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Original Research Article

Prevalence and Predictors of Depression in Children Aged 10-19 Years – A Tertiary Care Study

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Conflict of interest: Nil

Abstract

Introduction: Depression in children aged 10-19 years is a growing global issue in India where world's largest population of children of this age group with 250 million individuals resides. Global prevalence of depression in 2024 among 10-19 years aged adolescents vary from 6% to 21% according to (WHO) World Health Organisation.

Methods: An analytical cross-sectional study was conducted on children aged 10-19 years, with complaints of chest pain (non-cardiac origin). Self-designed questionnaire including demographic and predictors of depression for each participant was filled. PHQ 9 is patient health questionnaire tool of 9 items used to assess depressive symptoms. The participants who scored >15 were considered depressed. Univariate analysis was performed to find out psychosocial predictors. Adjusted odds ratio with 95% confidence intervals were derived. P-value less than 0.05 were considered statistically significant.

Results: Total 50 children between 10-19 years aged were assessed for depression using PHQ- 9 severity assessment tool. 26.6% were found depressed using PHQ 9 score 15 and above. On Univariate analysis female gender, elder in age, belonging to lower socioeconomic class, dropped out of school, experiencing family conflicts and experiencing domestic abuse were significantly associated with depression. Living with single parents had 3.76 times higher risk of depression. 15.7% males were experiencing academic stress. Living arrangement, chronic illness, use of social media and relationship breakdown were not found significant risk factors.

Discussion: Elderly female children belonging to lower socioeconomic class were affected most. Statistically significant predictors of depression were family conflicts and domestic abuse. Academic stress and parents living apart were another significant risk factor. Urgent need to stop early child marriage at rural level. Need to educate parents to reduce parental pressure on academics to improve mental health of children.

Keywords: risk factors, conflicts, stress, and depression.

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Introduction

Children between 10 to 19 years age constitute 23% of Indian population as adolescents according to World Health Organization (WHO). [1] Rajasthan is one of most socio-economically backward state where most of the population lives in rural areas according to 2011 census. [1] In 2024, global prevalence of depression among adolescent's ranges from 6% to 21.3% according to World Health Organisation. [2]

According to WHO, depression was estimated in 1.4 % of 10-14 years age and 3.5% of 15-19 years age adolescent. [2] Depression and suicide are among the priority covered by Mental Health Action Programme. In India, prevalence of depression was reported between 31% to 58.4% in a cross-sectional study, conducted by Kavya Sri T et al. [3] Puberty along with cognitive brain maturation leads to enhanced understanding and self-awareness in adolescents. Developmental transitions in brain circuits involved in responses to increased stress levels are reported higher in girls. [4] Depressed adolescents show increased risk of suicide that is linked to low levels and reduced transmission of serotonin neurotransmitter. [5]

Prevalence of depression was 31.75% in a study conducted on students of Jaipur in 2019 due to academic stress. [6] In Chandigarh, the annual incidence rate of depression was found to be 18 per 1000 per year. [7] In a study most frequent presentation of depression was idiopathic chest

pain and depression was found in 45.9% adolescents. [8] A study addressed significant association between depression and unexplained non-cardiac chest pain. [9]

In India, girls between 10-19 years age group continue to experience early child marriage and early pregnancy as well as dropout from secondary schools. [10] In a cross-sectional study on Kenyan pregnant adolescent, it was found that younger age, experienced stressful events and domestic violence were significantly associated risk-factors with higher PHQ-9 depressive scores. [11]

Clinic based study of retrospective design on 10-18 years aged children, found that during decade 1980-2006, prevalence of depression has increased from 6.6% to 13.49%. [7] Rashtriya Kishor Swasthya Karyakram (RKSK) launched in 2014 is a flagship health programme by government of India under National Health Mission, aimed at addressing the health needs of adolescents. [15] Depression is associated with decline in interpersonal performance of adolescent. Family unrest contributes to risk of depression among adolescents. [12] Children with depression face challenges with stigma, isolation and discrimination.

Materials and Methods

An analytical cross-sectional study was conducted on children aged 10-19 years, attending Paediatric OPD and admitted in ward with complaints of chest pain (non-cardiac) of American International Institute of Medical Science (AIIMS) college and GBH Hospital, a tertiary care hospital of Udaipur, Rajasthan. Informed consent was taken before participation. We inquired about the education of parents, income and occupation of head of family to assess socio-economic class of family on Modified Kuppuswamy scale. Self-designed questionnaire was completed for each participant. Families of participants are divided into five categories on the basis of scores; Upper (25-29), Upper middle (16-25), Lower middle (11-15), Upper lower (5-10), Lower (less than 5).

We inquired about their family status and living arrangements whether their parents live together or apart, experience of family disputes, abuse, academic stress, relationship breakup, loss of family member. Confidentiality was assured, once the data was collected. Approval from institutional ethical committee was taken. Duration of study was 12 months from January 2025 to December 2025 (Flowchart 1).

Patient health questionnaire-9 (PHQ-9) is tool used to assess depressive symptoms consisting of 9 questions based on DSM-5 criteria. The validity of scale has been confirmed in India.[13] PHQ-9 was our main outcome variable also to identify severity. The codes for the PHQ-9 questions vary from 0 = not at all to 3 = virtually every day. The severity of depression was classified into one of the five categories - none (0-4), mild (5-9), moderate (10-14), moderately severe (15-19), severe (20-27). The participants who scored 15 and above on PHQ-9 (moderately severe and severe category) were considered Depressed while those who scored less than 15 (none, mild and moderate category) were considered non-depressed.

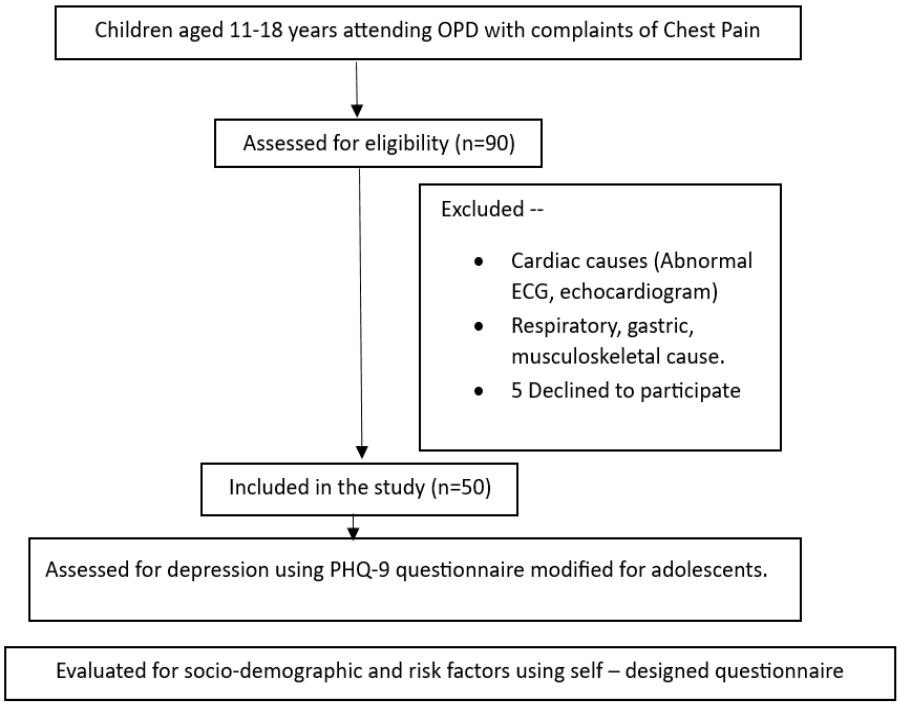

Figure 1: Study Flowchart

Statistical Analysis: Samples are divided in two groups (Depressed and Non-depressed according to PHQ-9 cut-off scores 15 or more) compared these groups using Chi-square test. Then, we assessed each potential correlates with PHQ-9 scores using independent samples t-test and ANOVA. SPSS version 22 was used in data analysis. The association between depression and its risk- factors was determined. Adjusted odds ratio-AOR with 95% confidence intervals were derived for all variables. Univariate analysis was performed to find out psychosocial factors that were significantly associated with depression. For all analyses, P-value less than 0.05 with 95% was considered statistically significant.

Results

Total 80 children between 10-19 years age attended paediatric OPD and admitted in paediatric award with complaints of chest pain during study duration. 25 were excluded due to respiratory, musculoskeletal and gastric and cardiac causes. 5 declined to participate in study as we suspect they had fear of disclosing family issues due to social stigma. Total 50 participants were falling under the category of a likelihood of depression. The socio-demographic characteristics of total 50 participants assessed for depression, can be found in Table 1.

The mean age + SD of participants was 14.2 + 2.4 years, with a range of age 10-19 years and included 19 (38%) males and 31 (62%) females. Depression was more prevalent in elderly female, belonging to lower socio-economic class. Among participants, 20 (40%) belongs to age group 11-14 years and 30 (60%) belongs to age group 15-18 years.

Depression was confirmed using PHQ-9 severity assessment tool. Mean PHQ score + SD was 13.5+ 4.6. Out of total 50 adolescents sampled, 32% (n=16) were Depressed using PHQ-9 cut-off (15+ score) and 68% (n=34) were found Non-depressed (PHQ-9 less than 15). According to figure 1, 10 adolescents were suffering from mild-depression, 16 from moderate depression, 9 from moderately-severe depression and 7 from severe depression. 8 had no depression. Out of 16 depressed adolescents, 11 were females and 5 were males.

As shown in Table 1, statistically significant risk factors associated with depression were female gender {t(58) = 2.02, P = 0.005}, elder in age {t(58) = -1.86, P = 0.036}, belonging to lower socioeconomic class {F(4,55) = 3.45, P = 0.013}, dropped out of school {t(58) = -2.84, P = 0.007}, living with parents single {t(58) = -3.51, P = 0.001}, experiencing family conflicts {t(58) = 3.94, P < 0.001}.

Adjusted odds ratio indicated that female child had 2.85 times {AOR- 2.85, 95% CI- 1.32-6.14} higher risk of suffering from depression than males. Those living with single parents/parents living apart had 3.76 times {AOR- 3.76, 95% CI- 1.37–10.33} higher depression due sense of insecurity. Depression was 0.41 times {AOR- 0.41, 95% CI- 0.18–0.94} higher in school dropout children as compared to those regular at schooling which was found statistically significant {t(58) = -2.84, P = 0.007}.

Out of 30 children of 15-18 years age group, 5 (14.2%) females were married and experiencing domestic abuse {t(58) = 2.85, P = 0.008} in the form of both parental and spousal violence and had 5.37 times higher risk of depression {AOR- 5.37, 95% CI- 1.86–15.46]. Bereavement due to loss of family member/parent {t (58) = 3.72, P < 0.001} were significantly associated with higher depressive scores. It is one of the negative life stressors. 2.14 times higher risk of depression in 3 (15.7%) male children, living with parents {AOR- 2.14, 95% CI- 1.12–8.77 belonging to upper-middle class due to academic stress {t(58) = -2.41, P = 0.01}.

Table 1: Predictors of depression among participants.

Variable	Category	Overall N 50(%)	Non-Depressed[1] N = 34(%)	Depressed[2] N = 16(%)	Mean (SD) PHQ-Score	95% Confidence Interval	Group Differences	(AOR) Adjusted Odds Ratio (95% CI)
Age (years)	10-14	20 (40)	15 (75)	5 (25)	12.1 (4.0)	10.8–13.4	t(58) = -1.86, P = 0.036	0.82 (0.32–1.21)
	15-18	30 (60)	19 (63.3)	11 (36.6)	16.6 (4.7)	14.1–17.1		
Sex	Male	19 (38)	14 (73.7)	5 (26.3)	13.0 (4.3)	11.5–14.5	t(58) = 2.02, P = 0.005	1.78 (0.89–3.57)
	Female	31 (62)	20 (64.1)	11 (35.8)	15.2 (4.4)	12.7–15.7		2.85 (1.32–6.14)
Socioeconomic scale (Kuppuswamy)	Upper	6 (10.0)	4 (66.7)	2 (33.4)	10.8 (3.5)	9.2–12.4	ANOV, F(4,55) = 3.45, P = 0.013	1.00 (0.22-3.37)

	Upper Middle	11 (16.7)	6 (80)	5 (40)	12.4 (3.8)	10.7–14.1		1.35 (0.31–5.94)
	Lower Middle	9 (18.3)	5 (80)	4 (20)	13.1 (4.1)	11.5–14.7		1. 80 (0.57–5.62)
	Upper Lower	14 (28.3)	11 (71.4)	3 (28.5)	15.0 (4.4)	12.4–15.6		2.25 (0.75–6.74)
	Lower	10 (16.7)	8 (80)	2 (20)	16.5 (4.6)	13.5–17.5		3.10 (1.02–9.42)
Schooling	Regular	30 (60)	22 (73.3)	8 (20)	11.9 (4.1)	10.7–13.1	t(58) = -2.84, P = 0.007	0.41 (0.18–0.94)
	Irregular	12 (20.0)	8 (66.6)	4 (33.3)	14.8 (4.3)	12.1–15.5		
	Dropout	8 (13.3)	4 (50)	4 (50)	17.0 (5.1)	15.3–18.7		
Family Status	Parents Together	35 (70.0)	30 (85)	5 (15)	11.5 (3.9)	10.2–12.8	t(58) = -3.51, P = 0.001	1.0 (1. 36-1.14)
	Parents Apart/Single	15 (30.0)	8 (53.3)	7 (46.6)	17.3 (4.8)	14.2–18.4		3.76 (1.37–10.33)
Living Arrangement	With Parents	38 (76.0)	32 (84.1)	6 (16.8)	13.8 (4.1)	11.4–14.2	t(58) = -2.38, P = 0.09	2.14 (1.12–8.77)
	Hostel Life	5 (10.0)	3 (60.6)	2 (40.3)	14.7 (4.3)	12.9–16.5		1.00 (1.23-1.57)
	Living with Guardian	7 (14.0)	6 (90.6)	1 (10.3)	15.4 (4.5)	13.2–17.6		2.26 (0.63–8.09)
Experiencing Academic Stress	Yes	28 (56)	24 (63.15)	4 (36.8)	17.3 (4.8)	14.7–18.9	t(58) = -2.41, P = 0.01	4.21 (1.68–10.56)
	No	22 (44)	20 (90.9)	2 (9.0)	11.0 (3.5)	9.8–12.2		
Experiencing Family Conflicts	Yes	30 (60)	25 (75)	5 (25)	16.6 (4.8)	14.0–17.2	t(58) = 3.94, P < 0.001	3.45 (1.05–5.71)
	No	20 (40)	10 (70)	10 (30)	11.8 (3.8)	10.7–12.9		
Experiencing Domestic Abuse	Yes	31 (62)	26 (70.7)	5 (29.2)	16.3 (4.7)	13.8–17.8	t(58) = 2.85, P = 0.008	5.37 (1.86–15.46)
	No	19 (38)	15 (79)	4 (21)	12.0 (4.1)	10.8–13.2		
Family history of depression	Yes	18 (36.7)	16 (57.1)	2 (42.8)	16.0 (4.8)	14.4–17.6	t(58) = -3.95, P = 0.06	2.63 (1.67–12.87)
	No	32 (64.3)	28 (87.5)	4 (12.5)	11.5 (3.7)	10.3–12.7		
Diagnosed with Chronic Illness	Yes	8 (16.3)	6 (75)	2 (25)	14.0 (4.5)	12.0–16.0	t(58) = 0.42, P = 0.672	1.94 (0.65–5.75)
	No	42 (84.7)	28 (73)	14 (26.9)	13.2 (4.3)	12.1–14.3		
Loss of Family Member/Parent	Yes	18 (36.0)	10 (55.5)	8 (44.4)	15.6 (4.9)	14.0–17.2	t(58) = 3.72, P < 0.001	2.72 (0.59–4.97)
	No	32 (64.0)	26 (80.9)	8 (19)	12.2 (4.0)	11.0–13.		
Excessive use of social media	Yes	6 (12.0)	2 (66.6)	1 (33.3)	14.2 (4.5)	12.3–16.1	t(58) = 0.56, P = 0.593	1.10 (0.25–4.75)
	No	44 (88.0)	42 (73.6)	15 (26.3)	13.3 (4.2)	12.2–14.4		
Experience Relationship breakdown	Yes	10 (20)	8 (80)	2 (20)	14.2 (4.6)	12.1–16.3	t(58) = 0.56, P = 0.593	2.84 (1.06–7.64)

Depressed[2] and non-depressed[1] is based on PHQ-classification of 0-14 and 15 onwards. ANOVA-One way Analysis of Variance, Student t-test p-value, Mean scores and 95% Confidence interval are based on scores of depressed participants

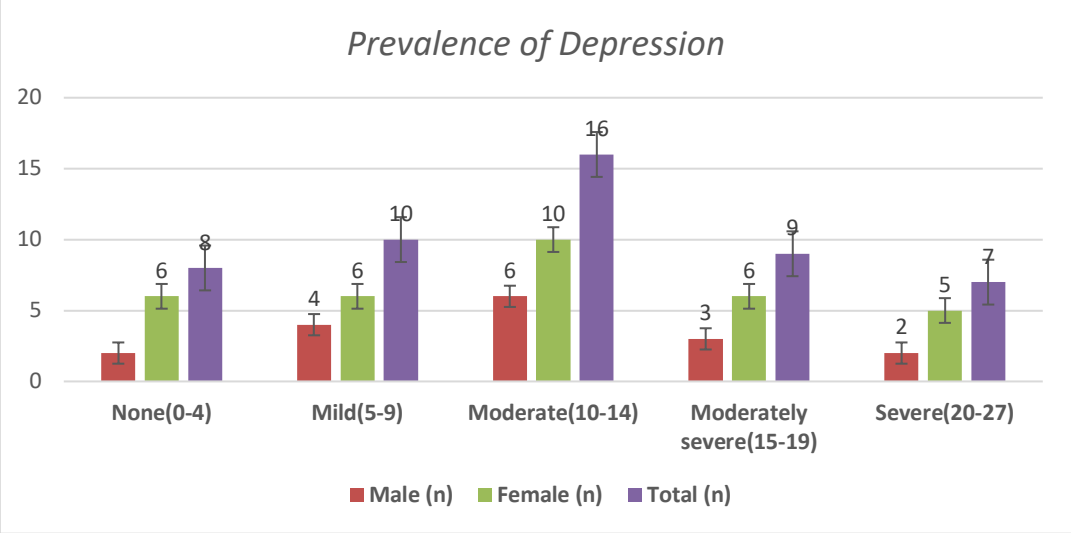

Figure 2: Prevalence of Depression

Discussion

Our finding that females experience higher level of depression was consistent with other researches. [8,12,16] The strength of our study lies in the use of a robust depression diagnostic tool such as PHQ-9. Depression was more prevalent in older adolescents with lower socioeconomic status experiencing negative life stressors and gender inequality was consistent with Indian cross-sectional study. [7,10,12,14] Poor family cohesion, living with single parent and loss of family member were negative life stressors. [15] Limited resources and hindering opportunities for education and employment lead to social isolation and low self-esteem in rural adolescents. Family conflicts as statistically most significant risk factor of depression in our study was similar to findings of study by Thapar et al in which family unrest was significant risk factor of depression in adolescents. [12] Higher depression was reported among adolescent girls from Bihar and Uttar Pradesh, facing parental and spouse domestic violence due to early child marriage. [15]

Similar to domestic abuse as one of statistically significant risk factor of depression in our study. Our finding that higher prevalence rate of depression among school-dropout girls compared to school-going girls was also reported in previous studies. [17]

Depression was not associated with living arrangement, family history of depression, use of social media and relationship breakdown whereas previous studies reported association with family history of depression and use of social media. [16,17] A study from Udaipur reported that violence in the form of physical attack by family members was significant risk factor of depression in urban adolescents. [18] In our study adolescents belonging to upper-middle class experiencing more academic stress as compared to lower class adolescents facing more domestic abuse as risk factor of depression. [19,20]

Limitation: Being a single centred study with limited data, it cannot capture the temporal sequence of depression.

Conclusion

Positive family atmosphere with the support of both the parents is a protective mechanism in mitigating depression in adolescents. Our findings underscore the importance of mental health support tailored to address specific risk factors to promote mental health of adolescents of Rajasthan. Government should provide adolescents friendly health services and stress management programme involving counselling in schools. Strict action should be taken by government to reduce early child marriage. Compulsory regular school education of girls across nine focus states of India including Rajasthan should be promoted.

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