



A Cross-Sectional Study on Depression, Anxiety and Perceived Stress Among In-School Adolescents in Indore city, Madhya Pradesh

Vishal Choubey, Abhijit Das, Abhishek Paul Majumder, Nidhi Dixit⁴

ABSTRACT

Background

Adolescence involves changes that heighten vulnerability to mental health disorders. This study assessed the prevalence and severity of depression, anxiety, and stress among in-school adolescents in Indore city.

Methodology

This cross-sectional study was conducted from January 2020 to June 2021 among 130 students from classes 11th and 12th. Data were collected using a semi-structured questionnaire, which included the Depression Anxiety Stress Scales (DASS-21) and questions on psychosocial factors. Statistical analysis was performed using IBM SPSS Version 26.0. Qualitative variables were described using frequency and percentage. Inferential analysis was conducted using the chi-square. A p-value of <0.05 was considered significant.

Results

The mean age of the participants was 18.05 (± 0.50) years. Most participants were from the 11th class, and the vast majority resided in urban areas. The study found that 40% of participants experienced depression, 44.6% anxiety, and 48.5% stress. Higher rates of these conditions were observed among older students and those in higher classes. Females reported significantly higher levels of anxiety and stress compared to males. Depression was significantly associated with family conflicts, perceived financial difficulties, parental alcohol consumption, and experiences of bullying. Elevated levels of stress were particularly evident among students who had experienced the loss of a parent.

Conclusions

The study revealed a high prevalence of depression, anxiety, and stress among school-going adolescents. There is a need for mental health programs in schools that focus on psychological well-being, especially for female students and those facing adverse social circumstances.

Key-words: *Adolescents, Mental Health, Depression, Anxiety, Stress, DASS-21*

GJMEDPH 2026; Vol. 15, issue 3 | OPEN ACCESS

2*Corresponding Author: Abhijit Das, MD, Assistant Professor, Department of Community Medicine, Tripura Medical College & Dr. BRAM Teaching Hospital, Agartala, Tripura, India, 799014, E-mail – adas9121@gmail.com; 1. Vishal Choubey, MD, Assistant Professor, Department of Psychiatry, Birsamunda Government Medical College, Shahdol, Madhya Pradesh, India, 484001; 3. Abhishek Paul Majumder, MD, Assistant Professor, Department of Community Medicine, Tripura Santiniketan Medical College, Agartala, Tripura, India, 799130; 4. Nidhi Dixit, MD, Senior Resident, Department of Psychiatry, Government Institute of Medical Sciences, Greater Noida, Uttar Pradesh, India, 201310

Conflict of Interest—none | Funding—none

© 2026 The Authors | Open Access article under CC BY-NC-ND 4.0



INTRODUCTION

Adolescence constitutes a distinct and pivotal period of life characterized by profound physical, emotional, and social transformations. The confluence of these factors, compounded by exposure to adversities such as poverty, abuse, or violence, can render adolescents susceptible to mental health disorders. Safeguarding adolescents against such adversities, fostering socio-emotional learning and psychological well-being, and ensuring access to mental health services are imperative for nurturing their health and resilience, both during adolescence and into adulthood.^[1] With a staggering 1.3 billion adolescents comprising approximately 16% of the global populace, addressing mental health concerns among this demographic is of paramount importance.^[2]

Globally, it is estimated that one in seven individuals aged 10 to 19 grapples with a mental disorder, accounting for a substantial 13% of the overall disease burden within this age cohort.^[1] Regrettably, these conditions often evade detection and intervention, exacerbating the plight of distressed adolescents. Those grappling with mental health issues are particularly susceptible to adverse outcomes, including social marginalization, discrimination, stigma (which impedes help-seeking behaviour), academic impediments, engagement in risky behaviors, physical ailments, and violations of fundamental human rights.

Anxiety and depression disorders collectively represent a significant proportion, approximately 40%, of mental health diseases affecting adolescents worldwide. Following closely are conduct disorders (20.1%) and attention-deficit hyperactivity disorder (19.5%). Emotional disorders, thus, loom large in the mental health landscape of adolescents.^[1] In the context of India, the prevalence of psychiatric disorders among adolescents is estimated at 7.3%.^[3]

Several studies from India have reported considerably higher prevalence rates of anxiety, depression, and stress among adolescents.^[4-12] Recognizing that understanding the burden of

any disease is essential to its mitigation, this study was done to ascertain the prevalence and severity of depression, anxiety, and stress among adolescents attending schools in Indore city, Madhya Pradesh as well as to elucidate the factors associated.

Methods

Study design, setting & duration

This was a cross-sectional study done in schools in Indore city between January 2020 to June 2021.

Study population and selection criteria

All students of 11th to 12th classes were eligible for the study. Participants absent on the day of the interview, not willing to participate, or undergoing treatment for mental illness were excluded from the study.

Sample size and sampling

Sample size was calculated using $n = Z^2 pq / d^2$, where $p = 14\%$, the proportion of 10-19 year olds experiencing any mental health conditions.^[1] With a 95% confidence interval, 10% precision, and 20% non-response, and rounding off the value, the minimum required sample size was calculated to be 60. Due to the prevailing COVID-19 pandemic and associated lockdowns, recruitment was limited to a single school, as permissions from other institutions were unavailable. Following approval from the school principal, students in the adolescent age group of classes 11th and 12th were approached. Subsequently, informed consent forms were distributed to students for obtaining parental/local guardian consent and assent from the students themselves. Universal sampling was employed to enrol all students of classes 11th and 12th. However, based on the selection criteria, a total of 130 participants were ultimately interviewed for this study.

Data collection and Data analysis

Data were collected using a semi-structured questionnaire which consists of three parts. The first section consisted of questions related to the socio-demographic characteristics of the participants. The second part of the questionnaire consisted of the DASS-21 Questionnaire to obtain the prevalence and severity of depression, anxiety, and stress.^[13,14]

The third part was related to psychosocial factors. Originally developed by Lovibond and Lovibond, the DASS-21 scale contains 21 questions focusing on symptoms of depression, anxiety, and stress in the past week. Each of the three subscales includes seven items, and each item had four response options: 0 = never, 1 = sometimes, 2 = a lot of the time, 3 = most or all of the time. Higher response values and higher total scores indicate higher levels of experiencing the condition measured. DASS-21 scale categorizes into normal, mild, moderate, severe, and extremely severe forms. The data were entered into an MS Excel spreadsheet, and subsequently, it was analyzed using IBM Statistical Package for Social Sciences (SPSS)

software (version 26.0). Qualitative variables were described using frequency and percentage. A chi-square test was applied to determine the association between different variables. A p-value of <0.05 was considered significant.

Results:

Basic characteristics of participants

The study included an equal number of male and female participants, with 65 individuals in each group. The mean age of the participants was 18.05 (± 0.50) years. Most participants were enrolled from the 11th class, with the vast majority (94.6%) resided in urban areas. Other basic characteristics are depicted in **Table 1**.

Table 1: Basic characteristics of the sample (n=130)

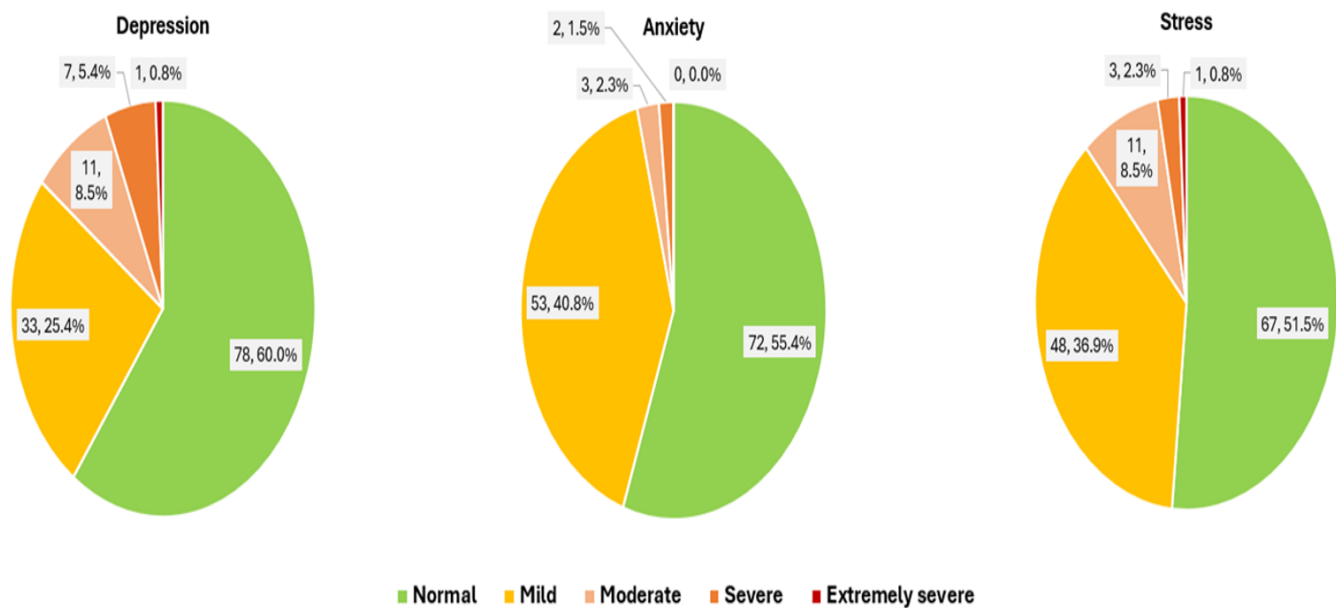
Variable	Category	Frequency	Percentage
Gender	Male	65	50
	Female	65	50
Class	11th	67	51.5
	12th	63	48.5
Age Group (years)	17-18	63	48.5
	>18	67	51.5
Residence	Urban	123	94.6
	Rural	7	5.4
Religion	Hindu	96	73.8
	Muslim	32	24.6
	Christian	2	1.5
Father's Education	Illiterate	1	0.8
	Primary/Middle School	4	3.1
	High School	32	24.6
	Higher Secondary	34	26.2
	Graduate & above	59	45.4
Mother's Education	Illiterate	2	1.5
	Primary/Middle School	15	11.5
	High School	34	26.2
	Higher Secondary	38	29.2
	Graduate & above	41	31.5
Father's Occupation	Govt. Employed	36	27.7
	Private Employed	25	19.2
	Business	56	43.1
	Self-Employed	13	10
Mother's Occupation	Govt. Employed	10	7.7
	Private Employed	12	9.2
	Business	3	2.3
	Self-Employed	3	2.3
	Housewife	102	78.5

Prevalence and severity of depression, anxiety, and stress

In terms of mental health, 40% (52/130) of participants reported experiencing depression,

44.6% (58/130) reported anxiety, and 48.5% (63/130) reported stress. The severity of these conditions, as assessed by the DASS-21, is illustrated in **Figures 1**.

Figure 1: Severity of depression, anxiety, and stress (n=130)



Psychosocial factors

Among the psychosocial factors examined, 38.5% reported experiencing family conflicts, 44.6% perceived financial difficulties, 15.4%

had a family history of mental disorders, 16.9% had experienced the loss of a family member, and 15.4% reported being bullied at school [**Table 2**].

Table 2: Distribution of psychosocial factors among participants (n=130)

Parameter	Present (n, %)	Absent (n, %)
Conflicts in family	50 (38.5%)	80 (61.5%)
Self-perception of financial difficulty	58 (44.6%)	72 (55.4%)
Parental alcohol consumption	50 (38.5%)	80 (61.5%)
History of mental disorder in family	20 (15.4%)	110 (84.6%)
Parental loss	22 (16.9%)	108 (83.1%)
Bullied in school	20 (15.4%)	110 (84.6%)

Associated factors

It was observed that depression was significantly higher among students of higher classes. Similarly, the prevalence of anxiety and stress was higher among students in higher

classes. Though the prevalence of depression, anxiety and stress was higher among females, it was significant for anxiety and stress only. Stress was significantly higher among older students [**Table 3**].

Table 3: Distribution of depression, anxiety and stress across participants' gender, age, and class (n=250)

Variables	Normal	Mild to Extremely severe	p-value [#]
Depression			
Gender			
Male	43 (66.2%)	22 (33.8%)	0.151
Female	35 (53.8%)	30 (46.2%)	
Age (in years)			
17-18	39 (61.9%)	24 (38.1%)	0.667
>18	39 (58.2%)	28 (41.8%)	
Class			
11th	49 (73.1%)	18 (26.9%)	0.002*
12th	29 (46.0%)	34 (54.0%)	
Anxiety			
Gender			
Male	43 (66.2%)	22 (33.8%)	0.014*
Female	29 (44.6%)	36 (55.4%)	
Age (in years)			
17-18	35 (55.6%)	28 (44.4%)	0.970
>18	37 (55.2%)	30 (44.8%)	
Class			
11th	42 (62.7%)	25 (37.3%)	0.044*
12th	30 (47.6%)	33 (52.4%)	
Stress			
Gender			
Male	40 (61.5%)	25 (38.5%)	0.024*
Female	27 (41.5%)	38 (58.5%)	
Age (in years)			
17-18	39 (61.9%)	24 (38.1%)	0.023*
>18	28 (41.8%)	39 (58.2%)	
Class			
11th	44 (65.7%)	23 (34.3%)	0.001*
12th	23 (36.5%)	40 (63.5%)	

[#]Chi-square, *Statistically significant

The association of depression, anxiety, and stress with various psychosocial factors is presented in **Table 4**. It was observed that depression was significantly associated with all

the factors, while anxiety and stress were significantly associated with most of the factors.

Table 4: Association of psychosocial factors with depression anxiety and stress (n=130)

Parameter		Depression		p-value [#]	Anxiety		p-value [#]	Stress		p-value [#]
		Present	Absent		Present	Absent		Present	Absent	
Conflicts in family	Present	35	15	<0.001*	28	22	0.042*	26	24	0.530
	Absent	17	63		30	50		37	43	
Self-perception of financial difficulty	Present	39	19	<0.001*	34	24	0.004*	32	26	0.175
	Absent	13	59		24	48		31	41	
Parental alcohol consumption	Present	37	13	<0.001*	36	14	<0.001*	33	17	0.002*
	Absent	15	65		22	58		30	50	
History of mental disorder in family	Present	15	5	0.001*	12	8	0.144	13	7	0.117
	Absent	37	73		46	64		50	60	
Parental loss	Present	16	6	0.001*	15	7	0.019*	18	4	<0.001*
	Absent	36	72		43	65		45	63	
Bullied in school	Present	16	4	<0.001*	15	5	0.003*	14	6	0.040*
	Absent	36	74		43	67		49	61	
Total		52	78		58	72		63	67	

[#]Chi-square, *Statistically significant

DISCUSSION

The National Mental Health Survey (2015–2016) reported a 7% prevalence of psychiatric disorders in 13–17 years and was nearly equal among both genders.^[3] A meta-analysis reports that 23.3% of school children and adolescents have psychiatric disorders.^[15] Considering these facts, this present study was done to assess the prevalence of depression, anxiety and stress among adolescent school children, with their association regarding various sociodemographic and psychosocial factors. Among the study participants, a prevalence rate of 40% for depression was observed, a

proportion closely aligned with the observations made by Jayashree et al. (40.8%) and Shukla et al. (39.7%).^[4,5] However, notable disparities were noted in the studies conducted by Malik et al. (52.9%), Sandal et al. (65.53%) and Shaikh et al. (54%), which reported substantially higher prevalence rates.^[6-8] The prevalence of depression appears to be evenly distributed between genders, mirroring the findings of The National Mental Health Survey (2015–2016).^[3] Consistent with the observations made by Salekar and Borker, a slightly higher rate of depression was noted

among individuals aged higher, though this difference was not statistically significant.^[9] Our study, similar to research by Sandal et al. and Salelkar et al., identified a heightened prevalence of depression among students in higher classes.^[7,9] The association between older age groups and higher academic performance pressure is evident. Factors contributing to this pressure may include demanding school schedules, heightened parental expectations, suboptimal exam results, ineffective study habits, and insufficient time to address academic priorities. Regrettably, our society tends to overemphasize the outcomes of board exams as the sole measure of a student's academic competence. Consequently, students in these higher classes experience elevated levels of negative mental states, such as depression, anxiety, and stress.^[10]

The prevalence of anxiety among our study participants was 44.6%, which is comparable to the findings of Jayashree et al. (54.7%) and Shaikh et al. (60%).^[5,8] However, Srinivas et al. reported a lower prevalence, with 37% of participants diagnosed with anxiety disorder.^[11] A study from Chandigarh showed a much higher prevalence (80.85%).^[7] Similar to the findings of Kumar et al., anxiety exhibited a notably higher incidence among female students, contrasting with 33.8% of male students experiencing similar symptoms.^[12] Students in the higher academic classes, i.e., class 12th, demonstrated a prevalence of 52.4%, while those in 11th class showed a prevalence of 37.3%. These findings align with previous research by Jayashree et al., who similarly observed heightened anxiety levels among females and individuals aged 15–16 years.^[5] Salelkar and Borker also documented an increased prevalence of anxiety among upper-level classes. However, statistical significance was not established in those studies.^[9]

Among the participants, 48.5% had stress, a trend consistent with the findings of Sandal et al. (47.02%) and Shaikh et al. (44%).^[7,8] Additionally, stress was more prevalent among females, with a statistically significant difference observed compared to male

students. This observation corresponds with the results reported by Sandal et al. and Shaikh et al.^[7,8] Senior students exhibited a higher prevalence of stress compared to their junior counterparts. These findings collectively emphasize the multifactorial nature of stress prevalence among student populations, necessitating targeted interventions to address varying risk factors across demographic subgroups.

Parental conflicts within the family are found to be a significant contributing factor to depression, anxiety, and stress among adolescents. Moreover, depression and anxiety were significantly more prevalent among students who perceived financial difficulties, a finding consistent with the research conducted by Sandal et al.^[7] Poverty presents a multidimensional impact, encompassing challenges such as the inability to fulfil basic needs, limited control over resources, inadequate education, and poor health outcomes.^[7] These factors collectively contribute to the psychological vulnerability of students, rendering them susceptible to depression, anxiety, and stress. Understanding these complex interplays between socioeconomic factors and mental health outcomes is crucial for the development of targeted interventions aimed at mitigating the adverse effects of poverty on adolescent well-being.

The occurrence of adverse events within the family, such as the loss of a family member, exerts a profoundly negative impact on children's mental well-being. Our study underscores this phenomenon, as depression and stress were significantly more prevalent among students who experienced parental loss. Similar findings were documented in a study by Bhasin et al., emphasizing the need for specialized care and support for children coping with recent parental loss.^[10] Both family members and school authorities must demonstrate compassion and provide necessary assistance to children navigating the challenges associated with parental loss. Furthermore, a review conducted by Zgambo et al. corroborates these observations, indicating



that children and adolescents who live without parental figures exhibit elevated levels of depressive symptoms compared to those residing with parental support.^[16] These findings underscore the importance of interventions aimed at addressing the unique needs of children facing familial adversity, ultimately promoting their mental health and well-being.

There exists a direct correlation between parental mental health and the well-being of their children. In our study, we observed a significant prevalence of depression among children with a familial history of mental disorders, a finding consistent with research by Sandal et al.^[10] An observational study conducted by Olsson et al. examined the relationship between parental depression and child mental health, revealing that children of depressed parents were nearly twice as likely to experience mental disorders compared to children of non-depressed parents.^[17] Furthermore, we noted higher rates of depression, anxiety and stress among participants who reported being bullied by their peers or seniors in school. This observation aligns with the findings of a study conducted by Khawaja et al., which demonstrated a significant association between various forms of abuse and bullying with psychological stress.^[18] These findings underscore the complex interplay between social dynamics, such as familial environment and peer interactions, and the mental health outcomes of children and adolescents. Awareness of these relationships is essential for the development of specific interventions aimed at promoting mental well-being and mitigating the adverse effects of adverse social experiences on young individuals.

The interpretation of the study findings must be considered within the context of several limitations. Firstly, the study was restricted to a single school in the city of Indore due to challenges in obtaining permissions from other institutions amid the COVID-19 pandemic,

limiting the generalizability of the results to wider populations. Additionally, the cross-sectional nature of the study prohibits the establishment of temporal associations between variables. Therefore, caution is advised when extending the findings to other contexts or inferring causality.

Conclusion:

This study revealed a high prevalence of depression, anxiety, and stress among adolescents attending school. Given the high prevalence identified, it is essential to implement counseling and guidance programs tailored for school-going adolescents. While existing school health programs address physical health, there is a notable deficiency in addressing psychological and emotional dimensions. School health initiatives should prioritize psychological well-being and incorporate activities fostering coping skills and self-esteem enhancement, such as yoga, meditation, and laughter sessions. Additionally, the inclusion of psychiatrists for regular visits to schools and counselling sessions for parents during parent-teacher meetings is recommended. Given the higher prevalence of depression, anxiety, and stress among girls compared to boys, prioritizing the well-being of female students during this sensitive developmental stage is crucial.

Ethics considerations

This study was approved by the Institutional Ethics Review Committee of Index Medical College (IMCHRC/IEC/2020/80). Prior to the enrollment of participants, explicit permission was obtained from the school principal and management. Additionally, informed consent was acquired from the parents, and informed assent was sought from the participants. The utmost care was taken to maintain the confidentiality and anonymity of the candidates throughout the entire process, including data collection, entry, and analysis

REFERENCES

1. Mental health of adolescents [Internet]. [cited 2024 Jan 28]; Available from: <https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health>
2. Adolescent mental health statistics [Internet]. UNICEF DATA [cited 2024 Sep 22]; Available from: <https://data.unicef.org/topic/child-health/mental-health/>
3. Murthy RS. National Mental Health Survey of India 2015–2016. *Indian Journal of Psychiatry* 2017;59(1):21.
4. Shukla M, Ahmad S, Singh JV, Shukla NK, Shukla R. Factors Associated with Depression among School-going Adolescent Girls in a District of Northern India: A Cross-sectional Study. *Indian J Psychol Med* 2019;41(1):46–53.
5. Jayashree K, Mithra PP, Nair MKC, Unnikrishnan B, Pai K. Depression and Anxiety Disorders among Schoolgoing Adolescents in an Urban Area of South India. *Indian J Community Med* 2018;43(Suppl 1):S28–32.
6. Malik M, Khanna P, Rohilla R, Mehta B, Goyal A. Prevalence of depression among school going adolescents in an urban area of Haryana, India. *International Journal Of Community Medicine And Public Health* 2015;2(4):624–6.
7. Sandal RK, Goel NK, Sharma MK, Bakshi RK, Singh N, Kumar D. Prevalence of Depression, Anxiety and Stress among school going adolescent in Chandigarh. *J Family Med Prim Care* 2017;6(2):405–10.
8. 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;62(4):311–4.
9. Salelkar SS, Borker SA. Prevalence of Depression, Anxiety and Stress among School Going Adolescents and their Relationship to Socioeconomic Status. *Indian Journal of Youth and Adolescent Health* (E-ISSN: 2349-2880) 2020;7(4):8–14.
10. Bhasin SK, Sharma R, Saini NK. Depression, anxiety and stress among adolescent students belonging to affluent families: a school-based study. *Indian J Pediatr* 2010;77(2):161–5.
11. Srinivasa S, Nair CC, L.s R. A study on prevalence of anxiety disorders among higher secondary school students. *Journal of Evolution of Medical and Dental Sciences* 2015;4(26):4473–9.
12. Kumar A, Yadav G, Chauhan N, Bodat S. Prevalence of depression, anxiety and stress among school going adolescents in Delhi: a cross sectional study. *International Journal Of Community Medicine And Public Health* 2019;6(12):5021–6.
- 13.. Lovibond: Manual for the depression anxiety stress scales - Google Scholar [Internet]. [cited 2024 Sep 23]; Available from: [https://scholar.google.com/scholar_lookup?title=Manual+for+the+depression+anxiety+and+stress+scales+\(DASS21\)&author=SH+Lovibond&author=PF+Lovibond&publication_year=1995&](https://scholar.google.com/scholar_lookup?title=Manual+for+the+depression+anxiety+and+stress+scales+(DASS21)&author=SH+Lovibond&author=PF+Lovibond&publication_year=1995&)
- 14.. Ng F, Trauer T, Dodd S, Callaly T, Campbell S, Berk M. The validity of the 21-item version of the Depression Anxiety Stress Scales as a routine clinical outcome measure. *Acta Neuropsychiatrica* 2007;19(5):304–10.
- 15.. Malhotra S, Patra BN. Prevalence of child and adolescent psychiatric disorders in India: a systematic review and meta-analysis. *Child Adolesc Psychiatry Ment Health* 2014;8:22.
16. Zgambo M, Kalembo F, Guoping H, Honghong W. Depression among Chinese children and adolescents: a review of the literature. *International Journal of Child, Youth and Family Studies* 2012;3(4.1):442–57.
17. Olfson M, Marcus SC, Druss B, Alan Pincus H, Weissman MM. Parental depression, child mental health problems, and health care utilization. *Med Care* 2003;41(6):716–21.
18. Khawaja S, Khoja AA, Motwani K. Abuse among school going adolescents in three major cities of Pakistan: is it associated with school performances and mood disorders? *J Pak Med Assoc* 2015;65(2):142–7.