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Original Research Article

Prevalence of possible depression and associated biosocial risk factors among adolescents in a private school in Chennai, South India

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ABSTRACT

Background: Depression among adolescents is often undetected because of lack of awareness in mental health. Schools are the best place to study, analyze and report adolescent depression. The objective of this survey is to find out the prevalence of possible depression and associated bio-social risk factors among high school going adolescents aged 15 and 16 years. This can help reform school curriculum based on the prevalence of depression.
Methods: A school based cross-sectional study done by randomly selecting 10 classrooms from the 11th standard high school compartment in a private school. Data was collected using a pre-designed and structured questionnaire based on Kutcher's Adolescent Depression Scale. The results were analyzed using R Studio software with Pearson Chi-square test and a p-value of <0.05 was considered statistically significant.
Results: Out of 486 students included in the study, 164(33.7%) have 'possible depression' and adolescents aged 16 years(39.5%) has higher proportion of possible depression than adolescents aged 15 years(29.2%), which is statistically significant(P=0.016). About 46.2% of adolescents having illiterate mothers had a possibility of depression. With regards to physical activity 28.1% who played for 3 hours and more had depressive signs and adolescents who played less had 37.2%. This difference is statistically significant (P=0.039).
Conclusions: Being a dormant and hidden disease, depression is one such disease that must be probed by regular health screening. Mother's literacy status and a modifiable factor 'physical activity' have shown promising statistical significance. Adequate physical activity must be included in school curriculum to reduce the risk of depression.

Keywords: Adolescent, Depression, Kutcher's scale, Physical activity, Mother's literacy status, School health

INTRODUCTION

WHO defines 'adolescents' as individuals in the 10-19 age groups.[1] Adolescent depression is an undetected, under diagnosed and untreated silent killer.[2] The nature of the disease makes it hidden. What one can see as symptoms is just the tip of the iceberg while what one cannot see is the submerged iceberg itself.

According to WHO, among 10-19 year-olds, mental health contributes to about 16% of the diseases, and suicide caused by mental issues is the third leading cause of death among this age group.[1] There is also a considerable increase in the mental problems among adolescents in the past 25 years.[3,4] If left untreated, the outcome of depression is poor self-related health, low levels of social status, ruining relationships and difficulty in overcoming major mental health issues.[5,6] It is also associated with increased risk of suicidal behaviors and

homicidal ideations causing harm to self and surrounding.[7] The staggering numbers and outcomes show that, despite huge advancements in the medical field, mental health has always been difficult to understand and treat.

Studies from India also show that there is a steady increase in the trend of depressive and affective disorders among adolescents over the past two decades and the lifetime prevalence rate is 15-20% for major depressive disorder. [4]

Good parenting is very important in adolescent mental health development. Educated mothers had an edge over illiterate mothers as adolescents felt more comfortable to disclose their mental issues.[8] In some nuclear families where both parents are working singleton adolescents might have to spend time alone in the house. This loneliness can precipitate depression. [9]

The relationship between physical activity and mental health has been a long debated one. It has been noted that physical activity has a positive effect on depression.[10-11] It is also noted that physical activity can also significantly reduce the risk of depression onset in high-risk population. [12]

Based on the previous correlations and associations, our study was designed to estimate the prevalence of possible depression among depression among adolscents in an urban based private school and to find out the association of bio-social variables like mother's literary status, parental availability, effect of siblings and amount of physical activity to it.

METHODS

This is a cross-sectional study. This study was conducted in a private school, Velammal Matriculation Higher Secondary School, Mogappair East, Chennai, Tamil Nadu, India among 11th Standard students. 10 classes were randomly selected from this standard and the sample was selected based on criteria of age 15 and 16 years. The study was conducted in the month of August 2019.

An informed consent was obtained from the Principal of the school and Headmistress of high school compartment and from the subjects after explaining to them that this was a non-invasive survey-based study and the information collected would remain confidential.

The students were given a questionnaire which was pre-designed and structured having yes/no type of questions. The questionnaire has two parts. In the first part bio-social variables like age, gender, working pattern of parents, mother's literacy status, number of siblings and level of physical activity of at least 3 hours a week were included. The second part includes 6 questions from Kutcher's Adolescent Depression Scale (KADS-6) which was specifically designed to diagnose and assess the severity of adolescent depression. The questions were based on the feeling of the subject over the last week 'on average' or 'usually'. Each question was given points – 0 (hardly ever), 1 (some of the time), 2 (most of the time), 3 (all of the time) – which were then added up. Highest attainable total score was 18 and lowest attainable total score was 0. Total score of 6 or above suggested 'possible depression' which required further assessment and a total score below 6 indicated 'probably not depressed'. [13]

Statistical analysis

The data obtained was analyzed using R Studio software with Pearson Chi-square test to find out the association between the variables and P value of less than 0.05 was considered statistically significant.

RESULTS

Out of 486 students who were studied, 164 students were found to have possible depression and the prevalence was found to be 33.7% (Table 1).

Table 1: Prevalence of possible depression among adolescents based on Kutcher's Adolescent Depression Scale (KADS-6).

Possible depression	Number	Percentage
Present	164	33.74%
Absent	322	66.26%

On univariate analyses, variables age, gender, mother's literacy status and student's physical activity had their impacts and were statistically significant being strongly associated with possible depression.

There was an increasing trend in possible depression as adolescents aged. Among the adolescents aged 15 years, proportion of children with possible depression was 29.2% and it was found to be increased by almost 10% i.e. 39.5% in the 16 years old (P=0.016). Among 486 students, male children were 257 and female children were 229, of which 35% of males and 32.3% of females were found to have possible depression and the difference was not statistically significant (P=0.529).

Adolescents with possible depression having single parent working represents 34.2% when compared to 32.6% who had both parents working (P= 0.739).Mothers of 52 adolescents were illiterate. Though the number of illiterate mothers was only one-tenth of the population, 46.2% of their children were found positive for depression which requires further evaluation (P=0.045). This indicates that literacy status of the mother can be considered as one of the independent predictors of adolescent depression.

Among 408 adolescents with siblings, 32.4% had possible depression while singletons had a higher chance at 41%, but not statistically significant (P=0.138). Physical activity was also significantly related to depression (P=0.039). Those adolescents who had any form of physical activity for less than 3 hours a week had an increased proportion (37.21%) of possible depression as opposed to those who had physical activity for 3 hours or more(28.1%) . All these bio-social variables are given in (Table 2).

Table 2: Analyses of bio-social and lifestyle variables correlated with possible adolescent depression based on Kutcher's Adolescent Depression Scale (KADS-6).

Variable	Total N (%)	Possible Depression N (%)	Not probable depression N (%)	p value
Age				
15 Years	271(55.8)	79(29.2)	192(70.8)	0.016
16 Years	215(44.2)	85(39.5)	130(60.5)	
Gender				
Male	257(52.9)	90(35.1)	167(64.9)	0.529
Female	229(47.1)	74(32.3)	155(67.7)	
Parents working				
One parent	348(71.6)	119(34.2)	229(65.8)	0.739
Both parent	138(28.4)	45(32.6)	93(67.4)	
Mother's literacy status				
Literate	434(89.3)	140(32.3)	294(67.7)	0.045
Illiterate	52(10.7)	24(46.2)	28(53.8)	
Siblings				
None	78(16.1)	32(41.1)	46(58.9)	0.138
Present	408(83.9)	132(32.4)	276(67.6)	
Physical Activity				
< 3 hours	301(61.9)	112(37.2)	189(62.8)	0.039

*Percentage is mentioned within brackets.

DISCUSSION

In our study, the prevalence of possible depression among 486 adolescents was 33.7%. This was almost double the percentage when compared to studies done by Shukla NK et al which was 18.7%.[14] The increasing rates of depression may be correlated to increasing academic pressure among high school students and to the working nature of parents in India.

There is also a statistically significant association between increasing age and increased chance of possible depression, which is similar to previous studies.[15-17] Existing studies show that there is a female preponderance to adolescent depression.[9-20] but in our study, there is not much difference between male and female depression rates and it was not statistically significant. From this study it can be assumed that the disparity in our study is because even adolescent males nowadays have reduced their overall physical activity which can again be related to depression.

This study also revealed that 46.2% of students having illiterate mothers are more susceptible to being depressed, which is significantly higher than that of literate mothers' wards. This is similar to studies done by Arroyo-Borrell et al, and Etherington et al, which shows mother's literacy status is one of the independent predictors of possible depression during adolescence. [21,22]

Physical activity produces natural changes in the body which helps alleviate depressive symptoms.[9] Physical activity is one modifiable factor which can be used to reduce the risk of developing depression and as an effective adjuvant in treatment plan for depression.[23-27] Our study showed similar results. The prevalence of depression in adolescents who played for 3 hours or more was 28.1% which was almost 10% less than those who had physical activity for less than 3 hours (37.2%).

CONCLUSION

It is clear from our study that the prevalence of adolescent depression might increase with age. So, school-going adolescents who undergo annual health check-ups should also be evaluated for mental health status. Teachers and staffs should be vigilant on students' behavioral changes and sudden deterioration of their academic performance. It should be reported to parents and school medical officer so that depression can be detected at an early stage.

Depression seems to be strongly associated with literacy status of the mother which emphasizes the fact that educating a girl child not only helps the present

generation but also the future generations to come. An easily modifiable factor, physical activity, was found to have lower depression rates and hence, schools must focus on incorporation of adequate play hours in students' timetables and monitor the implementation of such classes to benefit on the students' mental well-being.

In this study, nevertheless, is subject to potential limitations. In this study lacks the ability to be generalized because it was limited by a particular demographic profile. Readers must also bear in mind that the results of this study indicate the prevalence of possible depression and not clinical depression as clinical examination wasn't conducted to individual subjects. Future studies must focus on conducting detailed history taking and clinical discussion, at least in probable cases to provide more valuable data.

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REFERENCES

1. World Health Organization, Adolescent health and development, 13 Jul 2017. Available at: http://www.searo.who.int/entity/child_adolescent/topics/adolescent_health/en/. Accessed 28 August 2019.
2. Fazel MS, Stein K. Depression in young people often goes undetected. Practitioner. 2015 May 21;259(1782).
3. Collishaw S, Maughan B, Goodman R, Pickles A. Time trends in adolescent mental health. J Child Psychol Psychiat. 2004:45(8):1350-62.
4. Mojtabai R, Olfson M, Han B. National trends in the prevalence and treatment of depression in adolescents and young adults. Pediatr. 2016 Dec 1;138(6):e20161878.
5. Naicker K, Galambos NL, Zeng Y, Senthilselvan A, Colman I. Social, demographic, and health outcomes in the 10 years following adolescent depression. Journal of Adolescent Health. 2013 May 1;52(5):533-8.
6. Untreated Depression, 2008. Available at: https://www.webmd.com/depression/guide/untreated-depression-effects. Accessed 29 August 2019.
7. Williams SB, O'Connor EA, Eder M, Whitlock EP. Screening for child and adolescent depression in primary care settings: a systematic evidence review for the US Preventive Services Task Force. Pediatr. 2009 Apr 1;123(4):e716-35.
8. Garber J, Robinson NS, Valentiner D. The relation between parenting and adolescent depression: Self-worth as a mediator. J adol research. 1997 Jan;12(1):12-33.
9. Motl RW, Birnbaum AS, Kubik MY, Dishman RK. Naturally occurring changes in physical activity are inversely related to depressive symptoms during early adolescence. Psychosomatic medicine. 2004 May 1;66(3):336-42.
10. Brown HE, Pearson N, Braithwaite RE, Brown WJ, Biddle SJ. Physical activity interventions and depression in children and adolescents. Sports medicine. 2013 Mar 1;43(3):195-206.
11. Rothon C, Edwards P, Bhui K, Viner RM, Taylor S, Stansfeld SA. Physical activity and depressive symptoms in adolescents: a prospective study. BMC medicine. 2010 Dec;8(1):32.
12. Jerstad SJ, Boutelle KN, Ness KK, Stice E. Prospective reciprocal relations between physical activity and depression in female adolescents. J Consulting Clin Psychol. 2010 Apr;78(2):268.
13. Brooks S. The Kutcher Adolescent Depression Scale (KADS). Child and Adolescent Psychopharmacol News. 2004 Aug 1;9(5):4-6.
14. Shukla NK, Shukla M, Ahmad S, Shukla R, Khan Z. A cross-sectional study on depression among school going adolescent girls in Barabanki district, Uttar Pradesh, India. Intern J Contemporary Pediatr. 2016:4(1):178-181.
15. Twenge JM, Nolen-Hoeksema S. Age, gender, race, socioeconomic status, and birth cohort difference on the children's depression inventory: A meta-analysis. J Abnormal Psychol. 2002 Nov;111(4):578.
16. Mohanraj R., Subbaiah K. Prevalence of Depressive Symptoms among Urban Adolescents of South India. Indian Association for Child and Adolescent 2010.
17. Saluja G, Iachan R, Scheidt PC, Overpeck MD, Sun W, Giedd JN. Prevalence of and risk factors for depressive symptoms among young adolescents. Archives of pediatr and adol Med. 2004 Aug 1;158(8):760-5.
18. Piccinelli M, Wilkinson G. Gender differences in depression: Critical review. The British J Psychiatr. 2000 Dec;177(6):486-92.
19. Wade TJ, Cairney J, Pevalin DJ. Emergence of gender differences in depression during adolescence: National panel results from three

countries. J Am Academy of Child and Adol Psychiatry. 2002 Feb 1;41(2):190-8.
20. Lewinsohn PM, Gotlib IH, Lewinsohn M, Seeley JR, Allen NB. Gender differences in anxiety disorders and anxiety symptoms in adolescents. J Abnormal psychol. 1998 Feb;107(1):109.
21. Arroyo-Borrell E, Renart G, Saurina C, Saez M. Influence maternal background has on children's mental health. Int J equity in Health. 2017 Dec;16(1):63.
22. Etherington N, McDougall J, DeWit D, Wright V. Maternal factors and the emotional and behavioural functioning of adolescents with chronic health conditions. Disability and rehabilitation. 2016 Jul 2;38(14):1359-69.
23. Mammen G, Faulkner G. Physical activity and the prevention of depression: a systematic review of prospective studies. Am J Preventive Med. 2013 Nov 1;45(5):649-57.
24. Dunn AL, Trivedi MH, O'Neal HA. Physical activity dose-response effects on outcomes of depression and anxiety. InDatabase of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews 2001. Centre for Reviews and Dissemination (UK).
25. Ströhle A. Physical activity, exercise, depression and anxiety disorders. J neural transmission. 2009 Jun 1;116(6):777.
26. Dishman RK, Hales DP, Pfeiffer KA, Felton GA, Saunders R, Ward DS, et al. Physical self-concept and self-esteem mediate cross-sectional relations of physical activity and sport participation with depression symptoms among adolescent girls. Health Psychol. 2006 May;25(3):396.
27. Martinsen EW. Physical activity and depression: clinical experience. Acta Psychiatrica Scandinavica. 1994 Feb;89:23-7.

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