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RESEARCH ARTICLE

**THE RELATIONSHIP BETWEEN STRESS AND ACADEMIC PERFORMANCE OF FEMALE
 MEDICAL STUDENTS IN ALMAAREFA COLLAGES, IN RIYADH 2014-2015.**

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Abstract

Introduction: a study had been done in Al-Maarefa colleges for science and technology in a 100 female medical students about stress and its associated factors.

Objectives: to find out the proportion of stress among female medical students, mention the different factors that increase it, and compare the effects of stress on student GPA among different levels of same students.

Methods: this was a cross-sectional study, in which randomly selected female medical students between level 5 to level 12 completed online questionnaire with close-ended questions.

Results: high stress in only among the preclinical students, 82% of preclinical students, and 92% of clinical students are under moderate stress. 25% of students who have partial or total scholarship are under high level of stress, while 84% of them have moderate level of stress. Relationship with the family is an important factor we found that 43% of high stress is among those who have bad & very bad relationship with their families, while only 3% of high stress is among those who have excellent & satisfactory relationship with their families. College environment has great influence on the level of stress; 90% of students who are not feeling comfortable with college are all having moderate to high stress.

Conclusion: It was found that the majority of the students were under moderate level of stress despite their level. The most important factors that affected the level of stress among the students from different levels were total or partial scholarship, and bad relationship with families and friends, in which students were under high levels of stress. The college environment was associated with the level of stress of the students; students who were comfortable with their environment had a lower level of stress.

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Introduction:-

For the last five decades the term stress has enjoyed increasing popularity in the behavioral and health sciences. The idea of stress and its potential costs to the body was born to "selye", a scientist absolutely determined to make the concept of stress in international sensation.

Stress is simply a fact of nature, forces from inside or outside world affecting the individual. The individual response to stress in way that affects the individual as well as their environment. Because of that over finance of stress in modern lives, usually think of stress as a negative experience, but from biological point of view, stress can be natural, negative or positive experience. In general, stress is related to both external and internal factors. External factors; include the physical environment, home, school, job, relationship, with others, and all the situation, challenges, difficulties and expectations confronted with on daily basis. Internal factors; determine the body's ability to respond to, and deal with external stress inducing factors. Internal factors, which influence the ability to handle stress, include; the nutritional status, overall health and fitness levels, emotional well being, and the amount of sleep and rest everyone get.¹

Stress has many different effects on human cognition, physical, and behavior, which can be positive or negative. Sometimes, it can be helpful, providing people with extra energy or alertness they need. It could give a runner the edge he needs to persevere in a marathon, for example: this good kind of stress is called "Eustress". Unfortunately, stress is often not helpful and can be harmful, when not managed effectively. Stress could make a sale person buckle under pressure while trying to make a sales pitch at an important business meeting, for example. Moreover, stress can increase the risk of developing health problems, such as cardiovascular disease and anxiety disorders. This bad kind of stress is called "Distress", the kind of stress that people usually are referring to when they use the word stress.^{2,3}

And about stress among medical students, medical school is recognized as stressful environment that often exerts a negative effect on the academic performance, physical health, and psychological well being of the student, this research study is carried out of find proportion of stress among the female medical students in Almaarefa collage "MCST", Identify the common factors that may increase the stress, and compare the effects of stress on their GPAs among levels of the same students.

Objectives:-

1. To find out the proportion of stress among female students.
2. To compare the association of stress on GPA of student among different levels .
3. To identify the common factors which increase the stress.

Review of literature:-

The negative consequences of stress have been the subject matter of many health-related discussions. In addition, many academic studies have investigated its effect on academic performance. Even though the effect of stress on a person's health has been affirmed repeatedly by the medical community, the studies about the role that stress plays in impacting academic performance have mixed results.

Perceived stress among male medical students in Egypt and Saudi Arabia, 2008. This study to determine whether was a difference in perceived stress levels of male medical students. The sample consisted of 304 male medical students in Egypt and 284 male medical students in Saudi Arabia.

There was no significant difference between the two groups in number of stressors. However, Egyptian students were more likely to cite relationship, academic and environmental problems than Saudis. The prevalence of high stress was nearly equal in both groups. Anxiety and depression were significantly higher among Egyptian than Saudi students. A logistic regression analysis of independent predictors of sever stress between both groups combined revealed that a satisfactory family income and university-graduated father were independent protective factors. The independent risk predictors were anxiety and number of stressors.⁴

Many studies have assessed the effects of a stressful life of a person on the outcomes of his career, especially in the medical field. (Riyadh, KSA) in 2014, they applied the study on 404 interns. They investigated the prevalence of stress and its severity among physician interns also; attempts have been made to evaluate the possible correlations between the level of stress and possible stress-causing factors associated with sex, marital status, and stressful clinical rotations. It showed most of the interns were affected by a severe level of stress, followed by mild and moderate levels of stress. The stress level was significantly higher among female interns in comparison with male interns. Marital status had no role in causing stress. The highest stress level was reported by interns during the clinical rotations of medicine, followed by surgery, pediatrics, obstetrics and gynecology, and emergency. The prevalence of stress among the interns and their corresponding clinical rotations in all three hospitals had significant

linear correlations.⁵

Effects of stress on academic performance on medical students. This study was done in India, 2014. It aims, firstly to explore common sources of stress in medical students, secondly to establish correlation of stress, gender, attendance, and academic performance. Weak academic performance and high failure rate remains a persistent problem. On one hand, studies have reported that stress can be inversely related to academic performance, on the other hand, studies failed to detect an association between stress and academic performance. Interestingly, perceived stress and coping may be influenced by stress as well. 114 students how gave the informed for the study. Stress shows beneficial effects in females when compared to males. High attendance and better day-to-day performance in female medical students was associated with more amount of stress when compared to male students. Thus, stress among medical students should be acknowledged and attempts should be made to alleviate it.⁶

In 2011 study in Saudi Arabia was conducted to determine the prevalence of stress among medical students and to observe an association between the levels of stress and their academic performance. The prevalence of stress was measured and compared with the five study variables, such academic year, academic grades, regularity to course attendance, and perceived physical problems. The findings of the study suggest that the level of psychosocial stress was higher in the female students compared to the male students. The stress level in the initial three years of the course was higher than the last two years of the course. Physical problems might have led to extra stress. The study did not find a significant association between academic grades and regularity of attendance in the course on one hand and the presence of stress on the other hand. The findings of high level of stress among the medical students in the initial years also suggest that, when students are admitted to the medical school, special care must be taken to find out obvious psychiatric problems or psychological stress among them.⁷

AL HASHIM studied Stress among medical Saudi students, 2013. Sources of student stress can be academic pressures, social or personal issues and medical students have to face the challenge of rigorous curriculum and also have to learn how to deal with emotionally difficult experiences. This study conducted to determine prevalence of stress and to identify the risk factors of stress on 650 Saudi medical students, thus outcomes provided prevalence of stress was 53%. Gender has no role in stress among medical students, there is a statistically significant relationship between stress and having optimal place for studying outside the university, while comparing number of sleeping hours with stress, we could not find a statistically significant relationship among medical students.⁸

Sandler (2001) studied the effect of perceived stress on several endogenous variables on a random sample of 469 adult students aged 24 years or older enrolled in a four-year college. He found that perceived stress had significant total effect on many endogenous variables, in general, and on academic performance, in particular.⁹

Friedlander et al. (2007) done a study examined the joint effects of stress, social support, and self-esteem on adjustment to university. First-year undergraduate students were assessed multiple times during the year with a sample size of 378. Multiple regressions predicting adjustment to university were conducted like; perceived social support (friends and family), self-esteem (academic, social, and global, and stress.

Decreased stress predicted improved overall, academic, personal-emotional, and social adjustment. Increased global, academic, and social self-esteem predicted decreased depression and increased academic and social adjustment.¹⁰

Stress and Academic Performance Among Medical Students by Nudrat Sohail aimed to determine the relationship of stress and academic performance in first year medical students and to identify sources of stress, levels of stress and relevant coping strategies. Study was in Lahore, 2010. Two hundred and fifty students were surveyed, out of whom 120 students responded. Twelve students with their consent were interviewed. The study showed a diversity of stress sources and a high level of stress in the medical students. The results also show that higher level of stress is associated with poor academic performance.¹¹

Wintre and Yaffe (2000) studied first-year students; transition to university and their relationship with parents. This study investigates the contributions of; parenting style, current relationships with parents, psychological well-being, and what these variables make toward perceived overall adjustment to university, from both socio/emotional adaptation perspectives and actual academic achievement. The sample size was 408 (116 males and 292 females) first-year students attending university in a large metropolitan Canadian city.

The results indicated that mutual reciprocity and discussion with parents, as well as the psychological well-being variables, have direct links to adjustment to university.¹²

Dahlin, Jone borg, and Bo Runeson (2005) done a cross-sectional study was carried out at the Karolinska Institute Medical University, Stockholm, Sweden. The study was to assess the exposure to different stressors and the prevalence of depression among medical students at different levels of education, taking gender differences into account. The study sample size was 342, and the participants were all registered students in Years 1, 3 and 6 were enrolled in the study.

The results found that year1 students indicated experiencing the highest degree of pressure from studies. A gender difference was seen, where women reported higher levels of stress than men. Medical students had higher depression rates than the general population, and women students had higher rates than men.¹³

Methodology:-

Approach:-

Study design:-

Observational, descriptive, cross-sectional.

Study Area:-

Kingdom of Saudi Arabia, Riyadh, Central region, Al-Maarefa College.

Study Population:-

Al-Maarefa colleges of science and technology, a private institution of higher education for male and female, providing bachelor in scientific, academic disciplines in medicine, pharmacy, nursing, respiratory therapy, emergency medical care, and computer science. The population of the study is female medical students except preparatory year and foundation students.

Sample Size:-

100 female medical students.

Sample Technique:-

Random sampling selection of female medical students, who are between level 5 to level 12.

Data Needs:-

Data collection tool:-

online questionnaire with close-ended questions.

The questionnaire included:

1. Questions about the demographic information of the respondents.
2. Questions concerning the GPA of the student.
3. Questions on the different factors that might increase stress.

In addition to the questionnaire Cohen's scale had been used to assess the level of stress among students.

In this scale Individual scores on the ((PSS))"Perceived Stress Scale" can range from 0 to 40, scores ranging from 1-13 would be considered low stress, scores ranging from 14-26 would be considered moderate stress, and scores ranging from 27-40 would be considered high perceived stress.

Questionnaire validity and reliability had been tested before data collection.

Data Analysis:-

1. After clearing the data, it had been coded, entered, and analyzed, using statistical package for social science (SPSS).
2. Description analysis had been presented based on the results using tables and percentages.
3. Proportion had been calculated and statistical tests had been performed.

Ethical Consideration:-

1. Prior of starting the study, permission had been obtained from the college and consent from the participants.
2. Participants' confidentiality and privacy had been insured and data had not been used for any other purposes.

1 st term	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16
Title selection								
Objectives								
Background								
Lit review								
Area & Pop								
Sampling								
Instrument								
Analysis plan								
Proposal/ submission and approval								
2 nd term								
Finalize & training								
Data Collection								
Clearance, Coding, Entering								
Analysis								
Writing result/ Discussion/ Conclusion/ Recommendation								
Report submission								

Timeline:-**Results:-**

A study done on 100 female medical students in Al-maarefa collage about stress and association factors ended up with:

Table 1:- Association between level of students and level of stress:

Level	Low stress	Moderate stress	High stress	Frequency
Preclinical	10	71 (82%)	6	87
Clinical	1	12 (92%)	0	13
Total	11	83	6	100

High stress is only in preclinical students.

82% of preclinical students, and 92% are clinical students are under moderate stress.

Table 2:- Association between stress factors and level of stress:

Marital Status	Low stress	Moderate Stress	High stress	Frequency
Single	10	74 (82%)	6 (7%)	90
Married	1	8 (89%)	0	9
Divorced	0	1	0	1
Total	11	83	6	100

High stress is only in single students, while 89% of married students are under moderate stress.

Living with	Low stress	Moderate stress	High stress	Frequency
Family	10	67 (81%)	6	83
Husband	0	6 (100%)	0	6
Student residence	1	10 (91%)	0	11
Total	11	83	6	100

High stress is only among students who live with their family.

Students who live with their husband are all under moderate stress.

House owner	Low stress	Moderate stress	High stress	Frequency
Owned house	8 (14%)	45 (79%)	4 (7%)	57
Owned apartment	1 (20%)	4 (80%)	0	5
Rented house	1	5 (83%)	0	6
Rented apartment	1 (4%)	29 (90%)	2 (6%)	32
Total	11	83	6	100

Moderate stress is high among owned house and rented apartment 79% & 90% respectively

Income	Low stress	Moderate stress	High stress	Frequency
Less than 10,000	3	15 (79%)	1	19
10,000-25,000	3	26 (86%)	1	30
25,000-40,000	3	17 (77%)	2	22
More than 40,000	2	25 (86%)	2	29
Total	11	83	6	100

No relationship between level of stress and income

Table 3:- level of stress in relation to symptoms:

Stress symptoms	Low stress	Moderate stress	High stress	Frequency
Insomnia*	11	83	6	100
Migraine*	11	83	6	100

83% of students who have migraine and insomnia are under moderate stress.

Graph1:- frequency of symptoms:

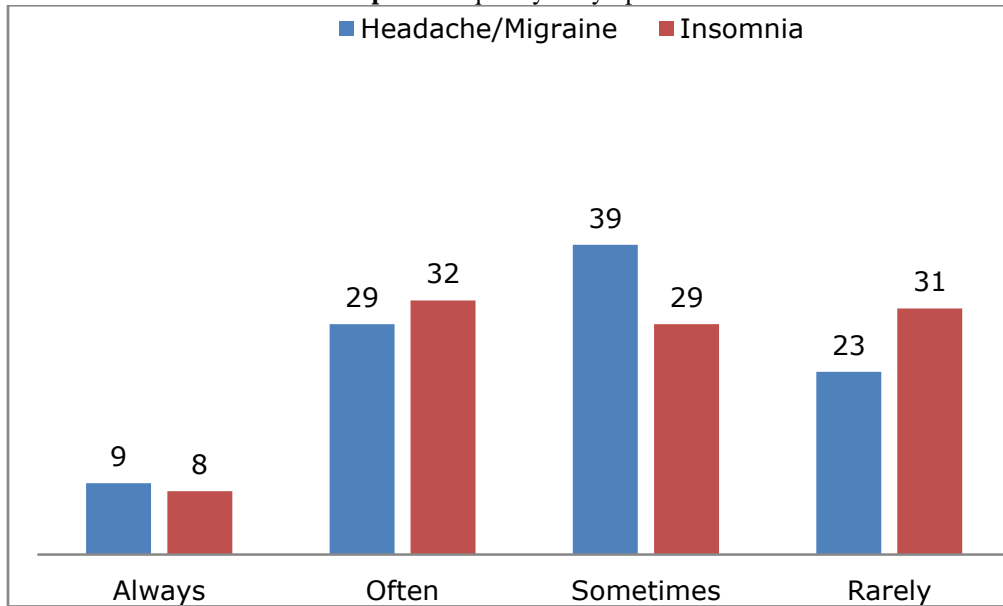


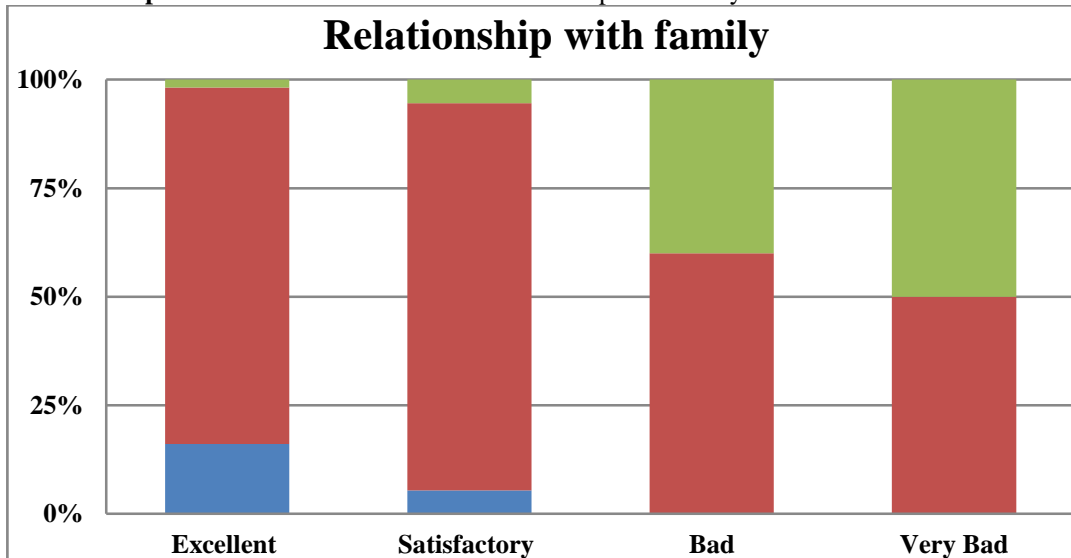
Table 4:- Distribution of stress factors:

Choosing specialty	Low stress	Moderate stress	High stress	Frequency
Parent's desire	0	3	0	3
People advice	0	1	0	1
Your choice	10	58 (79%)	5	73
Your choice with parents or people advice	1	21 (91%)	1	23
Total	11	83	6	100

Tuitions fees	Low stress	Moderate stress	High stress	Frequency
Totally out of pocket	1	10 (91%)	0	11
Partial scholarship	1	10 (71%)	3 (21%)	14
Total scholarship	9	63 (84%)	3 (4%)	75
Total	11	83	6	100

79% of students who entered medical college by their own choice are under moderate stress, while the rest of them (92%) did not enter medical college by their own choice and this variation is not statistically significant.
 25% of students who have partial or total scholarship have high stress
 84% of students who have total scholarship have moderate stress

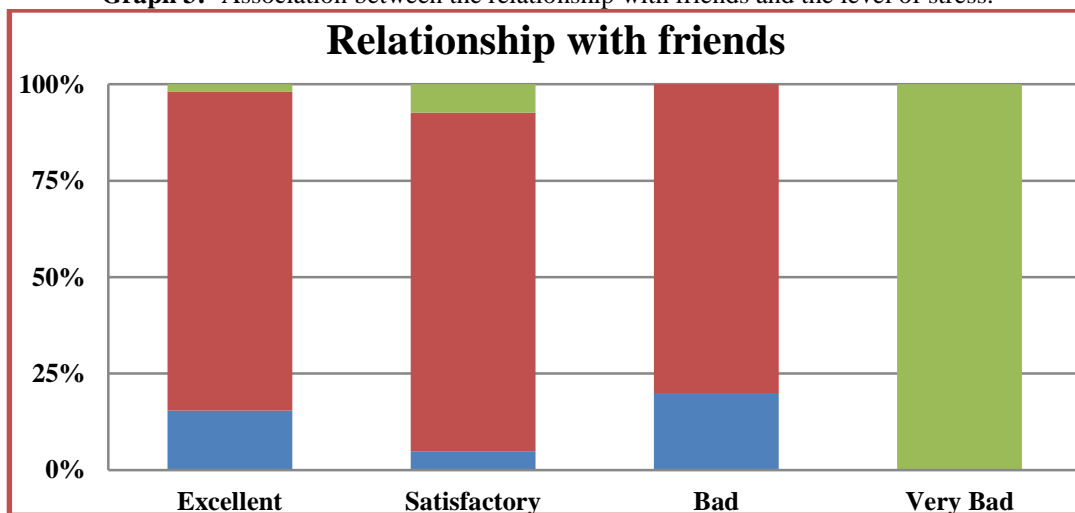
Graph 2:- Association between the relationship with family and the level of stress:



43% of high stress is among those who have bad & very bad relationship with their families, while only 3% of high stress is among those who have excellent & satisfactory relationship with their families.

There is a relation between the level of stress among the students and their relationship with their families, the level of stress is increasing when the relationship is getting worse and this value is statistically boarder lined significant (P = 0.056).

Graph 3:- Association between the relationship with friends and the level of stress:



29% of high stress is among those have bad & very bad relationship with their friends, while only 4% of high stress is among those have excellent & satisfactory relationship with their friends.

Table 5:- Distribution of stress factors:

Support from surrounding people	Low stress	Moderate stress	High stress	Frequency
Strong	8 (21%)	30 (79%)	0	38
Moderate	3	40 (89%)	2	45
Weak	0	10 (83%)	2	12
None	0	3 (60%)	2	5
Total	11	83	6	100

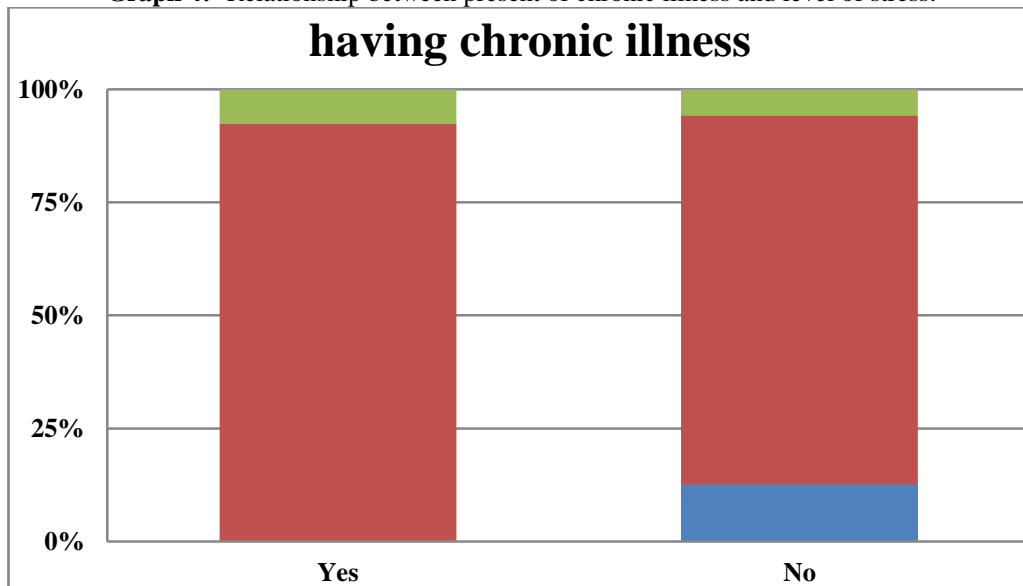
95% of students who hadn't got strong support have moderate to high stress level

79% of students who had got strong support have moderate to high stress level.

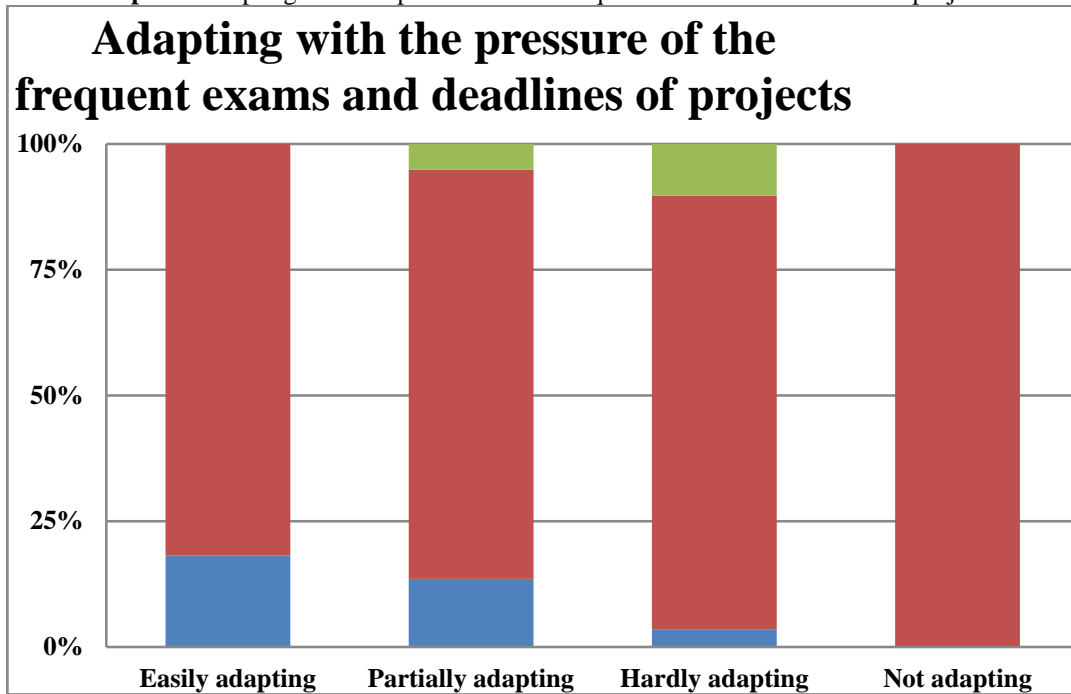
Feeling comfortable with the college	Low stress	Moderate stress	High stress	Frequency
Yes	5	27 (82%)	1 (3%)	33
No	2	15 (79%)	2 (11%)	19
Sometimes	4	41 (85%)	3 (6%)	48
Total	11	83	6	100

90% of students who are not feeling comfortable with college are all having moderate to high stress, and this variation is not statistically significant.

Graph 4:- Relationship between present of chronic illness and level of stress:



Low stress is only among those who don't have chronic illness, and this variation is not statistically significant.

Graph 5:- adapting with the pressure of the frequent exams and deadlines of projects:

91% of low stress is combining to those who are easily & partially adapting with study pressures, and this variation is not statistically significant.

Discussion:-

This study is about stress and associated factors in a group of female medical students of Al-Maarefa colleges of science and technology.

This research shows that most of students of pre-clinical and clinical are under moderate stress. However, high stress is only among preclinical students. According to the study, which was carried out in Iran among medical students, there were no significant differences in stress level between students of preclinical and clinical phases, which different from this research. Moreover, both researches agree that preclinical and clinical students suffer from moderate stress.¹⁴

This study, on female medical students showed that the moderate stress is high among those who lived in owned houses and rented apartments. While the study that done in Midwestern university on students about the sources of stress among those college students revealed in high level of stress with financial difficulties. The difference in the results would be due to the difference in sampling and the fact that it was done among non-medical students.¹⁵

In this study it was found that student who had partial or total scholarship had high stress, while others of who had total scholarship are under moderate level of stress. In comparison a study in the United States showed that student loan recipients do perform more poorly than their paid-tuition counterparts, and also have different studying habits and values related to coming to, and staying in college.¹⁶

According to this research, it was found that majority of students who entered medical college by their own choice were under moderate stress. This is opposite to a study conducted in Iran, where the majority of students who chose to study medicine had lower stress scores than those who were influenced by family or had no choice about the subject.¹⁴

A major finding of the present study was the occurrence of high stress among those with bad and very bad family, and friend relationships. In the same way, the students who got strong supports from people around them had low to moderate stress levels. Effects of social support and the environment around students have been shown in several studies. Results of a study in the US showed that social support from outside the medical school explained

significant variance in academic performances and level of stress. However, stress was significantly associated with social support that was an act as stress factor for the entire sample. It is very important to target stress-prevention strategies at students who have any level of stress to prevent the development of more serious conditions relating to stress.¹⁷

An interesting finding of the present study was that the level of stress of students who are feeling comfortable with college are moderate stress. This is contradictory to the finding of another study in North America, which suggest that mental health worsens after students join a medical school where the level of stress increased to high stress progressively during the college.^{18 19}

Conclusion:-

It was found that the majority of the students were under moderate level of stress despite their level. The most important factors that affected the level of stress among the students from different levels were: Students who had total or partial scholarship were under high levels of stress. Relationships with family and friends had a great influence on the level of stress; it was found that the majority of students who had bad relationship with their families and friends are under high level of stress. The college environment was associated with the level of stress of the students; students who were comfortable with their environment had a lower level of stress.

Recommendation:-

1. Medical students should utilize a daily planner to keep track of due dates for assignments, projects, presentations, and exams.
2. The Colleges can appoint one faculty member for every 10-15 students. This Faculty member establishes a close relationship with each student, orient him or her, and give academic as well as personal advice.
3. The parents should give support for their sons and daughters, and give care of them
4. The awareness of community should be raised about stress, and it's effects.

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Questionnaire:-

A group of medical students of Al-Maarefa Colleges are going to study the stress in relation to academic performance of female medical students in Almaarefa Colleges. This questionnaire is made for research purpose only, be sure that the information will be confidential and will not be used for any other purpose.

Please, answer the question depending on your own experience and check the suitable answer. Thank you for cooperation.

Level:

1) Nationality: Saudi Non-Saudi

2) 1. What is your social status?

Single

Married

Divorced

Widow

3) 2. With whom do you live?

Family

Relative

Husband

Student residence

3. Where do you live?

Owned house

Owned apartment

Rented House

Rented apartment

4. What category best describes your monthly household income?

Less than 10,000 SR

- 10,000 – 25,000 SR
- 25,000 – 40,000 SR
- More than 40,000 SR

❖ *Stress Symptoms*

1. *How often do you feel headache/ migraine?*

- Rarely
- Sometimes
- Often
- Always

2. *How often do you feel insomnia?*

- Rarely
- Sometimes
- Often
- Always

❖ *Stress Factors*

4) 1. *How did you choose your specialty?*

- Your choice
- Parents' desire
- People advice
- My choice with parents OR people advice

5) 2. *Your tuitions fees are expense by?*

- Totally out of pocket
- Partial scholarship
- Scholarship from government
- Full scholarship from the college

6) 3. *How do you vote your relationship with Parents/Family?*

- Excellent
- Satisfactory
- Bad
- Very bad

7) 4. *How do you vote your relationship with friends?*

- Excellent
- Satisfactory
- Bad
- Very bad

8) 5. *Do you get any support from people around you?*

- Strong
- Moderate

Weak

None

9) 6. Do you feel comfortable with the college?

Yes

Sometimes

No

10) 7. Do you have any chronic illness?

Yes

No

IF yes, mention

11) 8. How do you adapt with the pressure of the frequent exams and deadlines of projects?

Easily adapting

Partially adapting

Hardly adapting

Not adapting

What was your GPA in level 2(after you finished preparatory year)?

What is your current GPA?

Thank you for completing this questionnaire!

COHEN'S PERCEIVED STRESS SCALE PSS

How frequency do you find yourself experience to these common stress symptoms **in the last six months**

	Never	Almost never	Some-times	Fairly often	Very often
1. How often have you been upset because of something that happened unexpectedly?					
2. How often have you felt that you were unable to control the important events of your life					
3. How often have you felt nervous and upset?					
4. How often have you felt confident about your ability to handle your personal problems?					
5. How often have you felt that things were going your way?					
6. How often have you found that you could not cope with all the things that you should do					
7. How often have you been able to control irritations in your life?					
8. How often have you felt that you were on top of things?					
9. How often have you been angry because of things that happened that were outside of your control?					
10. How often have you felt difficulties were piling up so high that you could not overcome them?					

For each question choose from the following alternatives:
0 – never 1 - almost never 2 – sometimes 3 - fairly often 4 - very often