A Comparative Study of the Perceived Stress Levels and Sources of Stress among STEM and Conventional Students in Egypt

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Abstract

Egypt's educational system, comprising public and private institutions across all levels, faces multiple issues affecting its quality, equity, and relevance. A recent study by Egypt's Ministry of Health identified that 29.8% of high school students experience mental health problems like anxiety, speech defects, depression, stress and tension, emphasizing the significance of addressing such concerns. Therefore, we aimed to conduct a random sample study of 130 students from the STEM and conventional educational systems in Egypt to compare their perceived stress levels. An online Arabic questionnaire was shared with the targeted population over a period of two weeks. The questionnaire included inquiries about academic and demographic information as well as the Perceived Stress Scale (PSS-10). Respondents were asked about their personal information, academic performance, extracurricular activities, average studying hours, and perceived stress levels. The PSS-10 assessed stress levels based on questions covering coping, control, unpredictability, and overload. Statistical analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 25. Major findings revealed that STEM students suffer from higher stress levels than conventional students, mainly due to fewer hours of sleep. Additionally, significant differences were found in stress levels between male and female students across the sample. These findings underscore the need to address academic pressures and establish appropriate mental health screening in STEM schools to mitigate negative emotional effects. They are crucial in developing effective strategies for minimizing student stress levels, and educational institutions should utilize this data to assess their curriculum and make any necessary changes.

Keywords: Perceived stress scale, STEM education, Conventional education, Sleep hours, Extracurriculars

I. Introduction

As we navigate through the academic jungle, it's no secret that we may encounter academic-related stress, which is an aspect of most Egyptian students' life. A new study published by Egypt's Ministry of Health reveals that 29.8% of high-school students suffer from anxiety, tension, speech defects, or depression disorders. Deadlines, parental and societal pressure, desire for perfection, and poor time management are among the most common causes of stress among high school students.

Egypt's educational system is one of the biggest in Africa and the Middle East, comprising both public and private institutions at primary, preparatory, secondary, and tertiary levels. Despite governmental efforts to improve education, however, the system continues to be riddled with several problems that

negatively affect overall mental health among students. Egypt's high school system offers diverse programs geared toward career fields, including general, vocational, and technical education.

Despite the significant efforts in the field of educational psychology, no previous studies- to the best of our knowledge- have addressed the difference between stress levels among STEM schools students in Egypt and conventional schools, taking into account the learning system, the social interactions, extracurriculars, personal habits, and extra projects and tasks.

Therfore, this study aims to compare the prevalence of perceived stress among two major educational systems in Egypt, STEM high schools and conventional high schools, as they differ in academic advancement levels, curriculum, teaching methods, extracurriculars, skills, and knowledge they aim to impart. As well as determining and analyzing possible demographic and academic factors related to stress levels among both populations.

The methodology involved conducting an online Arabic survey asking for necessary demographic and academic information as well as the ten questions of the Perceived stress scale. Data were collected from 130 respondents, including males and females, STEM and non-STEM students, various academic levels, and educational grades. Data were analyzed to examine the difference in stress levels between both populations and the significance of association between stress levels and other variables.
Ensuring that the study is designed ethically and fairly to benefit students and educational institutions in Egypt, we will ensure that the findings and results of the study can be practically implemented in educational administrations.

Hypotheses

Null Hypothesis (1): There will be no statistically significant difference between STEM educational system's students and the conventional educational system's students regarding perceived stress levels.

Null Hypothesis (2): There will be no statistically significant difference between males and females regarding perceived stress levels.
Null Hypothesis (3): There will be no statistically significant difference between different educational grades (Grades 10 & 11 & 12) in terms of perceived stress levels.

II. Literature Review

Intensive research and experiments have been conducted to find the relation between academic performance and stress (including psychological, physical, social, and academic stress). Previous research has indicated a significant negative impact of stress on academic performance, which was roughly equal between males and females, ensuring that teachers play a vital role in reducing stress among their students [1]. Indirect stress may develop due to task load requirements [2], and stressed students tend to be slower and more considerate in their actions [3]. Stressors are widely spread among secondary school students in boarding schools; specifically, about 44.9% of pupils experience academic-related stressors [4].

To reduce levels of stress, experiments have been conducted on the effect of extracurriculars on reducing the amount of stress among high school students, and the results showed that students who participate in extracurricular activities show fewer levels of stress and worry [5]. Other studies showed that participation in extracurricular activities moderates the relation between academic related stress and coping and positively influences well-being [6]. Further approaches to reduce stress levels among students include developing social interactions with family, friends, and society. A preceding study has indicated that levels of stress among high school students were significantly predicted by family support, whilst levels of depression were significantly predicted by friends' support [7]. Another study comparing between conventional and boarding schools concerning their social activities has indicated that conventional

school students showed higher levels of peer-group integration than students from boarding schools, on the other hand, boarding school students showed higher success in gaining autonomy from parents and forming romantic relationships [8].

III. Methodology

1. Participants

This research employs a mixed online survey that lasted for two sequential weeks starting from the 11th of August, 2023. It was used to obtain data from a random sample of students from both the conventional educational system and STEM educational system in Egypt. 130 anonymous responses were collected from various high schools and localities in Egypt.

2. Measurements

2.1. Demographics

Respondents were asked to fill in their personal information, including birth date, gender, and average sleeping hours.

2.2. Academic Information

Respondents were asked about their academic performance, extracurricular activities during school months, average studying hours, educational system, educational level, as well as their academic grades.

2.3. Perceived Stress Scale (PSS-10)

The perceived stress scale (PSS) is a structured questionnaire used for assessing the level of stress that a population or a sample of it faces during a specific period. The test includes ten questions that cover topics such as coping, control, unpredictability, and overload. Questions such as " In the last month, How often have you felt that you were unable to control the important things in your life? " were asked, and the respondent was required to give an answer on a scale from 0 (Never) to 4 (Very Often). The final score will be the sum of the scores of each question by reversing the scores of questions 4, 5, 7, and 8. Where in these four questions, a score of 4 is actually 0, 3 is 1, 2 is 2, 1 is 3, and 0 is 4. A final score of 0-13 indicates low stress levels, 14-26 indicates moderate stress levels, and 27-40 indicates that the respondent suffers from severe stress.

3. Procedures

In order for the data to be collected effectively, a structured online validated Arabic questionnaire of multiple choice questions was done using Google Forms. It was accessible to the targeted populations and sent to them via social media and mail platforms, for instance, WhatsApp and Microsoft Outlook. Daily reminders for filling out the form were sent as well.
Participants' responses, which included concise/clear answers for the demographic, academic information, and PSS-10 sections, were recorded. Two weeks later, data were collected and begun to be analyzed.

4. Data collection and instrumentation

The collected data represented the score of stress of each individual, as well as other necessary information for testing the hypotheses. All analytic processes were done using the Statistical Package for the Social Sciences (SPSS) version 25 tool. Descriptive statistics tests were done to determine similarities and differences among both populations. *Table [1]* shows statistical methods used to compare between both populations (STEM & non- STEM). *Table [2]* shows statistical methods used to determine the relation between different demographic/ academic variables and stress scores.

Table [1]: Statistical tests used to compare between STEM & non- STEM.

Variable	Statistical Test	Variable	Statistical Test
Age	Independent sample t-test	**Stress Score**	Independent sample t-test
Educational Level	Chi-Square test	**Sleeping Hours**	Chi-Square test
Gender	Chi-Square test	**Studying hours**	Chi-Square test

Number of extracurriculars	Mann-Whitney test	**Categories of extracurriculars**	Mann-Whitney test
Academic performance	Chi-Square test		

Table [2]: Statistical tests used to determine the relation between different demographic/ academic variables and stress scores.

Relation	Dependent Variable	Independent variable	Statistical Test
Gender * Stress score	Stress Score	Gender (Males & Females)	Independent sample t-test
Educational level * Stress score	Stress Score	Educational Level (Grades 10 & 11&12)	One way ANOVA
Sleeping hours * Stress score	Stress Score	Sleeping hours (< 4) & (4-8) & (> 8)	One way ANOVA Post Hoc tests – Tamhane test.
Studying hours * Stress scores	Stress Score	Studying hours (< 6) & (6-12) & (> 12)	One way ANOVA
Categories of extracurriculars * Stress score	Stress Score	Number of different categories of extracurriculars (1-7)	Spearman's correlation coefficient test
Number of extracurriculars * Stress Score	Stress Score	Number of extracurriculars	Spearman's correlation coefficient test
Educational system * Stress score	Stress Score	Educational System (STEM & non-STEM)	Independent sample t-test

IV. Results

1. Demographic Analysis

A total of 130 responses were collected from conducting the online survey. Respondents included 83 females (64%) and 47 males (36%). STEM students represented 61% (79 students), while conventional (non- STEM) students represented 39% of respondents (51 students). The academic performance of the majority of respondents (92 students) ranged between 80-89%, 34 students ranged between 90-100%, while only 4 students were between 70-79%. Most of the respondents (92 students, 71%) aged between 15- and 17-years *Fig. (1).* 69% of respondents (90 students) were in grade 11, 20% (26 students) were in grade 12, while 11% (14 students) were in the 10th grade. Average sleeping hours for most of the students (116 students, 89%) ranged between 4-8 hours/day, while average studying hours for the majority of students (73 students, 56%) was less than 6 hours/ day *Fig. (1).*

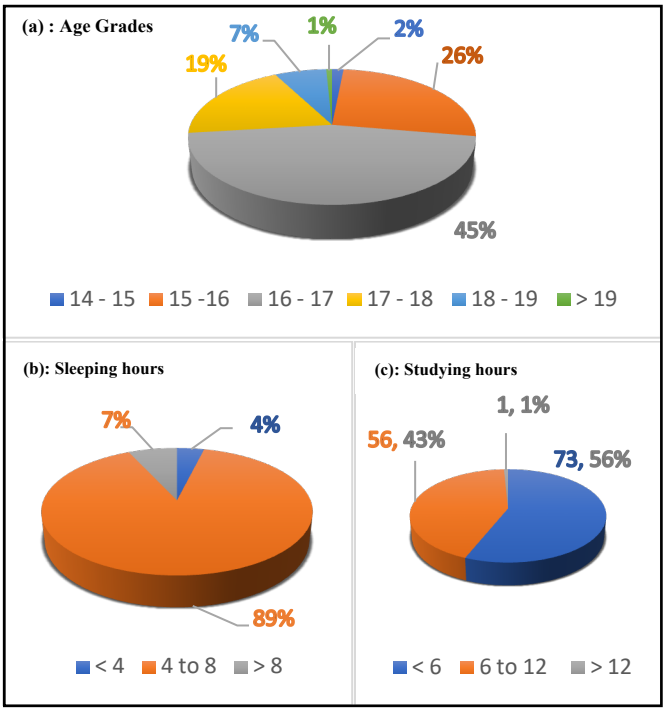

Fig. (1)

Fig. (1): Demographic Information

(a): The distribution of recorded age grades of the sample. 2 students were aged between 14 – 15 years, 34 students were between 15 – 16, 59 students were between 16 – 17, 25 were aged between 17 – 18, 9 students were between 18 – 19, and only one student was above 19 years. **(b):** Shows the average sleeping hours among students. 5 students used to sleep less than 4 hours/day during school months, 116 students used to sleep 4 to 8 hours/day, while 9 students used to sleep more than 8 hours/day. **(c):** This pie chart illustrates the average studying hours of the two populations. Only one student used to study more than 12 hours/day, 56 students used to study 6 to 12 hours/day, while 73 students used to study less than 6 hours/day.

Table [3] below indicates that there was no statistically significant difference between age, gender, educational grade, and studying hours between both populations. However, there was a statistically significant difference between academic performance, sleeping hours, number of extracurricular activities, and the variety of their categories.

Table [3]: Demographic information comparison between both educational systems.

	STEM	Non-STEM	P value *
Age (mean ± SD)	16 ± 0.925	16 ± 0.947	0.979
Gender (M/F)	30/49	17/34	0.591
Grade (grade 1/2/3)	11/54/14	3/36/12	0.300
Academic performance • **A (90-100%)** • **B (80-89%)** • **C (70-79%)**	 10 69 0	 24 23 4	< 0.001
Study hours • **< 6 hours** • **6-12 hours** • **>12 hours**	 38 40 1	 35 16 0	0.060
Sleep hours • **< 4 hours** • **4-8 hours** • **> 8 hours**	 3 75 1	 2 41 8	0.007
Activity categories • **None** • **1** • **2** • **3** • **4** • **5** • **6** • **7**	 1 8 5 14 18 13 10 10	 6 18 11 7 4 2 1 2	< 0.001
Number of activities (mean rank)	76.65	46.59	< 0.001

*The mean difference is significant at the 0.05 level.

2. Perceived stress scale Responses

Table [4] below shows the responses of 130 students to the perceived stress scale questionnaire, the questions from 1 – 10 correspond to the validated PSS -10 copy.

Table [4]: PSS – 10 responses

Question Number (Count, Percent)	0 (Never)	1 (Almost Never)	2 (Sometimes)	3 (Fairly Often)	4 (Very Often)
Question 1	5 (3.8%)	11 (8.5%)	45 (34.6%)	46 (35.4%)	23 (17.7%)
Question 2	5 (3.8%)	14 (10.8%)	29 (22.3%)	53 (40.8%)	29 (22.3%)
Question 3	2 (1.5%)	6 (4.6%)	20 (15.4%)	45 (34.6%)	57 (43.8)
Question 4	9 (6.9%)	24 (18.5%)	49 (27.7%)	28 (21.5%)	20 (15.4%)
Question 5	14 (10.8%)	51 (39.2%)	45 (34.6%)	17 (13.1%)	3 (2.3%)
Question 6	4 (3.1%)	14 (10.8%)	32 (24.6%)	57 (43.8%)	23 (17.7%)
Question 7	17 (13.1%)	32 (24.6%)	55 (42.3%)	19 (14.6%)	7 (5.4%)
Question 8	19 (14.6%)	51 (39.2%)	37 (28.5%)	16 (12.3%)	7 (5.4%)
Question 9	4 (3.1%)	12 (9.2%)	19 (14.6%)	50 (46.2%)	35 (26.9%)
Question 10	5 (3.8%)	11 (8.5%)	30 (23.1%)	36 (27.7%)	48 (36.9%)

3. Relation between demographic variables and stress levels.

Table (5): Significance of association of respondents' demographic/academic variables with stress score

	Stress Score Mean	Standard Deviation	P value	Significance of Association with Stress Scores
Educational System - STEM - Non-STEM	 26.4935 24.3000	 5.69770 6.51920	.047	Statistically significant
Gender - Females - Males	 27.0370 23.1522	 5.69527 6.06984	< .001	Statistically significant
Educational Grade - Grade 10 - Grade 11 - Grade 12	 23.6429 25.5455 27.0400	 5.59680 6.34254 5.33448	.244	Statistically insignificant
Studying Hours - < 6 hrs. - 6 – 12 hrs. - > 12 hrs.	 25.3857 25.9286	 6.42976 5.77410	.884	Statistically insignificant

Sleeping Hours - < 4 hrs. - 4 – 8 hrs. - > 8 hrs.	30.0000 25.7965 21.1111	3.67423 6.05209 5.66667	.021	Statistically significant
	Mean Square	**df**		
Grade (Among STEM population)	26.697	2	.445	Statistically insignificant
Grade (Among non-STEM population)	78.644	2	.158	Statistically insignificant

a. stress_score is constant when study_hours = >12 hours. It has been omitted.

There was a statistically significant negative relation between sleeping hours and stress levels. *Table [5]*. Post Hoc – Tamhane test indicated that the difference is mainly between individuals who sleep less than 4 hours and those who sleep more than 8 hours. *Table [6]*.

Table [6] Post Hoc tests - Multiple Comparisons

	Sleep Hours	Sleep Hours	Mean Difference	Sig.
Tamhane	<4 hours	4-8 hours	4.20354	.170
		>8 hours	8.88889*	.013
	4-8 hours	<4 hours	-4.20354	.170
		>8 hours	4.68535	.116
	>8 hours	<4 hours	-8.88889*	.013
		4-8 hours	-4.68535	.116

Table [7]: Correlation between the number of extracurriculars/ their categories and stress scores

	Spearman's rho	**P -value**	**Significance of Association with Stress Scores**
Categories of extracurricular activities * Stress Score	.038	.674	Statistically insignificant
Number of extracurriculars * Stress scores	.036	.686	Statistically insignificant

4. Linear Regression Analysis

Linear regression test was performed using those variables significantly associated with stress in univariable analysis as independent variables (i.e.: gender, educational system and sleeping hours), while stress scores were used as the dependent variable. The regression revealed that gender and sleeping hours were significant predictors of stress (p values <0.001 and 0.026, respectively), while educational system showed only marginal significance as a predictor (p value = 0.086).

V. Discussion

This current study aims to compare stress levels between STEM and Conventional students in Egypt and identify the significance of association of certain demographic and academic factors with stress levels among both populations.

Null Hypothesis (1): There will be no statistically significant difference between STEM students and conventional students in terms of perceived stress levels.

According to the findings of this study represented in *table [5]*, this hypothesis was rejected as there was a statistically significant difference between means of stress levels between both populations (p = .047). This is closely related to the nature of STEM schools in Egypt as being boarding schools for excellent students and associated with higher levels of competition and extracurriculars than conventional schools - *table [3]*. Previous studies have addressed the effect of being educated in a boarding school on stress levels and social interactions. Children sent to boarding schools tend to suffer from sudden and often irrevocable traumas, as well as bullying and sexual abuse [9]. One study analyzing the societal interactions of both boarding and day schools' students has shown that boarding schools' students reported higher success in gaining autonomy from parental environments as well as higher ability in forming romantic relationships than day schools' students. On the other hand, adolescents from day schools scored higher ability in peer- interactions and greater parental support [9]. Peer relationship has a great ability to reduce academic stress (t = - 38.62, p < 0.001) among students [10]. The same study revealed the significance of parental support in handling stress among children. The study's findings

showed that the parent-child relationship can negatively predict academic pressure ($t = -56.29$, $p < 0.001$). The lack of the previous two factors (parental and peer relationships) may be among the causes of the elevated stress scores among STEM students than conventional students.

STEM students in Egypt tend to participate in a variety of extracurriculars with higher levels than their non-STEM counterparts *table [3]*. The reason behind this is the intensive competition present between STEM students in terms of academic achievement, seeking for scholarships, and enhancing their experience and knowledge. Too many assignments, close deadlines, and dropping entertainment activities because of schoolwork were reported to be significant sources of stress among 61% of students [11], which are sources believed to be associated with extreme participation in extracurriculars. On the other hand, previous studies have indicated the influence of participating in extracurriculars on reducing academic stress levels. One study has indicated that there is a slightly negative correlation between extracurriculars and stress / suicidal ideation ($r = -0.083$, $p < 0.001$), ($r = -0.039$, $p < 0.01$) respectively [12]. Another study has shown that participating in extracurricular activities has a significant positive influence on academic outcomes, as well as moderating the relationship between academic stress and coping [6]. Despite these studies, our findings have not shown a significant correlation between number of extracurriculars or the variety of their categories and the reduction of stress levels ($P = .686$) ($P = .674$), respectively. *Table [7].* STEM students, when participating in extracurriculars, tend to reduce their sleeping hours instead of studying hours to cope effectively with the responsibilities that are required by extracurriculars and to balance between academic excellence and other activities. Our findings *table [3]*, have indicated that there is a significant difference in sleeping hours between STEM and non-STEM students ($P = 0.007$), while there was no statistically significant difference but a tendency between studying hours among both populations ($P = 0.060$). On the other hand, results in *table [5]* have indicated a significant association between sleeping hours and elevated stress levels, indicating that decreasing sleeping hours significantly increases stress levels among students ($P = .021$), while no statistically significant association was present between studying hours and elevated stress levels ($P = .884$), which is indicated by prior studies that revealed that there was a weak correlation between stress and study hours ($r = 0.062$) [13]. Post Hoc – Tamhane test *table [6]* shows that a significant difference in stress levels is present specifically between students who sleep less than 4 hours per day and those who sleep more than 8 hours ($P = .013$). At the same time, no statistically significant difference was present between those who sleep less than 4 hours or more than 8 hours and those who sleep between 4 to 8 hours per day. The significant association between sleeping hours and stress levels was indicated by several previous studies. Prior findings have shown that 80.2% of high school students in Lukasa were stressed due to a lack of quality and quantity of sleep [11]. Many students tend to be exhausted, and they get significantly less than the recommended 9 hours of sleep, 70% of them reported that they were often or always stressed by workload [14]. Poor quality sleep is proven to be significantly associated with elevated mental stress levels as well ($p < 0.001$) [15].

Null Hypothesis (2): There will be no statistically significant difference between males and females in terms of perceived stress levels.

This hypothesis was rejected by the outcome results represented in *table [5],* which indicates there was a statistically significant difference (<0.001) between males and females in terms of perceived stress levels. This finding is consistent with the findings of a preceding study which revealed that women were more likely than men in experiencing higher levels of stress [16]. For more specification, a previous study has indicated that women score higher levels of stress on the PSS -10 compared to their male counterparts [17]. This study has indicated that self-distraction, emotional support, venting, and instrumental support were common ways among students and especially females to cope with stress states and perceive temporal relief from stressors. One study has shown that Egyptian female dental students score higher levels of stress than males due

to personal and clinical factors, workload, and performance pressure [18]. Another study done on high school students in Lusaka revealed that upon the conduction of the questionnaire, 62% of males reported being stressed because of domestic responsibilities compared to 81.5% of females [11]. On the other hand, other findings indicated that females were better than males in handling academic stress [19]. Another study has indicated that higher secondary male students are subjected to higher academic stress levels than their female counterparts [20]. Furthermore, a neutral finding has indicated that there was no statistically significant difference between males and females on the perceived stress scale [21]. Past studies have suggested several reasons behind females being more subjected to stress. Daily stress associated with routine role functioning, gender caring role-related stress, gender violence, sexist discrimination, being more emotionally involved than males in social networks, and being affected by others' stress, are among the significant sources of stress to females [22].

Null Hypothesis (3): There will be no statistically significant difference between different educational grades (Grades 10 & 11 & 12) in terms of perceived stress levels.

According to the results shown in *table [5],* there was no statistically significant difference in perceived stress levels among the three populations (grades 10 & 11 & 12) (P = .244). Although by comparing means of stress levels among three populations, it can be inferred that means of stress levels have increased by the advancement in educational level, (Grade 10: Grade 11: Grade 12) = (23.6429: 25.5455: 27.0400). Therefore, this hypothesis was approved by the results. These findings contradict previous studies that aimed to compare different educational grades in terms of stress levels among high school students as well as university students. One study has indicated that 28% of grade 11 students experience high or extreme stress compared to 26% of grade 12 students, indicating that significant stressors included lack of time for revision, queries from society, and parental expectations [23]. Variety in these factors may be the reason behind the difference in the findings. Other findings have shown that junior university students experienced higher perceived stress levels than senior students (M=18.49, SD=5.46) & and (M=15.58, SD= 5.36), respectively [21]. On the other hand, a contradictory study to the previous findings revealed that mid-senior Egyptian dental students showed some higher stress levels than junior students [18].

Upon performing the linear regression test, findings revealed that sleeping hours and gender are significant predictors of stress, while educational system was found to be not a major cause and a significant predictor of stress among high school students.

Poor sleep is proven by previous findings to be a significant predictor and closely related to stress. A preceding study done on King Abdulaziz University's students have shown that upon the preforming an electronic self-administered questionnaire, results indicated that 65% of students experienced stress, while 76.4% of them suffered from poor sleep quality. Findings revealed that the increase in stress levels is a significant predictor of stress (Cramer's $V = 0.371$, $P < 0.001$) [24]. Another study done on medical students have shown that 76% of students were suffering from poor sleep quality, and 53% of them were suffering from elevated stress levels. Logistic regression test has revealed that students who do not experience stress are less likely to have poor quality of sleeping states [25]. Sleep deprivation or Insomnia triggers the body to release Cortisol hormone during day hours, and potentially to maintain an alert state of the body. Sleep and stress responses are greatly associated in the physiology of human body, as both share the the hypothalamic-pituitary-axis (HPA). A disruption in the function of HPA leading its axis to be acute can disrupt sleeping cycles. Upon experiencing prolonged or chronic stress, hypothalamus and pituitary glands send messages to the adrenal gland to secrete more cortisol, leading to an overly active HPA axis.

Major findings of this study have revealed the significant difference in stress levels between STEM and non-STEM students and suggested that a possible reason is that over-participating in extracurricular activities by STEM students has

reduced the quality and quantity of sleeping hours, which is significantly associated with elevated stress levels. On the other hand, participation in extracurriculars hasn't affected study hours between both populations, which was found to be not significantly associated with elevated stress levels. Females have shown higher stress scores than their male counterparts on the PSS. And it is found that advancement in educational level was not significantly associated with elevated or reduced stress levels in general. The same results were found when splitting the sample upon the educational system and examining the relation between educational levels and stress scores in each population independently *table [4]*.

Further studies that are concerned with similar topics and aspire to build upon this study may be concerned with determining stress differences between the genders more thoroughly, within STEM students or non-STEM students independently, to examine if there is a difference in coping abilities between males and females in both educational systems.

As the data reveal, there is no association between stress levels and extracurricular activities; nevertheless, further studies may be employed to determine if there is a specific sort of extracurricular activity that relieves stress, such as physical, literary, or social activities.

The study's findings may be shared with educational institutions, including teachers and administrators, to investigate possible methods to minimize student stress levels as the outcomes of the study could be used by educational departments to assess their curriculum and make the necessary adjustments.

The study findings revealed that STEM students suffer from elevated levels of perceived stress compared to their non-STEM counterparts, psychological guidance is required, and mental health instructors should be present in the educational environment to asses students overcome psychological problems when faced.

During the research process, there were certain situations in which we faced some limitations. For instance, recall bias, is a serious risk that can potentially influence the validity of survey data. It usually occurs because of individuals' failure to recall or recount their experiences, which can lead to errors in their responses. This risk could be considerable since the research variables' most recent encounter was three months ago. An approach to reduce recall bias was to employ multiple-choice questions with all possible responses that could aid respondents in remembering their answers.

Another important limitation was represented in the limited number of responses, a total of 130 responses may be inefficient enough to come up with strong and reliable data despite the significant effort made to widen the spread of the questionnaire and the daily reminders sent to respondents. However, there was a remarkable lack of responses that may decrease the findings' validity. In spite of lack of responses, the findings were consistent to a great extent with previous findings in the same feild. Future reseach can be conducted employing a greater number of respondents to ensure the validity of the data.

Furthermore, the original copy of the PSS-10 requires responses to situations that have occurred a month before. However, we have utilized the PSS-10 questionnaire in structuring an online survey that was concerned with situations that happened during a 3-month period before. A limitation that may influence negatively the accuracy of responses. However, we considered the employment of MCQs to reduce the recall bias.

Moreover, the research was concerned with Egyptian students and educational systems. Taking into account socioeconomics and cultural themes, it was hard to identify earlier literature studies on related topics that represent reliable findings closely related to the study topic. Nevertheless, similar socioeconomic and cultural conditions were maintained during researching in the literature.

Finally, the short time frame for collecting data, conducting the analysis, and discussing results and recommendations was a great challenge during the research process.

VI. Conclusion

This study was the first of its kind aimig to assess the variation in the prevalence of perceived stress between two types of educational systems in Egypt:

STEM and conventional secondary systems. Taking into consideration social, academic and extracurricular factors, and utilizing a significant number of statistical tests for data analysis. The sample (130 high school students) was chosen randomly, and respondents were asked to fill in an online Arabic survey to identify specific demographic information and determine stress score through the perceived stress scale – 10. The analytic tests done on the results revealed that STEM students are subjected to higher levels of perceived stress than conventional students. Lack of strong parental relationship, excess workload, and intensive competition contribute to this significant difference in stress levels. However, the most important factor was the lack of quality and the reduced quantity of sleep hours, which may be a result of over participating in extracurriculars. Additionally, we found that there was a significant difference between the two genders in terms of stress levels. Upon analyzing the influence of these factors on the overall mental health of students, addressing them and establishing appropriate mental health screening in STEM schools is an essential step that may aid in developing the creativity, innovation, and enthusiasm of students and reducing negative emotional and mental problems that may affect academic or social performance among students.

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