 ± 16.5), and environmental (63.5 ± 17.5). The reason for the low score of the environmental domain as given by the authors can be a result of adolescent's low perception against their high expectations from the environment of school or home. Nayak et al.[9] (Andhra Pradesh, 2014) reported the highest score for physical (71.3) followed by social (70.1), environmental (67.7), and psychological domain (63.3). It is generally believed that medical training is psychologically demanding and may have an adverse effect on the maintenance of interpersonal relationships, which could be the reason for the low psychological and social score. But our study reported the lowest psychological score as compared to other studies.[8] This could be due to additional stress on medical students due to lockdown amid COVID 19 pandemic.
domain (71.96 \pm 13.85 vs 72.20 \pm 12.40) score was found higher in females. Nayak et al.\cite{19}, Biswas et al.\cite{20}, and Zhang et al.\cite{21} also reported similar findings. Some researchers\cite{11,12} have attributed it to females being more emotional and sensitive to pressure. However, female students scored higher than males in the social relations domain. Studies show that women are better than men at dealing with different relationships.\cite{13}

A study conducted by Nayak et al.\cite{19} found mean score of physical (73.8 \pm 11.8 vs 70.0 \pm 12.0), psychological (67.3 \pm 12.8 vs 61.3 \pm 15.5), and social domain (71.3 \pm 17.5 vs 69.5 \pm 19.9) was seen higher in students belonging to rural areas while environmental domain (67.4 \pm 12.0 vs 67.9 \pm 14.3) score was higher in students with the urban nativity, which was in coherence with our study. On the contrary, Zhang et al.\cite{21} found each individual domain score was higher in medical students from the urban area.

One-third of the medical students (33.3\%) were spending >6 h on-screen and merely 15.6\% were doing physical activity >1 h. Higher screen time (> 6 h) was associated with lower psychological (48.39 \pm 17.29 vs 53.95 \pm 17.28) and social (53.32 \pm 23.07 vs 59.04 \pm 18.19) domain score and was found to be statistically significant (P < 0.05) when compared to screen time < 6 h. But in the contrary Biswas et al.\cite{20} found high internet usage was associated with high physical (68.27 \pm 15.56 vs 66.02 \pm 15.03), psychological (63.00 \pm 16.16 vs 61.67 \pm 14.55), and social domain (63.01 \pm 17.03 vs 60.63 \pm 16.92) score when compared with low internet usage. The reason for this could be due to internet usage for academic activities by students in routine, which gives a sense of satisfaction to students, whereas in the lockdown period internet is mostly used for nonacademic activities/kill the idle time, which may be responsible for the lower psychological score.

Our study revealed >1 h/d of physical activity was significantly associated with higher physical (72.83 \pm 12.12 vs 66.20 \pm 13.79) and psychological (59.28 \pm 16.44 vs 50.77 \pm 17.34) domain scores while social (55.0 \pm 18.93 vs 57.53 \pm 20.31) and environmental domain (72.56 \pm 13.33 vs 72.02 \pm 12.98) score was found higher for students with <1 h/d physical activity. Nayak et al.\cite{19}, Biswas et al.\cite{20} also reported similar findings.

Our study reported only half (49.7\%) of the students perceived overall QOL as good and above while Malibary et al.\cite{22} reported the corresponding figure as 73.3\%. This difference could be again due to the lockdown effect in our study amid COVID-19 pandemic on one's quality of life.

In our study more than two-thirds (68.8\%) of students were satisfied with their health while Malibary et al.\cite{22} reported the same as 59.7\%. A higher percentage of subjects satisfied with their health in our study could be due to a healthy and nutritious diet at home, avoidance of junk food, and family support during the lockdown period.

Our study reported overall quality of life was better among females, rural nativity, and students doing >1 h physical activity as compared to counterparts. Nayak et al.\cite{19} also reported consistent findings.

To summarize the findings, mean scores of domains of the present study were highest for the environmental domain (72.10 \pm 13.0) followed by physical (67.23 \pm 13.74), social (57.13 \pm 20.1), and lowest for the psychological domain (52.10 \pm 17.45). The level of internal consistency was found to be 0.883, which is considered as sufficiently reliable. One-third of the medical students were spending >6 h on-screen and merely 15.6\% were doing physical activity >1 h.

The Medical students have to undergo a lot of training, which is usually stressful due to overload of tremendous information, and lockdown amid COVID 19 pandemic has caused further
stress and anxiety among medical students by disrupting their routine life. It was found that during this time of crisis medical students were weaker in the psychological domain of quality of life among all the four domains. As they are backbone and future of the health system and the general public always look up to them as a role model of society. So it is important to maintain their mental wellness during this time of crisis. Physical activity and screen time were found important factors pertaining to the QOL of students, and it is likely that students would benefit from increased physical activity and minimizing screen time.

The social and psychological score took a significant toll on medical students during the lockdown, which can be due to disruption of the normal routine, the pressure of coping with huge curriculum, which is left uncovered due to lockdown and witnessing the stressful environment faced by their seniors/medical fraternity involved intensely to fight this deadly pandemic, which is psychologically stressful itself.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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