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A study comparing depression, anxiety, and coping styles between high school students attending and not attending coaching class for medical entrance examination

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Abstract:

BACKGROUND: Various kinds of stressors and psychological problems have been reported in the adolescent student population. This study assessed and compared depression, anxiety, and various coping styles among high school students attending coaching classes for medical entrance examination (MEE) and those not.

MATERIALS AND METHODS: Systemic random sampling technique was used to recruit 400 high school students with equal number of those attending (Group 1) and those not attending any coaching class for MEE (Group 2). They underwent screening for depression and anxiety through Patient Health Questionnaire-9 and Generalized Anxiety Disorder 7-item. Coping styles were assessed through brief COPE inventory. Screening positive subjects were assessed in detail by a psychiatrist using ICD-10 (International Classification of Diseases 10th Revision), Diagnostic Criteria for Research (DCR). The severity of depression and anxiety was measured through HAM-D and HAM-A, respectively.

RESULTS: Depression and anxiety were reported by higher proportion of Group 1 (36%) than Group 2 (22%), $\chi^2 (1) = 9.52$; $P = 0.002$. In both the groups, depressive disorder was the most common, followed by generalised anxiety-disorder and mixed anxiety-depression. The severity of depression (HAM-D score) and anxiety (HAM-A Score) was significantly more Group 1. "Active coping" ($\chi^2 = 4.79$ $P = 0.02$) and "Humor" ($\chi^2 = 30.90$, $P \leq 0.01$) were more commonly used by healthy students, while "Religious coping" ($\chi^2 = 37.92$ $P \leq 0.01$) were the most common among those diagnosed with depression/anxiety disorder.

CONCLUSION: Higher prevalence of the psychological problems in adolescent school students preparing for MEE highlights the importance of aptitude assessment, career counseling, and school mental health program before their exposure to the competitive academic atmosphere.

Keywords:

Adolescent, competition, coping, depression, entrance examination, students

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Introduction

"Adolescence" is derived from adolescere to grow up or to grow from childhood to maturity. The WHO identifies adolescence as the period in human growth and development that occurs after

childhood and before adulthood, from ages 10 to 19.^[1] There are 350 million adolescents in the Southeast Asia Region which comprises more than one-fifth (22%) of the population.

Adolescence represents a period of critical transitions in which peer relationships

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deepen, autonomy in decision-making grows, and intellectual pursuits and social belonging are sought.^[2]

Adolescence is largely a time of exploration and making choices, increasing ability for mastery over complex challenges of academic, interpersonal, and emotional tasks while searching for new interests, talents, and social identities.^[3]

Previous research has shown that high school students in India are living in an anxiety-ridden atmosphere with high expectations and pressure in various domains of life, particularly for academic achievement.^[4]

It is common for senior secondary/preuniversity students in India to attend coaching classes in addition to school education for a medical entrance examination (MEE). There is terrible competition at this academic stage since there are a small number of seats in reputed educational institutions than the number of candidates appearing for examinations in India.^[5]

Numerous reports are available in media about a high level of stress and anxiety and sometimes suicide among school students attending coaching for a MEE.^[6] A recent qualitative study conducted among Iranian adolescents found that differences in the style of studying for the university entrance examination and the school examinations were a significant contributor to academic stress.^[7]

More than 35 years ago, Earl predicted the increasing pattern of psychiatric morbidity in adolescents in future.^[8] Lifetime prevalence increases drastically from 1% in the population under age 12 years to around 25% by the end of adolescence with depression and anxiety among the most common disorder.^[9]

Coping strategies are the pattern of reacting or specific efforts of an individual in response to a conflicting or distressing situation to either completely mitigate or reduce resulting stress. Research suggests that adolescents using functional coping strategies such as positive appraisal experience less stress than those with unhealthy coping skills like anger.^[10]

There are numerous studies assessing academic stress and various types of mental health problems in medical and dental college students.^[11-14] However, medical students are successful candidates and represent a small fraction of high school students struggling to enter medical school. A number of studies in high school students preparing for MEE are limited in number. Moreover, to our knowledge, there is no study which assessed psychological disorders and compared the prevalence among high school students those struggling to enter medical school with others.

Our study was aimed to find and compare the prevalence of depression, anxiety, and various coping styles among high school students enrolled in the coaching class and those not.

Materials and Methods

Sample universe

The research team identified five coaching institutes offering preparation for a MEE and nine schools offering higher secondary education in the city where our medical college is situated. Among 3341 high school students, 996 were attending coaching classes for a MEE.

Sampling technique

The lists were prepared separately for both the groups (high school students attending and not attending coaching class) in which their names were arranged in alphabetical order. In Group 1 (coaching class students), every 5th student and in Group 2 (students not attending coaching) every 12th student was approached for participation in the study. In case a student not consenting to participate in the study, the next one was approached. A total of 400 high school students, 200 in each group, were recruited in the study.

Procedure

The study has two phases of assessment. In the first phase, all participants underwent screening for depression and anxiety through self-rated scales. Coping skills were also assessed through a self-administered questionnaire. In the second phase, those found positive in screening were assessed in detail by one of four psychiatrists of the department of psychiatry in our medical college who used ICD-10 DCR to establish a diagnosis. Psychiatrists also applied clinician-administered scales to measure the severity of depression and anxiety.

Tools

Semi-structured performa

It was used to collect sociodemographic details of students including a family history of psychiatric illness.

Patient Health Questionnaire-(PHQ-9)^[15]

It was used in the screening stage to identify students with clinically meaningful symptoms of depression. This is a self-administered depression scale of PHQ-9 which contains 9 questions and each item is scored 0–3, with 0 representing “not at all” and 3 indicating “nearly every day.” Its total score ranges from 0 to 27 and a cutoff score of 10 or above can be used for depression regardless of age.^[16]

Generalized Anxiety Disorder 7-item (GAD-7) scale^[17]

It was used to screen for symptoms of anxiety. GAD-7 is a widely used self-report measure developed to screen for

generalized anxiety disorder. Participants rate symptoms on a 3-point scale as occurring “not at all” (0), “several days”(1), or “more than half the days”(2) during the past 2 weeks. Its total score ranges from 0 to 14. At a cutoff score of 10, GAD-7 has a sensitivity of 89% and a specificity of 82% for GAD. It is moderately good at screening three other common anxiety disorders – panic disorder (sensitivity 74% and specificity 81%), social anxiety disorder (sensitivity 72% and specificity 80%), and posttraumatic stress disorder (sensitivity 66% and specificity 81%).

Hamilton Depression Rating Scale (HAM-D)^[18]

Its 17-item version was used in students diagnosed with depression to rate the severity. Each item in this questionnaire is scored on a 3- or 5-point Likert-type scale.

Hamilton Anxiety Rating Scale (HAM-A)^[19]

This clinician-administered questionnaire was used to rate the severity of anxiety in students diagnosed with an anxiety disorder. Developed by Max Hamilton, HAM-A is the most widely utilized assessment scale for anxiety symptoms. It consists of 14 items and each item is rated on 0–1 scale (0 – not present, 4 – severe).

Brief COPE(Coping Orientation to Problems Experienced) inventory^[20]

This 28-item self-reported questionnaire was used to identify the use of coping strategies in response to stress. It was developed to assess a broad range of coping responses, several of which had an explicit basis in theory. Some of the responses are assumed to be dysfunctional and few of them seem to be functional. There are at least two pairs of opposite polar tendencies. According to developer, they were included because absence of one response does not mean the presence of the opposite response and both may be used by an individual during a given period.. Each item in this inventory is scored from 1, “I usually don’t do this at all,” to 4, “I usually do this a lot.” It contains 14 two-item subscales and each one is analyzed separately: (1) self-distraction, (2) active coping, (3) denial, (4) substance use, (5) use of emotional support, (6) use of instrumental support, (7) behavioral disengagement, (8) venting, (9) positive reframing, (10) planning, (11) humor, (12) acceptance, (13) religion, and (14) self-blame. They are categorized into three categories – emotion-focused, problem-focused, and dysfunctional strategies.

Ethical consideration

The study was conducted after obtaining the approval from the institutional ethical committee (No 42954-85/ Academic-III/MCA/2016, date November 28, 2016, Research Project for MD Psychiatry thesis) and concerned authorities of coaching institutes and schools. Consent was obtained both from students and their

parents. Department of psychiatry of our medical college provided the contact details of three psychiatrists who provided free consultation service if any of the participants and their parents wished to seek help for any kind of psychological problem.

Both descriptive and inferential analyses were performed using the SPSS statistical software package (IBM SPSS Statistics version 23, SPSS Inc., Chicago, IL, USA).

Results

Sociodemographic details of both the groups of students are given in Table 1. Although the difference was found statistically significant between the two groups, most of the participants (91.5% and 96.5% in Group 1 and 2, respectively) had a negative family history of psychiatric illness. Group 1 students were more likely to have higher socioeconomic status (SES), $\chi^2 (1) = 43.23 P = 0.01$. Two groups did not differ in other variables such as mean age, gender, and medium and mode of education.

The result of screening by PHQ-9 and GAD-7 is shown in Table 2. Higher proportion of students in Group 1 were more likely to report anxiety and/or depression symptoms than Group 2 (36% % vs. 22%; $\chi^2 (1) = 9.52; P = 0.002$). There was no difference seen between male and female students, $\chi^2 = 0.042, P = 0.997$. Diagnosis of screening positive participants after a clinical assessment is shown in Figure 1. In both the groups, the depressive disorder was the most common psychiatric disorder,

Table 1: Sociodemographic, economical, and educational characteristic of participants

Variables	Group 1	Group 2	$\chi^2/t, P$
Mean age (SD)	16.15 (1.01)	16.22 (0.95)	2.75, 0.60
Gender			
Male	123	107	2.62, 0.11
Female	77	93	
Socio economic status (%)			
Upper	44	33.5	43.23, 0.01
Upper middle	10.5	12	
Lower middle	11	22.5	
Upper lower	28	9.5	
Lower	7.5	22.5	
Medium of education (%)			
English	85	78	3.25, 0.07
Hindi	15	22	
Mode of education (%)			
Co education	84	86	0.31, 0.575
Separate	16	14	
Family history of psychiatric illness (%)			
Absent	91.5	96.5	4.43, 0.035
Present	8.5	3.5	

t=Independent sample t-test, P=P (Significance level<0.05). SD=Standard deviation

followed by GAD and mixed anxiety and depressive disorder. HAM-D and HAM-A scores for participants in both the groups are given in Table 3. Most of the students in groups had a mild level of depression and anxiety. Depression was significantly more subjects in Group 1 students; $\chi^2 (1) = 8.48, P = 0.004$. No difference was noted in the number of students diagnosed with anxiety disorders between the two groups [Table 3]. Family history of psychiatric illness in subjects clinically

diagnosed with depression and/or anxiety disorders did not differ between the two groups, $\chi^2 = 2.99, P = 0.084$.

Table 4 shows an association between family history of psychiatric illness and psychiatric morbidity in both the groups. Among subjects with positive family history, psychiatric morbidity was more common in Group 1 students, $\chi^2 = 5.44, P = 0.038$. Same is true for the subjects who did not have a family history of psychiatric illness. They were also more likely to have psychiatry morbidity if they belong to Group 1 (attending coaching class for medical entrance), $\chi^2 = 6.61, P = 0.010$.

The pattern of coping strategies used by students with and without psychiatric morbidity is shown in Table 5. While "Religious coping," an emotion-focused strategy, was the most common coping style among students with depression/anxiety, "Active coping," a problem-focused strategy, was used by most of the healthy students. Dysfunctional coping styles (self-distraction and self-blame) were also seen more commonly among those suffering from depression/anxiety ($P < 0.01$).

Discussion

In our study, both the groups were comparable to each other in terms of age, gender, and medium and mode of education. Although the majority of subjects in both the groups belonged to the upper economic category, Group 1 students had significantly higher economic status. This is an expected finding because enrolling children in coaching

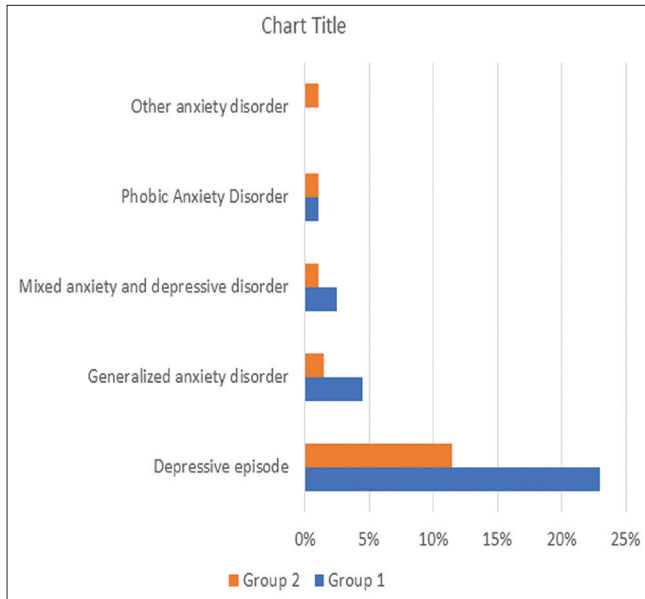


Figure 1: Diagnosis after clinical assessment in both the groups

Table 2: Result of screening by Patient Health Questionnaire-9 and generalized anxiety disorder-7

Variables	Number of students, n (%)		χ^2, P
	Group 1 (200)	Group 2 (200)	
PHQ-9 score ≥ 10	52 (26)	31 (15.5)	6.70, 0.009
GAD 7 score ≥ 10	31 (15.5)	17 (8.5)	4.64, 0.031
Both GAD 7 score ≥ 10 and PHQ-9 score ≥ 10	42 (21)	26 (13)	4.53, 0.033
Either GAD 7 score ≥ 10 or PHQ-9 score ≥ 10	72 (36)	44 (22)	9.52, 0.002

χ^2 =Chi-squared test, $P=P$ (Significance level<0.05). PHQ=Patient Health Questionnaire, GAD=Generalized anxiety disorder

Table 3: Severity of depression (Hamilton Depression Rating Scale score) and anxiety (Hamilton Anxiety Rating Scale scores)

Variables	Subject with Clinical diagnosis		$\chi^2 (df), P$
	Group 1 (62)	Group 2 (32)	
Depression (HAM-D score)	46	23	8.48 (1), 0.004
Mild (10-13)	35	11	
Moderate (14-17)	7	6	
Severe (>17)	4	6	
Anxiety (HAM-A score)	16	9	2.09 (1), 0.148
Mild (<17)	11	5	
Moderate (18-24)	3	2	
Severe (25-30)	2	2	
Family history of psychiatry illness			2.99 (1), 0.084
Present	15	3	
Absent	47	29	

χ^2 =Chi-squared test, $P=P$ (Significance level<0.05). HAM-D=Hamilton Depression Rating Scale, HAM-A=Hamilton Anxiety Rating Scale, DF=Degree of freedom

class for MEE is an extra financial burden for parents and difficult to afford by low-income families.

Around one-third of students in our study self-reported symptoms of either depression or anxiety. Previous studies using self-reported scales have also measured depression and anxiety symptoms from 12.2% to 28% in school-going adolescent students.^[21,22]

The detailed assessment found that approximately one of every four students in our study suffered from either depression or anxiety disorder. The clinical diagnosis was more commonly seen in Group 1 students who, in addition to school education, also attended coaching class for the MEE.

An inverse relation between SES and the prevalence of common mental disorders is well known.^[23,24] Therefore, the difference of SES between the two groups in our study cannot explain the higher prevalence of depression and anxiety in students attending a coaching class. However, SES might be playing the role of a confounding factor

than contributing because students with higher SES are more likely to afford extra education in a coaching class.

More students in Group 1 had a positive family history for psychiatry disorder and this could be seen as one of the possible explanations for the higher prevalence of psychological morbidity in them compared to Group 2. However, it is important to notice that only a small fraction of students (8.5% and 3.5%, respectively, in Group 1 and 2) had a family history of psychiatric illness. Moreover, further analysis found that Group 1 had a significantly higher chance of depression and anxiety disorders irrespective of family history. This suggests that the above factors (SES and family history) alone cannot explain the high vulnerability of students attending a coaching class.

Few studies reported increased vulnerability of female students for psychological problems, others do not agree with the same.^[4,25-27] Asal and Abdel-Fattah studied prevalence, symptomatology, and risk factor for depression among high school students in Saudi Arabia and found depression in girls was 1.5 times more vulnerable for depression than boys.^[26] Deb et al. found more boys than girls among high school Indian students suffered from anxiety.^[4] In addition to ambiguity regarding predisposition of a particular gender, the neurobiological basis is also not known if any such vulnerability exists. In our study, the association between gender and psychiatric disorder has not been found significant. We also agree that both genders are equally affected by stress of competition and fear of not able to succeed in the MEE and therefore do not differ in their predisposition for psychiatric disorders.

Table 4: Association of family history of psychiatric illness and psychiatric morbidity

Psychiatric morbidity	Students with positive family history		χ^2 (df), P
	Group 1 (17)	Group 2 (7)	
Present	15	3	5.44 (1), 0.038*
Absent	2	4	

Psychiatric morbidity	Students with negative family history		χ^2 (df), P
	Group 1 (183)	Group 2 (193)	
Present	47	29	6.61 (1), 0.010
Absent	136	164	

*Fisher's exact test. DF=Degree of freedom

Table 5: Use of various coping styles by students

Coping style	Students with either depression or anxiety (n=94)	Students without depression or anxiety (n=306)	χ^2 , P
Dysfunctional strategies			
Denial	23.4% (22)	20.26% (62)	0.42, 0.51
Substance use	21.3% (20)	29.41% (90)	2.39, 0.12
Venting	35.1% (33)	49.67% (152)	6.14, 0.01
Behavioral disengagement (give up)	55.3% (52)	42.81% (131)	4.53, 0.03
Self-distraction	72.3% (68)	24.84% (76)	70.43, <0.01
Self-blame	62.7% (59)	15.69% (48)	81.34, <0.01
Emotion focused strategies			
Positive reframing	32.97% (31)	31.70% (97)	0.05, 0.82
Emotional social support	44.7% (42)	47.39% (145)	0.21, 0.64
Religious coping	74.4% (70)	38.24% (117)	37.92, <0.01
Acceptance	8.5% (8)	11.44% (35)	0.64, 0.42
Humor	32.97% (31)	65.36% (200)	30.90, <0.01
Problem focused strategies			
Instrumental support	18.1% (17)	27.12% (83)	3.13, 0.08
Active coping (concentrate on efforts)	55.3% (52)	67.65 (207)	4.79, 0.02
Planning	30.85% (29)	40.52% (124)	2.92, 0.09

χ^2 =Chi-squared test, P=P (Significance level<0.05)

This study also explored the most regular and habitual coping style among students during difficult or stressful situations. Dysfunctional strategies (like “Self-blame” and “Self-distraction”) were seen among those diagnosed with either depression or anxiety disorder. Problem-focused strategies (like “Active coping”) were more commonly used by healthy students. Among various emotion-focused coping styles, the healthy group preferred “Humour,” while “Religious coping” was preferred by those with depression/anxiety. Kasi *et al.* so used Brief COPE to assess coping styles in patients with anxiety and depression and found that “religion” was the most common coping mechanism in those found positive on screening with Aga Khan University’s Anxiety and Depression Scale.^[28] Previous research has also shown that high use of emotion-focused coping, not problem-focused strategies, is a risk factor for depression and anxiety.^[29,30] However, none of these studies included high school students, especially among those preparing for a MEE. Nonetheless, a similar finding suggests that either the problem-focused approach or use of humor is protective for depression and anxiety for adolescent facing academic stress. Suldo *et al.* investigated a group of students facing academic stress and found that adolescents who used functional coping strategies such as positive appraisal (focusing on the good things) and peer/family support reported experiencing less stress than those who resort to anger coping.^[10]

Strength and weakness of the study

The study has recruited subjects (adolescent students) from real settings, not from patients attending the hospital. To dissect out relationship between psychiatric disorders and struggle for MEE, the study assessed both kinds of students, preparation for MEE, and those not. Standard tools were used to screen subjects and clinical diagnoses were established by an independent psychiatrist (not involved in the screening process) using the ICD-10 DCR criterion.

The study has the limitation that it was conducted in science stream students, and therefore, results cannot be extrapolated to other groups of students such as arts and commerce. Being a cross-sectional study, it is difficult to predict the change in psychological problems and copying style as student further advances in their studies.

Conclusion

This study found a higher prevalence of common mental health disorders in high school students, particularly those preparing for a MEE. The study highlighted that the above could not be explained by factors other than academic stress like family history or socioeconomic level or gender. It is therefore important that adolescent students undergo aptitude assessment

and career counseling before they expose themselves to a highly competitive atmosphere of coaching class for professional entrance examinations. School mental health programs should be carried out to help identify cases with noncoercive and nonjudgmental guidance to the students to choose their career, set goals accordingly, and manage the time to help them to prevent being overburdened.

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Conflicts of interest

There are no conflicts of interest.

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