

Pilot Study to Assess the Quality of Life, Sleepiness and Mood Disorders among First Year Undergraduate Students of Medical, Engineering and Arts

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ABSTRACT

Introduction: College students, who are in a phase of transition from adolescence to adulthood, face numerous challenges. Due to stress overload, students easily fall prey to mood disturbances like stress, anxiety and depression compromising their quality of life.

Aim: Present study was undertaken to see the effect of choice of professional course on quality of life and mood of the first year students of medical, engineering and arts students.

Materials and Methods: A cross-sectional study was conducted amongst 150 students, 50 participants from each stream. Enrolled subjects were administered questionnaires pertaining to their quality of life (WHOQOL-BREF), mood disorders (DASS-42) and sleepiness (ESS).

Results: Medical students showed significantly higher levels of stress (p-value=0.0001), depression (p-value=0.002) and anxiety (p-value=0.002), 30% of medicos labelled their quality of life as very good compared to 48% and 50% of engineering and arts students. A 38% of medical student's reported daytime sleepiness compared to 12% engineering and 6% arts students.

Conclusion: Present study shows that medical students are maximally vulnerable to mood disorders and have a poor quality life. As the student community forms the backbone of any nation, we as, educators should try to strengthen each individual by promoting not only physical and mental development but also aiming for overall holistic development.

Keywords: Anxiety, Depression, Sleep deprivation, Stress

INTRODUCTION

College students, who are in a phase of transition from adolescence to adulthood, are in the most challenging phase of life. Most students are away from home, trying to adjust in the new environment and anxious enough for their future [1]. Stress has been reported as an important determinant of health among students [2]. Researchers have categorized stress as academic, financial, time, health related or self-imposed [3]. Academic stress is due to the extensive knowledge that is to be acquired and the enormous amount of content to expertise on, in a limited duration [4]. Factors like peer pressure, sexual desires, family expectations and personal responsibilities also add up, affecting their quality of life [5,6]. As a reaction to these stresses, many students develop mood disorders like depression and anxiety which again compromises their quality of life. Prevalence of depression has been reported to be about 33% among university students while prevalence of stress has been reported to vary from 53.6% to 74% in Indian medical students [1,7,8].

Quality of life as defined by WHO is "an individuals' perceptions 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 and holistic concept incorporating in a complex way the persons' physical health, psychological state, level of independence, social relationships, personal beliefs and their relationships to salient features of the environment [9]. Quality of life is a well-researched topic in different population groups, healthy and diseased of which students group is no exception [10].

Majority of studies on quality of life assessment and mood disorders among students have focused on medical students, as medicine is generally regarded as most challenging. Studies have proven that compared to the general population, medical students face greater levels of stress [11]. Various factors, especially heavy and demanding study pattern, absence of any leisure activities,

difficulty in acquiring new content and exposure to death and suffering have been considered responsible [12]. Similar studies on students of engineering and management in India by Agarwal et al., have revealed that these students also experience role overload [13]. Relatively few studies have been conducted relating stress levels and perceived quality of life in India. Limited numbers have compared students from different streams [11]. Present study compares the professional course choice and the quality of life as well as mood status of medical, engineering and arts students. The information may be helpful for educators and policy makers in promoting college students well-being for the benefit of the society as a whole and student as an individual.

AIM

The primary aim of our study was to see the effect of professional course choice on the quality of life and mood of first year undergraduate medical, engineering and arts students. Secondary aim was to see the effect of mood changes on different domains of quality of life.

MATERIALS AND METHODS

Study design

It was a cross sectional study, enrolling first year students of either gender between age 18-22 years. Only first year students were included as it is a stage of transition from school to college life and the stress of change in study curriculum and environment is almost same across students of all courses.

Subjects and sample size

Prevalence of stress among Indian medical students has been shown to be varying from 54% to 73.5% thus the sample size calculated for these prevalence's varied from 36 to 85 [7,8]. To take an equivalent sample's from all the three groups, we took

the sample size of 50 each from medical, engineering and arts students. Thus, 150 first year students of different colleges in New Delhi, India, were enrolled after a written informed consent. Stratified random sampling was used for selection of 50 students each from the three strata i.e., medical, engineering and arts stream. Four colleges of each stream were identified, depending on feasibility and convenience, and further data was collected from these institutions only.

Rationale of study was explained to the students in class through a lecture. As all the students in class volunteered themselves a systemic random sampling was done inviting every fourth individual for participation, after excluding those with a history of neurological, psychiatric disorders or sleep disorders before joining the college. Further data was collected only from students enrolled for the study. They were asked to fill in paper based questionnaires which were in English. It took around 15-20 minutes to complete the questionnaires. It was an anonymous survey, and results were kept confidential. The study obtained ethical approval from the ethics committee of Vardhaman Mahavir Medical College and Safdarjang Hospital on 17/06/11 via the approval no. 21-11EC (04/28). The study was conducted for a duration of two months from July 2011 to August 2011.

Parameters

Each participant filled questionnaires for assessment of quality of life, stress, anxiety, depression and daytime sleepiness.

Quality of life

Quality of life was evaluated using the World Health Organization Quality of life (WHOQOL) BREF instrument which is an international cross-culturally comparable quality of life assessment instrument [9]. The World Health Organization Quality of Life (WHOQOL) questionnaires are most widely used QOL assessment tools in the world. It has been developed for its use both on healthy and ill subjects. The shorter version, the WHOQOL-BREF is more popular as its brevity reduces participant response burden [11]. It consists of 26 items; each item uses a Likert-type five-point scale. These items are distributed in four domains namely physical health and level of independence, psychological wellbeing, social relationships and environment. It included two more items that were examined separately: first, asked about the individual's overall perception of QOL and the second, about individual's overall perception of his/her health. Domain scores are scaled in a positive direction (higher scores denote higher quality of life). The mean score of items within each domain is used to calculate the domain scores compatible with the scores used in WHOQOL-100 and subsequently transformed to a 0-100 scale. Reliability of WHOQOL-BREF assessed using Cronbach's alpha was 0.89 (overall scale) and ranged from 0.74 to 0.77 for the individual domains [11]. All values were above 0.70, which demonstrated adequate internal consistency. Krägeloh et al., have shown that the individual items that combine to form the domain score were significantly correlated with the two global items assessing QOL and health, thus, demonstrating adequate criterion-related validity [11].

Questionnaire for stress parameters

Subjects were given a questionnaire of 42 items for scoring Depression, Anxiety and Stress Scale (DASS), which has 14 questions each for assessing depression, anxiety and stress levels [14].

Questionnaire for daytime sleepiness

Daytime sleepiness was scored using Epworth Sleepiness Scale (ESS) wherein values of ESS score >8 indicated excessive sleepiness (0-8: normal, 9-12: mild, 13-16: moderate and >16 –severe sleepiness) [15].

Students were considered as sleep deprived if their total duration of sleep reported by them was less than eight hours.

STATISTICAL ANALYSIS

Data analysis was done using SPSS version 16.0 (SPSS Inc, Chicago, IL, USA). The normality of data was tested using Shapiro Wilk test. The results were expressed as Mean (SD). Group comparison was done using frequency distribution and one-way analysis of variance. A probability value less than 0.05 ($p < 0.05$) was considered significant for all statistical tests applied.

RESULT

The students were comparable in baseline characteristics and majority resided in hostels [Table/Fig-1]. Medical and engineering students reported more consumption of tea as compared to arts students, among whom higher percentage of students smoked cigarette {24%(12)} and consumed alcohol {56%(28)} [Table/Fig-2]. There was no relation of mood changes with beverage consumption in any of the groups except for the anxious arts students who

Variables	Medical Students (n=50)	Engineering Students (n=50)	Arts Students (n=50)	F value	p-value
Age (Years)	19.9 (0.73)	19.9(0.89)	20.2(0.8)	1.971	0.143
Gender (Females)	58%(29)	60%(30)	74%(37)		
Hostellers	58%(29)	70%(35)	24%(12)		
Height (cms)	164.7(9.0)	166.9(8.5)	166(9.2)	0.817	0.444
Weight (kg)	61(9.1)	63.7(9.3)	60.5 (8.7)	1.901	0.153
BMI (Kg/m ²)	22.4(2.8)	22.7(2.1)	21.74(1.99)	2.261	0.108
Waist Circumference	31.56(2.57)	31.48(3.17)	30.8(2.93)	0.976	0.379

[Table/Fig-1]: Baseline characteristics of the Medical, Engineering and Arts undergraduate students. Data is represented as mean (SD) or % (n). Analysis of data was done by one-way ANOVA and post-hoc by Tukey test.

Variables	Medical Students (n=50)	Engineering Students (n=50)	Arts Students (n=50)	
TEA	No consumption	26%(13)	24%(12)	34%(17)
	2-3 times/month	20%(10)	26%(13)	44%(22)
	Consume weekly	16%(8)	24%(12)	18%(9)
	Consume daily	38%(19)	26%(13)	4%(2)
COFFEE	No consumption	26%(13)	12%(6)	8%(4)
	2-3 times/month	32%(16)	34%(17)	30%(15)
	Consume weekly	18%(9)	34%(17)	32%(16)
	Consume daily	24%(12)	20%(10)	30%(15)
SOFT DRINKS	No consumption	24%(12)	32%(16)	22%(11)
	2-3 times/month	48%(24)	44%(22)	36%(18)
	Consume /weekly	22%(11)	20%(10)	36%(18)
	Consume /daily	6%(3)	4%(2)	6%(3)
CIGARETTES	No consumption	94%(47)	88%(44)	76%(38)
	2-3 times/month	4%(2)	12%(6)	14%(7)
	Consume /weekly	2%(1)	0	2%(1)
	Consume /daily	0	0	8%(4)
TOBACCO (CHEWABLE)	0	0	0	
ALCOHOL	No consumption	86%(43)	68%(34)	44%(22)
	2-3 times/month	14%(7)	30%(15)	48%(24)
	Consume/ weekly	0	2%(1)	8%(4)
	Consume /daily	0	0	0

[Table/Fig-2]: Beverages and tobacco consumption among different groups. Data is represented as %(n).

showed an increased consumption of tea ($r=0.369, p=0.008$) [Table/Fig-3].

Comparison of exercise and sleep schedule

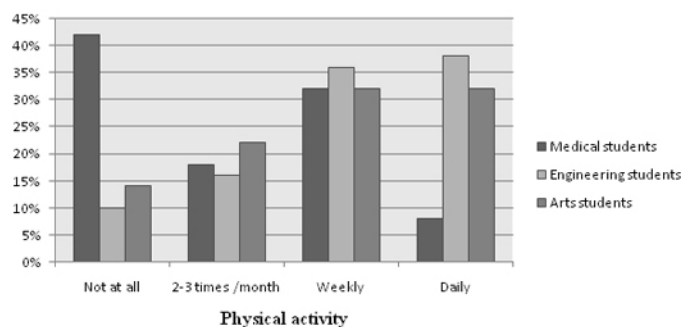
Medical students had maximally unhealthy lifestyle, with only 8%(4) students exercising daily. A significant proportion of medical students {42%(21)} did not undertake any physical activity at all compared to 10% (5) among engineering students and 14%(7) of arts students [Table/Fig-4]. Sleep deprivation (<8 hours of sleep) was also maximum in medical students with 62%(31) getting <8 hours of sleep. 38%(19) of medical students suffered from mild to severe sleepiness while only 12%(6) engineering students and 6%(3) arts undergraduates were found to have mild to moderate sleepiness [Table/Fig-5].

Assessment of mood and quality of life

A total of 80%(40) of medical students, 72%(36) in engineering and 66%(33) in arts opted for the respective courses as their choice

DASS Variables	Beverages and Tobacco	Medical Students r(p)	Engineering Students r(p)	Arts Students r(p)
Stress	tea	0.253(0.076)	-0.193(0.179)	0.244(0.088)
	coffee	-0.065(0.654)	-0.193(0.180)	-0.120(0.408)
	colas	0.144(0.320)	0.265(0.063)	0.017(0.909)
	cigarettes	0.176(0.222)	-0.117(0.419)	-0.209(0.145)
	alcohol	-0.019(0.897)	0.222(0.122)	0.026(0.859)
Depression	tea	0.224(0.118)	-0.168(0.245)	0.239(0.095)
	coffee	-0.147(0.309)	0.081(0.575)	-0.049(0.734)
	colas	0.052(0.718)	-0.112(0.438)	-0.202(0.159)
	cigarettes	0.219(0.127)	0.094(0.515)	-0.139(0.335)
	alcohol	0.080(0.579)	0.051(0.725)	-0.001(0.992)
Anxiety	tea	0.106(0.464)	-0.123(0.393)	0.369†(0.008)
	coffee	-0.024(0.867)	-0.059(0.682)	-0.015(0.916)
	colas	0.076(0.600)	-0.062(0.670)	0.117(0.418)
	cigarettes	0.246(0.085)	-0.015(0.916)	-0.138(0.340)
	alcohol	0.016(0.914)	0.031(0.830)	0.007(0.962)

[Table/Fig-3]: Correlation of beverages and tobacco consumption habits with stress, anxiety and depression among three groups of student's Medical, engineering and arts spearman correlation co-efficient applied. expressed as correlation r (Significance p): r (p-value); *p<0.05; †p<0.01.



[Table/Fig-4]: Frequency of exercise and other physical activity among the students of medical, engineering and arts undergraduate courses.

Variables	Medical students (n=50)	Engineering students (n=50)	Arts students (n=50)
Sleep duration ≥ 8 Hrs	38%(19)	44%(22)	52%(26)
ESS			
No Daytime Sleepiness	62%(31)	88%(44)	94%(47)
Mild Sleepiness	28%(14)	12%(6)	4%(2)
Moderate Sleepiness	8%(4)	0	2%(1)
Severe Sleepiness	2%(1)	0	0

[Table/Fig-5]: Sleep and daytime sleepiness among the students of medical, engineering and arts undergraduate courses. data is represented as %(n).

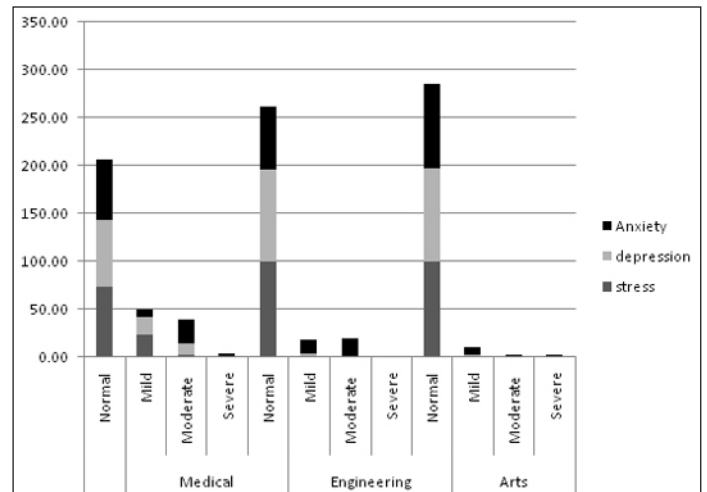
but stress, depression and anxiety was highest among medical students followed by engineering and arts students [Table/Fig-6-8]. Quality of life was reported as either good or very good by majority of students except 16%(8) medical students, 8%(4) engineering and 4%(2) arts students who perceived QOL as either poor or neither poor nor good [Table/Fig-9].

Variables	Medical Students (n=50)	Engineering Students (n=50)	Arts Students (n=50)
Current Profession			
You always wanted to do it/own choice?	80%(40)	72%(36)	66%(33)
Parental pressure/ parents in same profession	12%(6)	16%(8)	4%(2)
Peer pressure	0%	0%	2%(1)
You had no other option	8%(4)	12%(6)	28%(14)

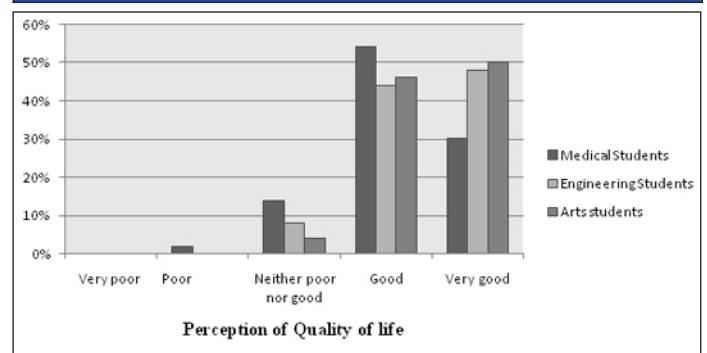
[Table/Fig-6]: Reason of choosing current stream of study/profession. Data is represented as %(n).

Variables	Medical Students (n=50)	Engineering Students (n=50)	Arts Students (n=50)	F Value	p-value
Stress	9.4(5.5)*§	6.4(3.4)†	4.76(3.37)§	14.621	0.0001
Anxiety	6.4(4.48)§	5.48(3.58)	3.76(3.12)§	6.507	0.002
Depression	6.0(5.3)*§	3.88(3.11)*	3.44(2.71)§	6.404	0.002
Physical Domain	70.7(13.1)*	82.5(12)**	67.7(15.2)†	15.589	0.0001
Psychological Domain	64.26(9)*	69 (10.71)**	62.3(9.58)†	6.216	0.003
Social Domain	44.16(15.7)	45.5(12.4)	49.28(11.64)	1.870	0.158
Environmental Domain	70.9(11.7)§	72.8(8.24)†	63.9(10.79)§†	9.606	0.0001

[Table/Fig-7]: Comparison of Mood Disorders and Quality of life. Data is represented as mean (SD). Analysis of data was done by one-way ANOVA and post-hoc by Tukey test. The significantly different (p value < 0.05) groups are flagged with *, † and §. * signifies that medical students are significantly different from engineering students, † signifies engineering students are significantly different from arts students. § signifies that medical students are significantly different from arts students.



[Table/Fig-8]: Severity of mood changes according to DASS among the students of medical, engineering and arts undergraduate courses



[Table/Fig-9]: Perception of quality of life among the students of medical, engineering and arts undergraduate courses.

Association of mood and Quality of Life (QOL)

Maximum mood disturbances was seen in medical students, who also had low scores in all the domains of QOL compared to engineering students but higher than arts students, except for social domain in which arts students scored highest [Table/Fig-7,8]. Pearson's correlation of mood i.e., stress, anxiety and depression showed a negative correlation with all four domains of quality of life in all the three groups [Table/Fig-10]. Medical students exhibiting mood derangements had significantly negative impact on all the domains of life (except the social domain if they had either stress or depression). Engineering students with mood changes had significantly negative impact on the physical and social domain. Arts students with mood changes had no effect on social domain but anxious arts undergraduates had significantly negative effect on physical or environmental domain of QOL.

DASS Variables	QOL Domains	Medical Students r(p)	Engineering Students r(p)	Arts Students r(p)
Stress	Physical	-0.378†(0.007)	-0.415†(0.003)	-0.210(0.142)
	Psychosocial	-0.416†(0.003)	-0.254 (0.075)	-0.159 (0.269)
	Social	-0.227 (0.052)	-0.429† (0.002)	-0.029 (0.839)
	Environmental	-0.349* (0.013)	-0.162 (0.262)	-0.249(0.081)
Depression	Physical	-0.544†(0.0001)	-0.512†(0.0001)	-0.264(0.064)
	Psychosocial	-0.521†(0.0001)	-0.273 (0.056)	-0.260(0.068)
	Social	-0.201 (0.161)	-0.321* (0.023)	-0.137 (0.342)
	Environmental	-0.382†(0.006)	-0.269 (0.058)	-0.226 (0.115)
Anxiety	Physical	-0.470†(0.001)	-0.544†(0.0001)	-0.344*(0.015)
	Psychosocial	-0.511†(0.0001)	-0.293* (0.039)	-0.263 (0.065)
	Social	-0.365†(0.009)	-0.250 (0.080)	-0.182 (0.206)
	Environmental	-0.348*(0.013)	-0.155 (0.282)	-0.335*(0.017)

[Table/Fig-10]: Correlation analyses between different parameters of DASS scale and domains of Quality of life among three groups of students of medical, engineering and arts. expressed as correlation r (Significance p): r (p-value); *p<0.05; †p<0.01.

DISCUSSION

College phase, in student's life is full of challenges and stresses. Reasons suggested are mainly future insecurities, fierce competition, demanding curriculum, new responsibilities, parental expectations, peer pressure, financial concerns, increased workload and burnout [16-18]. This study was a preliminary step to see the effect of choice of professional course on quality of life and mood of the first year students of medical, engineering and arts. We found that medical students were maximally stressed; anxious and depressed [Table/Fig-7,8]. Also, mood has a significant negative effect on all the domains of quality of life across all the groups [Table/Fig-10].

Medical students showed maximum mood disturbances. About 80% of medical students opted the current professional course by their choice thus the stress, depression or anxiety was not primarily because of being uninterested in course. Researchers have shown that attitude towards studying is associated with the interest in the field of study [19]. Zhang et al., have found a positive association of QOL and career development in field of interest [10]. The intense academic pressure coupled with hectic schedules of medical curriculum has been suggested as a cause for higher mood disturbances among medical student [20-23]. Behere et al., suggested that longer study hours and greater duration required for completion of professional degree, coupled with higher expectations from parents of similar background, posed a greater degree of stress on medical and engineering students [18]. 62% medical student were sleep deprived of which 38% reported mild to severe sleepiness on ESS scale compared to 12% engineering and 6% arts students reporting daytime sleepiness [Table/Fig 5]. Sleep deprivation is well established key factor causing mood changes [24]. It affects quality of life, decreases workplace performance,

increases occurrence of stress, anxiety and depression apart from impaired thinking and memory [25]. Rosenberg in 1971 reported that medical students are overwhelmed by the intensity and complexity of medical study [26]. They struggle to cope with the academic demands and are often sleep deprived, developing serious anxiety-related problems [27].

Ideally, medical students being closest to health and disease should be maximally aware of the facts of healthy living. However, in the present study we found that medical students had the most unhealthy lifestyle. They reported maximum sleepiness without any exercise or physical activities. The benefits of regular exercise are well known and include lowering of stress level by releasing endorphins and ensuring a good night sleep. In this study, only 8%(4) medical student's reported exercising daily while 38%(19) of engineering students and 32%(16) of arts undergraduates followed a daily exercise routine. Singh et al., have reported only 13% Indian medical students performing some type of regular exercise [24]. Studies have shown a positive association of exercise and mood [28,29]. Exercise promotes better ability to cope with stress as well as to have positive mental health [29,30]. Lack of exercise among medical students may be due to time constraints and demanding curriculum. This may be one of the reasons for greater mood disturbances in them. Zhang et al., have shown a positive association of physical exercise with quality of life of medical students in all the four domains [10].

Mood disturbances had a negative impact on all the four domains of quality of life measured by WHOQOL-BREF. Physical domain showed significantly negative correlation with stress, anxiety and depression in all groups. Cruz et al., too have shown that those having depression and anxiety score low compared to their healthy counter parts [31]. Sleep deprivation also may be one of the reasons for students in all groups to be significantly unsatisfied in physical domain. Henning et al., in their study on medical students found it to be the main reasons suggested by the students as the cause for their poor physical domain of quality of life [32]. Our study also documented sleep deprivation to be prevalent among all the groups of college students but maximally in medical students.

Except for social domain of QOL, arts students scored low on all other three domains of QOL compared to medical and engineering students. Though they reported minimum mood disturbances yet scored low on environmental, physical and psychological domain may be because of greater future and financial insecurities [31]. Low socioeconomic factors, parental stress and quality of emotional relationship of parents have been shown to have an effect on well-being of students [33]. Only 22%(11) of arts students were hostellers, thus, the time and effort spent in commuting could also be a likely cause. Researchers have also reported that transportation induces an extra stress in students' performance as it makes them tired, fatigued and poses financial burdens [32].

Quality of life has been shown to vary with age and gender [31,33]. In the present study, age group for all the three groups was same but proportion of females was slightly more in arts group which may be a cause for low scores of QOL in arts group. Studies have shown that females as well as peoples from lower socioeconomic background score low on all the domains of QOL [31]. Al-Fayez et al., found that older students in their study scored lower in QOL due to greater academics demands and social relationships [33]. In this study too medical students who suffer from higher academic load, comparatively scored low on QOL [20-23].

Engineering students were stronger on the psychosocial and environmental domain of quality of life. As the medical students are in constant touch with their seniors during practicals and clinics, it is likely that they are scolded for improvement of their performance. Johnson et al., have also shown that negative or inconsistent feedback about their performance promotes a sense of distrust and negative interdependence in medical students [34].

Also, medicos had less time for socializing coupled with worries of transportation as only 58%(29) were hostellers compared to 70%(35) of engineers [35]. Students of all groups scored low on social domain. The stress of adjusting to the changes in city, environment, food etc., may be reason for this in addition to missing of their homely atmosphere especially for hostellers [10].

LIMITATION

Present study was not without limitations. Though the subjects were selected randomly they were among the volunteers thus, it may have missed the students who have avoidant behavior. The study only included first year students thus we were not able to assess the trend of QOL and mood of students through the entire course curriculum in second, third and final years of their professional fields. We did not inquire about their rural/urban and socioeconomic background which has a major role to play with quality of life.

CONCLUSION

WHO has proposed the integrated health concept whereby health is understood not as the mere absence of illness but rather as a state of all-round physical, mental and social well-being. In the present study, we found that though maximum number of students chose their course by their choice yet they had significant mood disturbances and poor quality of life. Thus it is not only the matter of student's choice for their profession which has an impact on their quality of life and mood but the profession per se has an impact on these. The finding suggests inclusion of specific professional distressing programs and workshops in respective courses which may strengthen the students and help them learn how to relieve them from stress and strain during their training. Time management sessions, with importance of physical exercise and healthy sleeping habits along with their daily academic activities is warranted. Present study was a pilot study, including only first year students. Further follow up studies with larger sample size, enrolling students from all years can be done to see the progressive changes which may occur in quality of life and mood of the students as they become adjusted to their professional field. As the student community forms the backbone of any nation, we should try to strengthen each individual to have a healthy nation by promoting not only physical and mental development but also aiming for overall holistic development.

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