Original Research Article

Psychosocial risk-factors of depression in adolescents: a cross-sectional study at tertiary hospital of southern Rajasthan

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ABSTRACT

Introduction: Depression in adolescent is a growing global issue in India where world largest adolescent population with 253 million individuals resides. In 2024 global prevalence of depression among adolescent's ranges from 6% to 21.3% according to World Health Organization. Family unrest contributes to risk of depression among adolescents.
Methods: A Cross-sectional study was conducted on adolescents with non-cardiac chest pain between age 10-19 years. Research-designed questionnaire including demographic and risk factors was completed for each participant. PHQ 9 is patient health questionnaire tool of 9 items used to assess depressive symptoms. The participated adolescents who scored 15 and above were considered Depressed. Univariate analysis was performed to find out psychosocial risk factors. Adjusted odds ratio with 95% confidence intervals were derived. To test association of depression with socio-demographic factors we used PHQ-9 continuous scores as our main outcome.
Results: Total 60 adolescents 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.
Conclusions: Depression is common in elderly female of Rajasthan belonging to lower socioeconomic class. Most common risk factors being family conflicts and domestic abuse. Academic stress in male adolescents living with parents was significant risk factor. There is urgent need to educate parents, to reduce parental pressure on academic performance and to stop early child marriage at rural level to save mental health of adolescents.

Keywords: Depression, Family, Social, Adolescents, Abuse

INTRODUCTION

Depression in adolescent is a growing global issue in India where world largest adolescent population with 253 million individuals resides.[1] According to World Health Organization (WHO) adolescents are defined as people aged between 10 to 19 years and constitute 23% of Indian population.[2] Rajasthan is one of most socio-economically backward state where 75% of population lives in rural areas according to 2011 census. 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. Depression and suicide are among the priority covered by WHO's Mental Health Action Programme. In Indian adolescent prevalence of depression was reported between 31% to 58.4% in a cross-sectional study, conducted by Sri et al.[3] During the adolescents age, puberty along with cognitive brain maturation leads to

enhanced understanding and self-awareness. 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 by Zahra et al most frequent presentation of depression was idiopathic chest pain and depression was found in 45.9% adolescents.[8]

A study from Turkey addressed significant association between depression and unexplained non-cardiac chest pain.[9] In India, adolescent girls 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 with higher depressive scores PHQ-9.[11] Clinic based study on 10-18 years aged, of retrospective design, 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. Depression is associated with decline in interpersonal performance of adolescent. Children with depression face challenges with stigma, isolation and discrimination. Family unrest contributes to risk of depression among adolescents.[12] Lack of concentration, insomnia, weight loss, mood swings, menstrual irregularity, hair fall, nutritional deficiencies and body ache are health related issues.

METHODS

After the approval from institutional ethical committee, a cross-sectional study was conducted on adolescents between age 10-19 years with complaints of chest pain attending paediatric and cardiac OPD of American International Institute of Medical Science AIIMS college-GBH Hospital, a tertiary care hospital of Udaipur, Rajasthan. Duration of study was 12 months from January 2024 to December 2024.

Informed consent was taken before participation. Research-designed questionnaire was completed for each participant. 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. Families of adolescents 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). Authors 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. PHQ-9 (patient health questionnaire-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 participated adolescents 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.

Statistical analysis

SPSS version 22 was used in data analysis. The association between depression and its psychosocial factors correlates was determined in two ways. We divided our samples 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. Adjusted odds ratio- AOR with 95% confidence intervals were derived for all categorial 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

Out of total 95 adolescents (10-19 years age) attending paediatric and cardiac OPD with chest pain, 26 were excluded due to respiratory, musculoskeletal and gastric causes, 4 were excluded due to cardiac cause. 5 declined to participate in study as we suspect they had fear of disclosing family issues due to social stigma. Total 60 (63.1%) adolescent were falling under the category of a likelihood of depression.

The socio-demographic characteristics of total 60 adolescents assessed for depression, can be found in Table 1. The mean age + SD of participants was 15.4+2.6 years, with a range of age 10-19 years and included 19 (31.7%) males and 41 (68.3%) females. Among participants, 25 (41.7%) belongs to age group 11-14 years and 35 (58.3%) belongs to age group 15-18 years. Proportion of depression was higher in adolescents aged 15-18 years (68.7%). Depression was more prevalent in elderly female, belonging to lower socio-economic class.

33.3% fall in the category of upper-lower class (score 5-10), 23.3% in lower-middle (score 11-15) and 18.3% in
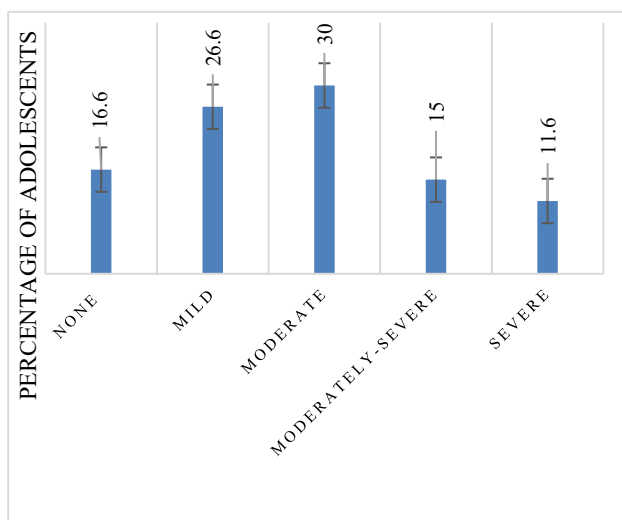
lower class (score less than 5). Father of majority of females were running some elementary occupation or craft and trade related works having primary or middle school certificate, earning 6768-20000 Rs or 20000-33000 Rs monthly income. About 18.3% (n=11) parents were illiterate and unemployed, earning less than 6767 Rs monthly income.

Depression was confirmed using PHQ-9 severity assessment tool. Mean PHQ score+SD was 13.5+4.6. Out of total 60 adolescents sampled, 26.6% (n=16) were Depressed using PHQ-9 cut-off (15+ score) and 73.3% (n=44) were found Non-depressed (PHQ-9 less than 15). According to figure 1 and 2, 26.6% (n=16) adolescents were suffering from mild-depression, 30% (n=18) from moderate depression, 15% (n=9) from moderately-severe depression and 11.6% (n=7) from severe depression. 16.6% (n=10) had no depression. Out of 16 depressed adolescents, 11 were females and 5 were males.
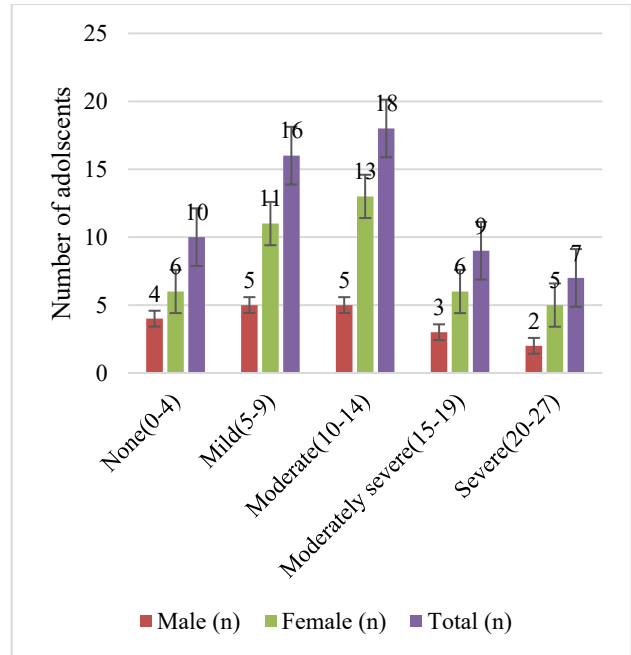
Psychosocial risk factors of depression

Sex, age, socio-economic status including parental education, family status, experiencing family conflicts, academic stress, experiencing domestic abuse was strongly associated with depression. Whereas living arrangement, diagnosed with chronic illness, excessive use of social media and relationship breakdown were not found to be significant risk factors.

On univariate analysis, as shown in Table 1, findings indicate that, 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) were statistically significant risk factors associated with depression (Figure 3).

Figure 2: Prevalence of depression.
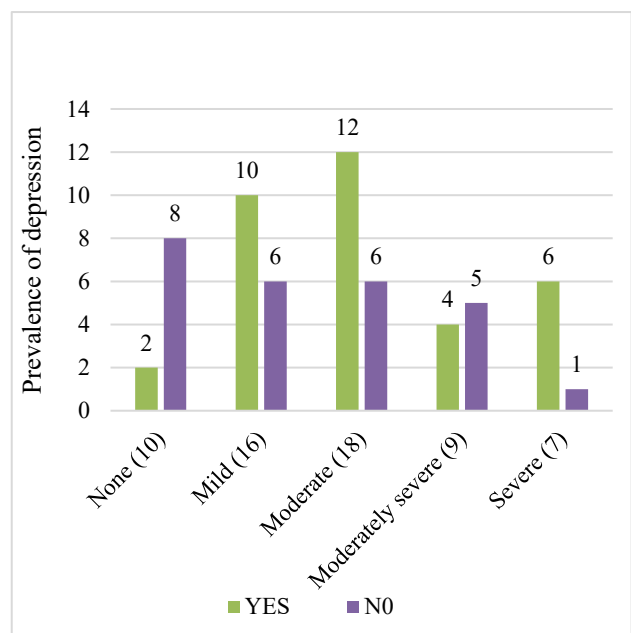
Figure 3: Experiencing family conflicts.

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. Adolescents 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 in adolescent. Depression was 0.41 times (AOR- 0.41, 95% CI-0.18–0.94) higher in school dropout as compared regular at schooling which was statistically significant (t(58) = -2.84, p=0.007). Out of 35 adolescents 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

Figure 1: Depression severity on PHQ-9 severity bands.

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 adolescents, 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).

Risk factors model using multivariate linear regression

The result of multivariate linear regression using PHQ-9 scores as the dependent variables and 14 predictors in two blocks are shown in Table 2. The overall model with all the predictors were statistically significant and explained 42% of variance in depression among the participants with F (7,45) =5.02, p<0.01. In block 1, the respondent's socio-demographic characteristics i.e. age, sex, socio-economic status, living arrangements and family status explained 28% of the variance in depression scores, which was found to be statistically significant with F (7,52) = 6.26, p<0.001, in which sex, socio-economic status, schooling and family

status were statistically significant with p<0.01. In Block 2, other participants characteristics uniquely explained 14% of the variance of the participants depression after controlling for socio-demographical factors in block 1, with F (7,45) =3.79, p<0.001, in which experiencing academic stress, family disputes, excessive use of social media and loss of family members were statistically significant with p<0.01. Therefore, two blocks of variables significantly contributed to the prediction of the participant's depression. These values test the overall contribution of each set of predictors to the variance in PHQ-9 depression scores.

After various iterations, when individual predictors using standardised beta scores were examined, being female (B=0.20, p=0.012, β=0.30), elderly adolescents (B=0.18, p=0.042, β=0.28), belonging to lower socio-economic class(B=-0.20, p=0.005, β= -0.28), with parents living apart(B=0.20, p=0.015, β=0.30), dropping out of school(B=0.25, p=0.014, β=0.38), having experienced family disputes(B=0.28, p=0.01, β=0.40), experienced academic stress (B=0.25, p=0.01, β=0.38), dealing with loss of family member (B=0.15, p=0.01, β=0.22), were independent correlates of depression.

Table 1: Demographic and psychosocial risk factors in participants with depression (n=60).

Variable	Category	Overall n=60 (%)	Non-depressed n=44 (%)	Depressed n=16 (%)	Mean (SD) PHQ-Score	95% confidence interval	Group differences	(AOR) adjusted odds ratio (95% CI)
Age (in years)	10-14	25 (41.7)	20 (80)	5 (20)	12.1 (4.0)	10.8–13.4	t (58)=-1.86, p=0.036	0.82 (0.32–1.21)
	15-18	35 (58.3)	24 (68.5)	11 (31.4)	16.6 (4.7)	14.1–17.1		
Sex	Male	19 (31.7)	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	41 (68.3)	30 (73.1)	11 (26.8)	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	ANOVA, F (4,55)=3.45, p=0.013	1.00 (0.22-3.37)
	Upper middle	10 (16.7)	6 (80)	4 (40)	12.4 (3.8)	10.7–14.1		1.35 (0.31–5.94) 1. 80 (0.57–5.62) 2.25 (0.75–6.74)
	Lower middle	20 (33.3)	16 (80)	4 (20)	13.1 (4.1)	11.5–14.7		
	Upper lower	14 (23.3)	10 (71.4)	4 (28.5)	15.0 (4.4)	12.4–15.6		
	Lower	10 (16.7)	8 (80)	2 (20)	16.5 (4.6)	13.5–17.5		3.10 (1.02–9.42)
Schooling	Regular	40 (66.7)	32 (80)	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	45 (75.0)	36 (80)	9 (20)	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 (25.0)	8 (53.3)	7 (46.6)	17.3 (4.8)	14.2–18.4		3.76 (1.37–10.33)
Living arrangement	With parents	42 (70.0)	32 (76.1)	10 (23.8)	13.8 (4.1)	11.4–14.2	t (58)=-2.38, p=0.09	2.14 (1.12–8.77)
	Hostel Life	12 (20.0)	8 (66.6)	4 (33.3)	14.7 (4.3)	12.9–16.5		1.00 (1.23-1.57)
	Living with Guardian	6 (10.0)	4 (66.6)	2 (33.3)	15.4 (4.5)	13.2–17.6		2.26 (0.63–8.09)

Variable	Category	Overall n=60 (%)	Non-depressed n=44 (%)	Depressed n=16 (%)	Mean (SD) PHQ-Score	95% confidence interval	Group differences	(AOR) adjusted odds ratio (95% CI)
Experiencing academic stress	Yes	38 (63.3)	24 (63.15)	14 (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 (36.7)	20 (90.9)	2 (9.0)	11.0 (3.5)	9.8–12.2		
Experiencing family conflicts	Yes	40 (66.7)	30 (75)	10 (25)	16.6 (4.8)	14.0–17.2	t (58)=3.94, p<0.001	3.45 (1.05–5.71)
	No	20 (33.3)	14 (70)	6 (30)	11.8 (3.8)	10.7–12.9		
Experiencing domestic abuse	Yes	41 (68.3)	29 (70.7)	12 (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 (31.7)	15 (79)	4 (21)	12.0 (4.1)	10.8–13.2		
Family history of depression	Yes	28 (46.7)	16 (57.1)	12 (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 (53.3)	28 (87.5)	4 (12.5)	11.5 (3.7)	10.3–12.7		
Diagnosed with chronic illness	Yes	8 (13.3)	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	52 (86.7)	38 (73)	14 (26.9)	13.2 (4.3)	12.1–14.3		
Loss of family member/parent	Yes	18 (30.0)	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	42 (70.0)	34 (80.9)	8 (19)	12.2 (4.0)	11.0–13.		
Excessive use of social media	Yes	3 (5.0)	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	57 (95.0)	42 (73.6)	15 (26.3)	13.3 (4.2)	12.2–14.4		
Experience relationship breakdown	Yes	10 (16.7)	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)
	No	50 (83.3)	36 (72)	14 (28)	13.3 (4.2)	12.2–14.4		

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

Table 2: Results of hierarchical multiple regression analysis on depression (n=60).

Variable	Category	β (SE)	95% CI β	β	P value	R² Change	F-ratio
Block 1: Socio-demographic characteristics							
Age (in years)	11–14	-0.10 (0.05)	(-0.20, 0.00)	-0.15	0.036		
	15–18	0.18 (0.07)	(0.04, 0.32)	0.28	0.042		
Sex	Male	-0.12 (0.06)	(-0.24, 0.00)	-0.20	0.412		
	Female	0.20 (0.07)	(0.06, 0.34)	0.30	0.012		
Schooling	Regular	-0.15 (0.05)	(-0.25, -0.05)	-0.18	0.020		
	Irregular	0.20 (0.07)	(0.06, 0.34)	0.30	0.012		
	Dropout	0.25 (0.08)	(0.09, 0.41)	0.38	0.014		6.26*
Socioeconomic scale	Upper	-0.08 (0.06)	(-0.20, 0.04)	-0.12	0.150		
	Upper middle	0.20 (0.07)	(0.06, 0.34)	0.30	0.015	R² = 0.28	
	Lower middle	0.12 (0.05)	(0.03, 0.21)	0.18	0.025		
	Upper lower	0.15 (0.06)	(0.05, 0.25)	0.23	0.010		
	Lower	-0.20 (0.08)	(-0.36, -0.04)	-0.28	0.005		
Living arrangement	With parents	-0.10 (0.05)	(-0.20, 0.00)	-0.15	0.041		
	Hostel life	0.20 (0.07)	(0.06, 0.34)	0.30	0.012		
	Living with guardian	0.15 (0.06)	(0.03, 0.27)	0.22	0.014		
Family status	Parents together	-0.12 (0.05)	(-0.22, -0.02)	-0.18	0.035		
	Parents apart/single	0.20 (0.08)	(0.04, 0.36)	0.30	0.015		
Block 2: Psychosocial risk factors							
Experiencing academic stress	Yes	0.25 (0.08)	(0.09, 0.41)	0.38	0.014	R² = 0.14	3.79*
	No	-0.10 (0.04)	(-0.18, -0.02)	-0.15	0.014		
Experiencing	Yes	0.28 (0.10)	(0.08, 0.48)	0.40	0.010		

Continued.

Variable	Category	β (SE)	95% CI β	β	P value	R² Change	F-ratio
family conflicts	No	-0.12 (0.05)	(-0.22, -0.02)	-0.18	0.010		
Excessive use of social media	Yes	0.16 (0.07)	(0.03, 0.29)	0.22	0.041		
	No	-0.10 (0.04)	(-0.18, -0.02)	-0.15	0.039		
Family history of depression	Yes	0.18 (0.06)	(0.06, 0.30)	0.24	0.010		
	No	-0.12 (0.05)	(-0.22, -0.02)	-0.18	0.010		
Diagnosed with chronic illness	Yes	0.15 (0.05)	(0.05, 0.25)	0.23	0.045		
	No	-0.12 (0.06)	(-0.24, 0.00)	-0.18	0.412		
Loss of family member/parent	Yes	0.15 (0.07)	(0.03, 0.27)	0.22	0.014		
	No	-0.08 (0.04)	(-0.16, 0.00)	-0.12	0.014		
Experiencing physical abuse	Yes	0.05 (0.03)	(-0.01, 0.11)	0.08	0.204		
	No	-0.10 (0.05)	(-0.20, 0.00)	-0.15	0.204		
Experience relationship breakdown	Yes	0.28 (0.10)	(0.08, 0.48)	0.40	0.010		
	No	-0.12 (0.05)	(-0.22, -0.02)	-0.18	0.010		
R²						0.42	

*$p<0.05$, *$p<0.01$. Note: F-ratios are calculated per block using hierarchical multiple regression: Block 1: $F(7,52)=6.26$, $p<0.001$ $R^2=0.28$, Block 2: $F(7,45)=3.79$, $p<0.001$ $R^2=0.14\beta$

DISCUSSION

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.

The strength of our study lies in the use of a robust depression diagnostic tool such as PHQ-9. The finding that females experience higher level of depression was consistent with other researches.[8,12,16] 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. The finding that higher prevalence rate of depression among school-dropout girls compared to school-going girls was also reported in previous studies.[17] No association of depression with living arrangement, family history of depression, use of social media and relationship breakdown was seen 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 the 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]

Being a single centered cross-sectional study with limited data, it cannot capture the temporal sequence of depression in adolescents.

CONCLUSION

The 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 adolescent girls across nine focus states of India including Rajasthan should be promoted. Positive family atmosphere with the support of both the parents is a protective mechanism in mitigating depression in adolescents.

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