



COMPARATIVE ASSESSMENT OF EMOTIONAL DISTRESS AMONG SCHOOL GOING ADOLESCENT GIRLS USING DEPRESSION, ANXIETY AND STRESS 21 (DASS-21) AND HOSPITAL BASED ANXIETY AND DEPRESSION (HADS) SCALES

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ABSTRACT

Background: Adolescent girls are particularly vulnerable to depression, anxiety, and stress because of rapid biological, psychological, and social changes. Screening for psychosocial-wellbeing and understanding the interrelationship between screening results is a matter of research interest. Present study aims to compare the performance of the Depression Anxiety Stress Scale-21 (DASS-21) and the Hospital Anxiety and Depression Scale (HADS) and assessing socio-demographic predictors of depression and anxiety among school-going adolescent girls. **Methods:** A school-based cross-sectional analytical study was conducted during January–June 2023 among 168 unmarried school going adolescent girls aged 13–19 years using multistage random sampling. Data were collected using a structured questionnaire along with the validated DASS-21 and HADS instruments. **Results:** According to DASS-21, 49.4% of participants had depression, 58.9% had anxiety. HADS identified 72.0% of participants with borderline or abnormal depression and 74.4% with borderline or abnormal anxiety. A significant association was observed between DASS-21 and HADS depression classifications ($\chi^2 = 13.544$, $p = 0.035$), indicating good agreement between the two screening tools. DASS-21 depression, anxiety, and stress scores differed significantly across age groups ($P < 0.001$), whereas HADS depression scores did not show significant age-related variation ($P < 0.001$). **Conclusion:** Both DASS-21 and HADS effectively identified substantial levels of depression and anxiety among adolescent girls and demonstrated significant agreement. DASS-21 provided the additional advantage of assessing stress and appeared more sensitive to age-related variations in emotional distress. Incorporating routine mental health screening using these validated instruments together with psychosocial interventions may be effective for identifying adolescents at risk of developing depression and anxiety.

KEYWORDS: Adolescent girls; Depression, Anxiety and Stress 21 (DASS-21); Emotional distress; Hospital Bases Anxiety and depression (HADS).

INTRODUCTION

Adolescence, defined as the period between 10 and 19 years of age, are vulnerable to psychological disorders. They are characterized by rapid physical, psychological, emotional, and social transitions that influence their lifelong health and well-being. There is growing evidence that mental health disorders with depression

and anxiety contributing substantially constitute a major public health challenge during adolescence and contribute substantially to disability and impaired psychosocial functioning worldwide.^[1,2] In India, where adolescents constitute nearly one-fifth of the total population, the growing burden of mental health problems among school-going girls has emerged as an

important public health concern requiring early identification and preventive intervention.^[3,4] Adolescent girls are particularly vulnerable to psychological distress because of gender-specific biological changes, sociocultural expectations, restricted autonomy, body image concerns, menstrual-related challenges, and greater sensitivity to interpersonal stressors. Previous research has demonstrated higher rates of depressive symptoms, anxiety disorders, emotional dysregulation, and psychosocial stress among girls than boys across both developed and developing countries.^[5,6]

Reliable and valid screening instruments are essential for the assessment of adolescent psychological distress. The Depression Anxiety Stress Scales-21 (DASS-21) is a widely used self-report instrument that measures three related but distinct dimensions of negative emotional states: depression, anxiety, and stress.^[7] The DASS-21 has demonstrated good internal consistency, construct validity, and factorial stability across diverse adolescent and young adult populations, including community, educational, and clinical settings.^[8,9] Recent psychometric studies have confirmed its suitability for screening emotional distress among adolescents and for identifying varying severity levels ranging from normal to extremely severe symptomatology.^[10,11] Another extensively used screening instrument is the Hospital Anxiety and Depression Scale (HADS), originally developed by Zigmond and Snaith to detect anxiety and depressive symptoms while minimizing the influence of physical illness on psychological assessment.^[12]

The HADS consists of 14 items divided equally into anxiety (HADS-A) and depression (HADS-D) subscales and has shown satisfactory reliability and validity in both medical and community populations, including adolescents and young adults.^[13,14]

It is a valid and reliable self-rating scale that measures anxiety and depression in both hospital and community settings. It facilitates the early 'identification of both anxiety and depression simultaneously. Questionnaire was designed to help us know how the participant feels in the recent past week. It was more easy and understandable than DASS-21.

Comparative studies have suggested that while the DASS-21 provides a broader assessment of emotional distress by including a stress dimension, the HADS remains particularly useful for brief screening of anxiety and depressive symptoms in epidemiological and clinical research.^[15,16] DASS-21 provides the additional advantage of assessing stress, whereas HADS offers a brief and practical measure of anxiety and depression, making both instruments valuable in school-based mental health screening programmes. Understanding the interrelationship between screening results by using DASS -21 and HADS scoring tools is a matter of research interest.

Although several Indian studies have examined adolescent mental health, comprehensive evidence regarding the prevalence and psychosocial predictors of depression, anxiety, and stress among school-going adolescent girls in northern India remains limited. Chandigarh, a rapidly urbanizing region with a heterogeneous socioeconomic and educational background with varying levels of family support, provides a unique context for examining adolescent psychological well-being. There is a paucity of literature on comparable comparative studies on psychosocial well-being using DASS-21 and HADS in this part of the country. Therefore, the present study aimed to assess the psychological well-being and socio-demographic predictors of depression and anxiety among school-going adolescent girls. The study attempts two internationally validated psychological screening instruments (DASS-21 and HADS), enabling comparison between assessment methods.

MATERIALS AND METHODS

Study Design and Setting

A school-based cross-sectional analytical study was conducted over a six-month period during January 2023 to June 2023 among adolescent girls aged 13–19 years studying in selected government and private schools in Chandigarh, India. This is part of a detailed findings of academic project submitted for Master of Public Health Program of the first author of the study.

Study Population and Sampling Technique

The study population comprised unmarried school-going adolescent girls enrolled in classes IX–XII and first-year college students within the age range of 13–19 years. Married adolescents, girls outside the specified age group, and participants with incomplete questionnaires were excluded from the study. A multistage random sampling technique was employed. In the first stage, government and private educational institutions were selected from the comprehensive list of schools and colleges in Chandigarh. In the second stage, students were randomly selected from different educational strata (classes IX, X, XI, XII, and first-year college) to ensure adequate representation across age groups and academic levels.

Sample Size

Sample size was calculated using the standard formula for estimating proportions in large populations:

$$n = Z^2 P (1 - P) / d^2$$

Assuming an anticipated prevalence of psychological problems of approximately 60%, a 90% confidence level, and 10% relative precision, the minimum required sample size was estimated to be 168 participants.

Data Collection Tools

Data were collected using a pre-tested structured questionnaire consisting of socio-demographic profile (age, class, family type, socioeconomic status, locality,

and educational background) and other personal characteristics Psychological well-being assessment was done by using two scales namely, Depression, Anxiety and Stress Scale-21 (DASS-21) and Hospital Anxiety and Depression Scale (HADS) described below using standardized questionnaires for this purpose:

- 1. Depression Anxiety Stress Scales-21 (DASS-21):** It is a widely used self-report instrument that measures three related but distinct dimensions of negative emotional states: depression, anxiety, and stress. DASS-21 scale, a validated 21-item instrument assessing depression, anxiety, and stress severity.^[7] Each DASS-21 item was scored on a 4-point Likert scale (0–3), and subscale scores were multiplied by two to obtain final scores comparable with the full DASS-42. Severity categories were classified according to recommended cut-off values for depression, anxiety, and stress.^[7,8]
- 2. Hospital Anxiety and Depression Scale (HADS):** It is used to detect anxiety and depressive symptoms while minimizing the influence of physical illness on psychological assessment.^[16] The HADS consists of 14 items divided equally into anxiety (HADS-A) and depression (HADS-D) subscales and has shown satisfactory reliability and validity in both medical and community populations, including adolescents and young adults.^[13,14] For methodological comparison with other epidemiological studies, the conceptual framework of the HADS was also considered. The HADS contains 14 items, with 7 items assessing anxiety (HADS-A) and 7 assessing depression (HADS-D), each scored from 0 to 3, yielding subscale scores ranging from 0 to 21. Scores of 0–7 indicate normal, 8–10 borderline abnormal, and 11–21 abnormal symptom levels.^[12,14]

Ethical consideration

Prior permission was obtained from the Department of Education, Chandigarh Administration, and from the principals of the participating institutions. Participants

were informed about the objectives, voluntary nature, confidentiality, and anonymity of the study, and written informed consent was obtained prior to data collection.

Statistical Analysis

Descriptive statistics were used to summarize socio-demographic characteristics and psychological outcomes as frequencies, percentages, means, and standard deviations. Chi-square test were used to find association between categorical variables and levels of depression, anxiety, and stress and various other characteristics. Analysis of Variance (ANOVA) was used for comparison of mean scores of DASS-21 and HADS scores according to age, locality and family types. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0.

RESULTS

Table 1 shows the distribution of participants according to the stages of depression, anxiety, and stress (N = 168). According to DASS-21, 50.6 % of the respondents fell into the normal range. 17.3% and 29.8% were in mild and moderate depressive stage. 2.4% fall under the category of severe depressive stage. Regarding depression, approximately half of the participants were in the normal category 85 (50.6%), followed by the moderate category 50 (29.8%), mild category 29 (17.3%), and severe category 4 (2.4%). None of the participants were classified as having extremely severe depression. For anxiety, the largest proportion of participants had normal anxiety levels 69 (41.1%), followed by moderate anxiety 44 (26.2%), severe anxiety 38 (22.6%), mild anxiety 15 (8.9%), and extremely severe anxiety 2 (1.2%).

With respect to stress, the majority of participants had normal stress levels 120 (71.4%), while 35 (20.8%) had mild stress and 13 (7.7%) had moderate stress. No participants were classified as having severe or extremely severe stress in either category.

Table 1: Stages of Depression, Anxiety and Stress of study participants.

Rating	Depression		Anxiety		Stress	
	Frequency	%age	Frequency	%age	Frequency	%age
Normal	85	50.6	69	41.1	120	71.4
Mild	29	17.3	15	8.9	35	20.8
Moderate	50	29.8	44	26.2	13	7.7
Severe	4	2.4	38	22.6	0	0
Extremely Severe	0	0	2	1.2	0	0
Total	168	100.0	168	100.0	168	100.0

Table 2 presents the distribution of participants according to the Hospital Anxiety and Depression Scale (HADS) (N = 168). For depression, the highest proportion of participants was classified as having borderline depression 63 (37.5%), followed by abnormal depression 58 (34.5%), while 47 (28.0%) participants had normal depression scores. Regarding anxiety, 75 (44.6%) participants had abnormal anxiety scores, 50 (29.8%) had borderline anxiety, and 43 (25.6%) had normal anxiety

scores. Highly statistically significant association between familial relationship and depression ($X^2 = 19.738$, $p = 0.003$) as well as anxiety ($X^2 = 19.870$, $p = 0.011$) was observed in this study. However, stress showed a borderline association with familial relationship ($X^2 = 9.218$, $p = 0.056$).

Table 2: Stages of Depression and Anxiety as per HADS.

HADS Score Categories	Depression		Anxiety	
	Frequency	%age	Frequency	%age
Abnormal	58	34.5	75	44.6
Borderline	63	37.5	50	29.8
Normal	47	28.0	43	25.6
Total	168	100.0	168	100.0

Table 3 compares depression ratings obtained using the DASS-21 and HADS. Among participants with normal DASS-21 depression scores, 22 (25.9%) were classified as abnormal, 36 (42.4%) as borderline, and 27 (31.8%) as normal according to HADS. Among those with mild DASS-21 depression, 9 (31.0%) each were categorized as abnormal and normal, while 11 (37.9%) were classified as borderline on HADS. Of the participants with moderate DASS-21 depression, 23 (46.0%) had

abnormal HADS scores, 16 (32.0%) had borderline scores, and 11 (22.0%) had normal scores. All participants with severe DASS-21 depression 4 (100.0%) were classified as abnormal on HADS. A statistically significant association was observed between DASS-21 and HADS depression classifications ($\chi^2 = 13.544$, $p = 0.035$), indicating good agreement between the two screening tools.

Table 3: Association between screening results using DASS-21 and HADS Scores.

DASS-21 Rating	HADS Rating			Total
	Abnormal	Borderline	Normal	
Normal	22	36	27	85
% within DASS Rating	25.90%	42.40%	31.80%	50.6
% within HADS Rating	37.90%	57.10%	57.40%	
Mild	9	11	9	29
% within DASS Rating	31.00%	37.90%	31.00%	17.3
% within HADS Rating	15.50%	17.50%	19.10%	
Moderate	23	16	11	50
% within DASS Rating	46.00%	32.00%	22.00%	29.8
% within HADS Rating	39.70%	25.40%	23.40%	
Severe	4	0	0	4
% within DASS Rating	100.00%	0.00%	0.00%	2.4
% within HADS Rating	6.90%	0.00%	0.00%	
Total	58	63	47	168
	34.5	37.5	28.0	100.0
			$\chi^2 = 13.544$ ($p = 0.035$)	

One-Way ANOVA was used to find the association between and within the group for Stress, Depression and Anxiety as per the score of DASS-21 and also by using sing HADS scale, Table 4 shows the variability in DASS-21 and HADS scores according to age. Significant differences in mean DASS-21 depression

scores ($F = 19.580$, $p < 0.001$), anxiety scores ($F = 14.717$, $p < 0.001$), and stress scores ($F = 14.187$, $p < 0.001$) were observed across age groups. However, no statistically significant difference was found in HADS depression scores according to age ($F = 2.371$, $p = 0.126$).

Table 4: ANOVA table showing variability of Scores using DASS-21 and HADS according to age.

Source of variation		Sum of Squares	df	Mean Square	F	P- Value
Total Score of Depression	Between Groups	561.609	1	561.609	19.580	P<0.001
	Within Groups	4761.337	166	28.683		
	Total	5322.946	167			
Total Score Anxiety	Between Groups	374.827	1	374.827	14.717	P<0.001
	Within Groups	4227.882	166	25.469		
	Total	4602.708	167			
Total Score Stress	Between Groups	381.080	1	381.080	14.187	P<0.001
	Within Groups	4458.896	166	26.861		
	Total	4839.976	167			
Total HADS _Depression score						
	Between Groups	30.856	1	30.856	2.371	P=0.126

	Within Groups	2160.424	166	13.015		
	Total	2191.280	167			

Table 5 presents the variability of DASS-21 and HADS depression scores according to type of family. No statistically significant differences were observed in DASS-21 depression scores ($F = 0.656$, $p = 0.520$) or

HADS depression scores ($F = 0.560$, $p = 0.572$) among different family types, indicating that depression scores did not vary significantly according to family type.

Table 5: ANOVA table showing variability of Scores using DASS-21 and HADS according to type of family.

Source of variation		Sum of Squares	df	Mean Square	F	P-Value
TotalDASS Depression Score	Between Groups	42.022	2	21.011	.656	P=0.520
	Within Groups	5280.925	165	32.006		
	Total	5322.946	167			
Total HADS Depression score	Between Groups	14.771	2	7.386	.560	P=0.572
	Within Groups	2176.509	165	13.191		
	Total	2191.280	167			

Table 6 shows the variability of DASS-21 and HADS depression scores according to locality.

When the means of DASS-21 and HADS were compared according to locality of the respondents as urban/rural both the scales have similar results. The DASS-21 score shows that there is no statistical significance difference between means. Similarly, for HADS score there is no statistical significance difference between the mean. Although the DASS-21 depression score yielded an F

value of 7.315, the reported significance indicates that the difference was not statistically significant. Similarly, HADS depression scores did not differ significantly according to locality ($F = 0.181$, $p = 0.572$). Therefore, locality was not significantly associated with depression scores in the study population.

Table 6: ANOVA table showing variability of Scores using DASS-21 and HADS according to locality.

Source of variation		Sum of Squares	df	Mean Square	F	P-Value
Total DASS Depression Score	Between Groups	224.656	1	224.656	7.315	P=0.520
	Within Groups	5098.290	166	30.713		
	Total	5322.946	167			
Total HADS Depression score	Between Groups	2.387	1	2.387	.181	P=0.572
	Within Groups	2188.892	166	13.186		
	Total	2191.280	167			

DISCUSSION

The present study evaluated depression, anxiety, and stress among school-going adolescent girls in Chandigarh using two standardized psychological screening instruments, namely the Depression Anxiety Stress Scale-21 (DASS-21) and the Hospital Anxiety and Depression Scale (HADS). The findings indicate a considerable burden of psychological distress, with anxiety being the most common emotional problem identified by both instruments. The screening tools (DASS-21 and HADS) indicated that 49.5% were positive for depression, 58.9% for anxiety issues and 28.6% had high stress levels in screening. Younger students belonging to nuclear and extended family rather than joint family were at higher risk of developing depression and anxiety. The study also demonstrated a highly significant association between familial relationships and both depression and anxiety. Strong Significant association was observed between the Scores of two depression measuring scales DASS-21 and HADS. These findings indicate that anxiety and depression are major public health challenges during adolescence in agreement with earlier reports.^[1,2]

According to the DASS-21, approximately half of the participants had normal depression scores, whereas nearly one-half demonstrated mild, moderate, or severe depressive symptoms. The HADS identified an even larger proportion of participants as having borderline or abnormal depression. These findings are consistent with previous studies reporting that depressive symptoms are increasingly common among adolescent girls.^[5,6] Similar observations have also been reported in the National Mental Health Survey of India, which highlighted the increasing burden of common mental disorders among adolescents and young adults.^[3,4]

Anxiety emerged as the predominant psychological problem in the present study. More than half of the participants demonstrated clinically relevant anxiety symptoms according to both DASS-21 and HADS, with HADS classifying nearly three-fourths of the respondents as either borderline or abnormal. These findings corroborate previous epidemiological studies demonstrating that adolescent girls consistently report higher anxiety levels than boys, may be because of hormonal changes, greater emotional reactivity, socio-

cultural expectations, academic competition, and concerns related to future education and career opportunities.^[5,6] The findings also support the requirement of early preventive interventions, need for regular monitoring and psychological support within educational institutions.

No statistically significant differences were observed in depression scores according to family type or locality suggesting that structural characteristics such as urban-rural residence or nuclear versus joint family status may have less influence on adolescent mental health than the quality of family interactions, socioeconomic conditions.

The findings of this study have important public health implications. The high prevalence of anxiety and depressive symptoms among apparently healthy school-going adolescents indicates that many emotionally distressed students remain unidentified in routine school health programmes. The World Health Organization has emphasized integrating mental health promotion, early screening, counselling services, and life-skills education within schools to improve adolescent well-being.^[1,2] Routine screening using validated instruments such as DASS-21 and HADS can facilitate early identification of vulnerable adolescents, enabling timely counselling and referral before symptoms progress to clinically significant psychiatric disorders.

A statistically significant association between depression classifications obtained from the two instruments demonstrates good agreement between the scales despite their conceptual differences. DASS-21 evaluates depression, anxiety, and stress as three distinct but interrelated emotional domains, whereas HADS was specifically developed to identify anxiety and depression while minimizing the influence of somatic symptoms.^[7,12] Previous psychometric studies have demonstrated excellent reliability, construct validity, and internal consistency of both instruments across adolescent and community populations.^[8-16] The present findings further support their usefulness as practical screening tools for identifying adolescents at risk of psychological disorders. Age showed a significant association with DASS-21 depression, anxiety, and stress scores, indicating that emotional distress varied across adolescence. In contrast, HADS depression scores did not differ significantly according to age, suggesting that DASS-21 may be relatively more sensitive in detecting developmental variations in emotional distress among adolescents.

The observed agreement between DASS-21 and HADS further supports the applicability of both instruments in epidemiological studies and community screening programmes. While DASS-21 offers the advantage of simultaneously assessing stress, anxiety, and depression, HADS provides a brief, practical, and easily administered screening tool for anxiety and depression. Their complementary use may therefore improve early

detection of emotional disorders among adolescents in educational settings.

One of the major strengths of the present study was the simultaneous use of DASS-21 and HADS for comprehensive assessment of psychological well-being of girls studying in government and private schools which is still under-represented in mental health research.

Despite several strengths, the study has several limitations. First, its cross-sectional design precludes establishing causal relationships between sociodemographic factors and psychological outcomes. The study also lacks external validity and results derived from specific settings of a particular region can't be generalized to all adolescents or other geographical regions. The study also suffers recall bias, reporting bias and social desirability bias as results are based on self reporting data on sensitive issues. Also, clinical psychiatric evaluation was not performed to confirm screening results. Finally, some of potentially important determinants couldn't be comprehensively examined.

CONCLUSION

The present study demonstrates a significant association between DASS-21 and HADS both successfully identified substantial levels of emotional distress. Depression scores obtained using the two instruments indicate that both are appropriate screening tools for adolescent populations. The observed agreement between DASS-21 and HADS further supports the applicability of both instruments in epidemiological studies and community screening programmes. Their complementary use may therefore improve early detection of emotional disorders among adolescents in educational settings.

Study suggests the need of psychosocial interventions irrespective of demographic characteristics of students. Routine mental health screening using both DASS-21 and HADS should be incorporated into school health services, accompanied by counselling facilities, life-skills education, stress management programmes, and family-based interventions. Strengthening mental health awareness among teachers, parents, and healthcare professionals may facilitate early recognition of emotional problems and reduce the long-term burden of psychiatric disorders in adolescents. School counselling services should be strengthened and referral pathways for adolescents identified as at risk should be established. Additional research comparing the diagnostic accuracies of DASS-21 and HADS is desired for their utility in adolescent mental health screening. Future studies adopting longitudinal study designs with larger and more diverse samples are also desired to examine causal relationships and monitor changes in psychological well-being over time.

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