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Quality of life, test anxiety and its relation to academic achievement among university students: A comparative study

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Abstract

Background: Quality of life (QOL) is one of the topics that have recently taken the attention of psychologists and human science and health researchers.

Objectives: To comparing the QoL, test anxiety and its relation to academic achievement among university students in faculties studying applied versus theoretical sciences.

Methods: Comparative cross-sectional study design was done on a convenience sample of 250 students who were selected from faculties applied and theoretical sciences. A self-administered questionnaire included demographic and academic data, QoL scale and a test-anxiety scale.

Results: More than two-thirds of the students from applied sciences faculties were having high Quality of Life (QoL) compared with less than half of those from theoretical sciences faculties. QoL of the students from applied sciences faculties tended to be higher with low and moderate test anxiety, with a significant weak negative correlation. Conversely, the correlation was positive among the students from theoretical sciences faculties, and the QoL was lowest among those with low test anxiety levels. Theoretical faculties there were a positive correlation between the quality of life and grade point average (GPA) and a negative correlation between anxiety and GPA.

Conclusion: More health educational activities are needed in universities, particularly in the theoretical sciences faculties.

Keywords: quality of life, anxiety, academic achievement, university student

Introduction

University life represents an important phase in students' lives and could be a source of stress among them thus affecting their Quality of Life (QoL) and wellbeing. This is accentuated by the fact that these students are in a transitional phase of their life from adolescence to adulthood when confronting such important life changes (Herrero *et al.*, 2018) [13]. Wellbeing or good QoL is a dynamic concept encompassing subjective, psychological and social dimensions and health-related behaviors (El-Ansari, *et al.* 2011) [8]. A good QoL is essential for their mental hygiene and general health (Huebner, 2010) [14]. Conversely, a low QoL is associated with low academic performance, with negative effects on students' mental and physical health (Dehghan-Nayeri and Adib-Hajbaghery, 2011) [7]. The problem is showing an increasing trend over time (Sivertsen *et al.*, 2019) [26].

The transition into university life is often associated with a number of stressful factors (Ewing *et al.*, 2019) [9], and a stressful environment may lead to psychological distress and negatively affect academic achievement (Turashvili and Japaridze, 2012) [28]. Among these stressors is the stress related to examinations and the fear of failure in tests (Hahn *et al.*, 2017) [10]. Test anxiety encompasses the fear of failure based on a judgment of student performance, as well as the threats to ego and self-esteem and the other consequences of failure (Manchanda *et al.*, 2018) [17]. Thus, test anxiety has cognitive, affective, as well as behavioral components (Negi *et al.*, 2019) [21]. Meanwhile, (Talbot, 2016) [27] clarified that test anxiety has a physiological component linked to emotionality and body, as a psychological component linked to worry.

The psychological aspects of test anxiety involve fears, apprehension, and cognitive impairment, which are due to student's focus on the self rather than the task when being in a challenging situation (Cipra and Müller-Hilke, 2019) [5]. Although examination anxiety can lead to tension and somatic symptoms leading to poor attention and deterioration in thinking (Krispenz and Dickhäuser, 2018) [15], normal anxiety helps prepare the student for the test (Birjandi and Alemi, 2010) [2]. Additionally, it may have a positive effect on a student's future performance in actual practice at work (Piemontesi *et al.*, 2018) [24]. However, the positive or negative effect of test anxiety varies among students (Hamzah *et al.*, 2018) [11].

The literature examined test anxiety among nursing students and demonstrated that they experience a higher level with a negative effect on their emotional wellbeing and QoL. It is

even more severe in comparison with other disciplines (Hamzah *et al.*, 2018) [11]. Meanwhile, test anxiety might have negative long-term impacts on student's academic and social functioning and Quality of Life (QoL) (von der Embse *et al.*, 2018) [29], thus underscoring the role of schools in alleviating such anxiety (Zwettler *et al.*, 2018) [31]. However, there is a paucity of studies comparing the QoL of university students depending on their disciplines, and relating it to test anxiety.

Significant of the study

Anxiety is among the most common feelings and reactions to stress. Studying itself can be stressful; however, there are also anxiety-provoking other aspects of college life and living in dormitories. Students face multiple anxiety-producing factors, such as financial burdens, jobs while studying, getting along with roommates, overly noisy research, completing assignments, satisfying family expectations, And concern to find a job or postgraduate higher education. In addition, frequent evaluation of the course and the need to be ready for these tests by adding the stress and anxiety of the student. Excessive anxiety has different demanding effects on the minds and bodies of the students. It would not only diminish their physical health but also decrease the health-related quality of life, learning capacity, information comprehension; It would not only diminish their physical health but also decrease the health-related quality of life, learning capacity, information comprehension, interpersonal relationship of the student. Several students try to cope with anxiety by self-destructive behaviors like smoking, alcohol consumption (Dehghan-*et al.*, 2011) [7].

Some evidence suggests that nearly 66 to 80 percent of students experience a high level of statistical anxiety when faced with the concepts and subjects of statistics and also assessments related to this course (Cassady, 2010) [3]. Some researchers believe that many students describe statistics as their academic study's most distressing course (Lavasani, *et al.* 2011) [16]. The study is aimed at comparing the QoL of university students in faculties studying applied versus theoretical sciences and the test anxiety among them.

Aim of the study

This comparative cross-sectional study is aimed at comparing the QoL of university students in faculties studying applied versus theoretical sciences and test anxiety among them.

The research questions:

1. Are QoL and test anxiety of students in applied and theoretical disciplines different?
2. Is there a correlation between students' QOL, test anxiety scores, and academic achievement (GPA).

Subjects and method:

Research design and setting:

A comparative cross-sectional analytic study design was used in conducting this study among students in Mansoura and Fayoum Universities. Mansoura University is one of the oldest universities in Lower Egypt, whereas Fayoum University is a newer one and is located in Upper Egypt.

Sample: The undergraduate students enrolled in the various faculties of these two universities during the academic year 2017-2018. The faculties were divided into two groups, namely applied and theoretical sciences. The group of applied sciences faculties included the faculties of medicine, nursing, pharmacy, dentistry, sciences, agriculture, and engineering. The theoretical sciences faculties group included faculties of arts, commerce, education, law, and tourism. A multistage, random sample was used to recruit the study sample. At the first stage, two lists were created Mansoura and Fayoum University. In the second stage, 125 students from each group of faculties of four classes (1st, 2nd, 3rd, and 4th,) were selected randomly from each selected applied and theoretical study. Finally, all eligible students in each selected class were voluntarily involved in the study. The sample size was calculated to detect any difference between the two groups in their QoL or test anxiety from baseline 0.50 with Odds Ratio (OR) 2.20 at 95% level of confidence and 80% study power. Using the OpenEpi computer software package, and after adjustment for a design effect 1.5 and a non-response rate of 10%, the required sample size turned to be 125 students per group.

Data collection method

The self-reported questionnaire included demographics, academic QoL scale, and a test-anxiety scale that was used for data collection. It included the following:

WHO Quality of Life Scale; it was developed by (World Health Organization's Quality of Life group, 1992). It was used to assess a student's perception of own QoL. It included 62 items under two main domains, namely general and self. The "general" domain involved 4 dimensions as following. The health and healthy environment dimension had 10 items such as "I feel active and vital" and "I care for the cleanliness of my surrounding environment." The family environment dimension had 11 items such as "I have a good standard of living" and "I have difficulty communicating with my parents." The faculty environment dimension had 10 items such as "There is good transportation to the faculty" and "I suffer discrimination at the faculty." The social/emotional dimension 11 items such as "My friends and neighbors like me" and "I get support from my family." The "self" domain had two dimensions, namely mental wellbeing, and psychological QOL. The mental wellbeing dimension had 10 items such as "I feel comfortable at school" and "I enjoy my life." The psychological QOL dimension had 10 items such as "I feel lonely" and "I do not easily cope with new matters."

Scoring: The items were on a 3-point Likert scale Yes, Sometimes, and No. These were scored 2, 1 and zero. The scoring was reversed for negative items so that a higher score indicates better QoL. For each dimension and domain and the total scale, the scores of the items were summed-up and the total divided by the number of items giving a mean score for the part. These scores were converted into percent scores. The student's QoL was considered high if the percent score was 60% or more and low if less than 60%.

Test Anxiety scale; developed by Nist and Diehl (1990) [22] to assess the anxiety experienced by students before taking an exam. It consists of 10 items such as "I panic before and during a test" and "My mind goes blank during a test." The

items were on a 5-point Likert scale" never, rarely, sometimes, often, and always.

Scoring: Items were scored 1, 2, 3, 4, and 5 for the responses never, rarely, sometimes, often, and always, respectively so that a higher score meant more test anxiety. The scores of the items were summed up and the total score ranged between 10 and 50. According to tool instructions, a score of 35 or higher indicates high test anxiety, whereas a lower score indicates low test anxiety.

Validity and reliability: The tool was rigorously revised by 3 experts in community health nursing and 2 experts in the medical-surgical department. The two scales are standardized with high validity. The reliability of the scales was tested in this study and proved to be good with Cronbach alpha coefficients 0.62 for the QoL scale, and 0.79 for the test anxiety scale. The tool was finalized after being pilot-tested on a sample representing approximately 10% of the study sample.

Pilot study: A pilot study was done on 10% (13 students) of the sample to test the clarity and feasibility of the developed tool. It had also provided an estimate of the time needed to fill out the tools. The purpose of the pilot study was to ensure the clarity of designed study tools, **e**xamine the utility of designed tools and identifies any difficulties or problems needed to handle before applying it.

Data Collection and Ethical Considerations

Permissions to conduct the study were obtained from the authorized persons in the two universities and dean of each of the selected faculty. The researcher met the dean of faculties and explained the purpose of the study and permission was taken to see students in their classrooms. The purpose of study and procedures were also explained to all students and the students were assured that they have the right to participate or refuse to participate. After that, the questionnaire was administered and explained to the students. A code number has been allocated and used on all data collection devices instead of a name. After the participants collected the data, the relation between the code number and the name of the participant was removed. Students were told that all of the information obtained will be kept secret to protect confidentiality. In addition, students have been assured that no other person will know their personality, and data has been coded to ensure anonymity.

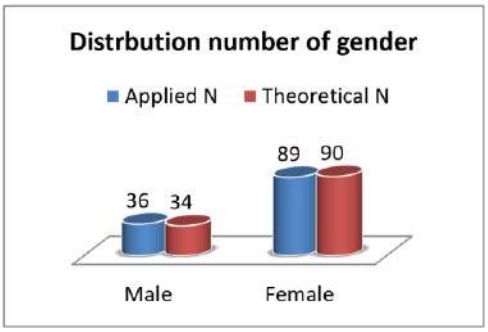
Statistical analysis: Data entry and statistical analysis were carried out using SPSS 20.0 statistical software package. Cronbach alpha coefficient was calculated to assess the reliability of the scales through their internal consistency. Quantitative continuous data were compared using the Student t-test in case of comparisons between two independent groups. When the normal distribution of the data could not be assumed, the non-parametric Mann-Whitney test was used instead of the Student t-test. Spearman rank correlation was used for assessment of the inter-relationships among quantitative variables and ranked ones. To identify the independent predictors of the QoL and test anxiety scores, multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significance was considered at p-value <0.05

Results

Table 1: Demographic and academic data of students in the two study groups (n 250)

Items	Group				X^2 test	p-value
	Applied (n=125)		Theoretical (n=125)			
	No.	%	No.	%		
Gender:						
Male	36	28.8	34	28.0		
Female	89	71.2	90	72.0	0.02	0.89 ns
Academic grade:						
Satisfactory	0	0.0	4	3.2		
Good	30	24.0	57	45.6	45.12	<0.001**
Very good	50	40.0	59	47.2		
Excellent	45	36.0	5	4.0		
GPA (%):						
Range	60.0-98.0		50.0-93.0			
Mean±SD	81.9±8.9		75.8±7.6		H=28.06	<0.001**
Median	81.00		75.00			

The samples of students from applied and theoretical sciences had an almost equal sex distribution with more preponderance of females. The students from applied sciences faculties had higher academic grades and Grade Point Averages (GPA), p<0.001. as shown in Table 1.



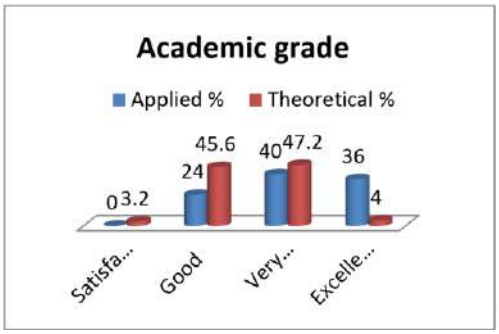


Table 2: Quality of Life (QOL) and test anxiety among students in the two study groups (n 250)

Items	Group				X^2 test	p-value
	Applied (n=125)		Theoretical (n=125)			
	No.	%	No.	%		
High (60%+) QOL:						
General:						
Health and healthy environment	82	65.6	48	38.4	18.53	<0.001*
Family environment	115	92.0	78	62.4	31.11	<0.001*
Faculty environment	19	15.2	19	15.2	0.00	1.00 ns
Social/emotional	111	88.8	113	90.4	0.17	0.68 ns
Self:						
Mental wellbeing	82	65.6	89	71.2	0.91	0.34 ns
Psychological QOL	42	33.6	40	32.0	0.07	0.79 ns
Total QOL:						
High (60%+)	88	70.4	58	46.4		
Low (<60%)	37	29.6	67	53.6	14.82	<0.001*
Test anxiety:						
Low (<20)	9	7.2	33	26.4		
Moderate (20-<35)	91	72.8	73	58.4	16.51	<0.001*
High (35+)	25	20.0	19	15.2		

(*) Statistically significant at $p<0.05$

As illustrated in Table 2, more than two thirds (70.4%) of the students from applied sciences faculties were having high Quality of Life (QoL) compared with less than a half (46.4%) of those from theoretical sciences faculties, and the difference was statistically significant ($p<0.001$). The differences were mainly in the QoL dimensions of "health and healthy environment" and "family environment." The "self" domain of QoL did not show any significant difference. As for the test anxiety, it tended to be higher among the students from applied sciences ($p<0.001$).

Table 3: Relations between Quality of Life (QOL) and test anxiety among students in the two study groups (n 250)

Test anxiety	QOL				X^2 test	p-value
	High		Low			
	No.	%	No.	%		
Applied faculties:						
Low (<20)	5	55.6	4	44.4		
Moderate (20-<35)	73	80.2	18	19.8	16.25	<0.001*
High (35+)	10	40.0	15	60.0		
Spearman rank correlation	r=-0.21, $p<0.05$					
Theoretical faculties:						
Low (<20)	2	6.1	31	93.9		
Moderate (20-<35)	45	61.6	28	38.4	29.42	<0.001*
High (35+)	11	57.9	8	42.1		
Spearman rank correlation	r=0.19, $p<0.05$					

(*) Statistically significant at $p<0.05$

Table 3: shows that the QoL of the students from applied sciences faculties tended to be higher with low and moderate test anxiety, with a significant weak negative correlation. Conversely, the correlation was positive among the students from theoretical sciences faculties, and the QoL was lowest among those with low test anxiety levels.

Table 4: Relations between Quality of Life (QOL) and academic achievement among students in the two study groups (n 250)

Academic achievement	QOL				X2 test	p-value
	High		Low			
	No.	%	No.	%		
Grade:						
Good	17	56.7	13	43.3		
Very good	34	68.0	16	32.0	5.872	.053
Excellent	37	82.2	8	17.8		
Grade:						
Satisfactory	3	75.0	1	25.0		
Good	24	42.1	33	57.9		
Very good	28	47.5	31	52.5	2.137	.545
Excellent	3	60.0	2	40.0		

(*) Statistically significant at $p<0.05$

Table 4: shows that the QoL of the students from applied sciences faculties tended to be higher with excellent grades, Also, the students from theoretical faculties had higher QoL with very good grades, with a significant weak negative correlation.

Table 5: Relations between test anxiety and academic achievement among students in the two study groups (n 250)

Academic achievement	Test anxiety						Test	p-value
	Low		Moderate		High			
	No.	%	No.	%	No.	%		
Grade:								
Good	5	16.7	15	50.0	10	33.3		
Very good	1	2.0	34	68.0	15	30.0	Fisher	0.001*
Excellent	3	6.7	42	93.3	0	0.0		
Grade:								
Satisfactory	1	25.0	3	75.0	0	0.0		
Good	19	33.3	21	36.8	17	29.8		
Very good	12	20.3	45	76.3	2	3.4	Fisher	0.001*
Excellent	1	20.0	4	80.0	0	0.0		

(*) Statistically significant at $p<0.05$

Table 5: shows that the anxiety level of the highest percent of the students from applied sciences faculties tended to be moderate with excellent grades, while, the students from theoretical faculties had moderate anxiety levels with very good grades, with a statistically significant relationship between the two groups.

Table 6: Correlation of students' QOL, test anxiety scores, and academic achievement (GPA) (n 250)

	Spearman's rank correlation coefficient					
	Applied (n=125)		Theoretical (n=125)		Total (n=250)	
	QOL	Anxiety	QOL	Anxiety	QOL	Anxiety
QOL						
Anxiety	-.208*		.193*		.054	
GPA	.401**	.024	.192*	-.069	.359**	.070

(*) Statistically significant at $p<0.05$ (**) statistically significant at $p<0.01$

Table 6: demonstrated that there was a positive correlation between the quality of life and GPA and a negative correlation between QoL and anxiety level for students of applied science faculties. Regarding the students from applied faculties, there was a positive correlation between the quality of life and GPA and a negative correlation between anxiety and GPA.

Discussion

The study findings indicate generally better QoL among the students from applied sciences faculties compare with their counterparts from theoretical sciences faculties. Meanwhile, they tended to have higher test anxiety scores, and the negative effect of being in a theoretical sciences faculty on the test anxiety score was independent of the various students' characteristics.

According to the present study results, the students from applied sciences faculties had better QoL in comparison with those from theoretical sciences faculties. The difference was particularly evident in dimensions of "health and healthy environment" and "family environment" of the "General" QoL domain. This might be explained by the significant differences in the socio-demographic characteristics between the two groups as pointed before. Our finding is in agreement with Backhaus *et al.* (2019) [1] Its study in Italy showed a negative impact of studying in

theoretical sciences faculties such as trade and student QoL law. However, a New Zealand study found no significant difference in medical QoL versus non-medical students, in disagreement with this (Henning *et al.*, 2012) [12]. The disparity with our result could be because our samples included many faculty students and not only medical and non-medical students.

On the other hand, the other QoL dimensions pertaining to faculty and social environment as well as the "self" domain of QoL did not show any significant differences between the two groups. This adds to the evidence that the family characteristics are more influential on students' QoL compared with the faculty characteristics and this was confirmed in the results of the multivariate analysis. Thus, the main negative predictors of the QoL score were personal and family factors such as the previous academic failure, the number of friends of the same sex, and having a chronic disease. Accordingly, a study on university students in Mexico revealed a significant negative relationship between disease symptoms and psychological well-being. (Contreras *et al.*, 2017) [6].

Regarding the relation between the quality of life and students' academic achievement, the present study revealed that that the QoL of the students from applied sciences faculties tended to be higher with excellent grades, Also, the students from theoretical faculties had higher QoL with very good grades. This is consistent with the finding from the Iranian WHO-Q_OL study in which medical students presented a similar satisfaction in all the components assessed (Mazaheri, 2010) [19]. Another study compared the QOL of medical students with the general population and found that medical students scored lower in physical, psychological and environmental health but not in social relationships (Henning *et al.*, 2012) [12]. Similarly, this study entailed the highest rating in social relations where the students reported a positive attitude towards their interactions with their friends and the support they provide to each other. This is a statement of a positive consequence for their future as doctors need to accept their friendly character in order to polish their relationship with doctors and patients (Marcinowicz *et al.*, 2014) [18].

Regarding the relation between the anxiety level and students academic achievement, the anxiety level of the highest percent of the students from applied sciences faculties tended to be moderate with excellent grades, while, the students from theoretical faculties had moderate anxiety level with very good grades, with a statistically a significant relations between the two groups. This disagrees with Mohammed *et al.* (2017) [20], who examined the effects of examination anxiety on university students' academic performance at Northwest University, Kano, Nigeria. Researchers found that students with elevated levels of anxiety received lower grades compared to their counterparts who won higher grades with modest levels of anxiety. Thus it was obvious that academic anxiety has an impact on university students ' academic achievement.

The present study has also assessed student's test anxiety and compared it between the students from applied and those from theoretical sciences faculties. The results demonstrated significantly higher levels of test anxiety among the students from applied sciences faculties in comparison with their peers in theoretical sciences faculties. This was further confirmed by the multivariate analysis result that being a student in a theoretical sciences faculty was the main independent negative predictor of the test anxiety score. This finding might be attributed to the more frequent testing in the applied sciences faculties leading to more stress among them, in addition to the nature of study and testing being generally more difficult. In accordance with this, a report on Canadian nurses showed high levels of stress linked to the essence of the profession, including the understanding of clinical practice by students, the transition between education and personal and family life, and dealing with it. (Chernomas and Shapiro, 2013) [4].

Lastly, the finding of the present study point to different relationships between the scores of QoL and test anxiety in the students from applied and from theoretical sciences faculties. The relation tends to be negative among the former and positive among the latter students. This implies that the QoL of the students from applied sciences faculties is more disturbed by their test anxiety. In agreement with this, a study in the United States by Seo *et al.* (2018) [25] A negative impact of stress and anxiety on QoL of university students has been reported. This study outcome could be clarified by variations in the preparation of the student for a paper and pencil test versus a realistic laboratory or clinical test in different test settings. The preparation for practical tests may need more time and more logistics that may have a negative impact on student's QoL. In line with this, Parra and Kaplan (2019) [23] in a study in the United Kingdom demonstrated the effect of the test environment on the test anxiety and performance of university students.

Conclusion and Recommendations

In conclusion, the university students from applied sciences faculties have better QoL in comparison with those from theoretical sciences faculties. However, they have higher test anxiety scores, and this has a more negative impact on their QoL. The students from applied faculties there was a positive correlation between the quality of life and GPA and a negative correlation between anxiety and GPA.

Hence, more health educational activities are needed in universities, particularly in the theoretical sciences faculties.

Conflict of interest

The authors declare no conflict of interest, financial or otherwise.

Acknowledgment

Declared none.

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