

Correlates of Depression, Anxiety and Stress among Female Students at Al-Jouf University, Saudi Arabia

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Abstract

Background: There is evidence that university students are at higher risk of psychological problems that may affect their emotional, psychosocial and physical health. **Objectives:** This study has been conducted to determine the prevalence of depression, anxiety and stress among female students at Al-Jouf University, Saudi Arabia and to identify their associated factors. **Methods:** The present study was descriptive cross sectional conducted among female students enrolled at Al-Jouf University. Two self-administered questionnaires have been used, the first is a structured one for identifying sociodemographic characteristics and risk factors of psychological illness among students, and the second is the Arabic version of Depression Anxiety Stress Scale (DASS21). Statistical analysis was done using SPSS version 16. **Results:** The mean age of the studied students was 21.23 ± 1.50 . The prevalence of depression, anxiety and stress among students was 75.3%, 84.7% and 41.8% respectively. Symptoms of moderate severity were predominant among students considered as having depression while, symptoms of extreme severity were predominant among students considered as having anxiety. Most of the students suffered from double and triple psychological illnesses. Sociodemographic, behavioral and medical factors have been significantly associated with the studied psychological illnesses such as number of sleeping hours per day, feeling loneliness, frequent drinking of coffee and presence of chronic physical and psychological illnesses. **Conclusion:** There is a need for intervention programs and appropriate support services targeting the university students.

Key words: Depression, anxiety, stress, university students, Saudi Arabia.

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Introduction

University students have to adapt to various psychosocial changes besides coping with the academic and social demands in preparing for their professional careers [1]. The high expectation of academic achievement has created a very stressful environment, which if left untreated can be hazardous to their physical and mental health. The common psychological problems among students are depression, anxiety and stress [2]. Many studies have revealed that

students' performance in school, college and university are affected by symptoms of depression [3], anxiety [4] and stress [5] which may impair their academic achievement [6], lead to deterioration in relationships [7], marital problems and affect future employment [8]. Western data suggest that females experience high levels of stress as compared to males. The possible reasons explained by different studies are: females are more likely to report concerns about the volume and

complexity of the material they had to cover, they are also more likely to report stress due to self-expectation and feeling of lack of competence and tendency for women to over report medical and psychological symptoms [9]. Several studies reported that females have higher level of depression, anxiety and stress which can be attributable to biopsychosocial factors such as social roles and physiological status [10]. A study conducted by Bayram and Bilgel, 2008 reported that the prevalence of depression, anxiety and stress, was 27.1%, 47.1% and 27.0% respectively among a group of Turkish university students [11]. Other studies reported high rates of psychological morbidity among university students globally [12-15]. A study was done among first year students in an Egyptian public university revealed that the prevalence of depression, anxiety and stress was 63.6, 78.4 and 57.8% respectively [16]. Many studies were conducted in Saudi Arabia assessing psychological problems of university students. A study conducted in Al-Ahsa, Saudi Arabia showed that the prevalence of symptoms of any depression or anxiety was 21.9%. This study revealed that female gender, financial and personal problems were significant predictors for major depression [17]. A study conducted in Taif area, Saudi Arabia revealed that 42.9%, 54.9% and 23.1% of the students had significant depression, anxiety and obsessive compulsive symptoms respectively [18]. Also, a study was done in Abha, Saudi Arabia found that 41.5%, 66.2% and 52.5% of the students had depression, anxiety and stress respectively [19]. Depression, anxiety and stress represent escalating mental health problems among university students especially among females. In addition, extremely limited studies have been conducted among university students in AlJouf

region, KSA. So, the present study was designed to determine the prevalence of depression, anxiety and stress among female students at AlJouf University, Saudi Arabia and to identify their associated factors.

Population and Methods:

1- Setting: The Kingdom of Saudi Arabia (KSA) has a population of 31 million people and is one of the countries experiencing demographic transition in its population structure. AlJouf University in AlJouf region is located in the Northern province of KSA. The female campus contains 8 colleges: Medicine, Science, Applied Medical Sciences, Pharmacy, Administrative Sciences, Education, Computer Science and Sharia. The total number of female students enrolled in AlJouf University according to registries for the academic year 2014-2015 was 7042.

2- Study design and sampling: A cross-sectional descriptive study design was used. The sampling frame consisted of all female students at different colleges and grades were the target population. The sample size was calculated using

$$N = \frac{P(1-P)Z^2}{d^2} \quad \text{assuming the}$$

prevalence of depressive and anxiety symptoms to be 40% [18] with a precision of 5%, applying a confidence level of 95% and 80% power of the study. The calculated sample size was 368 however, 340 questionnaires were completed yielding a response rate 92%.

A multistage proportionate sampling method was therefore applied. A sampling fraction was calculated to select participants in relation to the population in each college. For each college, students were chosen using a systematic random sampling technique (using the academic identification number) from the available registries.

The timing of the study was chosen to avoid the beginning and end of the semester, when students are typically undergoing a variety of stresses associated with moving, settling into a routine, or preparing for final exams.

3-Instrument: The data collection instrument was composed of two self-administered questionnaires. The first is a structured self-generated for identifying sociodemographic characteristics and risk factors of psychological illness among the students. The second is the Arabic short version of the standardized Depression Anxiety Stress Scale (DASS) which is a 21 item questionnaire. DASS-21 is a set of three self-report scales designed to identify the presence and measure severity of the negative emotional states of depression, anxiety and stress, seven items per scale [20]. The DASS-21 has been well accepted globally and is a reliable easy screening instrument. The items in the depression scale focused on low mood, low self-esteem and poor outlook for the future. The anxiety scale items focused on fear response and psychological arousal, while the stress scale was on persistent arousal and tension [21]. The students were asked to rate the extent to which they have experienced various symptoms over the past one week. Each item was scored on a 4-point Likert scale (0 = Did not apply to me at all, 1 = Applied to me to some degree, or some of the time, 2 = Applied to me to a considerable degree, or a good part of time, and 3 = Applied to me very much, or most of the time). Based on the manual guidelines, scores from each subscale were summed up and multiplied by two to suit the original 42-items. Each subscale score will range between 0 and 42 and higher scores indicated greater levels of distress [20]. For the depression scale, scores of 9 or less were considered 'normal', 10–13 were 'mild', 14–20 were 'moderate', 21–27 were 'severe'

and scores greater than 28 were considered 'extremely severe'. For anxiety scale, scores less than 7 were considered 'normal', 8–9 were 'mild', 10–14 were 'moderate', 15–19 were 'severe' and those above 20 were considered 'extremely severe'. For the stress scale, scores less than 14 were considered 'normal', 15–18 were 'mild', 19–25 were 'moderate', 26–33 were 'severe' and scores greater than 34 were considered 'extremely severe' [20].

Ethical Consideration

Prior ethical approval was obtained from the Ethics Committee of the College of Medicine at AlJouf University. The female students have been invited to participate in the study after explaining the purpose of the study and emphasizing the confidentiality of the collected data through anonymous self-administered questionnaires. The participation of the students in the present study was optional and based on informed verbal consent. Administrators of the University were informed about the study and its purposes.

Statistics: Statistical analysis was performed using the Statistical Package of Social Science (SPSS) version 16. Descriptive statistics were performed. Comparison between groups was done using chi-square and Fisher's Exact tests for qualitative variables. Logistic regression analysis was done to detect risk factors of depression, anxiety and stress. P-value was considered statistically significant when it is less than 0.05.

Results

The sociodemographic and psychological characteristics of the respondents are presented in Table (1). A total number of 340 students have been participated in the present study. Their mean age was 21.23 ± 1.50 with a range of 19-25 years. Majority of the students (82.6%) were not married.

Regarding the living arrangements, most of the students were living with their families (93.8%) except small percentage of them were living with friends (3.8%) or in university housing (2.4%). The number of sleeping hours per day was 7-8 hours among 41.5% of them. The family income was considered sufficient by most of the students (92.4%). Depression, anxiety and stress have been reported among 75.3%, 84.7% and 41.8% of the students respectively. Single, double and triple psychological illnesses have been reported among 19.1%, 34.4% and 37.9% of the students respectively.

Table (2) demonstrated the impact of sociodemographic characteristics of the students on depression, anxiety and stress. Statistical significant differences were found between symptoms of depression, anxiety and stress on one hand and the number of sleeping hours per day on the other hand. The symptoms of depression, anxiety and stress were less frequent among student who slept 7-8 hours. On the depression scale, 66% of the students who slept 7-8 hours had depression against 79.2% and 84.5% for students with longer and shorter sleeping durations respectively ($p=0.002$). Regarding anxiety, 78.7% of those who slept 7-8 hours had anxiety versus 87.5% of those who slept 9 or more hours and 90.3% of those who slept less than 6 hours ($p=0.03$). In stress, 33.3% of those who slept 7-8 hours had stress versus 52.1% of those who slept 9 or more hours and 43.7% of those who slept less than 6 hours ($p=0.01$). Regarding feeling loneliness of the students, 85.5% and 60.9% of the students who felt lonely had depression and stress respectively versus 72.7% and 36.9% who didn't feel lonely with statistical significant differences ($p=0.028$, $p=0.000$ respectively). The behavioral and medical factors and their relationship with depression, anxiety and stress have

been reported in Table (3). Depression was significantly associated with the frequent drinking of coffee and tea as 79.2% of the students who drank coffee and tea had depression versus 65.3% who didn't ($p=0.008$). Depression and stress were significantly associated with the presence of chronic physical illness. All students suffered from the presence of chronic physical illness had depression versus 74.2% who didn't ($p=0.05$). Also, 80% of the students suffered from chronic physical illness had stress versus 40% who didn't ($p=0.002$). Table (3) also showed that stress was significantly associated with the presence of chronic psychological illness as 88.5% of the students suffered from chronic psychological illness had stress versus 37.9% who didn't ($p=0.000$). Table (4) shows that sleeping hours ≤ 6 hours was a significant predictor for depression and anxiety. However, the table reveals that the presence of chronic psychological illness and feeling loneliness were significant predictors for stress.

Figure (1) showed that symptoms of moderate severity were predominant among students considered as having depression (30.3%) whereas, symptoms of extreme severity predominant among students considered as having anxiety (39.4%).

Figure (2) reveals that there were highly significant positive correlations between depression score and both anxiety and stress scores ($P=0.000$). Also, there was highly significant positive correlation between anxiety score and stress score ($P=0.000$).

Discussion

The present study aimed to assess depression, anxiety and stress among female students at AlJouf University, Saudi Arabia. In this study, the prevalence of depression, anxiety and stress was 75.3%, 84.7% and 41.8% respectively. This is higher than other

studies using similar instruments. Shamsuddin et al., 2013 reported that the prevalence of depression, anxiety and stress among Malaysian university students was 37.2%, 63% and 23.7% respectively [22]. Bayram and Bilgel, 2008 found that 27.1%, 47.1% and 27% of the students had depression, anxiety and stress respectively in Turkey [11]. The prevalence of depression, anxiety and stress in this study is also higher than other studies from similar sociocultural backgrounds. A study conducted among Saudi University students revealed that the prevalence of depression and anxiety was 24.4% and 18% respectively [17]. Also, an Egyptian study found the prevalence of depression, anxiety and stress among Egyptian medical students as 63.6, 78.4 and 57.8% respectively [16]. The high prevalence of symptoms of depression and anxiety among the studied girls could be due to the stresses faced by Saudi females as a result of the cultural and social changes in the Saudi society [23]. Another study explained this in light of the complexity of the Saudi job market for women, which makes choosing a career more difficult [24]. Other causes may be fear of making mistakes, feelings of inadequacy, or fear of unemployment after graduation, which are factors leading to distress in students in this age group [25]. Although the DASS questionnaire is not a diagnostic instrument, the rates of depression, anxiety and stress symptoms highlight the need for attention from health care professionals and the university administrative personnel.

Regarding the severity of symptoms of the psychological illnesses, this study revealed that 30.3% of the students had moderate depression while, 39.4% had extremely severe anxiety. These results are different from other studies. In a study conducted in Abha in Saudi Arabia, 14% of students showed

moderate symptoms of depression while 11% of them showed extremely severe symptoms of anxiety [19]. Also, 63.8% and 36.2% of the students complained of mild and severe depression respectively in a study done among Saudi secondary school girls in Taif area [18]. However, a study conducted among first year medical students in an Egyptian public university showed that symptoms of moderate severity were the predominant among students having depression, anxiety and stress [16]. The marked diversity in these studies results could be attributed to the difference in methodology used, case definition, method of collecting information, sampling procedures, age or the different geographical locations [26, 27]. The present study showed a high occurrence of double and triple psychological illnesses among the studied students which is a finding observed in studies carried out on Saudi adolescents [18, 19]. This could be attributed to many factors such as the overlapping diagnostic criteria, genetics, neurophysiology, neurochemistry, negative affect, temperament, perceived control, or to the interpersonal mechanisms [28, 29]. In the same time, previous studies have shown that the presence of anxiety symptoms increases the chance of developing depressive symptoms [30]. The current study investigates the effect of sleeping hours per day on depression, anxiety and stress and demonstrates its statistical significance. As students who slept 7-8 hours, which is the ideal sleeping hours per day were less liable to depression, anxiety and stress. These findings suggest that adolescents who don't sleep ideal sleeping hours may represent a group at increased risk of experiencing mental health problems. Many studies showed that insomniacs are more likely to report anxiety and depression and to

perceive their lives as being more stressful compared to good sleepers [31, 32]. A study done by Richards and Smith, showed that few sleeping hours are among the risk factors of depression, anxiety and stress in adolescent population [33].

Depressed and distressed students in the present study complained feeling loneliness in significant excess than normal students in agreement with a study conducted by Abdallah and Gaber [16]. Students who consumed frequent coffee or tea had higher depressive symptoms in the present study in consistent with a study conducted by Loke [34]. However other studies revealed an inverse relationship between tea, coffee consumption with depression and anxiety [35-37].

Depression and anxiety are common in persons with physical illnesses and have a significant association with physical health [38]. Key findings from eighteen surveys across 17 countries in Europe, the Americas, the Middle East, Africa, Asia, and the South Pacific indicated that the risk of depression, anxiety and stress are higher among persons with diabetes, as compared to the persons without diabetes [39]. This is comparable to the results of the present study which showed that depression and stress were significantly higher in the presence of chronic physical illnesses. Psychological illnesses can lead to negative outcomes including impairment in ability to work efficiently, deterioration in relationships, medical school dropout and other health problems [40]. In this study, Psychological illnesses are more prevalent in distressed students and this is consistent with a study conducted by Abdallah and Gaber [16].

Limitations of the study: The educational authorities in KSA prevent female researchers from conducting studies on male students. That is why

the researches did not have the opportunity to determine sex specific prevalence rates. In addition, the use of DAAS which is a self-reporting data collection tool necessitates psychiatric evaluation through structured clinical interview for final diagnosis.

Conclusion: Psychological illnesses in the form of depression, anxiety, and stress have been reported in a significant proportion of female students at AlJouf University, Saudi Arabia. Depression symptoms has been reported in 75.3% of students while, anxiety and stress symptoms were found in 84.7% and 41.8% of the students respectively. Nearly 40% of students suffered from extremely severe symptoms of anxiety whereas, 30.3% suffered from moderate depression. Concomitant presences of double and triple psychological illnesses were present among 34.4% and 37.9% of the students respectively. Socio-demographic, behavioral, and medical factors have been found to be significantly associated with the studied morbidities such as number of sleeping hours per day, feeling loneliness, frequent drinking of coffee or tea and the presence of chronic physical and psychological illnesses. There is a need for an organized intervention program for promotion of the mental health of university students.

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Table (1): Socio-demographic and psychological characteristics of the respondents

	No. (n= 340)	%
Age: (years)		
19 - 20	118	34.7
21 - 22	148	43.5
> 22	74	21.8
Mean \pm SD (Range)	21.23 \pm 1.50 (19.0 – 25.0)	
Marital status:		
Single	281	82.6
Married	59	17.4
Living arrangement:		
Living with family	319	93.8
Living with friends	13	3.8
Living in university housing	8	2.4
No. of sleeping hours per day:		
\leq 6 hours	103	30.3
7 - 8 hours	141	41.5
9 or more	96	28.2
Family income:		
Sufficient	314	92.4
Insufficient	26	7.6
Considered as having depression by DASS 21	256	75.3
Considered as having anxiety by DASS 21	288	84.7
Considered as having stress by DASS 21	142	41.8
Presence of psychological problems:		
Normal	29	8.5
Single illness	65	19.1
Double illness	117	34.4
Triple illness	129	37.9

Table (2): Socio-demographic factors and their relationship with depression, anxiety and stress scores

	Depression				P-value	Anxiety				P-value	Stress				P-value
	Present (n= 256)		Absent (n= 84)			Present (n= 288)		Absent (n= 52)			Present (n= 142)		Absent (n= 198)		
	N	%	N	%		N	%	N	%		N	%	N	%	
Age:															
(years)															
19 - 20	87	73.7	31	26.3		104	88.1	14	11.9		50	42.4	68	57.6	
21 - 22	109	73.6	39	26.4		121	81.8	27	18.2		55	37.2	93	62.8	
> 22	60	81.1	14	18.9	0.427	63	85.1	11	14.9	0.354	37	50.0	37	50.0	0.185
Living with:															
Family	239	74.9	80	25.1		269	84.3	50	15.7		131	41.1	188	58.9	
Others [♦]	17	81.0	4	19.0	0.535	19	90.5	2	9.5	0.753 [‡]	11	52.4	10	47.6	0.308
Sleeping hours/day:															
≤ 6 hours	87	84.5	16	15.5		93	90.3	10	9.7		45	43.7	58	56.3	
7 - 8 hours	93	66.0	48	34.0		111	78.7	30	21.3		47	33.3	94	66.7	
9 or more	76	79.2	20	20.8	0.002*	84	87.5	12	12.5	0.031*	50	52.1	46	47.9	0.014*
Family income:															
Sufficient	236	75.2	78	24.8		266	84.7	48	15.3		128	40.8	186	59.2	
Insufficient	20	76.9	6	23.1	0.841	22	84.6	4	15.4	0.989	14	53.8	12	46.2	0.194
Friendship problems:															
Present	55	72.4	21	27.6		62	81.6	14	18.4		34	44.7	42	55.3	
Absent	201	76.1	63	23.9	0.502	226	85.6	38	14.4	0.390	108	40.9	156	59.1	0.551
Feeling loneliness															
Yes	59	85.5	10	14.5		60	87.0	9	13.0		42	60.9	27	39.1	
No	197	72.7	74	27.3	0.028*	228	84.1	43	15.9	0.561	100	36.9	171	63.1	<0.001*

Chi-square test, ‡ Fisher Exact test, *Statistical significant difference ($P < 0.05$) ♦ Friends and university housing.

Table (3): Behavioral and medical factors and their relationship with depression, anxiety and stress scores

	Depression				P-value	Anxiety				P-value	Stress				P-value
	Present (n= 256)		Absent (n= 84)			Present (n= 288)		Absent (n= 52)			Present (n= 142)		Absent (n= 198)		
	N	%	N	%		N	%	N	%		N	%	N	%	
Frequent of drinking coffee/ tea:															
Yes	194	79.2	51	20.8		208	84.9	37	15.1		104	42.4	141	57.6	
No	62	65.3	33	34.7	0.008*	80	84.2	15	15.8	0.874	38	40.0	57	60.0	0.681
Presence of chronic physical illness:•															
Yes	15	100.0	0	0.0		11	73.3	4	26.7		12	80.0	3	20.0	
No	241	74.2	84	25.8	0.027*≠	277	85.2	48	14.8	0.261≠	130	40.0	195	60.0	0.002*
Presence of chronic psychological illness:••															
Yes	16	61.5	10	38.5		21	80.8	5	19.2		23	88.5	3	11.5	
No	240	76.4	74	23.6	0.091	267	85.0	47	15.0	0.767	119	37.9	195	62.1	0.000*

Chi-square test, ≠ Fisher Exact test, * Statistical significant difference ($P < 0.05$), • Examples: Diabetes, hypertension and bronchial asthma, •• Examples: Schizophrenia and obsession

Table (4): Logistic regression analysis of predictors of depression, anxiety and stress among the studied students

	Depression				Anxiety				Stress			
	P-value	OR	95% C.I.		P-value	OR	95% C.I.		P-value	OR	95% C.I.	
			Lower	Upper			Lower	Upper			Lower	Upper
Age: (years)	0.637				0.259				0.164			
19 – 20	Reference				Reference				Reference			
21 - 22	0.784	0.925	0.530	1.615	0.101	0.555	0.274	1.122	0.347	0.787	0.477	1.297
> 22	0.483	1.299	0.626	2.695	0.341	0.655	0.274	1.564	0.303	1.371	0.752	2.499
Living with others	0.731	1.224	0.387	3.869	0.563	1.565	0.343	7.153	0.270	1.670	0.671	4.156
Sleeping hours ≤ 6 hours	0.021*	2.074	1.117	3.851	0.037*	2.081	1.180	4.420	0.954	1.014	0.622	1.655
Insufficient family income	0.913	1.055	0.403	2.761	0.902	0.932	0.303	2.864	0.229	1.644	0.731	3.700
Friendship problems	0.654	3.622	0.728	4.027	0.118	0.251	0.764	3.660	0.452	0.368	0.109	1.660
Feeling loneliness	0.275	1.673	0.317	1.920	0.269	1.248	0.115	1.679	0.007*	2.567	1.335	3.816
Frequent of drinking coffee/ tea	0.361	0.781	0.313	1.951	0.310	0.459	0.337	4.678	0.125	0.079	0.508	1.367
Presence of chronic physical illness	0.079	2.600	0.714	9.471	0.751	0.893	0.085	3.516	0.346	1.163	0.254	2.223
Presence of chronic psychological illness	0.157	0.862	0.286	1.669	0.620	2.237	0.612	1.123	0.011*	1.953	1.337	4.268

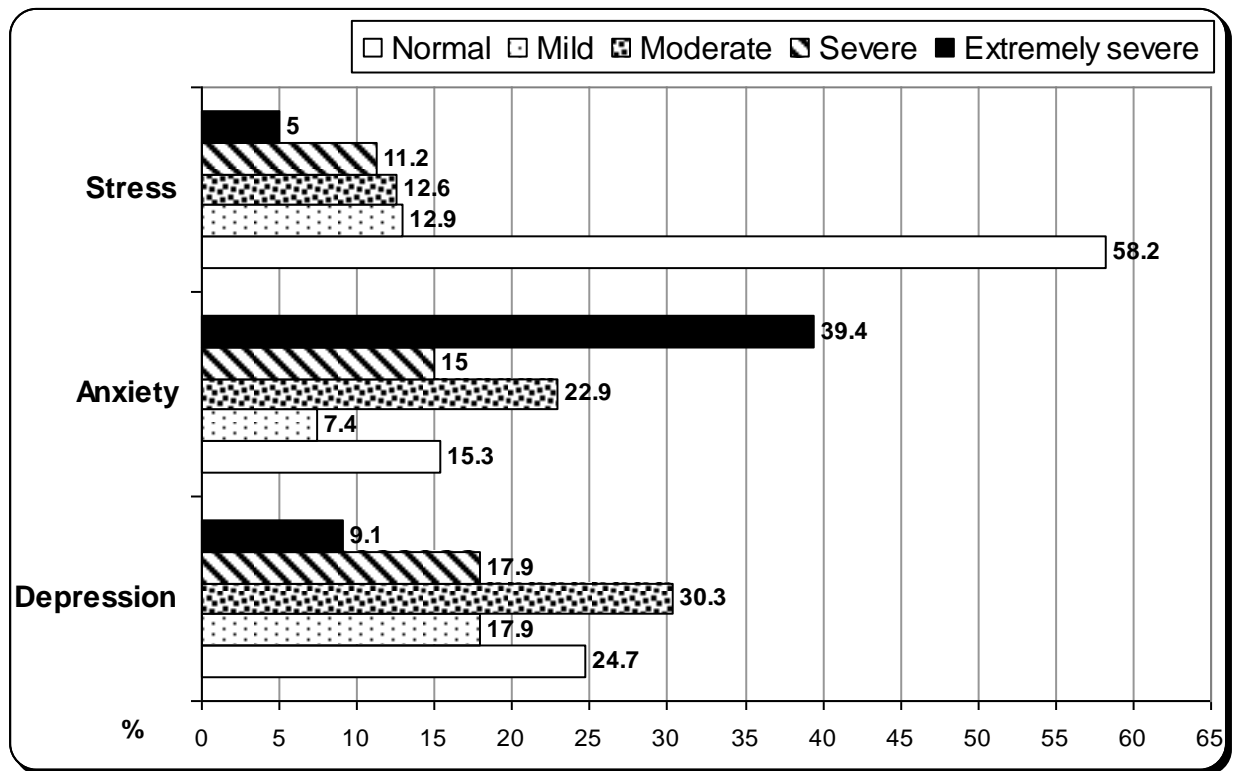


Figure (1): Severity of symptoms of depression, anxiety and stress among the studied students

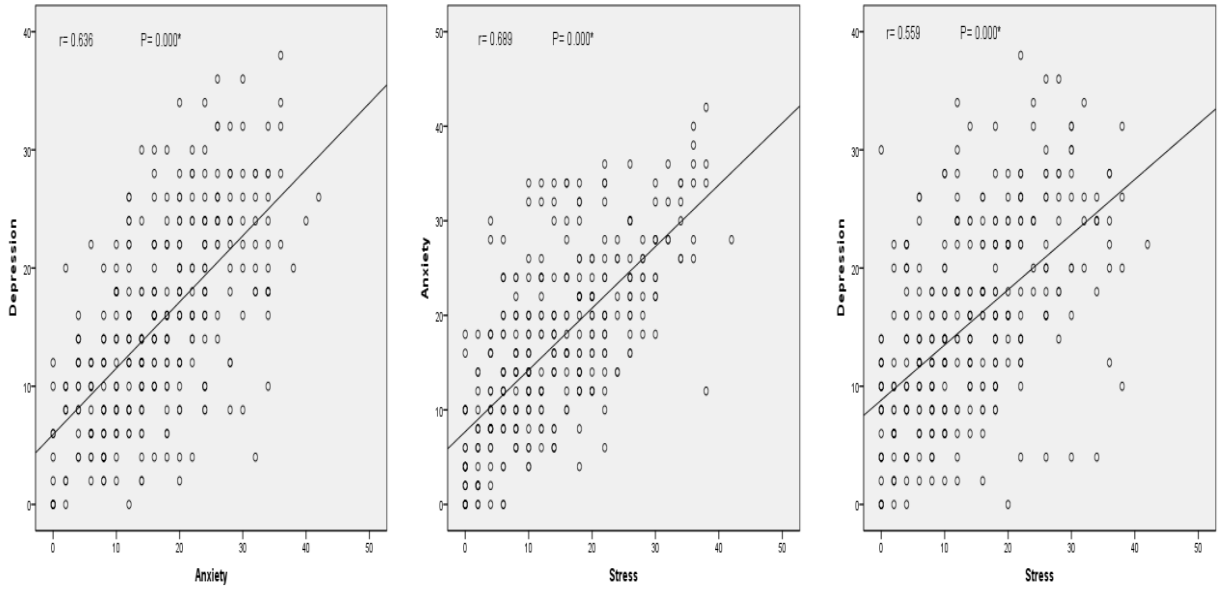


Figure (2): Correlation between severities of depression, anxiety and stress symptoms among the studied students