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RELATIONSHIP BETWEEN ACADEMIC ACHIEVEMENT AND DEPRESSIVE SYNDROME AMONG MIDDLE SCHOOL STUDENTS IN KENITRA

Nadia Meskini [1]*, Miloud Chakit [2], Mouloud Lamtai [3], Zakaria Ftih [4], Mohammed El aameri [5], Anis Sfendla [6] and Moulay Laarbi Ouahidi [7]

[1,2,3,5,7] Laboratory of Biology and Health, Faculty of Sciences, Ibn Tofail University, Kenitra, Morocco.
[4] Department of Mathematics, Faculty of Sciences, Ibn Tofail University, Kenitra, Morocco.
[6] Higher Institute of Nursing Professions and Health Techniques, Fez, Morocco.
*Corresponding Author Email: nadia.meskini@uit.ac.ma

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Abstract

The mental health of students is a critical factor in their academic success. In this study conducted in educational institutions in Kenitra, Morocco, we examined the relationship between depressive syndromes, anxiety symptoms, and academic performance. We analyzed data from 295 students using the Mini International Neuropsychiatric Interview (MINI), the hospital anxiety and depression scale (HADS), The perceived stress scale (PSS), the Kruskal-Wallis test, the Mann-Whitney U test / T-Student, and Spearman's correlation coefficient. Our findings have significant implications for the field of education. They underscore the importance of early intervention in students' mental health to enhance their academic success. This research provides essential insights for education professionals and policymakers, emphasizing the importance of promoting a healthy school environment and raising awareness about the mental health needs of students. In essence, this study enhances our understanding of the complex links between mental health and academic performance, urging targeted interventions to support students' well-being and improve their educational journey. Our results reveal a significant correlation between the presence of major depressive syndromes and lower academic performance. Additionally, students with moderate anxiety symptoms also exhibited less satisfactory academic performance. These findings highlight the detrimental impact of depression and anxiety on academic achievement.

Keywords: Mental Health, Academic Performance, School Environment, Technology, MINI-Test, HADS-Test, PSS-test, Morocco.

1. INTRODUCTION

Dropping out of school represents a major social problem in Morocco and has remained at the center of the concerns of educators, school administrators, educational psychologists and political decision-makers for several years. However, despite all the efforts and the money invested, it seems that we still have not fully understood this problem which remains a complex phenomenon associated with the presence of numerous risk factors and which generates significant consequences both at the individual and social levels.

In recent decades, depression has become increasingly prevalent among adolescents. Recently, studies examining the relationship between emotional difficulties and school experience have developed [1,2]. Although a deteriorated school experience is observed among students experiencing internalizing disorders, still few researchers associate depression with the risk of dropping out of school among adolescents and even fewer have attempted to identify the mechanisms that link depression at the risk of dropping out, as well as the educational trajectories of young depressed people [3,4]. In today's complex educational landscape, students face a myriad of challenges that extend beyond their academic pursuits. The

undeniable connection between students' mental well-being and their academic performance has sparked significant interest within the fields of education and psychology. This study endeavors to unravel the intricate web of correlations between major depressive syndromes, anxiety symptoms, and the academic achievements of middle school students, grounded in a dataset sourced from the Kenitra Province in Morocco. The research builds upon the extensive body of knowledge highlighting the pivotal role that students' mental health plays in shaping their educational outcomes [5,6]. Employing a robust analytical framework, we examine data from 342 participants, applying the Mini International Neuropsychiatric Interview (MINI), the Hospital Anxiety and Depression Scale (HADS), Kruskal-Wallis Test, Mann-Whitney U Test, and the Spearman's correlation coefficient.

2. MATERIALS AND METHODS

2.1 Participants

This research is founded on the examination of data gathered in the 2021/2022 academic year from numerous middle schools, both public and private, within the Kenitra Province. The sample under investigation encompassed 342 participants, with an average age of 13.64 years and a standard deviation of 1.29. It's noteworthy to mention that one participant had incomplete data, suggesting unanswered questions or left fields. Among the participants, 49.6% were boys, while 50.4% were girls.

2.2 Instruments

2.2.1 The Mini International Neuropsychiatric Interview (MINI)

Depression was also assessed in this study using an interview-based diagnostic tool known as the Mini International Neuropsychiatric Interview (MINI), which is developed in the United States for doctors, clinical research, psychologists and psychiatrists [7]. This standardized validated measurement is compatible with the diagnostic criteria established by the DSM-5. MINI consists of three screening questions and seven main questions, which mostly include "Yes" or "No". Once all questions are posed, the number of yes or no responses are tallied in order to determine the disorder that aligns with the responses given by participant. For this study, the psychometric properties of the MINI are satisfactory in terms of validity [8], faithfulness and sensitivity [9].

2.2.2 The hospital anxiety and depression scale (HADS)

Depression and anxiety were measured in this work using the HADS questionnaires. As known, HADS is a valuable psychological instrument comprised of 2 subscales: HADS for anxiety scale (HADS-A) and HADS for depression scale (HADS-D). Each subscale yields consisted of 7 items which result in a score ranging from 0 to 21 for anxiety and 0 to 21 for depression, respectively. Higher levels of anxiety and depression were associated by an increasing HADS-A/HADS-D score. The anxiety/Depression severity was divided into three categories: 0 to 7 = normal, 8 to 10 = borderline abnormal and 11 to 21 = abnormal (case) [10].

2.2.3 The perceived stress scale (PSS)

To evaluate stress level in the teachers in this study, the PSS questionnaire [11] was used. PSS is a scale that assesses the frequency with which life (or work) situations are generally perceived as "threatening, unpredictable, uncontrollable and distressing". It is based on a 5-point Likert scale ranging from 1 (= never) to 5 (= very

often), with a range of 0 to 40 which are obtained by adding up all the elements on the scale. It was approved that the “low perceived stress” is indicated by score of 0–13, 14–26 is indicated as “moderate” and 27–40 as “high perceived stress” [12].

2.2.4 Additionally, academic performance was assessed using grades from the second semester of the 2020/2021 school year.

We selected the outcomes from the second semester of the preceding year since they correspond closely to the period when we administered our questionnaire to students. This choice aligns with our utilization of a cross-sectional study methodology.

2.3 Statistical Analysis

Data processing was carried out using SPSS software (IBM SPSS Statistics 21), involving standard descriptive analyses like mean and standard deviation. In addition, to assess the relationship between the MINI and HADS instruments concerning academic performance, we employed the Mann-Whitney U Test, the Kruskal-Wallis Test, and Spearman's Correlation Test.

2.4 Ethical considerations

To conduct this study, prior authorization was obtained for data collection. Additionally, each student has the autonomy to decide whether they wish to participate in the questionnaire and can withdraw at any time without facing any adverse consequences. In order to encourage candid responses, all students are kindly requested not to disclose their identity while answering.

3. RESULTS

3.1 Comparative Analysis of Middle School Student Academic Performance Based on MINI Threshold

This table compares middle school students' academic performance based on the presence or absence of major depressive syndrome, determined by the MINI threshold.

Students without major depressive syndrome (210) had an average performance of 14.955 with a standard deviation of 2.624.

Students with the syndrome (107) had a slightly lower average performance of 13.937 with a standard deviation of 2.946.

The Mann-Whitney U Test / T-Student yielded a statistically significant difference (p-value = 0.002), indicating that the presence of major depressive syndrome is associated with lower academic performance among middle school students.

Table 1: Academic performance comparison in relation to the presence of major Depressive. Syndrome

	MINI-Threshold						Mann-Whitney U Test / T-student	
	Absence of major depressive syndrome			Presence of major depressive				
	Number	Average	Standard Deviation	Number	Average	Standard Deviation	*U*	*P-value*
Academic performance	210	14,955	2,624	107	13,937	2,946	8871,500	0,002

Table 2: Academic Performance Comparison in Relation to the Presence of Major Depressive Syndrome by gender

	MINI-Threshold						Mann-Whitney U Test / T-student	
	Absence of major depressive syndrome			Presence of major depressive				
	Number	Average	Standard Deviation	Number	Average	Standard Deviation	U	P-value
Academic performance Boys	119	14.52	2.521	33	13.092	3.021	1411.5	0.014
Academic performance Girls	91	15.524	2.662	73	14.319	2.872	2446	0.004

Table 3: Academic performance comparison in relation to the presence of major Depressive Syndrome by type of school

	MINI-Threshold						Mann-Whitney U Test / T-student	
	Absence of major depressive syndrome			Presence of major depressive				
	Number	Average	Standard Deviation	Number	Average	Standard Deviation	*U*	*P-value*
Academic performance Public	113	13.074	2.518	72	12.423	2.602	3462.5	0.088
Academic performance Private	94	16.361	1.663	34	16.038	1.985	1433	0.373

3.2 Comparative Analysis of Academic Performance Based on HADS-Depression and HADS-Anxiety Domains

3.2.1 Comparison using the Kruskal-Wallis Test at a P-value of 0.05

This table explores the relationship between levels of depression and anxiety symptomatology, assessed through the HADS-Depression and HADS-Anxiety domains, and students' academic performance. The Kruskal-Wallis test results indicate significant differences:

Students without depression or anxiety symptomatology achieved the highest academic performance.

Levels of doubtful depression and anxiety symptomatology showed a negative impact on academic performance.

Levels of certain depression and anxiety symptomatology also demonstrated a negative influence on academic performance.

The Kruskal-Wallis test results revealed statistically significant differences for depression (p-value = 0.000) and anxiety (p-value = 0.010), suggesting that the presence of depressive and anxious symptoms is associated with lower academic performance among students.

Table 4: Academic performance based on levels of depression and anxiety symptomatology using the Kruskal-Wallis test

	Academic Performance			*Kruskal wallis - Test*	
	Number	**Mean**	**Standard Deviation**	***Chi-square***	***P - value***
HADS-Depression					
No depression symptomatology	171	14.743	2.748	16.159	0.000
Doubtful depression symptomatology	71	13.249	2.593		
Certain depression symptomatology	49	13.768	2.909		
HADS-Anxiety					
No anxiety symptomatology	153	14.607	2.769	10.851	0.004
Doubtful anxiety symptomatology	75	14.115	2.548		
Certain anxiety symptomatology	66	13.236	3.050		

Table 5: Academic performance Based on Levels of Depression and Anxiety Symptomatology Using the Kruskal-Wallis Test by sexe/gender

	Academic Performance			*Kruskal wallis - Test*	
	Number	**Mean**	**Standard Deviation**	***Chi-square***	***P - value***
HADS-Depression- Boys					
No depression symptomatology	97	14.162	2.696	6.376	0.041
Doubtful depression symptomatology	30	13.054	2.553		
Certain depression symptomatology	11	12.595	2.772		
HADS-Depression- Girls					
No depression symptomatology	74	15.504	2.645	16.102	0
Doubtful depression symptomatology	41	13.392	2.645		
Certain depression symptomatology	38	14.107	2.893		
HADS-Anxiety- Boys					
No anxiety symptomatology	85	14.106	2.624	4.033	0.133
Doubtful anxiety symptomatology	31	13.535	2.499		
Certain anxiety symptomatology	20	12.811	3.183		
HADS-Anxiety- Girls					
No anxiety symptomatology	68	15.234	2.836	10.48	0.005
Doubtful anxiety symptomatology	44	14.523	2.531		
Certain anxiety symptomatology	45	13.408	3.04		

Table 6: Academic performance based on levels of depression and anxiety symptomatology using the Kruskal-Wallis Test by type of school

	Academic Performance			*Kruskal Wallis - Test*	
	Number	**Mean**	**Standard Deviation**	***Chi-square***	***P - value***
HADS-Depression- Public					
No depression symptomatology	94	13.323	2.624	5.645	0.059
Doubtful depression symptomatology	52	12.366	2.172		
Certain depression symptomatology	30	12.425	2.651		
HADS-Depression-Private					
No depression symptomatology	77	16.476	1.712	3.369	0.186
Doubtful depression symptomatology	19	15.667	2.088		
Certain depression symptomatology	19	15.888	1.868		
HADS-Anxiety- Public					
No anxiety symptomatology	85	13.268	2.717	7.379	0.025
Doubtful anxiety symptomatology	46	12.945	2.178		
Certain anxiety symptomatology	48	12.038	2.487		

HADS-Anxiety- Private					
No anxiety symptomatology	68	16.28	1.74	0.795	0.672
Doubtful anxiety symptomatology	29	15.97	1.93		
Certain anxiety symptomatology	18	16.431	1.901		

3.2.2 Comparison using the Mann-Whitney U Test at a P-value of 0.016 (0.05/3)

This chart explores the relationship between symptoms of depression and anxiety, assessed by the HADS-Depression and HADS-Anxiety domains, and academic performance. The results indicate:

Students without symptoms of depression have better academic performance than those with uncertain symptoms.

The presence of symptoms of depression is associated with lower academic performance (p-value = 0.000).

Students without symptoms of anxiety perform better than those with definite symptoms.

The presence of symptoms of anxiety is also linked to lower academic performance (p-value = 0.003).

In summary, the presence of symptoms of depression and anxiety is correlated with lower academic performance, with statistically significant differences between the groups, highlighting the negative impact of mental health on academic performance.

Table 7: Academic performance based on levels of depression and anxiety symptomatology using the Mann-Whitney U test

	HADS-Depression						Mann-Whitney U Test / T- student	
	No depression symptomatology			Doubtful depression symptomatology				
	Number	Average	Standard Deviation	Number	Average	Standard Deviation	*U - Value*	*P - Value*
Academic Performance	173	15,084	2,763	72	13,656	2,469	42,68,500	0,000
	HADS-Anxiety							
	No anxiety symptomatology			Certain anxiety symptomatology				
	156	14,921	2,697	66	13,710	2,995	38,43,500	0,003

Table 8: Academic performance based on levels of depression and anxiety symptomatology using the Mann-Whitney U test by gender

	HADS-Depression- Girls						Mann-Whitney U Test / T-student	
	No depression symptomatology			Doubtful depression symptomatology				
	Number	Average	Standard Deviation	Number	Average	Standard Deviation	*U - Value*	*P - Value*
Academic Performance	74	15.504	2.645	41	13.392	2.645	880.5	0
	HADS-Depression- Girls						Mann-Whitney U Test / T-student	
	No depression symptomatology			Certain depression symptomatology				
	Counts	Average	Standard Deviation	Counts	Average	Average	*U - Value*	*P - Value*
	74	15.504	2.645	38	14.107	2.893	984.5	0.007
	HADS-Anxiety- Girls							
	No anxiety symptomatology			Certain anxiety symptomatology				
	68	15.234	2.836	45	13.408	3.04	1027.5	0.002

Table 9: Academic Performance Based on Levels of Depression and Anxiety Symptomatology Using the Mann-Whitney U Test By type of school

	HADS-anxiety- Public						Mann-Whitney U Test / T-student	
	No anxiety symptomatology			Certain anxiety symptomatology				
	Number	Average	Standard Deviation	Number	Average	Standard Deviation	*U - Value*	*P - Value*
Academic Performance	85	13.268	2.717	48	12.038	2.487	1499.5	0.011

3.3 Relationship between Academic Performance and Stress Levels

This table presents the results of a correlation analysis between two variables: "Moy - S2 - Last - Year" (Mean of the second semester of the previous year) and "PSS-Total-Score" (Total score on the PSS questionnaire, which assesses perceived stress levels). The Spearman's Rho correlation coefficient is -0.219, indicating a negative correlation between these two variables. In other words, there is an inverse relationship between the mean of the second semester of the previous year and the total score on the PSS questionnaire. When the mean of the second semester increases, the perceived stress score decreases, and vice versa.

The p-value (Two-Tailed Significance) is 0.000, which is less than 0.01. This means that the correlation is statistically significant at the 0.01 level (two-tailed). In other words, there is a strong likelihood that the observed correlation is not due to chance.

Table 10: Correlation between Academic Performance (Last Year) and Perceived Stress (PSS-Total-Score)

			Academic performance
Spearman's Rho	PSS-Total-Score	Correlation Coefficient	-,219**
		Two- Tailed Significance	,000
		Counts	295
** Correlation is significant at the 0,01 level (two-tailed).			

Table 11: Correlation between Academic Performance (Last Year) and Perceived Stress (PSS-Total-Score) by gender

Gender	Academic performance		
Male	PSS score	Pearson correlation	-,161
		Significance	,054
		N	144
Female	PSS score	Pearson correlation	-,331**
		Significance	,000
		N	151
** Significant correlation at the level 0.01.			

Table 12: Correlation between Academic Performance (Last Year) and Perceived Stress (PSS-Total-Score) by type of school

Type of school	Academic Performance		
Public	PSS score	Pearson correlation	-,187*
		Significance	,012
		N	179
Private	PSS score	Pearson correlation	-,076
		Significance	,421
		N	114
* Significant correlation at the level 0.05.			

4. DISCUSSION

The mental health of students is a critical factor in their academic success. In this study conducted in educational institutions in Kenitra, Morocco, we examined the relationship between depressive syndromes, anxiety symptoms, and academic performance. We analysed data from 295 students using the Mini International Neuropsychiatric Interview (MINI), the hospital anxiety and depression scale (HADS), The perceived stress scale (PSS), the Kruskal-Wallis test, the Mann-Whitney U test / T-Student, and Spearman's correlation coefficient.

Several authors agree on the use of a categorization which makes it possible to account for different degrees of severity of depression [13,14]. We can make a distinction between depressive, depressive syndrome and major depressive disorder. Depressed mood is relatively common in most people and is mostly temporary sadness or irritability. In scientific writings, it is generally assessed using a single item. It occurs in 20% to 35% of adolescents and 25% to 40% of adolescent girls [15].

When several symptoms are observed and they present with a certain intensity, we then speak of a depressive syndrome. This is often assessed using cutoff scores on self-reported measures. Between 10% and 25% of adolescents present with a depressive syndrome [16]. In Quebec, 16% of adolescents aged 12 to 17, or 10% of boys and up to 25% of girls, present with a depressive syndrome [13]. It appears that the presence of a depressive syndrome in adolescence is a strong predictor of major depression in adulthood [17].

Several animal models are used in the study of the impact of stress in the cognitive function [18-22].

Our comprehensive analysis uncovers a tapestry of compelling connections between the presence of major depressive syndromes, anxiety symptoms, and the academic performance of middle school students in the Province of Kenitra. These discoveries corroborate and expand upon existing research, underscoring the substantial influence of students' mental health on their academic accomplishments [2, 23 ,24]. Notably, the presence of major depressive syndromes is demonstrated to be inversely related to academic performance, substantiating prior investigations into this domain [11, 25]. Furthermore, our findings expose substantial correlations between perceived stress levels and academic performance, emphasizing the urgency of instituting stress management strategies within educational programs [27-29].

These results show a significant correlation between the mean of the second semester of the previous year and the level of perceived stress. A higher mean is associated with a lower level of perceived stress, and this correlation is statistically significant. Also, there is a difference in this relation according to gender and type of school [30-34].

Many risk factors have been associated with depression in adolescents. These are biological, personal, family and academic in nature [35-38]. First, having a parent who is themselves depressed is a predictor of depression during childhood and adolescence. In families where one member is depressed, there are more problems with communication, cohesion, support and educational practices [39,40]. Also, experiencing stressful events seems associated with depression and it would be more harmful to experience them simultaneously than sequentially [11,41].

Our results reveal a significant correlation between the presence of major depressive syndromes and lower academic performance. Additionally, students with moderate anxiety symptoms also exhibited less satisfactory academic performance. These findings highlight the detrimental impact of depression and anxiety on academic achievement.

5. CONCLUSION

In conclusion, this study advances our comprehension of the intricate nexus involving mental health, stress, and academic accomplishments among middle school students. The implications of our findings are profound and serve to emphasize the imperative consideration of students' mental health in the design of educational initiatives. To enhance students' academic triumphs, the implementation of strategies aimed at stress management is paramount. Moreover, the identification and support of students requiring mental health assistance should be integrated into the educational ecosystem. These recommendations are fortified by recent investigations within the field that accentuate the pivotal role of stress in shaping academic success and advocate for tailored interventions.

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