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Depression in children aged between 10-18 years: What is not known?

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***Abstract*---**Mental health conditions account for 13% disability adjusted life years(DALYs) of the total global burden of disease and injury in population.2 Common mental disorders include depression, bipolar disorder, schizophrenia, other psychoses, dementia, and developmental disorders including autism. This Cross-sectional study conducted upon children between age of 10-18 years at Paediatrics OPD of Dr. Susheela Tiwari hospital, Haldwani (UK),India from January 2019 to October 2020. Sample was taken from attending OPD population.Two questionnaires were used in this study one for collection of demographic data and other is Standard PHQ-A, to screen cases of depression. The study shows that the prevalence of depressive orders is more in subjects with comorbidities as compared to subjects with no comorbidities which is statistically significant (p value<0.001).The prevalence of depressive disorder was found to be more in urban areas as compared to rural areas but this observation was observed to be statistically insignificant(p value = 0.62).This study also shows that prevalence and severity of depressive disorders was more common in females as compared to males which is statistically significant (p value<0.01). According to the study the prevalence of suicidal tendency was more in mild depressive patients which is statistically insignificant. In our study, 31 (40.8%) subjects of lower

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middle class, 41(40.6%) of upper lower class and 84 (37.7%) subjects of lower socioeconomic class screened positivefor depression No significant association of depression with socioeconomicstatus in adolescents were observed in our study. Our study analyses the spectrum of severity of depressive disorder in the candidates. Among 156 positive screened candidates, 118 (75.6%) had mild depressive disorder, 24 (15.3%) had moderate depression, 12 (7.6%) were moderately severe and 2 (1.2%) of the patients were in severe category. It has been observed that depression in adolescents is associated with increasing age, female sex, poor academic performance, co-morbidities, type of family and family history of depression. Relationship of depression in adolescents with history of addiction, history of self harm, socio-economic status of family, education status of parents, number of siblings, area of residence and religion, was observed to be statically insignificant

***Keywords*---**children, depression, socioeconomic status.

Introduction

Mental health conditions account for 13% disability adjusted life years(DALYs) of the total global burden of disease and injury in population[1].Common mental disorders include depression, bipolar disorder, schizophrenia, other psychoses, dementia, and developmental disorders includingautism[2].

Depression is a common illness worldwide, with more than 322 million people affected in 2015. It is the single most important source of disability (among all causes) in 10-18 year age group, corresponding to 3.8% of the disability-adjusted life-years (DALYs)[3].Depression accounts for more than one-tenth of the global burden of disease among 10 to 18-year-old children[4]. Depression (major depressive disorder) is a common and serious medical illness that negatively affects how you feel, the way you think and how you act. It is a state of low mood and aversion to activity that can affect a person's thoughts, behavior, tendencies, feelings, and sense of well-being. Depression can lead to a variety of emotional and physical problems and can decrease your ability to function at work and at home. Children with depression often present with symptoms of sadness, irritability, tantrums, physical complaints (headache, stomach ache), tearfulness, feeling bored, separation anxiety as well as poor academic performanceand disturbed family relations[5].

Adolescence is a critical and formative period in which individualsbegintheir transition from childhood to adulthood. Ensuring that adolescents are fully supported in all facets of life is critical for fostering this transition and laying the foundation for a healthy and productive environment for remainder of their lives. Depression among adolescents is a rising problem globally[6]. There is a need to understand the factors associated with depression among adolescents.

Material and Method

This Cross-sectional study conducted upon children between age of 10-18 years at Paediatrics OPD of Dr. Susheela Tiwari hospital, Haldwani (UK), India from January 2019 to October 2020. Sample was taken from attending OPD population on the basis of following inclusion and exclusion criteria.

Inclusion criteria

Children visiting Paediatrics OPD at Dr. Susheela Tiwari Hospital, Haldwani in age group of 10-18 years.

Exclusion criteria

1. Child <10yrs or >18yrs
2. Patients having Childhood Developmental Disorders including Autism, ADHD and MR.
3. Candidates who refuse to participate.
4. Established or diagnosed depression patients undergoing treatment

Two questionnaires were used in this study one for collection of demographic data and other is Standard PHQ-A, to screen cases of depression:

Questionnaire on demographic profile and factors related with depression:

The basic information and risk factors for depression wasobtained using this proforma. The questionnaire was specifically designed forthis study, based on the literature review. This questionnaire had 20 itemswhich include academic performance in last examination, presence of anycomorbidity, history of any type addiction, history of suicidal attempt, family history of depression, number of siblings, type of family, qualification of parents, occupation of parents, annual income of family, area of residence.

Patient Health Questionnaire-9 modified for adolescents (PHQ-A):

PHQ-A is a modified version of Patient Health Questionnaire(PHQ),90 a multiple-choice self-report inventory, copyright of Pfizer Inc, that was used as a screening tool for mental health disorders of depression, anxiety, alcohol, eating, and somatoform disorders.

Scoring and Interpretation of Patient Health Questionnaire for adolescents (PHQ-A)

Each item on the measure is rated on a 4-point scale
0 = Not at all;
1 = Several days;
2 = More than half the days; and
3 = Nearly every day.

The total score can range from 0 to 27, with higher scores indicating greater severity of depression. The raw scores on the 9 items should be summed to obtain a total raw score and should be interpreted using the table:

Interpretation Table of Total Raw Score	
Total Raw Score	Severity of depressive disorder or episode
0-4	Screened Negative
5-9	Mild
10-14	Moderate
15-19	Moderately severe
20-27	Severe

Note: If 3 or more items are left unanswered, the total raw score on the measure should not be used. Therefore, the child should be encouraged to complete all of the items on the measure.

Statistical Analysis

Data was entered on Microsoft Excel sheet and analyzed using Statistical Package for Social Sciences Programmed (SPSS) Inc 26.0 software. Categorical variables were presented in number and percentages. Descriptive statistics were calculated and chi-square was used as test of significance. A p-value of <0.05 was considered statistically significant.

Results

Among 412 candidates, 08 candidates were excluded from the study on account of mild mental retardation, autism, and other psychiatric illness. 4 candidates failed to complete the questionnaire and hence excluded from the study. Baseline characteristics is platted in table no 1.

Table no 1: Baseline characteristics of study Participants

S.No.	Baseline characters	n	Percentage %
1.	Age groups: 10-12 year 13-15 year 15-18 year	 156 207 37	 39 51.75 9.25
2.	Gender Male Female	 219 181	 54.75 45.25
3.	Religion Hindu Muslim Sikh Christian	 300 90 6 4	 75 22.5 1.5 1
4.	Type of family Single parent	 26	 6.5

	Nuclear Joint	177 197	44.25 49.25
5.	Parents education status Illiterate Primary Intermediate High School Graduate Post graduate	 8 40 111 89 152 0	 2 10 27.75 22.25 38.0 0
6.	Socioeconomic status Lower Upper lower Lower middle Upper middle Upper	 223 101 76 0 0	 55.75 25.25 19 0 0
7.	Area of residence Urban Rural	 235 165	 58.75 41.25

Table no1 shows that the mean age of study subjects was 13.21±1.85 years. The maximum no. of study subjects were found in age group 13-15 years, comprising of 51.75 % of the total study subjects group followed by age group 10-12 years comprising of 39.0 % and group of 16-18 years comprising 9.25% of the total

Out of total 400 subjects, total no. of males were 219 comprising of 54.75% of total candidates and the no. of females were 181 comprising of 45.25 % of the total subjects. Maximum subjects were Hindu (300) comprising of 75% of the total followed by Muslim (90) comprising 22.5%, Sikh (6) comprising 1.5% and minimum were Christian (4) comprising of 1.0% of the total subjects. Maximum number of depression cases were seen in joint families, 49.25% (197) followed by nuclear 44.25% (177) and 6.5% (26) in families with single parent. The education level of parents of majority of subjects was till primary level only, comprising of 62.0% (248) subjects, only 152 parents (38%) had an education level of graduate and above. According to the study 223 subjects belonged to lower socioeconomic status comprising 55.75%, 101 belonged to upper lower socio-economic status comprising25.25% and 76 belonged to lower middle socio-economic status comprising 19.0 % of the total no of candidates. In our study, out of total 400 candidates 235 of total subjects were residents of urban region comprising 58.75% and remaining 165 lived in rural regions comprising of 41.25% of the total candidates.

Table no 2: Risk factor for depression in study participants

S.No.	Risk factor	Level	Total n=400	Depression n=156 (%)
1.	H/o co-morbidities	Yes	91	39 (42.6%)
		No	309	117 (37.8%)
2.	H/o Domestic violence	Yes	176	74(42%)
		No	224	82(36.6%)

3.	Academic performance	Good(>75% marks)	37	4 (10%)
		Average(50-75% marks)	276	93 (33.6%)
		Poor(<50% marks)	87	59 (67.8%)
4.	H/o Addiction	Yes	27	14 (51.8%)
		No	373	142 (38%)
5.	H/o of suicidal attempt or self-harm behaviour	Yes	23	15(65.2%)
		No	377	141(37.4%)
6.	Family history of depression	Yes	36	19(52.7%)
		No	364	137(37.6%)
7.	Parents alive	Yes	358	136(38.85%)
		Only single parent	39	18(46.1%)
		No	3	2(66%)

Table 2 shows the prevalence of Depression broken down by psychiatric and psycho-social characteristics. The prevalence of Depression was higher among the child having co-morbidities (42.6%), who had experienced domestic violence (42%% vs 36.6% among those who had not experienced domestic violence). Depression was more prevalent among respondents with h/o of suicidal tendency or self-harm tendency other psychiatric disorders/problems (65.2%), among child having h/o of addiction (51.8%). The prevalence of depression was also higher among those who had family h/of depression (52.7%) and those who don't have any parent's alive (66%).

Table no 3: Severity of depressive disorder in screened positive subjects (n=156)

S.no	Severity of depression	No.	Percentage %
1.	Mild	118	75.64%
2.	Moderate	24	15.38%
3.	Moderately Severe	12	7.70%
4.	Severe	2	1.28%

Table no 3 shows that Among156 screened positive candidates, more than three fourths belonged to only mild grade of depression comprising 75.64%.In the rest one fourth subjects, 24 subjects belonged to moderate grade depression, comprising 15.38%.Moderately severe depression was seen in 12(7.70%) subjects and 2(01.28%) subjects had severe depressive disorder.

Table no 4: Association of severity of depression with various factors

	Severity / Factor		Mild	Moderate	Moderately Severe	Severe	P value
1.	Comorbidities	Yes	10	18	9	2	P value <0.01
		No	106	6	3	2	
2.	Addiction	Yes	6	5	2	0	P value = .05
		No	111	19	10	2	
3.	Suicidal tendency	Yes	9	4	2	0	P value <0.05
		No	109	120	10	1	
4.	Family history of depression	Yes	10	5	3	1	P value <0.05
		No	106	19	9	1	
5.	Place of living	Rural	54	9	3	1	P value= 0.62
		Urban	64	15	9	1	
6.	Sex	Male	59	9	2	1	P= <0.01
		Female	59	15	10	1	
7.	Age	10-13 yr (n=156)	32	3	8	0	Chi squre value = 23.50
		13-15yr (n=207)	75	10	7	2	P value <0.01
		15-18yr (n = 37)	11	6	2	0	

The study shows that the prevalence of depressive orders is more in subjects with comorbidities as compared to subjects with no co-morbidities which is statistically significant(p value<0.001).The prevalence of depressive disorder was found to be more in urban areas as compared to rural areas but this observation was observed tobe statistically insignificant(p value = 0.62).This study also shows that prevalence and severity of depressive disorders was more common in females as compared to males which is statistically significant (p value<0.01). According to the study the prevalence of suicidal tendency was more in mild depressive patients which is statistically insignificant.

According to the study the subjects with family history of depression have more prevalence of depressive disorders with increasing grades of severity whereas subjects with no family history of depression had mild depressive disorders. The result was statistically significant (p value<0.01).Although, the percentage of depression is higher among addicted children (50%) as compared to non-addicted children (38.8%) but stastically there is significant difference in addicted and non-addicted subjects (p value<0.05).

Discussion

The mean age of study subjects was 13.21±1.85 years. The maximum no. of study subjects were found in age group 13-15 years, comprising of 51.75 % of the total study subjects group followed by age group 10-12 years comprising of 39.0 % and group of 16-18 years comprising 9.25% of the total study subjects which is same as a retrospective study conducted at PGI, Chandigarh, India by Singh MM et al[7].

In our study , 156 out of total 400 (39%) subjects screened positive for depression using standard patient health questionnaire-9 modified for adolescents (PHQ-A).The prevalence in our study (39%) is comparable with the prevalence observed (38%) in a similar screening tool based past study conducted by Chauhan S et al[8]in public schools of Noida of Uttar Pradesh.

Our study analyses the spectrum of severity of depressive disorder in the candidates who attended Paediatric OPD at our tertiary care centre. Among 156 positive screened candidates, 118 (75.6%) had mild depressive disorder, 24 (15.3%) had moderate depression, 12 (7.6%) were moderately severeand 2 (1.2%) of the patients were in severe category.Similar findings were seen in a school based study by Chauhan S et al[8] and found the prevalence of mild depression in (75.73%), moderate depression in (23.52%), moderately severe in (0.01%) and no subject in the study fell in the severe depression category. Our findings were similar to a school based study by SinghMM et al[7] .[53] at Chandigarh India, in which they (59.4%) falling into mild category. However, Chickmagalure Shivaswamy V K et al[9] in their study reported that moderate depression was the commonest type of depression followed by mild, severe and extreme severe forms.
This study shows a gradual and consistent increment in the prevalence of depressive disorders in study subjects with increasing age i.e.27.6% in age group of 10-12 years, 45.4% in 13-15 years and 51.4% in age group of 16-18 years. We found this association to be statistically significant (p<0.01). Similar findings have been observed in study conducted by Chakraborty T et al[10],

Prevalence of depression is much higher in females (47%) as compared to males (32.4%), which is statistically significant (p value<0.001). These findings have been substantiated by the past studyconducted by Sharma V et al[11] In her study 60% females were screened positiveas against 50% male candidates which was found to be statically significant(p value<0.05).In past scientific work by Chakraborty T et al[10], 60.5%females were screened positive in comparison to 58% male. In another similar paststudy by ChauhanS et al[8], 35% males and 42% females were screenedpositive for depression. In both the above studies, this association was found to bestatistically insignificant.

Out of the subjects with presence of one or more comorbidities,96.2% screened positive for depression, while only 35% of subjects with nocomorbidities screened positive (p<0.001).In another past study based on standard PHQ-9 questionnaire conducted by Chauhan S et al[8], association of depression in adolescents with comorbidities was studied.

Candidates who secured >75%(distinction) marks in last examination were screened negative in our study. 32.5%candidates with first division, 40.1% with second division and 84% candidates withthird division were screened positive for depression. This showed that proportion ofcandidates screened positive for depression consistently increased with poor academicperformance, which was found to be statistically significant (p<0.05) BansalV et al[12], it was observed that 10(52.6%) studentswith evidence of distress/depression had history of inability to cope up with studieswhile only 24(22.6%) normal students had such history.

In study done by Chickmagalure Shivaswamy VK et al[9], this association was found to be stastically significant. They observed that the prevalence of suicidal ideation was significantly higher (47.7%) among depressed subjects compared to non-depressed subjects(11.4%).this is similar to our study ,suicidal tendency found in 65.2% subjects.Positive family history of depression wasstatistically associated (p value <0.01) with depression in our study. Similar associationof depression in adolescents with family history of depression was observed by Sagar R et al[13]. In our study, area ofresidence is not statistically associated with depression. A study conducted by Srinath S et al[14].They found that there wasno significant difference among prevalence rates of depression in urban, slum andrural areas. 14 (51.8%) candidates with history of addiction screened positive for depression in comparison to 142 (38%) candidates with no history of any type of addiction. In our study history of addiction was found to be statistically associated with depression. Findings from Gururaj G et al[15] in NMHS 2015-16 showed that nearly 30% of those with depression have substance use disorder as a comorbid condition.

Conclusion

In our study, out of total 400 candidates, 156 (39%) screened positive fordepression. Among subjects that were screened positive for depression, more than twothird (75%) were suffering from mild depression. This shows that adolescentsare vulnerable to depression and early detection through opportunistic screening can prevent progression to moderate and severe forms of depression.

It has been observed that depression in adolescents is associated with increasing age, female sex, poor academic performance, co morbidities, type offamily and family history of depression. Relationship of depression in adolescents with history of addiction, history of self harm, socio-economic status of family, education status of parents, number of siblings, area of residence and religion, was observed to bestatically insignificant. Positively screened candidates were referred to child psychologist /psychiatrist for counseling and further intervention/management including pharmacotherapy.

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