Journal of Depression and Anxiety
ISSN: 2167-1044
OPEN ACCESS Freely available online
Research Article

The Burden of Depression among Indian Adolescents: A Study on Cross-Sectional Data

Ravi Prakash Jha[1],Deepak Dhamnetiya[1], Neha Shri[2], Priyanka Patel[3], Krittika Bhattacharyya[4], Mayank Singh[5*]

[1]Department of Community Medicine, Dr Baba Saheb Ambedkar Medical College and Hospital, Delhi, India;[2]Research Scholar, International Institute for Population Sciences (IIPS) Mumbai, Maharashtra, India;[3]Department of Development Studies, International Institute for Population Sciences (IIPS) Mumbai, Maharashtra, India;[4]Department of Statistics, University of Calcutta, Kolkata, India;[5]Department of Fertility Studies, International Institute for Population Sciences (IIPS) Mumbai, Maharashtra, India

ABSTRACT

Background: Depression has been identified as a leading cause of disability, and studies suggest that people who have experienced depression at a young age are more likely to have depression throughout their lives. This study aims to assess the prevalence and determinants of depression among adolescents in Bihar and Uttar Pradesh states of India which holds the majority of adolescents in the country.

Methods: We have utilized data from Understanding the Lives of Adolescents and Young Adults (UDAYA) survey which was conducted in Bihar and Uttar Pradesh among 10-19 years old in 2016. Descriptive statistics, Bivariate analysis and multinomial logistic regression analysis were used to fulfill the objective of this study.

Results: Prevalence of depression was found to be higher among married female adolescents 49.6% (aged 15-19 years) in comparison to unmarried males 36% (10-19 years) and female adolescents 42.4% (10-19 years). Among adolescent males who ever seriously consider attempting suicide was 8.44 times (RR: 8.44; CI: 4.5-15.81) more likely to have minimal to mild depression and 22.74 times (RR:22.72; CI:7.74-66.7) more likely to have moderate to severe depression. Also, Adolescent males who were substance users were 2.35 times (RR: 2.35; CI: 1.24-4.43) more likely to have moderate to severe depression. Adolescent unmarried females who were not currently attending school was 39% more likely (RR: 1.39; CI: 1.06-1.83) to have moderate to severe depression; whereas adolescent unmarried females who ever attempt suicide was 42.21 times (RR: 42.21; CI: 26.39-67.51) more likely to have moderate to severe depression. For married adolescent females having premarital relationship (RR: 1.78; CI: 1.25-2.54), substance use in family (RR: 1.85; CI: 1.28-2.67), faced physical violence (RR: 1.59; CI: 1.09-2.34), faced emotional violence (RR: 1.93; CI: 1.31-2.82), faced dowry related abuse (RR: 3.33; CI: 2.43-4.57) and ever attempted suicide (RR: 56.85; CI: 26.57-121.66) were significant predictors of facing moderate to severe depression.

Conclusion: Results highlight the need of targeting adolescents' behavior and depressive symptoms especially in rural areas. Further, this study raises the prevalent issues such as violence, lack of freedom, suicidal ideation which adversely impacts the mental health of adolescents and draws our attention towards the urgent need of addressed.

Keywords: Depression; Adolescents; Mental health; Development

INTRODUCTION

World Health Organization recognizes adolescence as a phase of development on biological, mental and emotional front in an individual life. Adolescence period is accompanied by a spectrum of physical, psychological and social development. WHO and UNICEF define Individual in the10–19-year age-group as adolescents. Although most adolescents believe themselves to be healthy and have lower levels of mortality and morbidity compared to children and adults, the health status of adolescents is affected by varying conditions as a consequence of transitional state and diverse social determinants of health [1]. Normal stress of adolescence and unhealthy behavior such as substance abuse often makes adolescents more vulnerable to mental health problems such as depression, anxiety, mood disorders etc. Depression is a chronic disease which can impair normal functioning, cause depressive thoughts and adversely affect the quality of life [2]. Depression is documented to be associated with poor health behaviors and an increased risk of suicide [3].

Correspondence to: Mayank Singh, Department of Fertility Studies, International Institute for Population Sciences (IIPS) Mumbai, India, E-mail: singhmayank.251195@gmail.com

Received: 10-Aug-2022, Manuscript No. JDA-22-18780; **Editor assigned:** 15-Aug-2022, PreQC No. JDA-22-18780 (PQ); **Reviewed:** 29-Aug-2022, QC No. JDA-22-18780; **Revised:** 05-Sep-2022, Manuscript No. JDA-22-18670 (R); **Published:** 12-Sep-2022, DOI:10.35248/2167-1044.22.11.477

Citation: Jha RP, Shri N, Patel P, Bhattacharyya K, Dhamnetiya D, Singh M (2022) The Burden of Depression among Indian Adolescents: A Study on Cross-Sectional Data. J Dep Anxiety.11:477

Depression has been listed as a leading cause of disability and is estimated that around 322 million people of all ages suffer from depression [4]. Depression is the major contributor to suicidal deaths. Suicide is the third leading cause of death among adolescents. Other than the gender and genetics factors, depression among adolescents is documented to be associated with parental control, conflict between the child and parents, rejection and being bullied by parents, teachers [5,6]. Studies have shown that those who have experienced depression at an early age often struggle with depression throughout their lives [7] and its early onset predicts more severe depression during adulthood [8]. Adolescent married girls are more vulnerable to depression due to unsafe sex, early marital relationships and gender roles.

India has the largest adolescent population in the world (253 million) and every fifth person in the country is between 10 to 19 years [9]. Adolescents in India face a high burden of common mental disorders including depression. A study revealed that forty percent of the school going adolescents in age group 13-18 years in Chandigarh had depressive disorders [10].

Adolescents aged 10-14 years are understudied and is a difficult age group to reach. Thus, their needs are distinct from those aged 15-19 years. Although ample studies on the depression exist, certain areas such as the prevalence of depression among married adolescent are understudied. Thus, there is a need for a better understanding of the factors underlying depression among adolescents. Given the gendered and development aspects, analysis was stratified by sex (unmarried males, females and married females), with a special focus on the prevalence of depression among married adolescent girls in the age group 15-19 years.

Although mental health status among adolescents is well known in other countries, little is known about the magnitude of depression and associated factors among Indian adolescents. Studies on prevalence of depression and the associated factors are crucial to enable the formation of appropriate policies in India to promote mental health. This study aims to assess the prevalence and determinants of depression among adolescents in Bihar and Uttar Pradesh states of India which holds the majority of adolescents in the country.

METHODOLOGY

We utilized data from the prospective cohort study Understanding the Lives of Adolescents and Young Adults (UDAYA) among 10-19 years old which was conducted in Bihar and Uttar Pradesh (UP). This survey was led by the Population Council in year 2016 and was supported by Bill and Melinda Gates Foundation, David and Lucile Packard Foundation under the guidance of Ministry of health and Family Welfare (MoHFW), government of India. This study collected data on various aspects such as family, mobility and decision making, self -efficacy, sexual and reproductive matters, health, substance abuse and violence etc. from unmarried boys (10-19 years), unmarried girls (10-19years) and married girls (15-19 years). This survey followed a multi-stage systematic sampling approach with three stage sampling in rural areas and four stage sampling in urban areas. We had analyzed the data of 20594 adolescents for this study. The Population Council's Institutional Review Board gave its approval to the project and its data collection. It also guaranteed that the participants' privacy was protected and that informed consent was obtained from respondents during the survey.

Variable description

Outcome variable: The outcome variable was depression symptoms which were collected using Patient Health Questionnaire-9. PHQ-9 is a standard depression screening instrument used worldwide. The depressive severity was assessed using Likert scale from the respondents. The Likert scale responses included "not at all (0)", "several days (1)", "more than half the days (2)" and "nearly every day (3)". The respondents were asked if they were bothered about those problems in last two weeks. The questions included (1) little interest in doing things (2) feeling down, depressed or hopeless (3) trouble falling or staying asleep, or sleeping too much (4) feeling tired or less energy (5) poor appetite or overeating (6) feeling bad about themselves (7) trouble concentrating on things, such as reading or watching televisions (8) moving or speaking slowly that people could have noticed and (9) thoughts of dying or hurting themselves. The responses were recoded and a summary depressive symptom score ranging from 0-27 was generated, categorized as "No depression" (0), "Minimal to mild depression" (1-9) and "moderate to severe depression" (10-27).

Exposure variable: Sticking to the objectives, the respondents were categorized into three categories; unmarried adolescent's male (10-19year), unmarried adolescent's females (10-19 year) and married adolescent's females (15-19 year). Place of residence was taken as rural and urban as provided in the survey. Caste was recoded as SC/ST (Schedule Caste/Schedule Tribe), OBC (Other Backward Classes) and others. Religion was recoded as Hindu and Non-Hindu. Wealth index was recoded into poorest, poorer, middle, richer and richest. Substance use in family was recoded as "using" as 1 and "not using" as 0. Eligible respondents' years of education was taken into account which was categorized as "0-7 years of schooling", "8-10 years of schooling", "11-12 years of schooling" and "12+ years of schooling". A respondent was categorized as substance user if the respondent was using tobacco, alcohol or drug. Substance use in family was recoded as "no" if none in the family was using any kind of substance and "yes" if anyone in the family was substance user. Eligible respondents were asked if they were currently attending school and was recoded as "no", and "yes". Variables on father beating mother, violence against respondents used in this study were recoded as "yes" and "no".

The response was coded as "yes" if they had responded affirmatively on being allowed to visit alone to a (a) shop or market or visit a friend/relative inside their village/ward (b) shop or market or visit a friend/relative outside their village/ward and (c) attend any programme (a mela, sports event, girls' group meetings) inside their village/ward. The Respondents were asked if they ever seriously considered attempting suicide and the response was categorized as "yes" and "no". Further, response was recorded on if they played games. Data on Violence was categorized as emotional, physical and sexual for Married female adolescents. Further, they were asked about their pre-marital relationship and dowry related abuse. The respondent was considered to be facing abuse due to dowry if she was ever asked by her husband's family that the dowry/gift/cash brought by her was too little or asked to bring more of it. Table 1 presents the issues and criteria used for collecting information and different behaviors in this work.

Table 1: Characterization of variable used in this study.

Variables	Questions used	Classification
Father ever beaten mother	Has your father ever beaten your mother?	Yes No
Respondents physically hurt by their parents	Have you been physically hurt (for example, beaten) by your father or mother from the time you turned 10 years old?	Yes No
Allowed to visit alone	Are you usually allowed to go alone to a shop or market or visit a friend/relative inside your village/ward? If no, are you allowed to go only with someone else, or not at all? Are you usually allowed toa shop or market or visit a friend/relative outside your village/ward alone? If no, are you allowed to go only with someone else, or not at all? Are you usually allowed to attend any programme (a mela, sports event, girls' group meetings) inside your village/ward alone? If no, are you allowed to go only with someone else, or not at all?	Yes No
Ever seriously attempting suicide	During the past one year, did you ever seriously consider attempting suicide?	Yes No
Playing games	Do you play any sports or games or engage in physical activities like walking, skipping, running, yoga etc	Yes No
Pre-marital Relationship	Have you ever had a boyfriend?	Yes No
Substance abuse	Have you ever consumed tobacco products, eg., smoke cigarette, eat paan, gutka etc.?	Yes No
Dowry related abuse	Has anybody in your husband's family ever said that the dowry/gift/cash you brought was too little? Has anyone in your husband's family ever asked you to bring more cash/gifts/ dowry from your parent's family?	Yes No

Statistical analysis

Descriptive statistics and bivariate analysis were used to see the prevalence of depression among adolescents by socio-demographic and behavioural characteristics, and a further Chi-square test of significance was used to show the association between depression and background characteristics. To further access the predictors associated with the depression, a multinomial logistic regression model was fitted. Multinomial logistic regression was used since the dependent variable (depression) was nominal with more than two possible discrete outcomes (no depression, minimal to mild depression, and moderate to severe depression) and more than one independent variable. In multinomial logistic regression analysis, no depression was taken as a baseline outcome. Participants who received appropriate scores from the BDI and had a neuropsychiatric diagnosis in the past or still, and those who received psychotherapy or medical treatment for psychiatric diseases in the last 6 months were not included in the experiments.

RESULTS

According to Udaya Wave 1 (2015-16), a total of 20594 adolescents aged 10-19 years were successfully interviewed. Among those approximately 49.34% (N=10161) adolescents belonging to Uttar Pradesh and remaining 50.66% (N=10433) adolescents belonging to Bihar. These two states contribute to one-fourth of the country population and approximately three out of 10 adolescents belonging to these states combinedly [11]. Uttar Pradesh constitutes 82.3% (N=8363) of unmarried adolescents, whereas Bihar contributes 67.3% (N=7025) of unmarried adolescents aged 10-19 years, remaining 17.7% adolescents in Uttar Pradesh and 32.67% adolescents of age 15-19 years in Bihar were married. Among all adolescents, only 25% of females (N=5206) aged 15-19 were married, the remaining 45.9% females (N=9419) aged 10-19 years and 28.9% males (N=5969) aged 10-19 years was unmarried at the time of interview. The flow diagram illustrates a summary of how we arrived at the final categories of married and unmarried adolescents (Figures 1 and 2).

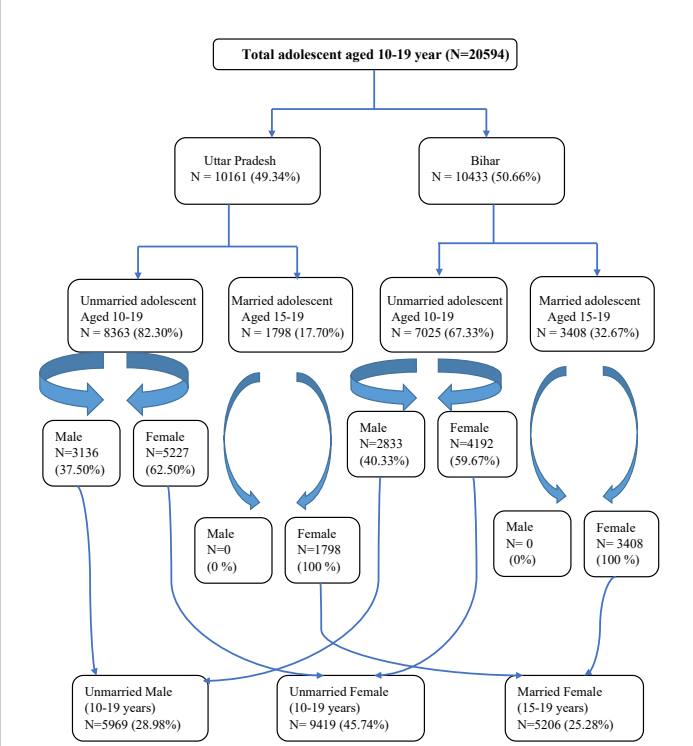

Figure 1: Flow diagram to understand the structure of udaya wave 1 data 2015-16.

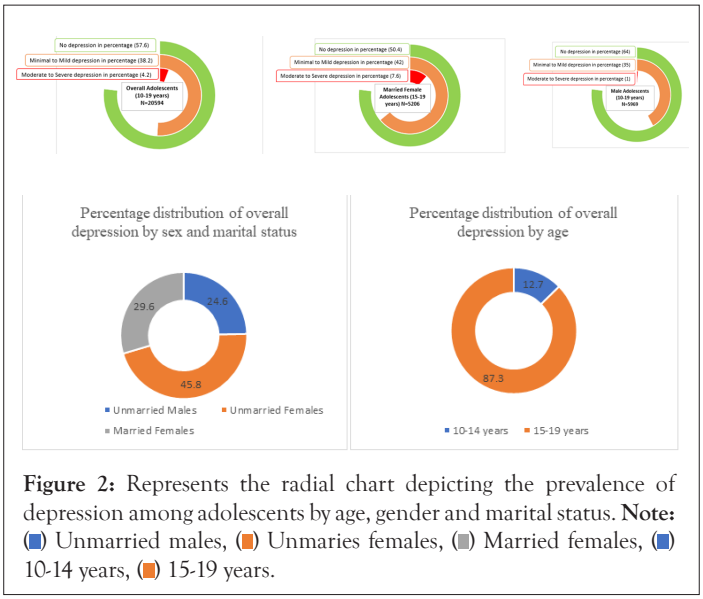

Figure 2: Represents the radial chart depicting the prevalence of depression among adolescents by age, gender and marital status. **Note:** (■) Unmarried males, (■) Unmaries females, (■) Married females, (■) 10-14 years, (■) 15-19 years.

The above Figure 2 depicts the prevalence of depression among adolescents. Out of 20,594 adolescents, around three-fifths (57.6%) do not have any depressive symptoms and two-fifths (38.2%) have minimal to mild depression. among all male adolescents (n=5969), 35% have minimal to mild depression. However, thirty-eight percent of unmarried female adolescents have minimal to mild depression. Surprisingly, a little more than two-fifths (42%) of the married female adolescents have minimal to mild depression. Likewise, moderate to severe depression is more prevalent among married female adolescents. Around eight percent of the married female adolescents and four percent of unmarried female adolescents have moderate to severe depression, whereas only one percent of the male adolescents have moderate to severe depression. This clearly represents the gender difference in the prevalence of depression among male and female adolescents in the states of Uttar Pradesh and Bihar. Minimal to mild depression was also highest among married adolescent in reproductive ages whereas it was least prevalent among male adolescents aged 10-19 years. Further distribution of depression among unmarried females was same as overall adolescent depression. Additionally, it was also found that among depressed adolescents, 45.8% were unmarried female adolescents followed by married females (29.6%) and unmarried males (24.6%). Among overall depressed adolescents nearly three fourth of them were adolescent females. Around 87.3% depressed adolescents belonged to the late adolescents age (15-19 years) group.

Table 2 presents adolescents' socio-demographic, behavioral and other characteristics by gender and marital status. More than half (52.54%) of the adolescent boys belong to UP, and the remaining 47.46% of adolescent boys belong to Bihar. Among Adolescent girls, 55.4% of unmarried girls reside in Uttar Pradesh, and 65.4% of married adolescents resided in Bihar. More than 80% of all adolescents (Unmarried boys, unmarried girls, and married girls) reside in rural areas. In addition, 56.87% adolescent boys, 56.29% unmarried adolescent girls, and 60.47% married adolescent girls belonged to OBC. Majority (more than 80%) of adolescents follow Hinduism. In terms of wealth, the lowest proportion (14.15%) of adolescents fall into the poorest wealth quintile, and the highest percentage of adolescents (23.71%) are from Richest wealth quintile. Approximately three-fourth of the adolescent family member is substance users. In addition, nearly half (49.77%) of the married reproductive-aged adolescents have 0-7 years of schooling and only 2.85% married adolescents, and 4.03% unmarried adolescents have 12+ years of schooling. The majority (79.03%) of currently married adolescents aren't not currently attending school, whereas the highest proportion (82.47%) of male adolescents is presently attending the school. While going through the parental violence, we see that a greater share (32.15%) of married adolescents face this problem. In contrast to the previous result, nearly 3 out of 5 male adolescents have been physically hurt by their parents. The majority of married adolescents (88%) reported of not being allowed to visit alone. Among adolescent girls (n=401), 7.71% of married adolescents ever had seriously considered attempting suicide. Pre-marital relationship and substance use by the respondent is higher among adolescent males as compared to female. A major proportion of married adolescents' face sexual violence (34.53%, N=1693), followed by emotional (28.55%, N=1399) and physical violence (25.99%, N=1274).

Table 2: Socio-demographic and behavioral characteristics of Indian adolescents aged 10-19 years.

Background Characteristics	Adolescent boys		Adolescent girls				Total Percentage
	(Unmarried 10-19 Years)		Unmarried (10-19 years)		Married (15-19 years)		
	Sample	Percentage	Sample	Percentage	Sample	Percentage	
State							
Uttar Pradesh	3,136	52.54	5,227	55.49	1,798	34.54	10161 (49.34)
Bihar	2,833	47.46	4,192	44.51	3,408	65.46	10433 (50.66)
Place of Residence							
Urban	1,030	17.26	1,625	17.26	730	14.03	3386 (16.44)
Rural	4,939	82.74	7,794	82.74	4476	85.97	17208 (83.56)
Caste							
SC/ST	1,535	25.71	2,185	23.2	1,505	28.91	5225 (25.37)
OBC	3,394	56.87	5,302	56.29	3,148	60.47	11844 (57.51)
Others	1,040	17.42	1,932	20.51	553	10.62	3525 (17.12)
Religion							
Hindu	5,013	83.98	7,319	77.7	4,417	84.84	16748 (81.33)
Others	956	16.02	2,100	22.3	789	15.16	3846 (18.67)
Wealth Index							

Poorest	747	12.51	1,276	13.54	892	17.13	2914 (14.15)
Poorer	1234	20.67	1,692	17.96	1135	21.81	4061 (19.72)
Middle	1405	23.54	2,047	21.74	1278	24.54	4730 (22.97)
Richer	1376	23.05	2,308	24.5	1198	23.02	4882 (23.71)
Richest	1208	20.24	2,096	22.26	703	13.51	4007 (19.46)
Substance use in family							
No	1,625	27.22	2,560	27.18	1,271	24.42	5456 (26.49)
Yes	4,344	72.78	6,859	72.82	3,935	75.58	15138 (73.51)
Respondent level of education							
0-7year of schooling	2,662	44.6	3,438	36.5	2,591	49.77	8691 (42.20)
8-10year of schooling	2,362	39.58	3,907	41.48	1,827	35.09	8096 (39.31)
11-12year of schooling	800	13.4	1,694	17.98	640	12.3	3134 (15.22)
12+year of schooling	145	2.43	380	4.03	148	2.85	673 (3.27)
Respondent currently attending school							
No	1,013	17.53	2,340	26.75	3,021	79.03	6373 (34.74)
Yes	4,765	82.47	6,406	73.25	802	20.97	11972 (65.26)
Father ever beaten mother							
No	4,302	79.27	6,578	74.07	3,330	67.85	14210 (73.95)
Yes	1,125	20.73	2,303	25.93	1,578	32.15	5006 (26.05)
Respondent physically hurt by parents							
No	2,307	40.05	5,808	63.97	3,471	68.24	11587 (58.14)
Yes	3,454	59.95	3,272	36.03	1,616	31.76	8341 (41.86)
Allowed to visit alone							
Yes	4,181	70.05	2,088	22.17	625	12	6894 (33.48)
No	1,788	29.95	7,331	77.83	4,581	88	13700 (66.52)
Ever seriously consider attempting suicide							
No	4,508	98.01	8,118	96.06	4,792	92.29	17418 (95.48)
Yes	91	1.99	333	3.94	401	7.71	825 (4.52)
Play Games							
Yes	5,080	85.11	4,717	50.08	782	15.01	10579 (51.37)

No	889	14.89	4,702	49.92	4,424	84.99	10015 (48.63)
Pri-marital relationship							
No	3,003	77.31	6,624	85.29	4,418	84.86	14045 (83.32)
Yes	882	22.69	1,142	14.71	788	15.14	2812 (16.68)
Substance Use (Respondent)							
No	4,996	83.7	9,268	98.4	5,051	97.03	19315 (93.79)
Yes	973	16.3	151	1.6	155	2.97	1279 (6.21)
Violence among married women							
Emotional Violence							
No					3,500	71.45	3500 (71.45)
Yes					1,399	28.55	1399 (28.55)
Physical Violence							
No					3,627	74.01	3627 (74.01)
Yes					1,274	25.99	1274 (25.99)
Sexual violence							
No					3,212	65.47	3212 (65.47)
Yes					1,693	34.53	1693 (34.53)
Dowry related abuse							
No					3,893	74.78	3893 (74.78)
Yes					1,313	25.22	1313 (25.22)

Table S1 illustrates the Uttar Pradesh witnesses a significantly higher prevalence of minimal to mild (44.52%) and moderate to severe (8.98%) depression among the adolescent married female while 1.39% of adolescent's male reported severe depression. Variation of depression symptoms within different strata of some background variables such as residence, caste, religion wealth index, respondent current school attendance was not observed. Respondent's level of education is negatively related to depressive symptoms in unmarried male adolescents. Higher the use of the substance in the family is associated with more depression among unmarried female adolescents. Prevalence of minimum to mild and moderate to severe depression is higher among male adolescents with 12+ years of schooling followed by adolescents having 11-12 years of schooling among unmarried male while prevalence of moderate to severe depression increased with increasing in the years of education among unmarried female adolescents. Minimal to mild depression is more among those adolescents who were physically hurt by their parents in unmarried male while depression among adolescents is higher among those where her mother has ever been beaten by parents (40.4 minimum to mild, 6.33 moderate to severe) or respondent herself have been hurt by parents (41.9% minimal to mild) in unmarried female. Furthermore, the use of the substance is significantly associated with depression. For instance, 42.06% of male adolescents face minimal to mild depression among substance users, whereas 33.5% of adolescents who are non-substance users have the same level of depression among unmarried male respectively. Estimates show that 64.14% of unmarried adolescent girls have minimal to mild depression, and 24.97% have moderate to severe depression who ever seriously consider attempting suicide among unmarried female adolescents. Among married and unmarried adolescent's female, depression is more (52.07% for minimal to mild, 9.17% for moderate to severe) where the respondent was allowed to visit alone. Depression is found to be higher among those respondents who reported facing violence or if they reported of her mother had ever facing the physical violence. Depression is more (52.07% for minimal to mild, 9.17% for moderate to severe) where the respondent was allowed to visit alone among married adolescent's female respectively.

Table 3 presents the Multinomial logistic regression estimates of type of depression among unmarried adolescent's male, female aged 10-19 years and married adolescent's female aged 15-19 year. 'No depression' is taken as a reference category in the dependent variable and the first category of independent variables are taken as a reference category.

Table 3: Multinomial logistic regression estimates of type of depression among unmarried adolescent's male, female aged 10-19 years and married adolescent's female aged 15-19 year.

Background Characteristics	Unmarried Adolescent Male		Unmarried Adolescent Female		Married Adolescent Female	
	Minimal to mild depression	Moderate to severe depression	Minimal to mild depression	Moderate to severe depression	Minimal to mild depression	Moderate to severe depression
	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)	RRR (95% CI)
State						
Uttar Pradesh®						
Bihar	1 .0 (0.87, 1.16)	0.64 (0.35, 1.19)	0.94 (0.85, 1.05)	1.34** (1.05, 1.7)	0.74*** (0.63, 0.88)	0.69** (0.51, 0.95)
Place of Residence						
Urban®						
Rural	1.21** (1.03, 1.41)	2.08** (1.11, 3.9)	1.09 (0.97, 1.21)	0.84 (0.65, 1.08)	0.89 (0.76, 1.05)	0.74* (0.55, 1)
Caste						
SC/ST®						
OBC	0.87 (0.73, 1.03)	0.67 (0.33, 1.36)	0.95 (0.83, 1.09)	0.8 (0.59, 1.09)	0.83** (0.7, 1)	0.79 (0.56, 1.11)
Others	1.01 (0.81, 1.26)	0.91 (0.39, 2.09)	0.86* (0.73, 1.01)	0.83 (0.58, 1.19)	1 (0.76, 1.32)	1.24 (0.75, 2.03)
Religion						
Hindu®						
Others	1.37*** (1.14, 1.65)	1.69 (0.83, 3.47)	1.16** (1.02, 1.31)	1.52*** (1.16, 2)	1.22* (0.97, 1.53)	1.93*** (1.31, 2.86)
Wealth Index						
Poorest®						
Poorer	0.94 (0.7, 1.27)	0.96 (0.23 3.98)	1.11 (0.89, 1.39)	1.24 (0.71, 2.17)	0.89 (0.67, 1.19)	1.03 (0.6, 1.79)
Middle	1.02 (0.76, 1.37)	0.97 (0.25, 3.84)	1.2* (0.97, 1.47)	1.09 (0.63, 1.87)	1.06 (0.81, 1.39)	0.85 (0.5, 1.46)
Richer	1.01 (0.76, 1.36)	1.75 (0.47, 6.48)	1.21* (0.98, 1.48)	1.79** (1.07, 2.98)	1 (0.77, 1.31)	1.25 (0.75, 2.09)
Richest	1 .00 (0.74, 1.36)	1.97 (0.51, 7.64)	1.21* (0.97, 1.5)	1.52 (0.89, 2.6)	0.93 (0.69, 1.25)	0.84 (0.47, 1.51)
Substance use in family						
No®						
Yes	0.86** (0.74, 0.99)	0.65 (0.36, 1.18)	1.21*** (1.08, 1.35)	1.45*** (1.11, 1.9)	1.15 (0.97, 1.37)	1.85*** (1.28, 2.67)
Respondent level of education						
0-7year of schooling®						
8-10year of schooling	1.32*** (1.11, 1.58)	1.66 (0.72, 3.8)	1.31*** (1.15, 1.5)	1.43** (1.04, 1.97)	1.05 (0.88, 1.26)	1.33* (0.96, 1.86)
11-12year of schooling	1.52*** (1.22, 1.89)	2.35* (0.91, 6.07)	1.38*** (1.18, 1.63)	1.78*** (1.23, 2.58)	1.14 (0.89, 1.48)	1.1 (0.67, 1.83)
12+year of schooling	2.18*** (1.49, 3.2)	3.28* (0.87, 12.34)	1.09 (0.85, 1.39)	2.01** (1.18, 3.41)	1.27 (0.82, 1.97)	1.59 (0.7, 3.64)
Respondent currently attending school						
Yes®						
No	0.92 (0.76, 1.12)	1.02 (0.47, 2.19)	1.09 (0.96, 1.23)	1.39** (1.06, 1.83)	0.97 (0.77, 1.22)	0.93 (0.6, 1.46)
Father ever beaten mother						

No®						
Yes	1.23** (1.03, 1.47)	0.96 (0.45, 2.05)	1.11 (0.98, 1.26)	1.60*** (1.22, 2.11)	1.15 (0.95, 1.4)	0.93 (0.66, 1.32)
Respondent physically hurt by parents						
No®						
Yes	1.23*** (1.06, 1.41)	1 (0.57, 1.77)	1.27*** (1.13, 1.42)	1.09 (0.84, 1.42)	0.89 (0.74, 1.07)	0.86 (0.61, 1.22)
Allowed to visit alone						
Yes®						
No	1.23** (1.03, 1.48)	0.74 (0.31, 1.81)	0.84*** (0.75, 0.94)	0.97 (0.75, 1.26)	0.77** (0.6, 0.97)	0.93 (0.6, 1.45)
Ever seriously consider attempting suicide						
No®						
Yes	8.44*** (4.5, 15.81)	22.72*** (7.74, 66.7)	9.17*** (6, 14.01)	42.21*** (26.39, 67.51)	13.61*** (6.58, 28.14)	56.85*** (26.57, 121.66)
Playing Games						
Yes®						
No	0.88 (0.73, 1.07)	1.57 (0.8, 3.08)	0.76*** (0.68, 0.84)	0.95 (0.75, 1.2)	0.55*** (0.44, 0.68)	0.73 (0.49, 1.09)
Substance Use (Respondent)						
No®						
Yes	1.29*** (1.08, 1.56)	2.35*** (1.24, 4.43)	2.30*** (1.48, 3.58)	1.86 (0.83, 4.17)	1.41 (0.86, 2.3)	0.9 (0.39, 2.1)
Pri-marital relationship						
No®						
Yes					1.66*** (1.34, 2.06)	1.78*** (1.25, 2.54)
Violence among married women						
Emotional Violence						
No®						
Yes					1.35*** (1.08, 1.69)	1.93*** (1.31, 2.82)
Physical Violence						
No®						
Yes					1.45*** (1.16, 1.82)	1.59** (1.09, 2.34)
Sexual violence						
No®						
Yes					1.05 (0.88, 1.25)	0.8 (0.58, 1.12)
Dowry related abuse						
No						
Yes					1.52*** (1.26, 1.84)	3.33*** (2.43, 4.57)

Note: p-value<0.01=***, p-value<0.05 =**, p-value<0.10= *.

The unmarried women living in Bihar are 30% more likely to have moderate to severe depression than women living in Uttar Pradesh while married women living in the Bihar are 26% (RR: 0.74, CI: 0.63-0.88) less likely to have minimal to mild depression and 31% (RR: 0.69, CI: 0.51-0.95) less likely to have moderate to severe depression than unmarried women living in Uttar Pradesh. Unmarried male from rural area are 1.21 times more likely to have minimal to mild depression whereas 2.08 times more likely to have moderate to severe depression in comparison to their counterparts from urban area while married women living in rural areas are 26% (RR: 0.74, CI: 0.55-1.0) less likely to have moderate to severe depression than unmarried women living in urban areas. Respondents who reported of Mother being beaten ever by father are 1.23 times more likely to have minimal to mild depression in unmarried male while 1.6 times more likely to have moderate to severe depression in unmarried female in comparison to respondents who didn't report of mother being beaten by father.

Respondent who are not allow to visit alone are 16% (RR: 0.84, CI: 0.75-0.94) less likely to have minimal to mild depression in unmarried female, 1.23 times more likely to have minimal to mild depression in unmarried male and 23% (RR: 0.77, CI: 0.6-0.97) less likely to have minimal to mild depression among married female. Respondents whoever seriously considered attempting suicide are 8.44 times more likely to have minimal to mild depression and 22.74 times more likely to have moderate to severe depression in unmarried male, 13.6 times more likely to have minimal to mild depression and 56.8 times more likely to have moderate to severe depression in married female as compared to not attempt suicide. Surprisingly, respondents who do not play any game are 24% (RR: 0.76, CI: 0.68-0.84) less likely to have minimal to mild depression in unmarried female and 45% (RR: 0.55, CI: 0.44-0.68) less likely to have minimal to mild depression in married women as compared to playing game.

Married women who having premarital-relationship are 1.7 times more likely to have minimal to mild depression and 1.8 times more likely to have moderate to severe depression than women who did not have pre-marital relationships. Violence among married women is found to be significantly associated with both minimal to mild depression and moderate to severe depression. Adolescent brides facing emotional violence are 1.3 times more likely to have minimal to mild depression and 1.9 times more likely to have moderate to severe depression than adolescent brides who did not face emotional violence. Similarly, minimal to mild depression is 1.4 times higher among married adolescent women than married women who didn't face physical violence. Married women experiencing dowry-related abuse are 1.5 times more likely to have minimal to mild depression and 3.3 times more likely to have moderate to severe depression than married women not experiencing dowry abuse.

DISSCUSION

Findings from this study confirm the suspicion that a considerable amount of depression is prevalent among Indian adolescents. Further, this study adds to the growing body of literature suggesting that suicidality, substance use in the family, substance use by the respondents, being hurt by their parents or mother being beaten by the father are significantly associated with depression among married adolescent girls and unmarried adolescents' boys and girls in India. Our study estimated the overall prevalence of depression among adolescents to be 42.4%. In addition, prevalence of depression was found to be higher among married female adolescents in comparison to unmarried male and female adolescent. Suicidal ideation was more prevalent among married adolescents. These findings are consistent with the previous studies which indicate that issues like depression, self-harm and suicidality disproportionally affect the older adolescent and girls, especially married girls [12,13]. A cross sectional study which was undertaken in urban areas of Bihar estimated that the prevalence of depression is 49.2% among school going adolescents, and it was higher in older adolescents and female adolescents [14]. Findings from our study are in line with the previous studies which have documented that married adolescent girls are more vulnerable to violence [15].

As evident from the findings of this study, depressive symptoms among unmarried male respondents were predicted by place of residence being rural, from a relatively wealthy home and religion being other than Hindu. As expected, parental physical abuse and facing violence in their home or in their spouse's home were significantly associated with mild and severe depression among unmarried male and female respondents. This is consistent with previous research that has found multi-generational pattern of family violence to affect girls' propensity for future violence, suicidality and self-harm [16]. Further, in a patrilineal Indian society, Child brides are more vulnerable to experiences of violence.

Our study found that Substance abuse, witnessing parental violence and experiencing violence was associated with depression. This finding is in line with several other studies where alcohol use is documented to be a predictor of depression in clinical and population samples among adolescents [17,18]. A number of studies have indicated that violent behavior, alcohol consumption, are directly related to suicidal ideation [19,20]. Shaikh and his colleagues found that poor mental health of adolescents was predicted by harsh parental behaviour, disturbed family relationships and substance abuse. Recent evidence on adolescents in India suggests that family conflict have been compromising their mental health and safety [21,22]. Studies have recognized depression to be an initial disorder preceding the substance abuse in adolescents [23].

Von and colleagues documented an association between a lower socio-economic status and more depressive symptoms in young adolescents [24]. Disadvantageous work characteristics, material disadvantage, reduced social support and risky health behaviour are identified as the risk factors for depressive state [25]. Findings from this study show that respondents from richer wealth quintile had more depressive symptoms than respondents from lower wealth quintile among unmarried females. However, better economic status and higher years of education did not show any profound association with depressive symptoms among unmarried male and married female adolescents. Individuals having financial and physical assets are documented to have more control of their lives which decreases their vulnerability to anxiety or mood disorders or psychological symptoms [26]. Findings from previous study emphasize that identity stressors can lead to depression among students in higher education [27]. Further, minority populations are more likely to experience poor mental health status such as loneliness and depression. Our findings clearly indicate the need of targeting adolescents' behaviour and depressive symptoms especially in rural areas.

High prevalence of mild and severe depression was noticed across married female adolescents experiencing physical or emotional violence in this study. Women who are victim of domestic violence

have reported to have higher rates of depression, anxiety, drug and alcohol abuse [28,29]. Unsurprisingly, results show that female respondents who were not allowed to visit alone had higher depressive symptoms irrespective of their marital status than those who were allowed to visit alone. Mostly in Indian society, women after marriage move into their spouse's house where women face gender rules. This study confirms the pre-existing annotation that depression is higher among married adolescents who had pre-marital relationship. The possible reason may be due to social-cultural acceptance of arrange marriage. In Indian society, parents choose a spouse based on the caste/ethnicity, religion etc. Although, the marital pattern is changing and young people are choosing their own spouses for love, the values and beliefs attached with arrange marriage changes the marital behaviour of adolescents. Thus, with the change in spouse choice adolescents become psychologically coercive to cope up with the long-term relationship or dissatisfaction from their past-relationship with their partners which portend depression among them.

Dowry related abuse was also found to be significant associated with depressive episodes. Studies in the past have found dowry demands and harassment to be associated with mental health problems for women [30,31]. Adolescent girls who have experienced violence or abused are at high risk for suicide and are found to be vulnerable to developing suicidal thinking and behavior [32].

CONCLUSION

Our study concludes that adolescents are highly vulnerable for developing depressive symptoms. Prevalence of depression is found to be substantially high among adolescents, especially among unmarried females who are in their late adolescent period. Substance use in the family, substance use in adolescents, lack of freedom, violence in the family, suicidal tendency and lack of indulgence in games has been found to be significantly associated with depression. Experiencing physical, emotional or sexual violence by husband and facing with dowry related abuse by any family member are one of the major risk factors for depression among married females in the states of UP and Bihar. Results highlight the need of targeting adolescents' behaviour and depressive symptoms especially in rural areas. Further, this study raises the prevalent issues such as violence, lack of freedom which adversely impacts the mental health of adolescents and draws our attention towards the urgent need of addressal. Adolescents should be provided with supportive and healthy environment in the family, school and in the community. Information, education and communication regarding the risk factors, early warning signs and healthy coping methods to overcome depression among adolescent should be given to parents and teachers. Under school health programme adolescents should be screened for mental health issues monthly by teachers and bi annually by doctors. A mental health nurse or multipurpose worker trained in mental health issues should be provided at subcentre level for providing mental health services. A community participation in the development of mental health services by creating self-help groups can play a key role in the reduction of mental health issues specially depression in the community.

DECLARATIONS

Ethics approval and consent to participate

Each interviewee gave informed consent, and consent from a parent or guardian was required for unmarried teenagers aged 10–17. Names were never entered into the computer forms used to collect data. Signing the consent form was optional to protect the respondent's or parent's privacy; nevertheless, the interviewer had to sign a declaration confirming she or he had communicated the consent form's content to the respondent or parent. The Population Council's Institutional Review Board gave its approval to the project and its data collection. All methods were performed in accordance with the declaration of Helsinki. It also guaranteed that the participants' privacy was protected and that informed consent was obtained from respondents during the survey.

Consent for publication

Not applicable.

Availability of data and materials

The information was gathered as part of the Population Council's UDAYA project, which is publicly accessible on the HarvardDataversewebsite on request at

https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/RRXQNT https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/ZJPKW5.

Competing interests

The authors declare no conflict of interest, financial or otherwise.

Funding

There was no funding from any source for this study.

Author's contribution

MS, DD and RPJ contributed in conceptualizing the study. MS, DD, KB, PP, NS and RPJ were responsible for the analysis. All authors contributed to the interpretation of the data, and critically revised all versions of the manuscript and approved the final version.

Acknowledgements

Not applicable.

REFERENCES

1. Laski L. Realising the health and wellbeing of adolescents. bmj. 2015 Sep; 351.
2. Liu Q, He H, Yang J, Feng X, Zhao F, Lyu J. Changes in the global burden of depression from 1990 to 2017: Findings from the Global Burden of Disease study. J Psychiatr Res. 2020 Jul; 126:134-40.
3. Birmaher B, Ryan ND, Williamson DE, Brent DA, Kaufman J, Dahl RE, et al. Childhood and adolescent depression: a review of the past 10 years. Part I. J Am Acad Child Adolesc Psychiatry. 1996 Nov; 35(11):1427-39.
4. World Health Organization. Depression and other common mental disorders: global health estimates. World Health Organization; 2017.
5. Malhotra S, Kohli A, Kapoor M, Pradhan B. Incidence of childhood psychiatric disorders in India. Indian J Psychiatry. 2009 Apr;51(2):101.
6. Maharaj RG, Alli F, Cumberbatch K, Laloo P, Mohammed S, Ramesar A, e al. Depression among Adolescents, Aged 13-19 Years, Attending Secondary Schools in Trinidad Prevalence and Associated Factors. West Indian Med J. 2008 Sep; 57(4).

7. Lewinsohn PM, Rohde P, Klein DN, Seeley JR. Natural course of adolescent major depressive disorder: I. Continuity into young adulthood. J Am Acad Child Adolesc Psychiatry. 1999 Jan; 38(1):56 63.

8. Weissman MM, Wolk S, Goldstein RB, Moreau D, Adams P, Greenwald S, et al. Depressed adolescents grown up. Jama. 1999 May; 281(18):1707-13.

9. United Nations. World Population Prospects: The 2017 Revision, DVD Edition. 2017.

10. Baggio L, Palazzo LS, Aerts DR. Planejamento suicida entre adolescentes escolares: prevalência e fatores associados. Cadernos de Saúde Pública. 2009;25:142-50.

11. Santhya KG, Acharya R, Pandey N, Singh SK, Rampal S, Zavier AJ, et al. Understanding the lives of adolescents and young adults (UDAYA) in Bihar, India.

12. Bhan N, Jose R, Silverman JG, Raj A. Family violence as a determinant of suicidality and depression among adolescents in India. J. Glob. Health. 2019 Oct 15;3.

13. Shaikh BM, Doke PP, Gothankar JS. Depression, anxiety, stress, and stressors among rural adolescents studying in Pune and a rural block of Nanded district of Maharashtra, India. Indian J Public Health. 2018 Oct; 62(4):311.

14. Jha KK, Singh SK, Nirala SK, Kumar C, Kumar P, Aggrawal N. Prevalence of depression among school-going adolescents in an urban area of Bihar, India. Indian J Psychol Med. 2017 May;39(3):287-92.

15. Bhan N, Jose R, Silverman JG, Raj A. Family violence as a determinant of suicidality and depression among adolescents in India. J. Glob. Health. 2019 Oct 15;3.

16. Scott S, Pant A, Nguyen PH, Shinde S, Menon P. Demographic, nutritional, social and environmental predictors of learning skills and depression in 20,000 Indian adolescents: Findings from the UDAYA survey. PloS one. 2020 Oct 16;15(10):e0240843.

17. Cerdá M, Bordelois PM, Keyes KM, Galea S, Koenen KC, Pardini D. Cumulative and recent psychiatric symptoms as predictors of substance use onset: does timing matter?. Addiction. 2013 Dec;108(12):2119-28.

18. Marmorstein NR. Longitudinal associations between depressive symptoms and alcohol problems: The influence of comorbid delinquent behavior. Addict. Behav. 2010 Jun; 35(6):564-71.

19. Park S. Gender-specific factors of suicide ideation among adolescents in the Republic of Korea: a nationally representative population-based study. Arch Psychiatr Nurs. 2013 Oct 1;27(5):253-9.

20. Anteghini M, Fonseca H, Ireland M, Blum RW. Health risk behaviors and associated risk and protective factors among Brazilian adolescents in Santos, Brazil. J Adolesc Health. 2001 Apr; 28(4):295-302.

21. Aggarwal S, Berk M. Evolution of adolescent mental health in a rapidly changing socioeconomic environment: A review of mental health studies in adolescents in India over last 10 years. Asian J Psychiatr. Kistner Feb;13:3-12.

22. Aggarwal S. Suicide in India. Br. Med. Bull. 2015 Jun; 114(1).

23. Deykin EY, Levy JC, Wells V. Adolescent depression, alcohol and drug abuse. American Journal of Public Health. 1987 Feb; 77(2):178-82.

24. Von Rueden U, Gosch A, Rajmil L, Bisegger C, Ravens-Sieberer U. Socioeconomic determinants of health related quality of life in childhood and adolescence: results from a European study. J Epidemiol Community Health. 2006 Feb; 60(2):130-5.

25. Stansfeld SA, Head J, Fuhrer R, Wardle J, Cattell V. Social inequalities in depressive symptoms and physical functioning in the Whitehall II study: exploring a common cause explanation. J Epidemiol Community Health. 2003 May;57(5):361-7.

26. Muntaner C, Eaton WW, Diala C, Kessler RC, Sorlie PD. Social class, assets, organizational control and the prevalence of common groups of psychiatric disorders. Soc. Sci. Med. 1998 Dec; 47(12):2043-53.

27. Byrd DR, McKinney KJ. Individual, interpersonal, and institutional level factors associated with the mental health of college students. J Am Coll Health. 2012 Apr ;60(3):185-93.

28. Campbell J, Kub JE, Rose L. Depression in battered women. JAMWA. 1996; 51(3):106-11.

29. Gleason WJ. Mental disorders in battered women: An empirical study. Violence Vict. 1993 Mar; 8(1):53-68. .

30. Stroope S. Disease and dowry: Community context, gender, and adult health in India. Social Forces. 2015 Jun; 93(4):1599-623.

31. Raguram R, Weiss MG, Keval H, Channabasavanna SM. Cultural dimensions of clinical depression in Bangalore, India. Anthropol Med. 2001 Apr 1;8(1):31-46.

32. Kermode M, Herrman H, Arole R, White J, Premkumar R, Patel V. Empowerment of women and mental health promotion: a qualitative study in rural Maharashtra, India. BMC public health. 2007 Dec;7(1):1-0.