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**Original Article**

# Mental Morbidity among Medical Students in India

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**Abstract**
**Aims:** *The current study compares the rate and pattern of mental morbidity in medical students of first semester and final semester and to evaluate its association with socio-demographic and other variables.*
**Methods and Material:** *This was cross-sectional study done at tertiary care centre of North India. Sample included first and final semester students. Socio-demographic information sheet and GHQ-60 questionnaire was administered, based on which probable cases (score of 12 or above) of psychiatric problems were detected which were then diagnosed according to ICD-10. A battery of instruments to determine the role of various factors including personality disorders, neurosis, life events, family and college environment were administered. Frequency distribution, chi-square test and 't' test were applied.*
**Results:** *Medical college entrants had higher psychiatric problems than their outgoing counterparts (32% V/s 25%) with higher male preponderance. Low and middle family income outgoing medical students had significantly higher frequency of mental ill health (p=0.05). Mentally unwell entrants had significant difference on all the parameters of MHQ as compared to outgoing students who were positive on only four parameters. Medical entrants had more dysfunctional personality traits, less coping responses as compared to outgoing students. In medical outgoing group, significant differences were observed on both presumptive stressful life events and medical college environment scale while significant differences exist only on medical college environment scale in entrant group.*
**Conclusions:** *Compared to medical outgoing students, entrant had more psychiatric problems with larger disturbances on MHQ, dysfunctional personality traits, less coping response, difficult medical college environment.*
**Keywords:** *Medical students, coping response, environment, life events.*

## Introduction

Medical schools offer an extremely challenging academic experience and are responsible for delivering a highly systematic curriculum to the students [1]. They are responsible for ensuring that the graduates turn out to be highly knowledgeable, skillful and professional candidates [2]. In order to achieve these goals, they offer a curriculum of didactic lectures, modeling, supervised practice, mentoring and hands-on experience to augment individual study[3]. Although medical students begin with better mental health indictors than age-similar college graduates in the general population [4]. Unfortunately, some aspects of the training process have unintended negative consequences on students' personal health [3]. Along with high workload, examination stress and performance pressure, there are stressors in the individual's personal life, which also adds to the situation [5,6]. So medical training can be extremely stressful and that high stress is a risk factor for a wide range of psychological and health related consequences [7].

It is well-documented that medical students experience high levels of stress and psychological morbidity compared to age matched peer students [8,9, 6,10] Mild depression among medical students ranges from 25% to 60%, and moderate to severe depression affects approximately 13% to 14% of medical students [11,12]. Psychological distress can manifest in a variety of ways including burnout, depression, stress, low mental quality of life (QOL), low physical QOL, and fatigue [13,9,14,10]. Physical health related issues like headaches, gastrointestinal disorders and self-medication with drugs and alcohol may occur [15] but also lead to tragic consequence of suicide [10].

For an individual medical school trainee, it may lead to psychological morbidity (anxiety or depression), loss of objectivity, an increased incidence of errors and even improper behaviour, such as cheating in examinations, fraud or negligence[5,6]. Studies suggest that medical students, who experience a high incidence of personal distress[16] have potential adverse consequences on academic performance[17], competency[18], professionalism[19], and health [20]. Stress in medical students has been linked to academic dishonesty [21] and decreased empathy [22]. Furthermore, it is recognized that doctors in training and in practice who fail to manage their stress levels are less likely to be safe or competent health care providers [23]. Untreated depression presents a public health concern not just for trainees, but for the general population as it has been associated with increased burnout, poor quality patient care, and a decline in the physician workforce [24].

Physician self-care is an important foundation for quality patient interactions and outcomes [25]. Student physicians' distress and burnout may predict adverse future health status and practice performance [26]. So, it is critical for medical educators to understand the prevalence and causes of factors that can positively and negatively influence student health [3].

In order to address this issue, current study was undertaken to evaluate the rate and pattern of mental morbidity in medical students of first semester and final semester and to compare on various measures of neurosis. It also aimed to find the association of socio-demographic variables, role of personality disorder, coping strategies in these students, to understand the significance of family and college environment the contribution of life events in the development of these disorder.

## Materials and Methods

This was a cross-sectional study which was conducted at tertiary care centre in North India. The sample included all the students of first and final semester, who gave written informed consent for the participation of the study.

Instruments Used

**1.Socio-demographic information sheet**: It consist of socio-demographic profile & details containing information regarding – Age, gender, religion, occupation, monthly income, marital status, education, family type, family education, birth order, domicile, language and residential location (hostler or day scholar) etc.

**2. Goldberg's General Health Questionnaire, (GHQ-60**) Hindi Version (Gautam & Nijhawan, 1982)[27].

David P. Goldberg – GHQ, 60 item version is a self-administered questionnaire. The respondent is asked to compare his recent state with his usual state. Minimum score is 0 and maximum is 60. The optimum threshold for case detection in a general practice setting was found to be a score of 12 or above with sensitivity of 95.4% and specificity of 87.7%. It assists general practitioners and physicians in the identification of the patients with minor psychiatric illness and it would serve epidemiologists acting as a screening device. It can detect affective neurosis, neurasthenia or even psychotic episodes or organic psychosis, when accompanied by anxiety or affective symptoms.

**3. Middlesex Hospital Questionnaire (MHQ)** (Crown & Crisp, 1966). Hindi version (Bhat & Srivastava, 1974) [28]. It is a 48-item short clinical diagnostic self-rating scale for psychoneurotic patients consisting of six subscales. It allows rapid qualification of common symptoms and traits relevant to the conventional categories of neurotic illness to provide a rapid approximation to what would be expected from a diagnostic – psychiatric interview. It also provides total quantitative score on neurosis. Hindi version of MHQ was applied to groups of normal population (homogenous and heterogenous) and a neurotic population and found it to be very sensitive, reliable and valid instrument for differentiating the neurotics from the normal.

**4. ICD-10 International Personality Disorder Examination** for WHO[29]. The ICD-10 International Personality Disorder Examination (IPDE) was employed to assess personality disorders. This scale was readily available (edited by Loranger, Janca, & Sartorius, in 1997 for W.H.O.). Initially scale was developed taking several items. Later on these items were reduced to only 59 items. It includes Paranoid, schizoid, dissocial, impulsive, borderline, histrionic, anakastic, anxious and dependent personality disorder.

**5. Coping Response Inventory** [Moos, 1992] [30]. CRI was developed by Dr. Rudolf Moos, at Stanford University, California (in the year 1988, revised in 1992). The coping responses inventory is composed of eight subscales that measure different types of coping responses to stressful life circumstances. The first four subscales measure 'approach coping' (Logical Analysis, Positive Reappraisal, Guidance/Support and Problem Solving), the second set of four subscales measure 'avoidance coping' (Cognitive Avoidance, Resigned Acceptance, Seeking Rewards and Emotional Discharge). The first two subscales in each set reflect 'cognitive coping strategies', the third and fourth subscales in each set reflect 'behavioural coping strategies'.

**6. Family Environment Scale** [Moos, 1974] Revised and Hindi Version (Joshi, 1984) [31]. The family environment scale suitable for Indian cultural norms as developed by Dr. M.C. Joshi and O.R. Vyas was used. This scale has been developed to provide a handy tool to know family environment of the subject. The family environment scale (FES) assesses the social climates of all types of families. It focuses on the measurement and description among family members, on the directions of personal growth which are emphasized in the family, and on the basis organizational structure of the family. It involves three dimensions- Relationship Dimension (cohesion, expressiveness and conflict), Personal growth dimension **(**Independence, Achievement orientation, Intellectual cultural orientation, Active recreational orientation and Moral religious emphasis) and System Maintenance Dimensions **(**Organization and control**).** The scale consists of 90 Items and there are 9 items in each subscale. The item of each sub-scale are scattered in the scale. Each item is scored on a two-point scale where the score of "0"

(Zero) represent the category of "no" and the score of "1" (one) represent the category of "yes". There is no aggregate score for the scale; all the sub-scales are scored separately. Some of all the items in each sub-scale represent them.

**7. Medical College Environment Scale**. Standardized interview schedule for college environment scale was prepared in the form of ten statements, covering major aspects of medical college environment. The statements are required to be replied in three categories: Yes, cannot say and No. The scoring was done in the form of three-point rating scales as 2, 1, and 0 depending on nature and direction of facilitation or disturbance of medical college environment as perceived by the respondents.

**8. Presumptive Stressful Life Events Scale (PSLES)** by Gurmeet Singh et al., 1984[32]. It is modified version of the Social Readjustment Rating Questionnaires (SRRQ) of Holmes and Rahe (1967). Hundred was kept as the highest stress score and zero as no perceived stress. Scale items were classified into (a) desirable, undesirable or ambiguous and (b) personal or impersonal. Scoring of stressful life events was done as follows. If a subject perceived one stressful life event in preceding one year, a score of 1 was given, if a subject perceived 2 stressful life events in the same period a score of 2 was given & likewise. Any particular event that happened twice or more in the preceding year was taken to happen on and a score of (1) was given for that particular event.

**Assessment procedure**

Approval from Institutional Ethical Committee was taken at the outset of the study. All the students of first and final semester who were willing to participate in the study and agreed to give written informed consent were recruited. At the start of the study, the participants were informed briefly about the purpose of the study.

Study was conducted in two phases. In first phase, socio-demographic information sheet and GHQ-60 questionnaire was administered to all the participants of first and final semester. On the basis of the questionnaire probable cases (who scored 12 or above on GHQ-60) of psychiatric problems were detected. Thereafter these probable cases were interviewed to ascertain "Psychiatric Casenessness" in these screened participants. Diagnosis was made in consultation with a qualified psychiatrist according to the ICD-10. False positive cases were dropped.

In second phase, the diagnosed participants with psychiatric problems were individually administered a battery of instruments to determine the role of various factors including personality disorders, neurosis, life events, family and college environment. Scores obtained on different measures were arranged and entered in excel sheet and data was analyzed.

Frequency distribution in terms of mean and standard deviation, proportions and percentage was carried for socio-demographic and clinical details. Statistical procedure used included chi-square test and't' test (Statistical analysis for comparing means of two groups (with small samples – either or both $\leq$ 30).

**Results**

GHQ scores of 12 and above were more in medical college entrants than outgoing students, which depicts that there was higher prevalence of psychiatric problems in medical college entrants than their outgoing counterparts (32% V/s 25%). The above table also reveals that male students both in medical entrants as well as in outgoing group outnumbered their female counterparts in the rate of psychiatric problems (33.33% & 26.13% Vs 26.66% & 21.42%).

Medical entrants of low, middle and higher income groups were more or less evenly distributed in terms of their mental health and ill health. Thus, family income did not influence prevalence of psychiatric problems in medical entrants. However low and middle family income

outgoing medical students had significantly higher frequency of mental ill health (36% & 37% respectively) as compared to their counterparts who had higher family income (10%).

In the medical entrant group, percentage of mentally healthy hostler was more as compared to their day-scholar counterparts (35% v/s11%). Hostler and day-scholar were more or less evenly distributed in terms of their mental health and ill-health in outgoing group. Thus, residence did not influence prevalence of psychiatric problems in medical outgoing students (Table 1).

Significant difference were seen on all these seven measures of MHQ, suggesting that mentally unwell medical entrants had significantly more free-floating anxiety, obsessional neurosis, phobic anxiety, somatic anxiety, depression, hysterical neurosis and total neurotic score as compared to mentally healthy ones. While mentally unwell medical outgoing students showed significant differences on only four of the seven measures, including free floating anxiety, somatic anxiety, depression and total neurotic score as compared to their mentally healthy counter parts.

Significant differences were observed on seven of the nine measures of IPDE, suggesting that mentally unwell medical entrants have significantly more paranoid, schizoid, dissocial, borderline, anankastic, anxious and dependence personality traits as compared to mentally well. It was observed that mentally unwell outgoing medical students had more borderline and anxious personality traits as compared to mentally well as significant difference was observed only on two measures (borderline and anxious personality traits) (Table 2).

Out of the eight measures of CRI, significant differences were found only a single measure of seeking support or guidance. It suggests that healthy medical entrants make more efforts to seek support and guidance in crisis as compared to the ones who are mentally unhealthy. While significant differences were observed on three of the eight measures in mentally well medical outgoing students suggesting that mentally healthy medical outgoing student having more problem solving and seeking reward as their coping mechanism as compared to mentally unwell ones but at the same time they have significantly less resigned acceptance in comparison to mentally unwell as coping response to stressful life circumstances (Table 3).

There was no significant difference on any measure of family environment scale in mentally well and unwell medical entrants. Although significant differences were observed on two measures in medical outgoing group. Thus, mentally unwell medical outgoing students had more achievement - Orientation and less moral-religious emphasis in their family environment as compared to mentally healthy ones.

Presumptive stressful life event scale had no significant difference in medical entrant group while medical college environment scale suggested that mentally unwell medical entrants had more difficulties in adjusting as compared to mentally well. While in medical outgoing group, significant difference was observed on both presumptive stressful life events and medical college environment scale suggesting that mentally unwell outgoing students had significant more stressful life events and more unlikely college environment then their mentally healthy counter parts (Table 4).

**Table 1.** Socio-demographic composition and clinical variables of mentally well and unwell participants in Medical college entrants and outgoing students.

| Groups | Subgroups | Medical College Entrants (n = 141) | | | Outgoing Medical Students (n=116) | | |
|---|---|---|---|---|---|---|---|
| | | Mentally well | Mentally unwell (≥12) | Total | Mentally well | Mentally unwell | Total |
| GHQ | Male | 68 | 43 | 52(36.8%) | 61 | 27 | 34(29.3%) |
| | Female | 21 | 9 | | 21 | 7 | |
| ICD-10 | Male | 74 | 37 (33.33) | 45(31.9%) | 65 | 23 (26.1%) | 29 (25%) |
| | Female | 22 | 8 (26.66) | | 22 | 6 (21.4%) | |
| Family type | Joint | 49 (73%) | 18 (27%) | 67 | 20 (77%) | 6 (23%) | 26 |
| | Nuclear | 47 (64%) | 27 (36%) | 74 | 67 (74%) | 23 (26%) | 90 |
| Family income | Low | 46 (71%) | 19 (29%) | 65 | 16 (64%) | 9 (36%) | 25 |
| | Middle | 18 (60%) | 12 (40%) | 30 | 26 (63%) | 15 (37%) | 41 |
| | High | 32 (70%) | 14 (30%) | 46 | 45 (90%) | 5 (10%) | 50 |
| Domicile | Rural | 43 (66%) | 21 (33%) | 64 | 19 (70%) | 8 (30%) | 27 |
| | Urban | 53 (69%) | 24 (31%) | 77 | 68 (76%) | 21 (24%) | 89 |
| Family education | Both educated | 45 (66%) | 23 (34%) | 68 | 61 (75%) | 20 (25%) | 81 |
| | Father educated | 39 (72%) | 15 (285) | 54 | 23 (79%) | 6 (21%) | 29 |
| | Both uneducated | 12 (63%) | 7 (63%) | 19 | 3 (50%) | 3 (50%) | 6 |
| Language | Hindi | 69 (69%) | 31 (31%) | 100 | 49 (75%) | 16 (25%) | 65 |
| | English | 27 (66%) | 14 (34%) | 41 | 38 (75%) | 13 (25%) | 51 |
| Residential distribution | Hostler | 80 (65%) | 43 (35%) | 123 | 64 (73%) | 24 (27%) | 88 |
| | Day scholar | 16 (89%) | 2 (11%) | 18 | 23 (82%) | 5 (18%) | 28 |

**Table 2** Mean and SDs of mentally well and unwell medical entrants and outgoing students on different measures of MHQ (Middlesex Hospital Questionnaire) and IPDE

| Subscale | Medical entrants | | | Outgoing medical students | | |
|---|---|---|---|---|---|---|
| | Mentally well (n=30) (Mean ±SD) | Mentally unwell (n=45) (Mean ±SD) | t value | Mentally well (n=30) (Mean ±SD) | Mentally unwell (n=29) (Mean ±SD) | t value |
| **Middlesex Hospital Questionnaire** | | | | | | |
| FFA | 3.30 (±2.03) | 7.85(±3.05) | 7.15*** | 3.80(±2.45) | 7.03(±2.20) | 5.35*** |
| OBS | 6.23(±1.7) | 7.51(±2.35) | 2.15* | 7.06(±2.18) | 7.41(±2.76) | 0.54 |
| PHO | 4.06 (±2.5) | 5.62(±3.27) | 2.21* | 4.06(±2.48) | 4.51(±2.40) | 0.71 |
| SOM | 3.13(±2.4) | 6.58(±3.15) | 5.10*** | 2.00(±1.53) | 3.96(±1.86) | 4.44*** |
| DEP | 3.40(±1.7) | 6.46(±3.20) | 4.78*** | 2.60(±1.70) | 5.62(±2.70) | 5.16*** |
| HYS | 2.26(±2.3) | 4.33(±2.49) | 4.10*** | 2.06(±1.80) | 3.00(±2.20) | 1.78 |
| Total Neurotic Score | 22.4(±8.2) | 38.33(±12.90) | 5.99*** | 21.60(±8.5) | 31.62(±9.0) | 4.39*** |
| **IPDE** | | | | | | |
| Paranoid | 2.00(±1.2) | 3.00(±1.22) | 3.49*** | 2.47(±0.97) | 2.31(±1.45) | -0.49 |
| Schizoid | 3.63(±1.4) | 4.50(±1.61) | 2.38* | 3.73(±1.08) | 3.38(±1.52) | -1.03 |
| Dissocial | 0.80 (±0.88) | 1.47(±1.14) | 2.70** | 0.86(±1.10) | 1.10(±0.860 | 0.92 |
| Impulsive | 1.36(±1.2) | 1.82(±1.38) | 1.45 | 1.33(±1.09) | 1.65(±1.37) | 1.00 |
| Borderline | 1.40(±0.7) | 2.20(±1.01 | 3.73*** | 1.26(±0.69) | 2.03(±0.98) | 3.48*** |
| Histrionic | 2.20(±1.3) | 2.58(±1.49) | 1.13 | 2.40(±1.16) | 2.58(±1.45) | 0.54 |
| Anankastic | 2.43(±1.3) | 3.85(±1.35) | 4.57*** | 2.66(±1.64) | 3.38(±1.70) | 1.64 |
| Anxious | 1.56(±1.0) | 3.20(±1.42) | 5.39*** | 1.46(±1.16) | 2.45(±1.32) | 3.02** |
| Dependence | 2.30(±1.5) | 3.15(±1.52) | 2.45* | 2.00(±1.23) | 2.55(±1.50) | 1.55 |

* = P<0.05, ** = P <0.01, *** = P<0.001

FFA-Free-Floating Anxiety, OBS- Obsessional traits and symptoms, PHO- Phobic Anxiety, SOM-Somatic concomitants of anxiety, DEP- Neurotic Depression, HYS- Hysterical personality traits.

**Table 3** Mean and SDs of mentally well and unwell medical Entrants and outgoing medical students on different measures of Coping Response Inventories (CRI)

| Subscale | **Medical entrants** | | | **Outgoing medical students** | | |
|---|---|---|---|---|---|---|
| | Mentally well(n=30) (Mean±SD) | Mentally unwell(n=45) (Mean±SD) | t-value | Mentally well(n=30) (Mean±SD) | Mentally unwell(n=29) (Mean±SD) | t-value |
| L.A. | 11.66(±3.95) | 10.40(±3.15) | -1.53 | 9.80(±3.93) | 9.20(±2.57) | -0.68 |
| P.R. | 13.63(±3.55) | 12.87(±3.47) | -0.93 | 13.40(±2.96) | 13.06(±2.65) | -0.45 |
| S.G. | 14.00(±3.44) | 12.33(±3.37) | -2.08* | 12.80(±4.23) | 12.00(±3.67) | -0.77 |
| P.S. | 13.73(±3.62) | 13.13(±3.35) | -0.73 | 15.13(±2.75) | 13.34(±3.14) | -2.33* |
| C.A. | 7.93(±3.49) | 8.06(±3.28) | 0.17 | 7.06(±3.37) | 8.13(±3.62) | 1.18 |
| A.R. | 5.66(±3.67) | 7.13(±3.60) | 1.71 | 4.60(±3.46) | 7.13(±3.24) | 2.90** |
| S.R. | 12.73(±3.24) | 11.17(±3.42) | -1.97 | 13.40(±2.62) | 11.13(±2.85) | -3.17** |
| E.D. | 5.90(±3.02) | 6.82(±3.24) | 1.24 | 4.53(±2.19) | 4.80(±2.21) | 0.45 |

* = P<0.05, ** = P<0.01

LA-Logical Analysis, PR-Positive Reappraisal, SG-Guidance/Support, PS- Problem Solving, CA-Cognitive Avoidance, AR-Resigned Acceptance, SR-Seeking Reward, ED-Emotional Discharge

**Table 4** Mean and SDs of mentally well and unwell medical entrants and outgoing medical students on different measures of Family Environment Scale (FES), Presumptive Stressful Life Events (PSLE) and Medical College Environment Scale (MCES)

| Subscale | Medical entrants | | | Outgoing medical students | | |
|---|---|---|---|---|---|---|
| | Mentally healthy (n=30) (Mean ±SD | Mentally unhealthy (n=30) (Mean ±SD | t-value | Mentally healthy (n=30) (Mean ±SD | Mentally unhealthy (n=30) (Mean ±SD | t-value |
| COH | 8.36(±0.89) | 8.15(±0.79) | -1.07 | 8.33(±0.802) | 8.00(±1.44) | -1.10 |
| EXP | 6.06(±1.31) | 5.77(±1.39) | -0.90 | 5.80(±1.49) | 5.48(±1.52) | -.81 |
| CONF | 2.50(±1.07) | 2.78(±1.28) | 0.98 | 2.60(±1.22) | 2.69(±1.44) | 0.26 |
| IND | 6.90(±1.54) | 7.22(±1.36) | 0.95 | 7.40(±1.16) | 6.89(±1.31) | -1.56 |
| AO | 5.96(±1.15) | 5.84(±0.87) | -0.52 | 5.13(±1.10) | 5.69(±0.85) | 2.16* |
| ICO | 5.70(±1.51) | 5.71(±1.45) | 0.03 | 5.73(±1.64) | 5.51(±1.92) | -.47 |
| ARO | 6.10(±1.65) | 5.53(±1.84) | -1.36 | 6.33(±1.60) | 5.38(±2.17) | -1.92 |
| MRE | 6.93(±1.46) | 7.00(±1.22) | 0.21 | 7.60(±1.10) | 5.65(±1.73) | -2.50* |
| ORG | 7.26(±1.11) | 7.00(±1.16) | -0.99 | 7.40(±1.10) | 7.03(±1.14) | -1.25 |
| CONT | 5.43(±1.19) | 5.26(±1.11) | -0.62 | 5.06(±1.36) | 5.27(±1.03) | 0.66 |
| COH | 8.36(±0.89) | 8.15(±0.79) | -1.07 | 8.33(±0.802) | 8.00(±1.44) | -1.10 |
| EXP | 6.06(±1.31) | 5.77(±1.39) | -0.90 | 5.80(±1.49) | 5.48(±1.52) | -.81 |
| **PSLE** | 1.83(±2.58) | 3.06(±3.41) | 1.68 | 1.13(±1.27) | 2.27(±1.83) | 2.79** |
| **MCES** | 6.23(±4.43) | 11.24(±4.22) | 4.94*** | 4.86(±3.12) | 6.75(±3.73) | 2.11* |

** = P<0.001, * = P<0.05, ** = P<0.01

COH-Cohesion, EXP- Expressiveness, CONF-Conflict, IND- Independence, AO-Achievement-Orientation, ICO- Intellectual - Cultural Orientation, ARO-Active Recreational Orientation, MRE-Moral - Religious Emphasis, ORG-Organization, CONT-Control

PSLE- Presumptive Stressful Life Events Scale.

MCES- Medical College Environment Scale

## Discussion

One of the significant findings emerged from this study was that prevalence of psychiatric problems were higher in medical entrants as compared to medical outgoing students (32% Vs 25%).There can be several possible explanations of this important observation. Medical entrants find medical college as new environment to which they have to reorientation themselves or unlearn earlier school milieu, which may be considered relatively less competitive, more familiar to them and easy to cope. Similar results were obtained by Mahroon et al in 2017 in which the prevalence rate of approximately 40% was observed in students of medical university of Bahrain with higher prevalence of disorder in initial part of the education like year 1 as compared to later years (Year 5) [33]. Another study by Muzafar et al in 2015 reported burnout of 35.9% according to Copenhagen Burnout Inventory in Lahore, Pakistan [34]. However, the study by Almojaliet al in 2017 reported a higher prevalence of 53.2% of all types of stress by medical students of Saudi Arabia. The reason for this disconcordance might be the difference in socio-cultural background and use of different scale for assessment-Kessler Psychological Distress Scale (K10) [35].

Current study depicted socio-demographic and psychological determinants of emotional health and ill health both in entrants and outgoing students. As regards to gender effect, both in medical entrants and outgoing ones, it was observed that males in comparison to females were more prone to psychiatric problems (33.33% Vs 26.66% & 26.13% Vs 21.42% respectively). It may be because females have more security than males in aspects including priority in hostel accommodation. Females may also have positive self-concept and self-esteem due to their entrance to glorious job of medicine and thus remaining free from social role of housewife, while males may feel more social obligation of being sole bread earner. The results of this study is in contradiction with studies by Mahroon et al in 2017[33] and Muzafar et al in 2015 [34] where females had more prevalence as compared to males. The reason for this discordance might be that the latter studies had more female subjects recruited and being an Arab country, females would be facing different socio-cultural barriers, the reason of increased prevalence of psychiatric morbidity quoted in their study also.

It was also found that day-scholar medical entrants had more psychiatric morbidity than hostler, which could be due to proper personality development of hostler which included several

factors of adequate social exposure and development of interpersonal relationship among peers with similar results by Muzafar et al in 2015[34]. It might be possible that day scholar had additional burden to travelling each day and facing day to day family issues.

However, family income played a vital role in outgoing medical students as low and middle family income students were more prone to develop mental ill health than those who belong to high income group. It may be that outgoing students may be concerned for their future settlements, deprived of their needs leading to frustration and disappointment. Similar results in study by Muzafar et al 2015 in which cause of burn out was family responsibility. In Pakistan, married medical students and those belonging to poor families are expected to support their families financially. Such medical students may find it difficult to meet the demands of medical education on the one hand and the financial and emotional support of their families on the other. Thus, the combined demands of medical education, family, and the stress arising from occasional conflicts between these demands can exhaust the students to the level that they become burnt out [34].

Mentally unhealthy medical students both at entrants and outgoing levels have scored significantly higher on overall neuroticism level and its constituent measures but this trend was more evident in entrants than outgoing students as it might be possible that outgoing students resolved some of their problems due to adaptation in their long medical educational process. Similar results were obtained from review of literature by Derbye et al in 2005, where it was emphasized that first-year medical students were faced with the challenges of being uprooted from family and friends and adapting to a demanding new learning environment [3]. Rosiek et al in 2016 also concluded that students toward the end of their education cope better with stress than students starting their university Studies and the level of perceived stress among students entering education is higher compared to the group of students in their final year of studies [36].

The role of personality disorders assessed through ICD-10 International Personality Disorder Examination was more in mentally unhealthy medical entrants than mentally unhealthy outgoing medical students. We could not find any study using IPDE to assess personality disorders in medical students. However, study by Burghi et al 2017 used Myers- Briggs Type Indicator to assess personality profile and found statistically significant difference between extraversion- introversion preferences and distress and burnout scores [26].

Mentally healthy outgoing students used more problem solving and reward seeking and less resigned acceptance as coping response than mentally unhealthy ones. On the contrary, mentally healthy medical entrants significantly employed support seeking or guidance than their unhealthy counterparts. Similar results were reported in a study by Imran et al in 2016 where healthy or approach coping responses were employed by mentally healthy students whereas avoidance coping response were more employed by unhealthy students. The most common coping strategies adopted by students during stress were religion, active coping, acceptance, planning, positive reframing, and self-distraction. [1]

None of the family environment measures played a significant role in medical entrants. It may be that students don't want reveal their family problems in a new setup. Mentally unhealthy outgoing medical students scored significantly higher on Achievement Orientation and lower on moral religious values than the ones who were mentally healthy. It suggests that too much achievement pressure on the part of parents also create problems to students and at the same time, if family doesn't have proper moral and religious emphasis, problems might ensue. However indirect evidences from study by Sreeramareddy et al 2007 shows that medical students whose parents were doctors had higher stress conferring to high achievement orientation and expectations [37].

As regards to medical college environment, mentally unhealthy medical students both at entrance and outgoing level perceived medical college environment significantly more disturbing than their normal counterparts. The results are supported by study Muzafar et al [34]and Shah et al [38]in which medical students reported stressors to be of academic in nature including lack of sleep, lack of time off, high frequency of tests, fear of failure and high parental expectations. Similarly, Sreeramareddy et al[37] found the vastness of syllabus, tests/exams, high parental expectations, and lack of time and facilities for entertainment as major stressors in undergraduate Nepalese medical students With similar results by Imran et al 2015, the most frequently occurring sources of stressors were broadness of academic syllabus, increased frequency of exams, tough routine, lack of guidance from seniors, living away from home, lack of guidance from faculty, poor living conditions in dormitory, fear of failing exams and high family expectations. Students rated the academic syllabus being too broad, tough routine, and increased frequency of exams as the most severe stressors [1].

Lastly role of life events was also studied using Gurmeet Singh presumptive stressful life event scale. The findings were not significant in medical entrants. However, outgoing mentally unhealthy student group scored significantly more on life events than the ones who were healthy.

**Limitation and future directions**

The results of the study cannot be generalizable due to its cross- sectional nature. A prospective longitudinal study needs to be undertaken to understand the psychiatric morbidity in individual medical student and to find the trends with each semester. The role of quality of life in relation to psychiatric morbidity in medical students should also be studied using suitable quality of life scales. Targeted intervention strategies need to be developed to solve the issue and benefit the medical students.

**Conclusion**

Significant psychiatric morbidity in medical students (32% in entrants and 25% in outgoing students) in India. Medical college entrants had more psychiatric problems as compared to their outgoing counterparts with higher male preponderance. Medical entrants had higher neurotic traits, dysfunctional personality, used single coping mechanism of seeking support or guidance and more difficulties in adjusting to the medical college environment. While for outgoing students, low family income had significant impact with lesser neurotic traits, dysfunctional personality trait, difficult family environment, adverse life events and medical college environment. However, they had more problem-solving skills and reward seeking as their coping mechanism.

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