

Prevalence of Depression among Tenth Graders one Month Prior to Board Exam (SSS)

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Abstract To know prevalence of depression among tenth graders one month prior to board exam & to assess their symptomatology of depression a cross-sectional study among the tenth graders in rural area, using the Quick inventory of depressive symptomatology (QIDS) a self assessment report was undertaken. Research question underlying was whether exam causes depression. Study was conducted in three schools under the vigilance of respective class teachers. Total 407 students took the QIDS self report questionnaire along with personal information questionnaire. 92% students were found depressed. Out of 407 students, 166 students (41%) were suffering from moderate depression, 65 students (16%) were suffering from severe and 10 students (2%) were suffering from very severe depression. 32/407 (8%) students did not fulfill the criteria of depression. Gender prevalence ratio i.e. male to female students were almost equal. Prevalence of somatic symptoms was higher though guilt was the most common symptom noticed. Possibility of board examination being attributer may be considered, however further detail study is need of hour to confirm role of board examination.

Keywords Adolescent, Depression, Board exam going students, Excessive guilt, Common symptoms of depression, Role of exam

1. Introduction

Depression (major depressive disorder or clinical depression) is a common but serious mood disorder. It causes various symptoms that affect how you feel, think, and handle daily activities, such as sleeping, eating, or working [1]. To be diagnosed with depression, the symptoms must be present for at least two weeks. It has become a common and alarmingly increasing disorder among adolescents [1]; affecting their socialization, family relations, and school performance; with long term consequences. Some long term consequences include risk of alcohol abuse, antisocial behaviors, & hospitalizations.

Biggest concern among adolescents is rising rate of suicides, the third leading cause of death among older adolescents (Centre for Diseases Control, WISQARS) [2]. WHO has stated that incidence of depression is rapidly rising and threat looms that depression will be the most common disease, surpassing Diabetes Mellitus and Cancer. WHO stated that by 2020 depression could be 2nd most prevalent disease [3].

Previous studies with similar premise have proven an increase in the prevalence of depression among school

students. A study done in NIMHANS Bangalore, found 18.4% adolescents depressed. Malaysian Study revealed 10.3% of secondary school students suffering from depression. Karim Munir, Psychiatrist from Harvard Medical School & Ibrahim Yildirim, PhD, Turkey University, found 45.1% of the students with depressive symptoms, while preparing for national University entrance examination. A Saudi Arabian study revealed prevalence of depression among school students was 22.4% as moderate, 7.3% as severe and 3.7% as very severe, with self criticism, agitation, and loss of energy as the commonest symptoms. Prevalence of depression among adolescents was 50.3% in one Malaysian study published in 2015 [1]. Trinidad study revealed, one fourth of the secondary school students were significantly depressed which was strongly associated to age, gender, school type & family structure [4]. All of these studies found clear predominance of depression among girls. Other variables according to the 1986 study of Minnesota high school students revealed that trouble with brother or sister (Sibling role) was one of the most common risk factor for developing depression among adolescents and according to Kaslow et al, family variables associated with depression are parental psychopathology, divorce, low socio-economic-status (SES), negative life circumstances including loss of family member, domestic abuse, or neglect, and low levels of social support.

Nowadays, depression and suicidal tendencies among students have been found correlated [1, 5] & increased

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especially before and after board exams. Does that mean board exams have a role to attribute depression among students? To find answer of this question if not directly but indirectly, we decided to examine students of tenth grade one month before the board exams. We decided to focus on symptomatology & level/intensity of depression just before exam.

2. Material and Method

We approached students of tenth grade from three different schools on consecutive days, one month prior to their final board exams in 2015. They were all apparently healthy students, with no known illnesses.

Instrument- depression was assessed by QIDS scale and a personal information questionnaire. QIDS is a linkert type of self report scale with fourteen questions. A Marathi (local language) translated version was used. Personal information questionnaire consisted of 9 questions regarding age, sex, qualification of parents, number of siblings, total number of family members, total income of family, exam phobia, getting 'blank' during exam, excessive parental worry about SSC/board exam.

Method- We obtained school's permission and written consent from students. We collected data from 407 students (of which boys were 226 and girls were 181) of 3 schools participated on consecutive days, 1 month prior to SSC exam.

All the students were briefed about the test & research project. Test was simultaneously administered in class-room settings under the strict vigilance of teachers & investigators. Discipline and care was taken to constraint students from imitating/copying or interacting with each other while writing self report questionnaire. There was no time constraint while answering questionnaire.

Observations made were tabulated, prevalence was inferred, major symptoms were evaluated percentage wise & other variables were noted.

3. Results

92% students of our study population were depressed. Out of them 55.53% were male & 44.47% were female students. 90.05% female students among themselves (out of 181 female students) showed depressive tendencies, whereas in case of male it was 93.80% (out of 226 male students). Prevalence of depression among both sexes was similar. Out of the 407 students, 10 students (2%) revealed very severe depression, 65 (16%) had severe depression, and 166 (41%) had moderate depression. 18 female and 14 male students (total approx. 8%) were not suffering from depressive features out of total study group of 407.

Other factors attributing depression were lower literacy of parents, worrisome parents (79%) & their children (90%). More than 50% students were suffering from exam-phobia

like symptom.

We did not find significant association between grades of depression & sex of students. This means levels of depression are similar among both sex.

4. Discussion

Our findings should be interpreted in the light of study's limitations, first being a study of exam-going students i.e. students under the sheer pressure of first qualifying/life turning exam may over-react to the questions. No such other study is done as per our search hence value of observations even with limitations cannot be under-rated or disregarded, we thought. Second limitation was assessment of depression was done in class rooms based on one-timed applied self-report questionnaire. Though use of self-report questionnaire is well accepted & considered valid for such assessment studies, however limitations are also accepted in view of generalization. Third limitation is statistical value. Instead of vigorous statistical evaluation our results are derived through percentage based analysis. Significance of this study rests on observations, it's percentage-wise strength and the direction one gets for further future study to explore research question.

Our focus in this study was to find out presence of depression & its symptomatology. One review mentions that depressive symptoms & depressive disorder in adolescents are much similar and can be considered equal while diagnosing it [6]. This review published in Lancet 2012 corroborates our decision to consider diagnosis of depression in adolescents very close to symptomatology. Hence our focus was both depression & symptoms.

Many researchers had mentioned too many common symptoms of depression which causes difficulty in fixing only a few; e.g. only 3/5 common symptoms are not mentioned by researchers while discussing symptomatology of adolescent depression. Some studies had mentioned common symptoms like irritability, conduct disorder, substance abuse, mood reactivity, somatic complaints, and change in appetite/behavior. While another study observed self-criticism, agitation, & loss of energy most common symptoms [7]. Weiner (1980) reported that the triad of common symptoms is fatigue, hypochondria & difficulty in concentration [7]. However, these studies were not focusing on symptomatology especially. So we decided to focus our search to find out only 5 commonest symptoms if possible & observe the order if any. Table 2 depicts it.

92% students of our study population show signs of depression which is an alarming observation. It calls for future detailed studies. A meta-analysis of studies in 2012 reveals 43.55% prevalence of depression in children & adolescents [8]. Same study mentioned that prevalence of depression in adolescent in Iran ranges from 14.77% to 73% [8]. This is the only study we came across whose prevalence is closer to our observation. However, observations of this meta-analysis were not drawn from exam going period. Such

observations invariably ascertain presence of high prevalence of depression among school going adolescents.

Table 1. Prevalence of depression is tabulated

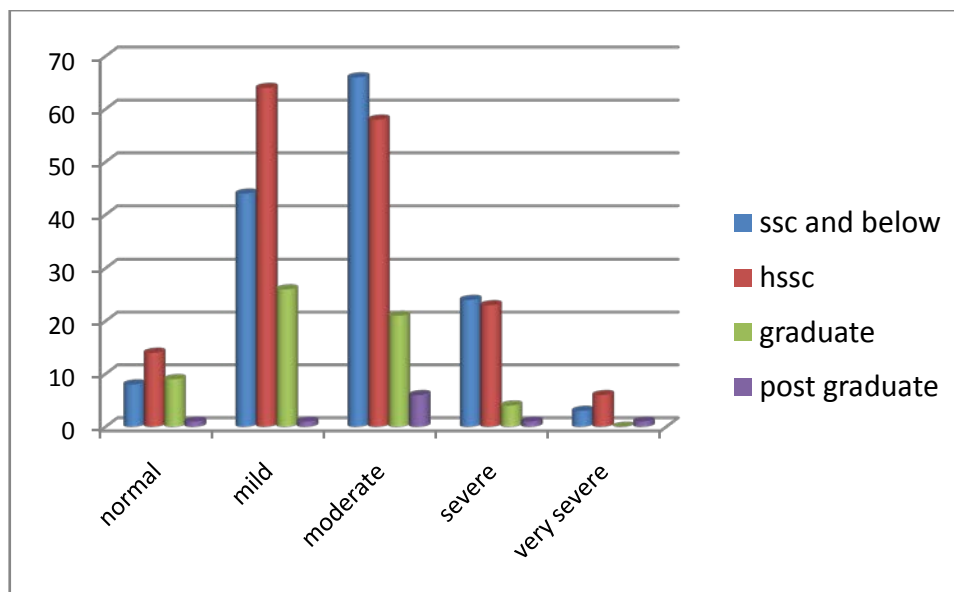
No.	QIDS rating	Score	No. of students N= 407			
			Male		Female	
1	Normal	0-5	14	06%	18	10%
2	Mild	6-10	68	30%	65	36%
3	Moderate	11-15	103	46%	63	35%
4	Severe	16-20	36	16%	29	16%
5	Very Severe	21-27	04	02%	06	03%
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Chi square with Yell correction = 5.13
d.f.= 4, P = 0.273 (less than 0.05)

Table 2. Frequency of Common symptoms

No.	Symptoms	No. of Students N = 407	% of students Order of symptom
1	Guilt	156	38.32% (1 st)
2	restlessness	86	21.36% (2 nd)
3	Lack of concentration	84	20.63% (3 rd)
4	Terminal Insomnia	82	20.14% (4 th)
5	Loss of Interest	73	17.93% (5 th)
6	Psychomotor Retardation	64	15.72% (6 th)
7	Sad feeling	50	12.28 % (7 th)
8	Initial Insomnia	48	11.79% (8 th)
9	Suicidal Ideation	40	11.54% (9 th)
10	Change of Weight	45	11.04% (10 th)
11	Hypersomnia	29	7.12% (11 th)
12	Change of Appetite	28	6.87% (12 th)

Table 3. Graph showing impact of father's education on depressive features



It is well documented that prevalence of depression in adolescents varies quite a lot & is not consistent also [6]. Reasons of variations in prevalence are multi-factorial [6]. However prevalence of depression found in our study is much more & remarkable. Reasons to explain this observation demands certain details which comprises of limitations of this study and some details are beyond the scope of this study. Measuring depression in children/adolescents is difficult and sometimes it remains undetected (Leaf 1996), may be because of changing symptomatology, irritability, fluctuations in symptoms [8, 6]. Irritability one of the common symptoms many reports is surprisingly not our finding. Such observations point towards varying and inconsistent symptomatology. Varying symptomatology is also noticed by many and considered one of the factors causing diagnostic difficult.

Prevalence of disease varies from clinic population to community population also [8]. A study of adolescents from North-India found prevalence of male reporting to clinic is more than that of female. Reason authors mentioned in their study is shyness of female adolescents to attend psychiatry clinic [8]. A reversal of male/female ratio was observed, with depressed male students – MORE – than depressed female students. 90.05% females showed depressive tendencies, whereas in case of males it was 93.80%. This is an unusual observation; most of the earlier researchers have found female students outnumber this ratio [6]. But a Malaysian study published in 2015 found that depression among adolescent was not associated to gender [1]. However, clinic based study observes that male-female ration of health seekers has always remained in favor of males. Numbers of boys who have reported to psychiatry OPD were more [3]. So we think prevalence ratio of depression in adolescents on the basis of gender is no more consistent and meaningful. Similar views are expressed by other authors as well [6]. Wide range of difference in prevalence of depression in adolescents occur because of screening instrument, diverse ecological and cultural differences, different geographical environment, varying sensitivity of individuals, etc. mentions Anita Thaper in Lancet (2012). Heterogeneous, diverse causes of depression widen the range of prevalence. So comparison of prevalence of depression in adolescents among various studies is not meaningful [6].

Commonest symptom we have observed is excessive guilt. A study similar to our study in Saudi Arabia mentioned 'self-criticism' a commonest symptom [7]. Common symptoms of Saudi Arabia study were self-criticism, agitation & loss of energy [7]. Male students experience guilt more due to externalizing behavior while female students experience it more when they breach norms of compassion & trust [9]. Externalizing behavior or breach of trust of parents/peer group may start from adolescent's age which coincides and over-rides depressive features. However, guilt is recognized as a normative symptom among many adolescents [10]. In fact, Cohen T R et al assert that mild guilt is useful in building of moral character. But excessive guilt makes adolescents prone for suicide. One pilot study of Malaysia

observed strong association of suicidal adolescents with prominent low self esteem and hopelessness [11]. Depressed & excessively guilty adolescent are also more vulnerable for adult mood disorder [12]. Our observation of more than 38% guilty adolescents may point towards significance of risk involved & severity of rise in the risk involved in adolescent depression. This is because guilt expresses combination of negative affect and one's belief that one is solely responsible for the undesired outcome [13]. Researchers find this belief is associated with negative cognitive error of responsibility. Meaning these adolescents when scores less marks, strongly feel that they are responsible for their or family's misfortune in future. Some researchers think that this belief is because of lack of development of abstract thinking [13]. Abstract thinking develops when one grows into adulthood. By virtue of abstract thinking one is capable of comprehending that there is 'no' linear cause-effect relationship. Meaning thereby multiple causes/factors attribute any single effect. Hence, no single cause can be held responsible for any effect/event to take place. So we assume increased guilt observed in this study may be because of lack of abstract thinking & externalizing behavior of study population.

We cannot claim to have found any relationship between guilt & depression in this work but it would not be irrelevant to mention here that Nurten Sergin of Turkey observed inverse relationship between guilt of adolescents & literacy of their mothers [14]. We observed low level of mother's literacy in our findings which might have additional correlation with procurement of guilt of these adolescents.

Frequency of other four commonest symptoms was less than 21%. Difference between first & rest of the commonest symptoms is close to double, i.e. two times. However, this observation lacks statistical validity, but of course may draw attention if one looks at it from the perspective of percentage. Restlessness & lack of concentration indicate co-morbid anxiety. It is found that restlessness, lack of concentration, loss of interest (Anhedonia) & insomnia together cause poor academic performance [15]. Depression affects academic performance negatively because of symptoms like sleep disturbances, loss of interest, loss of appetite, restlessness, poor self esteem, indecisiveness etc. Table 2 shows most of these symptoms which indicate closely that depression of our study population are likely to be closely associated with stress of facing exam [15]. Sleep disturbances are associated with poor academic performance [16]. According to center for disease control sleep deprivation is closely linked with depressive symptoms, poor academic performance & risky behavior [16]. According to our observations more than 20% of the study population who suffered from sleep disturbances e.g. initial insomnia (11%), terminal insomnia (20%), and hypersomnia (7%) inevitably experience depression.

40% students revealed indication of moderate depression. 18% students were suffering from severe and very severe depressive symptoms prior to examination. Earlier studies mentioned overall 18% to 25% depressed adolescent students. But these studies were not conducted for exam going students. This may be an indication stress of exam

attributing rise in prevalence of depression. Factors identified earlier by other researchers which attribute depressive symptoms, like type of school, Family size, Role of siblings [4], were NOT supported by our observations. Factors like, stress of exam, parental worry about examination, exam-phobia, Literacy of parents, found existing along with depressive symptoms in our study. Similar study at Selangor, Hong Kong observes that stressful events, cognitive error, impaired coping skills are associated factors [5]. There is one Indian study which observed inability to cope up with studies is one of the factors associated with depression among adolescent students [17]. P value of inability to cope up with study was 0.01; highest among all other factors they studied [17]. This study was done on 9th stand students in the beginning of the school. There was no exam pressure then; students were supposed to be in jovial mood. When our study is compared with this study, one may interpret that exam may have caused steep rise in depression of the students we examined. However, their linear causal attribution is beyond the scope of this study.

Education of parents is one of the associated factors most of the researchers had observed [4]. We also found similar findings (table 3). Severe and very severe depression is less whenever father was graduate or post-graduate. HSSC or SSC educated fathers had more or less similar but inconsistent impact on depressive features of their wards. We observed that illiteracy or education of fathers up to HSSC/SSC had more or less insignificant impact on depressive features of their wards. Where ever father is postgraduate then depressive features were less common (Table 3). Education of mothers is not included because most of the mothers of study group were illiterate.

Does board exam attribute depression?

At the end of adolescence 20% adolescents suffer from depression reports Ind Psychiatry J. 2009 [17]. Prevalence of possible depression found among students of Malaysian school is 10.3% [5]. One out of every fourth secondary school student in Trinidad was found suffering from significant depression reports West Indian Med J 2008 [4]. Life time prevalence of depression among adolescents/school students is 10 to 20%, many have observed.

These studies affirm that school students suffer from depression. It also documented that academic stress is one of the recognized risk factors [6]. However, experience of clinical psychiatry indicates that prevalence of depression increases as age advances from 10 to 15 years, especially among 10th & 12th graders affective disorder is quite high [1, 8]. Almost half of adolescents face difficulty in adapting to stressful situation like problem with parents, academic competition with peers etc. They suffer from depression when fail to cope up with such stressful situation [1]. Poor academic performance was found associated with depression in one Egyptian study [1, 18, 6]. Many school students who report to psychiatry OPD belong to 10th & 12th graders. Trends in major child adolescence Psychiatry OPD indicate rise in affective disorders (rise from 2% to 13%), disorders of

psychological development (7% to 22% rise), and emotional disorders (8.5 to 13% rise) [8]. Many of them report hypersomnia, forgetfulness, lack of concentration, somatic & affective complaints. Consistent to our observation one study found that stress of education can contribute to depression among medical students of 1st & 2nd year, i.e. aged 18 to 19 years [10]. Prevalence they observed was as high as 59.3 to 65.6% [3]. This study is published in 2010, contemporary period to our study. 'Stress inducer' role of exam is well recognized in this decade in social media too, i.e. Raj Chengappa reported in India today (march 28, 2005) that many educationist, psychologist, strategy makers, psychiatrist observe that exam strongly attributes to depression & suicide among students (*indiatoday.intoday.in> Magazine > Cover Story*).

However, we admit that 92% students of our study group fulfilled the criteria of depression which is an alarming figure. Why would so many students feel depressed? All of them cannot be genetically disposed or chemically deranged, one may argue. But other than genetic disposition/imbalance of neurotransmitter second major cause of depression is adverse condition or adverse life experiences. One review mentioned that role of genetic disposition especially parental depression is more significant than that of adverse conditions [2]. We have not examined parental depression in this study group. So we propose that adverse condition like exam stress or less scoring or humility due to failure or possible rejection may cause chemical changes in their brain which in turn make them feel & remain depressed. These changes reflect in their thoughts & behavior [19]. Adverse conditions usually cause mild to moderate depression [13]. Our observation in table 2 depicts that 74% students were suffering from mild to moderate depressive features, support the proposition favorably.

There is a biological explanation on how would adverse conditions cause depression. Gene-environment interaction activates fear related brain circuit which is strongly associated with depression among adolescents [6]. There are two circuits which are found associated and thought to be attributing depression closely. Amygdale-hippocampus-PFC along with activation of HPA axis & striatum (Anterior cingulate cortex/ACC) linked with prefrontal cortex (PFC) and affecting secretion of dopamine are the two recognized circuits, which when dysfunctions causes depression [6]. As a result of consistent stress of exam or failures or low scores or dissatisfactory result HPA axis gets over activated. Over activated HPA axis pours more adrenaline in blood to produce anxiety and related symptoms. Imbalance of neurotransmitters like dopamine/serotonin completes dysfunction of these two neural circuits which eventually form biological basis of depression among adolescents [6].

With due consideration to literature, a few of them mentioned above, cue based assumption from this work one may assume that there is positive, linear correlation between board's examination & depression. Our findings demand detail pertinent future studies.

5. Conclusions

92% students of our study population were depressed just before board's exam. This observation demands further study. Commonest symptom was guilt (38.32%). Possibility of exam attributing depression in adolescents merits further detail study.

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