



A study to assess the quality of life of undergraduate medical students

Abstract

Background and aims: Although the quality of life (QoL) of medical students is a relatively well-researched topic in the West, there is a dearth of it in developing countries like India. The aim of this study was to examine the QoL of Indian undergraduate medical students and its associations with sociodemographic and other parameters. **Methods:** A cross-sectional study was conducted on 349 medical students in Telangana, India. Students self-reported their QoL using the World Health Organization Quality of Life-BREF (WHOQOL-BREF) and the Short-Form Health Survey (SF-36) tools. Data were collected on the individuals' characteristics, including the year of study, substance use, physical exercise, academic performance, and other parameters. **Results:** Male students scored better than females in several SF-36 domains and the WHOQOL-BREF psychological domain; females performed better in the social relationships domain ($P=0.006$). Students in the second and third year had higher scores compared to first-year students. Smoking was negatively associated with the physical component score ($P=0.027$). Alcohol consumption was related with a higher score in the psychological domain ($P=0.049$). Living with parents led to higher scores on the environmental domain ($P=0.001$) and mental component ($P=0.048$), but a lower score on the psychological domain compared to those living in the hostel ($P=0.017$). Students with better academic performance had better scores on all domains. **Conclusion:** This study indicates that medical students in the first year and females, in particular, have a lower QoL. Medical schools need to formulate tailor-made policies and ensure better conditions for interns, incoming students and female students in particular.

Keywords: India. Smoking. Alcohol. Parents. Academic Performance. Medical Schools.

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INTRODUCTION

Medical education is no child's play. The objective of medical education is to produce highly skilled and efficient doctors who are capable enough to sustain the health of an individual and the community at large. Thus, it comes as no surprise that it is a very challenging course that demands sound mental health and interpersonal skills from an aspirant, among other things. Many studies have found an increased incidence of anxiety, stress, and other disorders of mental health among medical students.[1-4] A few studies have also found a correlation between medical students' quality of life (QoL) and the increased tendency of depression and burnout, and suicidal ideation.[5-7]

This can possibly be attributed to greater workload, competitiveness, increased proximity to diseases and death, and the medical curriculum itself.[8-10] The aforementioned mental stress can be further accentuated by factors such as alcohol dependency,[11] substance abuse, tobacco usage, unfavourable living conditions, past medical trauma, and

personal relationships, to name a few.[12-14] The impairment of QoL in medical students can have wide-ranging impacts on the community as well, as it has the potential to reduce the quality of care provided by doctors.[15] As a result, a number of studies have been done over the last three decades to assess the QoL in the healthcare sector.

Health-related quality of life (HR-QoL) is a multi-faceted concept that involves the subjective perception of respondents regarding their own physical and mental well-being.[16] QoL is defined as one's subjective perception of one's own well-being within one's socio-cultural context or as the accomplishment of the ideal of perfection.[17,18] Another definition of the term HR-QoL is "The value assigned to duration of life as modified by impairments, functional states, perceptions, and social opportunities that are influenced by disease, injury, treatment, or policy".[19]

The assessment of QoL is a relatively well-researched topic in the West. However, there is a lack of research in

this field in developing countries.[20] This study aims to fill in the existing lacunae by making a comprehensive analysis of the QoL of undergraduate medical students in India and its associations with sociodemographic practices and other parameters.

METHODS

This cross-sectional study was conducted in medical colleges in Telangana, India. In these institutions, undergraduate medical students are selected on the basis of a state-wide examination that assesses a student's basic knowledge and commands in biology and physical sciences. Usually, students start medical school at 18 years of age. During the first year, students are taught anatomy, biochemistry, and physiology. In the second year, they are taught pathology, microbiology, pharmacology, and forensic medicine. Also, in the second year, they have their first direct clinical contact with patients in hospitals (scheduled clinical rotations). In the third and fourth years, they learn ophthalmology, obstetrics and gynaecology, otorhinolaryngology, medicine, surgery, psychiatry, paediatrics, etc. In the fifth year (internship), students provide exclusive medical assistance.

All the eligible subjects were approached after class hours to participate in the survey. Participation was completely voluntary. Informed consent was obtained from all individual participants included in the study. The questionnaires were anonymous, personally identifiable information such as name and identification number was not collected. Students were requested to sit at a fair distance from each other so as to assuage their privacy concerns. No teaching staff or college administrators were present at the time of filling in the questionnaire. Students were requested to drop the filled-up questionnaires in a sealed box and not to hand them directly to the investigator, in order to ensure anonymity. Students were assured of confidentiality and informed that the data collected shall be published and later would be provided to medical education policymakers. The study was approved by the Institutional Ethics Committee and was conducted according to the ethical principles laid down by the declaration of Helsinki.

Materials

The participants were requested to complete a questionnaire which consisted of three parts. The first part was a semi-structured form asking for sociodemographic and other data. The second part was the World Health Organization Quality of Life-BREF (WHOQOL-BREF) tool,[21] comprising 26 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment. Each item is measured on a five-point Likert scale. The higher scores represent better QoL. The reliability of WHOQOL-BREF is good for each of the four domains (Cronbach's alpha = 0.925).[22] The third part was the Short Form Health Survey (SF-36), which includes 36 questions for evaluating eight domains of HR-QoL: physical functioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, and mental health.[23] The physical component score (PCS) and the mental component score (MCS) are aggregated from these domains. Scores on

each domain range from zero to 100, with zero representing the worst and 100 representing the best HR-QoL.

Statistical analysis

The descriptive tools of statistical analysis including percentages, measures of central tendency, and measures of variability (standard deviation and range) were applied. This study employed the 'two-independent sample t-procedure' and analysis of variance (ANOVA).[24] Differences between the means were evaluated by constructing a series of 95% confidence intervals. The Cohen's d effect size was calculated to establish the magnitude of the differences found between the statistically significant groups for comparing gender and the domains of the SF-36. A P-value <0.05 was considered to denote statistical significance. The statistical analysis was carried out using Microsoft Excel 2010, Quality Metric Health Outcomes Scoring Software 4.5.1, and SPSS 23 (SPSS Inc., Chicago, IL, USA).

RESULTS

After excluding subjects below 18 years of age, a total of 1774 subjects were found eligible for the study. One thousand four hundred and twenty five subjects could not be included because of the following reasons: refusal to participate without citing any reason (667), attending examinations (600), and unavailability (144). Three hundred and sixty three subjects took part in the study, out of which 14 responses were discarded because they were incomplete. Hence, the final study sample was 349 subjects. The demographic details are summarised in Table 1.

On the WHOQOL-BREF, a higher score was reported for males on the psychological domain (P=0.032), while a higher score for female students on the social relationships domain was seen (P=0.006). Medical students who were in their second and third years of medical school had higher scores in the physical (P=0.002), psychological (P<0.001), and environmental (P=0.002) domains, while the scores of first-year students were the lowest. Alcohol consumption was correlated with a higher score in the psychological domain compared to those who do not consume alcohol at all (P=0.049). Smokers were found to have a higher score on the psychological domain (P=0.04). Students living in the medical school hostel or in private rooms had a higher score on the psychological domain (P=0.017). Students living with parents at home had a higher health score on the environmental domain (P=0.001). The regular physical exercise was positively associated with HR-QoL on the physical domain (P=0.039). Students who reported as never having been involved in a committed non-marital relationship had the highest score in the environmental domain (P=0.043) compared to those who have been in one; those who had been in a relationship within the last one month, but not currently, had the lowest score. Students reporting their own academic performance as "very good" or "excellent" reported higher scores on all the four domains of the WHOQOL-BREF (P<0.01). On SF-36, students who did not consume alcohol in the past one month had a higher PCS (P=0.049). Smoking had a negative association with PCS of SF-36 (P=0.027). Students living with parents at home had a higher MCS (P=0.048). Students with regular physical exercise had a higher PCS (P=0.031).

Table 1: Characteristics of the study sample

| Demographic details | Variable | Participants, N | Percentage (N=349) |
|---|--|-----------------|--------------------|
| Gender | Male | 150 | 42.9 |
| | Female | 199 | 57.1 |
| Year of study | I Year | 227 | 73.0 |
| | II and III year | 83 | 15.8 |
| | IV and V year | 41 | 11.2 |
| Living arrangements | In a hostel/lodge | 152 | 43.6 |
| | With parents at home | 197 | 56.4 |
| Tobacco usage | Yes | 11 | 3.2 |
| | No | 338 | 96.8 |
| Alcohol usage | Yes | 18 | 4.2 |
| | No | 331 | 94.8 |
| Physical exercise | Never | 90 | 25.8 |
| | Occasionally (1-3 times a week) | 207 | 59.3 |
| | Regularly (4-7 times a week) | 52 | 14.9 |
| Relationship history | Never been in a romantic relationship | 291 | 83.4 |
| | In the past, but not within one month | 17 | 4.9 |
| | In the past, within one month (recently) | 7 | 2.0 |
| | Currently in a relationship | 34 | 9.7 |
| Self-assessment of academic performance | Poor | 11 | 3.2 |
| | Average/good | 224 | 64.2 |
| | Very good/excellent | 114 | 32.7 |
| Internet usage | Never | 15 | 4.3 |
| | 1-3 times a week | 106 | 30.4 |
| | 4-7 times a week | 228 | 65.3 |

Students who had been in a relationship within the last one month, but not currently had the lowest MCS ($P=0.047$), while these students also had the highest PCS ($P=0.025$). Students with a better academic performance had a higher MCS ($P=0.002$). This data is shown in Tables 2 and 3.

On SF-36, the scores for males were higher than females in the components of bodily pain ($P=0.031$), general health ($P<0.001$), social functioning ($P=0.023$), mental health ($P=0.021$), and also the PCS ($P=0.008$) and MCS ($P=0.012$). This data is shown in Table 4.

On SF-36, second and third-year students were found to have higher scores in the components of role physical, vitality, social functioning, mental health as well as the PCS and MCS ($P<0.001$). Fourth and fifth-year students had higher scores in the physical functioning ($P=0.007$), general health ($P=0.018$), and role emotional ($P<0.001$) components. This data is displayed in Table 5.

DISCUSSION

The current study aimed to compare the QoL of undergraduate medical students with a host of social parameters and personal habits. The higher scores for male students compared to females are concurrent with the findings of a study on medical students in Brazil[5] and Iran,[13] and also, of a study on university students in Serbia,[25] all of which reported

higher QoL for males. This can probably be partly explained by a traditional patriarchal society in India that confers less freedom to females than males in general and also, because of a dearth of safety for Indian women in the social scenario.

The higher scores for second and third-year students in comparison to the incoming group is in contrast to the findings of a study in Brazil,[5] which reported impaired QoL in second-year students compared to their incoming first-year counterparts. However, it must be noted that the systems of medical education in these two countries are different; students in Brazil have their first contact with patients in the third year whereas it occurs in the second year in India.[26] The gradual increase in QoL may be attributed to greater stability and the prospect of a fairly secure future after students have spent a year in medical school, and also among first-year students, it may portray that the transition to a whole new environment can be challenging. It may also showcase the after-effects of a highly challenging two-year pre-medical course in the light of increased competitiveness; on an approximate, for every 14 that write the examination, only one gets admission into medical school.[27] The lower PCS and MCS in interns are similar to the results of an Iranian study,[13] which also found lower scores among medical students who were in internship.

The lower score for students who do not consume alcohol is in line with the results of a study in Serbia that

Table 2: Relationship among data for various parameters, the four domains of the WHOQOL-BREF, PCS and MCS

| Parameter | Variable | Mean±SD | | | | PCS | MCS |
|--------------------|-----------------|-------------|---------------|----------------------|---------------|------------|------------|
| | | Physical | Psychological | Social relationships | Environmental | | |
| Gender | Male | 68.75±17.28 | 65.24±15.32 | 61.26±15.69 | 63.44±13.65 | 52.07±7.09 | 46.83±7.51 |
| | Female | 67.06±14.22 | 61.48±16.75 | 66.42±18.54 | 65.81±16.36 | 50.04±7.14 | 44.80±7.46 |
| | P-value* | 0.32 | 0.032 | 0.006 | 0.15 | 0.008 | 0.012 |
| Year of study | I year | 66.30±15.97 | 61.49±15.83 | 61.89±17.26 | 63.82±15.19 | 50.78±7.11 | 44.71±7.49 |
| | II and III year | 73.37±14.51 | 70.07±15.90 | 65.91±16.31 | 70.46±14.90 | 54.02±7.12 | 48.76±7.36 |
| | IV and V year | 72.87±15.05 | 66.14±16.74 | 63.80±17.20 | 68.36±13.15 | 53.33±7.22 | 48.50±7.69 |
| | P-value† | 0.002 | <0.001 | 0.18 | 0.002 | <0.001 | <0.001 |
| Living arrangement | Hostel | 66.71±15.55 | 66.77±15.60 | 61.48±17.76 | 61.89±15.01 | 50.97±7.58 | 44.31±7.44 |
| | Parents | 68.77±15.63 | 62.62±16.39 | 63.23±16.38 | 67.12±14.50 | 51.61±7.41 | 46.06±8.72 |
| | P-value* | 0.22 | 0.017 | 0.34 | 0.001 | 0.43 | 0.048 |
| Tobacco | Yes | 69.05±15.45 | 71.88±15.88 | 68.06±16.69 | 70.58±14.82 | 51.49±7.26 | 45.81±8.16 |
| | No | 67.74±20.95 | 62.36±15.23 | 62.28±24.57 | 64.57±17.14 | 56.54±7.43 | 45.72±7.98 |
| | P-value* | 0.84 | 0.04 | 0.44 | 0.25 | 0.027 | 0.97 |
| Alcohol | Yes | 69.42±19.51 | 68.69±18.75 | 63.02±23.36 | 67.77±16.36 | 47.11±7.37 | 46.02±7.45 |
| | No | 67.71±18.75 | 61.17±15.86 | 62.46±16.68 | 64.63±14.85 | 51.53±9.33 | 45.77±9.20 |
| | P-value* | 0.65 | 0.049 | 0.73 | 0.38 | 0.049 | 0.90 |
| Exercise | None | 62.41±15.82 | 59.15±17.71 | 61.86±16.81 | 63.28±15.12 | 50.05±7.92 | 44.37±8.01 |
| | Moderate | 66.56±15.17 | 63.88±14.77 | 62.40±15.97 | 65.13±14.56 | 52.22±8.68 | 46.08±9.18 |
| | Regular | 68.67±16.87 | 61.11±17.30 | 63.88±20.98 | 65.97±15.95 | 53.67±8.03 | 47.43±7.45 |
| | P-value† | 0.039 | 0.05 | 0.78 | 0.51 | 0.031 | 0.106 |

WHOQOL-BREF=World health organization quality of life-BREF; PCS=Physical component score; MCS=Mental component score

*Student's t-test; †One-way analysis of variance (ANOVA)

Table 3: Relationship among data for various parameters, the four domains of the WHOQOL-BREF, PCS and MCS

| Parameter | Variable | Mean±SD | | | | PCS | MCS |
|----------------------|-------------------------|-------------|---------------|----------------------|---------------|------------|------------|
| | | Physical | Psychological | Social relationships | Environmental | | |
| Internet usage | None | 72.54±19.67 | 64.84±22.46 | 67.18±16.79 | 66.80±16.03 | 53.29±7.28 | 48.54±8.21 |
| | Low | 66.02±15.03 | 61.67±14.55 | 60.63±16.92 | 61.87±14.01 | 52.85±8.74 | 47.91±8.31 |
| | High | 68.27±15.56 | 63.00±16.16 | 63.01±17.03 | 65.97±15.08 | 54.67±7.59 | 45.23±8.38 |
| | P-value* | 0.22 | 0.68 | 0.043 | 0.05 | 0.14 | 0.013 |
| Relationship history | Never | 68.26±15.46 | 63.46±15.19 | 62.62±16.64 | 69.11±14.71 | 51.44±7.36 | 45.99±7.39 |
| | Past | 66.71±15.38 | 58.99±18.02 | 58.67±17.09 | 64.37±11.79 | 53.43±8.76 | 47.78±7.24 |
| | Recently | 64.28±15.15 | 58.71±23.57 | 64.14±29.40 | 62.31±8.83 | 58.38±9.01 | 39.33±7.13 |
| | Currently | 71.42±17.47 | 62.5±20.36 | 62.5±19.81 | 62.5±18.92 | 49.54±7.31 | 44.45±7.01 |
| | P-value* | 0.57 | 0.61 | 0.82 | 0.043 | 0.025 | 0.047 |
| Academic performance | Poor | 62.46±14.86 | 55.11±14.60 | 57.45±16.41 | 57.29±14.25 | 48.09±8.39 | 44.01±7.39 |
| | Average/ good | 66.65±15.53 | 61.55±15.83 | 61.37±16.40 | 64.24±14.49 | 51.49±7.99 | 44.77±8.10 |
| | Very good/ excellent | 72.31±15.10 | 68.32±15.08 | 66.81±17.39 | 69.42±14.34 | 51.79±9.24 | 48.12±9.56 |
| | P-value* | 0.002 | <0.001 | 0.010 | 0.001 | 0.38 | 0.002 |

WHOQOL-BREF=World health organization quality of life-BREF; PCS=Physical component score; MCS=Mental component score

*One-way analysis of variance (ANOVA)

found a negative correlation between alcohol usage and certain domains on SF-36.[28] The current study, however,

does not distinguish between different degrees of alcohol consumption.

Table 4: Relationship among gender and the components of the Short Form-36 Health Survey (SF-36)

| Domain | Mean±SD | | | Effect size (Cohen's d) | P-value (t-test) |
|----------------------|----------------------|--------------|----------------|-------------------------|------------------|
| | All students (n=349) | Male (n=150) | Female (n=199) | | |
| Physical functioning | 49.08±9.76 | 49.11±10.23 | 49.06±9.45 | 0.01 | 0.96 |
| Role physical | 46.83±8.16 | 46.09±8.19 | 47.08±8.13 | 0.12 | 0.26 |
| Bodily pain | 51.09±8.69 | 52.20±8.74 | 50.17±8.65 | 0.23 | 0.031 |
| General health | 51.88±7.68 | 53.50±8.39 | 50.40±7.11 | 0.39 | <0.001 |
| Vitality | 53.43±8.73 | 54.09±9.28 | 52.45±8.36 | 0.19 | 0.084 |
| Social functioning | 45.70±7.85 | 46.04±7.39 | 44.11±8.18 | 0.24 | 0.023 |
| Role emotional | 42.86±7.96 | 42.29±8.52 | 43.34±7.48 | 0.13 | 0.32 |
| Mental health | 46.41±7.84 | 47.49±8.12 | 45.53±7.67 | 0.25 | 0.021 |
| PCS | 51.05±7.12 | 52.07±7.09 | 50.04±7.14 | 0.29 | 0.008 |
| MCS | 45.33±7.48 | 46.83±7.51 | 44.80±7.46 | 0.27 | 0.012 |

PCS=Physical component score; MCS=Mental component score

Table 5: Relationship between year of study and the components of the Short Form-36 Health Survey (SF-36)

| Domain | I Year | II and III Year | IV and V Year | P-value* |
|----------------------|------------|-----------------|---------------|----------|
| Physical functioning | 48.06±9.26 | 50.76±10.65 | 52.59±11.53 | 0.007 |
| Role physical | 45.63±8.10 | 50.87±8.27 | 49.38±8.21 | <0.001 |
| Bodily pain | 50.77±8.71 | 52.08±8.74 | 51.59±8.62 | 0.48 |
| General health | 51.09±8.28 | 52.36±7.52 | 54.86±7.91 | 0.018 |
| Vitality | 52.68±9.09 | 57.12±8.72 | 54.35±8.74 | <0.001 |
| Social functioning | 44.94±7.71 | 49.23±7.98 | 46.80±7.83 | <0.001 |
| Role emotional | 41.96±8.34 | 46.53±8.03 | 48.67±8.02 | <0.001 |
| Mental health | 45.58±7.93 | 50.03±8.03 | 49.12±7.64 | <0.001 |
| PCS | 50.78±7.11 | 54.02±7.12 | 53.33±7.22 | <0.001 |
| MCS | 44.71±7.49 | 48.76±7.36 | 48.50±7.69 | <0.001 |

PCS=Physical component score; MCS=Mental component score

*One-way analysis of variance (ANOVA)

A previous French study also found a relationship between smoking and QoL, with small positive associations for occasional or light smoking and larger and diffuse negative associations above this threshold.[29] In our study sample, the differences between different frequencies of smoking were not distinguished; however, a statistically significant lower PCS was seen for smokers in comparison to non-smokers.

The higher MCS for students living with parents contrasts the findings of a study in the Netherlands,[30] where students living with parents reported a lower general health status. The poor score of students living in the medical school hostel on the environmental domain reiterates the call for better living conditions in Indian hostels.

The higher scores for students with regular physical exercise are consistent with a study on adults in England.[31] This signifies the necessity to provide facilities for greater physical activity and sports in educational institutions and the society at large, a practice which is fast diminishing in India. These concerns are also raised by the findings of a study done to assess QoL among medical students in India.[32]

Though the varying scores for students with a relationship history can be influenced by other factors, it is a widely agreed observation that romantic relationships have an influence on mental health; past studies have confirmed this.[33]

The better academic performance was associated with higher scores on all WHOQOL-BREF domains and a higher MCS as well. This is in line with a recent study in Thailand, which also reported better QoL in medical students with higher academic achievement.[34]

The proportion of respondents with a past medical history of trauma was too low to make a statistically significant deduction. As all the students in our study sample were above the poverty line, a relation between economic status and HR-QoL also could not be conjectured.

Several initiatives were mentioned in a research article comparing the QoL of medical students with that of non-medical students and a general population reference group in New Zealand,[35] and these recommendations are need to be modelled to the Indian scenario as well. Overall, there is a call to attention for a holistic approach to supporting the students' physical and mental health during their most important years of medical education.

Limitations

There are a number of limitations with this study. Owing to the cross-sectional nature of our study, we could not establish the cause-effect relationship. The factor of response bias also exists; since participation was completely voluntary, some students with a lower QoL might have chosen not to respond. All the students approached were part of a single educational curriculum. The study also involved students from a particular city only; hence, generalisability may be difficult. Since the proportion of students in our study sample within certain parameters, such as tobacco users, was too low, there are possibilities of type II errors.

Conclusion

The medical schools need to ensure better conditions for interns and incoming students in particular, and there is a need to address the social and other causes underlying a lower QoL of females than males. The counselling efforts may be initiated to help first-year students better cope with the new environment. Better conditions in college hostels and facilities for greater physical activity need to be provided.

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