USING BIRLESON DEPRESSION SELF-RATING SCALE TO MEASURE DEPRESSIVE SYMPTOMS AMONG URBAN ADOLESCENTS IN HANOI, VIETNAM

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This study was conducted to assess the prevalence of depressive symptoms among adolescents using the Birleson Depression Self-Rating Scale (DSRS) and to explore how demographic factors such as gender, grade level, and academic performance influence these symptoms. This is a cross-sectional study involving 996 students from two secondary schools in Hanoi, Vietnam. Participants completed the DSRS, and data were analyzedto calculate the prevalence of depressive symptoms. Associations between depressive symptoms and demographic factors were examined using odds ratios and regression analysis. The overall prevalence of depressive symptoms was 11%. Males reported significantly higher depressive symptoms compared to females (OR=0.52, p < 0.01). Depressive symptoms varied by grade but did not show a significant gradient, with seventh and sixth graders showing slightly lower symptom scores compared to eighth graders. Academic performance was related to depressive symptoms, with students performing poorly showing higher rates of depression, though this was not statistically significant across all levels. The study confirms the utility of the DSRS in detecting depressive symptoms in adolescents and highlights significant gender and academic performance disparities in the prevalence of these symptoms. The findings suggest the need for targeted mental health interventions and school support systems to address the identified risk factors.

Keywords: Depression, Adolescents, Birleson Depression Self-Rating Scale, Mental Health Screening.

I. INTRODUCTION

Depression among adolescents is a critical public health issue that significantly impacts the developmental, social, and academic facets of young lives.[1] Mental health issues account for 13% of the global disease and injury burden among individuals aged 10-19 years, with the majority of these conditions remaining undiagnosed and untreated.[2] With the rising global prevalence and the potential for long-term adverse effects into adulthood, early and accurate detection of depression is paramount. However, one of the primary challenges in addressing adolescent depression effectively is the difficulty in its diagnosis and measurement, given the variability in how depressive symptoms manifest during adolescence.[3,4]

The Birleson Depression Self-Rating Scale (DSRS) is valuable in this context. Developed specifically for children and adolescents, the DSRS facilitates the self-assessment of depressive symptoms, enabling early detection and intervention.[5,6] This scale, comprising 18 items, measures various aspects of depression, such as mood, anhedonia, and cognitive changes, with each item rated on a three-point scale reflecting the frequency of symptoms. This scoring system provides a nuanced view of the depressive experiences of adolescents, making it a widely used tool in both clinical and research settings.

The utility of the DSRS in diverse populations underscores its adaptability and the potential for cross-cultural application, which is crucial given the varying expressions of depressive symptoms across different cultural backgrounds. The scale's sensitivity and specificity have been validated in numerous studies, establishing it as a reliable measure for screening depressive symptoms in young populations.[7]

In Vietnam, a recent epidemiological survey conducted across ten provinces found that about 12% of children suffer from mental disorders. This suggests that nearly 3 million children in the country need mental health interventions.[8] This paper aims to explore the application of the DSRS in measuring depression among adolescents. By examining its effectiveness and the consistency of its outcomes across different demographic groups, this study seeks to reinforce the scale's role in the early detection of depression, thus contributing to better mental health outcomes for adolescents.

II. MATERIALS AND METHOD

1. Study Design and Participants

This cross-sectional study was conducted at two secondary schools in Hanoi, Vietnam, from May to June 2021. Students enrolled in grades 6-9 at two selected secondary schools were eligible to participate in this study, provided they had received consent from both their parents and the schools. The study focused solely on individuals who were considered to be in normal physical health to address mental health concerns specifically. Exclusions from the sample included students absent during the study period, those with incomplete or inaccurate data, or whose parents did not consent to participate. All secondary schools were catalogued, from which two were randomly selected. Subsequently, all students meeting

these criteria were invited to join the study, resulting in a total enrollment of 996 students.

2. Data Collection Procedures

After obtaining necessary approvals from school authorities, informed consent from the parents, and assent from the adolescents, trained researchers administered the DSRS during regular school hours. The scale was presented in Vietnamese, and all instructions were clearly explained to ensure understanding among the participants. Researchers were available to answer any queries from the respondents, ensuring that each item on the DSRS was responded to accurately, reflecting the students' experiences over the past few days.

3. Instrument

The Birleson DSRS consists of 18 items that adolescents respond to based on a 3-point scale: 0 (never), 1 (sometimes), and 2 (often). The items are designed to capture various symptoms associated with depression, such as sadness, irritability, and withdrawal. The total score can range from 0 to 36, with higher scores indicating more severe depressive symptoms. For this study, a cut-off score of 15 was used to identify potential cases of depression, aligning with established practice in previous research.[5] Other variables included gender, grade and latest academic performance.

4. Statistical Analysis

Data were analyzed using Stata version 16.0. Descriptive statistics, including means, standard deviations, and frequency distributions, were used to describe the sample characteristics and the distribution of DSRS scores. The prevalence of depressive symptoms was calculated as the proportion of students scoring 15 or above on the DSRS. Chi-square tests were employed to examine the association between demographic

variables (such as age and gender) and the presence of depressive symptoms. Multivariate logistic and Tobit regressions were used to detect factors associated with depressive symptoms and DSRS scores, respectively. A p-value of less than 0.05 was considered statistically significant for all tests.

5. Ethical approval

The study was approved by the school's Board of Directors as well as by the parents and students participating in the study. The personal information of the students is completely confidential. The study does not cause any harm or affect the students' learning process. All collected information is used solely for research purposes and not for any other purposes.

III. RESULTS

Table 1 presents the demographic characteristics of students from selected secondary schools. The data indicate a relatively balanced gender distribution, with 626 females (55.5%) and 502 males (44.5%). Regarding grade level, the largest group comprises sixth graders, representing 36.3% of the sample, followed by eighth graders at 34.9% and seventh graders at 28.7%. Regarding academic performance, most students (72.4%) are rated as having 'Good' performance. Students with 'Fair' performance represent 19.7%, while those with 'Poor' performance account for 7.0%. A small fraction (0.9%) has an unknown performance status.

Table 1. Demographic characteristics of selected secondary school students

Variable	Category	Frequency	Percent (%)
Gender	Female	626	55.5
	Male	502	44.5
Grade	Sixth	410	36.3
	Eighth	394	34.9
	Seventh	324	28.7
Performance	Good	817	72.4
	Fair	222	19.7
	Poor	79	7.0
	Unknown	10	0.9

Figure 1 and Table 2 present the mean scores of individual items from the Birleson Depression Self-Rating Scale (DSRS) among selected secondary school students. The item "I enjoy the things I do as much as I used to" shows the highest mean score, suggesting that students frequently engaged in preferred activities, indicating a lower prevalence of depressive symptoms related to anhedonia. Conversely, the item "I get tummy aches" has the lowest mean score, implying that this symptom is less commonly reported among the students. Notably, symptoms like "I feel very lonely" and "I feel very bored" also score higher, suggesting these emotional states are more prevalent. The error bars represent the confidence intervals,

indicating the variability and reliability of the mean scores for each symptom reported by the students. The overall Cronbach's alpha for the scale is 0.8269, suggesting the high reliability of the instrument in measuring depressive symptoms among adolescents.

Table 2. Descriptive statistics of the DSRS instrument

Item	Response			Mean	SD	Item-total correlation	Cronbach's alpha if the item is deleted
	0 (%)	1(%)	2 (%)				
I get tummy aches	48.4	48.1	3.5	0.55	0.56	0.3704	0.8260
I feel very lonely	46.5	45.5	8.0	0.61	0.63	0.6443	0.8096
I feel very bored	26.9	57.6	15.5	0.89	0.64	0.6216	0.8112
I have lots of energy	4.8	41.1	54.2	1.49	0.59	0.6206	0.8113
I feel so sad I can hardly stand it	64.7	31.6	3.7	0.39	0.56	0.6180	0.8116
I have bad dreams	52.9	43.5	3.6	0.51	0.57	0.4163	0.8235
I can stick up for myself	3.9	30.6	65.5	1.62	0.56	0.4218	0.8231
I am easily cheered up	2.6	25.1	72.3	1.70	0.51	0.5455	0.8159
I am good at the things I do	2.0	50.5	47.4	1.45	0.54	0.5137	0.8177
I look forward to things as much as I used to	15.8	56.2	28.0	1.12	0.65	0.3028	0.8326
I feel like crying	42.9	47.2	9.9	0.67	0.65	0.5658	0.8152
I feel like running away	74.5	22.4	3.1	0.29	0.52	0.5895	0.8135
I think life isn't worth living	77.6	18.9	3.6	0.26	0.51	0.5209	0.8173
I sleep very well	6.1	25.9	68.0	1.62	0.60	0.4860	0.8199
I like to go out to play	5.5	36.8	57.7	1.52	0.60	0.3685	0.8270
I enjoy my food	1.6	23.3	75.1	1.73	0.48	0.3846	0.8238
I like talking with my family	2.4	27.8	69.8	1.67	0.52	0.6024	0.8128
I enjoy the things I do as much as I used to	5.2	43.5	51.2	1.46	0.59	0.5049	0.8187
Total				19.56	3.47		0.8269

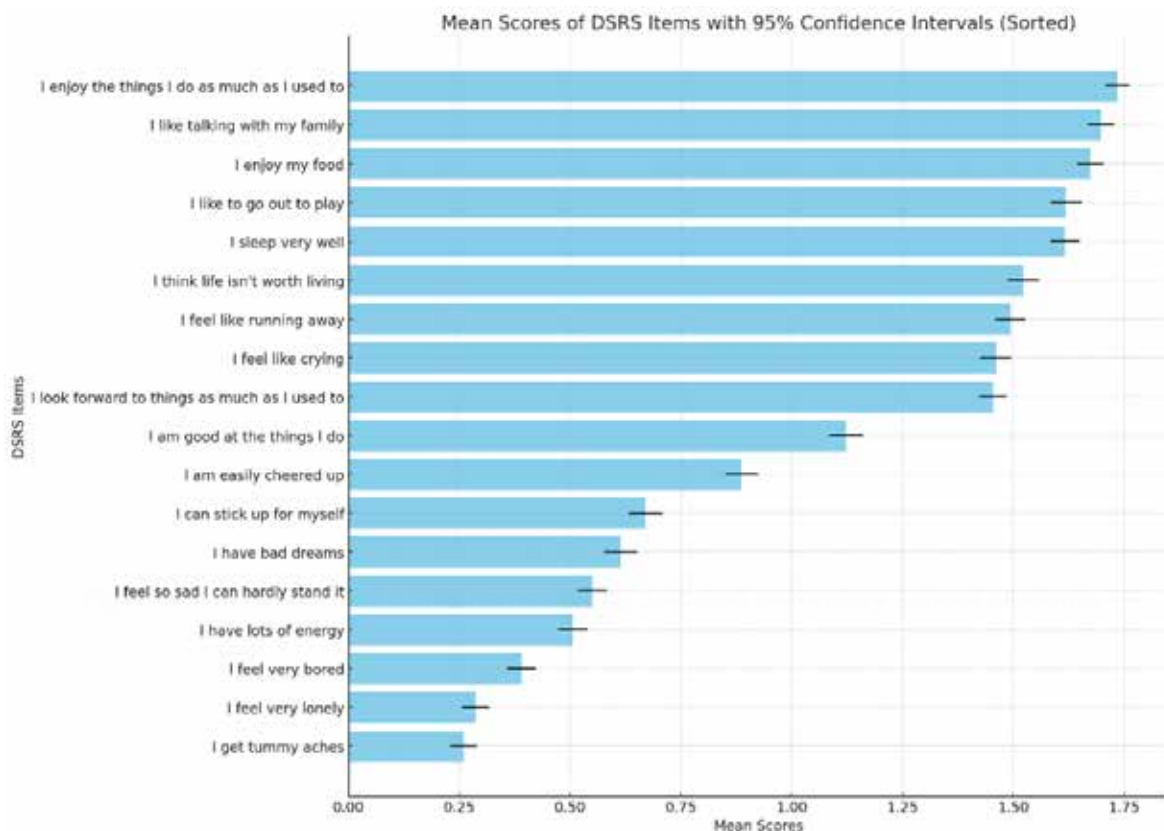Mean Scores of DSRS Items with 95% Confidence Intervals (Sorted)

Table 3 shows that 124 (11.0%) were identified as having depressive symptoms (DSRS ≥ 15). The gender breakdown shows a significant difference, with a higher percentage of males (14.5%) reporting depressive symptoms compared to females (8.1%), and this difference was statistically significant (p-value < 0.01). By grade level, eighth graders showed the highest percentage of depressive symptoms (10.7%), though no significant difference was observed across grades (p-value = 0.857). Academic performance indicates a slight variation in depressive symptoms, with students having "Fair" performance reporting the highest percentage of symptoms (13.5%); however, this was not statistically significant when compared to other performance levels (p-value = 0.48).

Table 3. Depressive symptoms according to different demographic characteristics of selected secondary school students

Characteristics		Depressive Symptoms				p-value
		Yes (DSRS ≥ 15)		No (DSRS < 15)		
		N	%	N	%	
Total		124	11.0	1004	89.0	
Gender	Female	51	8.1	575	91.9	<0.01
	Male	73	14.5	429	85.5	

Characteristics		Depressive Symptoms				p-value
		Yes (DSRS ≥ 15)		No (DSRS < 15)		
		N	%	N	%	
Grade	Eighth	42	10.7	352	89.3	0.857
	Seventh	37	11.4	287	88.6	
	Sixth	45	11.0	365	89.0	
Performance	Fair	30	13.5	192	86.5	0.48
	Good	87	10.6	730	89.4	
	Poor	6	7.6	73	92.4	
	Unknown	1	10.0	9	90.0	

Table 4. Factors associated with depressive symptoms and DBSR score

Characteristics	Having depressive symptoms		DBSR score	
	OR	95%CI	Coef.	95%CI
Gender				
Male	ref		ref	
Female	0.52***	(0.36 - 0.76)	-0.73***	(-1.14 - -0.32)
Grade				
Eighth	ref		ref	
Seventh	0.94	(0.59 - 1.51)	-0.53**	(-1.04 - -0.02)
Sixth	0.99	(0.63 - 1.55)	-0.42*	(-0.89 - 0.06)
Performance				
Fair	ref		ref	
Good	1.20	(0.77 - 1.89)	0.31	(-0.20 - 0.83)
Poor	1.93	(0.77 - 4.84)	-0.43	(-1.31 - 0.46)
Unknown	1.37	(0.17 - 11.31)	-0.04	(-2.22 - 2.14)

*** p<0.01, ** p<0.05, * p<0.1*

Table 4 presents that female students show a significantly lower likelihood of experiencing depressive symptoms compared to males, with an odds ratio (OR) = 0.52 and a confidence interval (95%CI) = 0.36 to 0.76, alongside a decrease in DBSR scores indicated by a coefficient of -0.73 (95%CI: -1.14 to -0.32). In terms of grade, seventh graders exhibit a moderately lower risk and severity of depressive symptoms than eighth graders, as shown by coefficients of -0.53 and -0.42 for seventh and sixth graders, respectively.

IV. DISCUSSION

Our study, utilizingthe Birleson DSRS, reveals insightful findings regarding depressive symptoms among adolescents. We found significant gender differences in the prevalence and severity of depression, with males reporting higher instances of depressive symptoms than females. Grade level also appears to influence depressive symptoms, with lower reports from seventh and sixth graders compared to eighth graders. Academic performance further delineates differences in depressive experiences, although these findings were not statistically significant across all performance levels.

The DSRS has proven to be a reliable and effective tool for measuring depression in adolescents, as evidenced by its internal consistency and the robustness of its item-total correlations. The scale's ability to capture a wide range of depressive symptoms-from somatic complaints like stomach aches to cognitive and emotional states such as feelings of loneliness or boredom-underscores its comprehensive nature. These properties make DSRS a valuable instrument for early identification and intervention in both clinical and educational settings.[7]

Our findings indicate an overall prevalence rate of 11% for depressive symptoms among the adolescent population studied, as determined by DSRS scores of 15 or higher. This figure aligns with global prevalence rates reported in similar age groups but also underscores a critical public health concern.[9] This prevalence highlights the need for vigilant monitoring and proactive interventions within the school environment, where adolescents spend a significant portion of their daily lives.[10] Similarly to our study, a prior survey conducted in Japan involving 2,453 elementary and junior high school children (aged 6 to 15) revealed an average score of 8.75, and the prevalence of emotional disorders was 14.9%.[11] Understanding and addressing the depressive symptoms at this stage is crucial, as adolescence is a formative period during which mental health issues can have long-lasting impacts on educational attainment, social relationships, and overall quality of life.

Current analysis highlights several key factors associated with the presence and severity of depressive symptoms. Consistently across various studies, including our study, males reported higher depressive symptoms than females. This could be attributed to social and cultural expectations that discourage males from expressing emotions or seeking help, potentially exacerbating feelings of depression. The significantly lower DSRS scores among females might reflect either a lower prevalence of depressive symptoms, different coping mechanisms, or under-reporting due to social desirability biases.[12,13] The variation in depressive symptoms across different grades could be linked to the developmental challenges unique to each stage of adolescence. For instance, eighth graders exhibited higher depressive symptoms compared to sixth and seventh graders, possibly due to the increased academic and social pressures often encountered as students prepare for higher education and undergo significant physiological changes. Younger students might have less exposure to such stresses or may be more resilient in some cases.[14]

The identification of factors associated with depressive symptoms has significant implications for developing targeted preventive and therapeutic interventions. Understanding that specific demographics, such as male students and lower academic performers, are at higher risk can help design specific programs

tailored to these groups. Furthermore, the incorporation of routine screening using tools like DSRS in schools can aid in early detection and intervention, potentially mitigating the progression of depressive symptoms.

Despite its strengths, this study has several limitations. The cross-sectional design limits the ability to draw causal inferences between the observed factors and depressive symptoms. Additionally, using self-report measures, while practical, may introduce response biases that could affect the accuracy of the data. Future studies could benefit from longitudinal designs to better understand the progression of depressive symptoms over time and from incorporating multiple sources of information, including parental and teacher reports, to validate and enrich self-reported data.

V. CONCLUSION

The Birleson Depression Self-Rating Scale serves as a potent tool for identifying depressive symptoms in adolescents, with our study highlighting critical demographic and academic factors that correlate with depression. The findings advocate for enhanced mental health resources and tailored intervention strategies within educational frameworks to support at-risk students.

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