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Test Anxiety Among Health Profession Students: A Cross-Sectional Survey at Fatima College of Health Sciences in Al Ain, United Arab Emirates

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Abstract

Background: Test anxiety (TA) affects students before and/or during exams and has become an incremental worldwide phenomenon.

Objectives: This study aimed to measure the TA intensity for health profession students (HPSs) at the Fatima College of Health Sciences (FCHS) at Al Ain Campus, UAE, and to recognize demographic and academic correlative and/or associated factors.

Methods: A three-section questionnaire was used to collect data including the HPSs' demographic and academic characteristics as well as to collect their response to the achievement anxiety test (AAT). This AAT assesses the intensity of TA and determines two independent subscales of debilitating and facilitating patterns of this TA. The HPSs were recruited from five departments at the FCHS to voluntarily participate in the study.

Results: The number of students who participated in the study was 215 from all academic levels. The results revealed that out of 95 points, the mean total AAT score was 57.2 points (60.2%), with no significant difference among departments; the debilitating independent subscale had 31.9%, and the facilitating independent subscale had 28.3%. All the studied academic factors and two of the studied personal factors showed a significant correlation with AAT scores.

Interpretation: The HPSs at FCHS, Al-Ain Campus had a moderate TA intensity level, and almost half of this TA is of the good facilitating type that encourages and motivates students to study and prepare well for their exams. Senior students with high college entry grades, high GPA in the previous semester, high CGPA, a lower average course load per semester, living in a villa, and having family social support had significantly lower AAT scores.

Conclusions: The HPSs at FCHS have a comparatively lower TA intensity than other health colleges in the UAE and Gulf region. Different academic and demographic factors showed a significant correlation with AAT scores.

Keywords: Test anxiety; Achievement Anxiety Test; Facilitating and debilitating test anxiety; Health Professions' Students; Fatima College of Health Sciences; Test anxiety-associated factors

Introduction

Assessment of students' academic achievement and degree of accomplishment of course learning outcomes is an integral component of the teaching and learning process in higher education institutions, including

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health profession programs. Instead, students' assessment can induce a type of anxiety called test anxiety (TA), which is reported to be the common type of anxiety present among university students [1]. Anxiety is defined as an undesirable and unclear feeling such as when a person predicts a dangerous situation [2]. In general, an average level of anxiety is useful in sustaining individuals' hard work and responsibility [3]; however, extreme levels of anxiety are harmful to individuals' mental and physical well-being as well as their social, familial, occupational, and educational performance [4]. Anxiety has become a common phenomenon that represents a universal cause of poor academic performance among students globally [5]. Meanwhile, TA that arises before, during, and/or after tests and examinations [6- 8] is one of the psychological conditions that can be defined as an undesirable reaction toward academic assessment [5] and as a feeling of extreme fear of underperformance accompanied by cognitive deficits [6, 9]. The TA is a bidimensional construct of cognitive (worry) dimension and affective (emotional) dimension. The cognitive dimension refers to cognitive concerns about performance, such as worry about testing situations or negative performance expectations and can directly influence the performance of students on exams. On the other hand, the affective expectations do not directly affect test performance [5, 10], and it includes behavioral or physical reactions to tests such as fear, nervousness, and physical discomfort. In other words, TA negatively affects not only students' cognitive abilities but also their physical and emotional well-being [11]. Previous studies have reported several drawbacks for TA cognitive symptoms, such as negative thinking, difficulty concentrating, blocking of memory and recall as well as physical symptoms that manifest in students before a test. These symptoms include headache, sweating, rapid heartbeat, restlessness, unusual body movements, insomnia, fatigue, muscle contraction, upset stomach, tremors, and emotional symptoms in the form of stress, disappointment, and helplessness [6,7, 9, 11-17]. Hence, TA weakens students' test-taking ability, decreases their ability to present knowledge about the content in the course being assessed, and accordingly leads to poor performance in the test and affects the test scores and overall grades and academic achievements [18]. It should be noted that nearly all students experience TA [11, 12] before any assessment, and a mild form of anxiety could even have a facilitating effect [13] on students' academic performance, as it can motivate students to learn [19]. On the other hand, this anxiety might be extreme enough to cause debilitating effects and inhibit students' performance and seriously affect their grades [13, 18].

TA levels continue to rise among university students worldwide [1, 5, 20], including health profession students (HPSs) [5, 7, 8, 11, 15, 20-25]. There is no doubt that health profession education is difficult, demanding, and challenging due to the high academic loads and competencies required to meet patients' needs and expectations while ensuring safe, high-quality patient care, and it requires hard work and dedication, resulting in students feeling stressed most of the time and having TA that hinders students' well-being and interferes with their performance [7, 20]. Several previous studies indicated a different prevalence of TA among HPSs ranging from 25% to 93.5% [5, 7, 8, 15, 24, 26]. Among those studies, a study conducted in Malaysia on first-year pharmacy students in which the TA was reported in 32.6% of students [21] and a study applied in India among physiotherapy students and 27% of students had moderately high TA [22]. Another study conducted in the Kingdom of Saudi Arabia (KSA) revealed a moderate TA among medical, dental, and pharmacy students at Imam Abdulrahman Bin Faisal University [7] and a very high (93.5%) prevalence among nursing students at King Saud Bin Abdulaziz University for Health Sciences, where 14.4% of students demonstrated severe anxiety [5]. In the United Arab Emirates (UAE), two studies were carried out at Gulf Medical University on health sciences students, the first in 2015, which showed that 43% of students have a high level of TA [6], and the second study conducted in 2022, indicating that a high level of TA was reported in 82.6% of the students [20]. Many factors are reported to be related to TA among students in different parts of the world. Such factors include the student's age, academic program, low previous and cumulative grade point average (GPA, CGPA), academic level, assessment system, long duration of examination, students' motivation, extensive course load, poor study and learning skills, lifestyle, lack of physical exercise, competition, social status, family responsibilities, poor time management skills, history of medical and mental illness, low self-esteem, parental educational level, family income, lack of social support and relationships, parental pressure, and female gender [5, 7, 8, 20-25, 27-29]. A study conducted in the KSA [7] reported that half of female medical students reported TA, and another study conducted in the KSA [17] showed TA in 65% of medical students, with a higher prevalence among female students. In Belgrade, Serbia, female medical students demonstrated significantly higher TA than male students [14]. In addition, the tool used to assess TA is a correlative factor [23]. One of the tools that is used to measure students' TA is the Achievement Anxiety Test (AAT). This instrument was developed by Alpert and Haber (1960) [30]. It consists of two independent subscales: a facilitating subscale (nine items) and a debilitating subscale (ten items). The items on the facilitating subscale are of the form "Anxiety helps me to do better during exams and tests," while items on the debilitating subscale are of the form "Anxiety interferes with my performance during examinations and tests." Each item has a 5-point scale where 5 is the number for maximum response. The sum of the maximum of the ten debilitating items is 50, the sum of the nine facilitating items is 45, and

the total sum for the whole AAT scale is 95 points. Although TA is proven to be more common among university students and HPSs have been shown to be more prone to TA than humanities students [6], studies have also indicated that there is a wide range of prevalence of TA among HPSs in different universities in different countries, making it imperative to determine its intensity in the interested university or country. Additionally, if any customized mitigation and/or management system is required to be developed to prevent or manage this TA problem, preliminary data are mandatory to visualize the intensity, scope, and associated factors of this problem in the specific university. Therefore, the present study aimed to provide basic data and information regarding TA intensity in terms of total AAT score, as well as independent debilitating and facilitating item scores for HPSs at Fatima College of Health Sciences (FCHS) at Al Ain Campus, UAE. In addition, to recognize the demographic and academic correlative and/or associated factors.

Methods

Study Design

The current cross-sectional study is a population-based survey conducted at the FCHS-Al Ain Campus, UAE between March, and June 2023. Self-reported data were collected using a three-section questionnaire. The first section was allocated for welcoming participants, participants' study information sheet, and a consent form. The second section is a literature-based questionnaire that included 14 items related to participants' demographic and academic information. Meanwhile, the third section included the Alpert-Haber Achievement Anxiety Test (AAT) (1960) [30, 31], which is composed of 19 items to measure total anxiety as well as its independent subscales: facilitating (AAT^+, 9 items) and debilitating (AAT^-, 10 items) components [31]. The test-retest reliabilities for a 10-week interval are 0.88 and 0.87 for AAT^+ and AAT^- respectively, while they are 0.75 and 0.76 over an 8-month period [30]. In validating the AAT^+ and AAT^- subscales, Albert and Haber (1960) cited high positive correlations between anxiety subscales of several anxiety scales with the AAT^- [30]. On the other hand, negative correlations were reported between the AAT^+ subscale and AAT^- subscale as well as other anxiety scales [30]. For each item, a five-word response was available from which the participant selected the response that was most convenient to her. Scoring of the participant's response was performed through a 5-point Likert scale [32], as in Table (1). An Excel sheet was used to record the participant's information and the 5-point Likert response, and it was used to calculate the sum of her AAT^+ and AAT^- independent subscales and the percentage from the subscale total as well as the total AAT sum and percentage. The range of the sum of the nine AAT^+ items is from 9-45, while the range of the sum of the ten AAT^- items is 10-50.

Table 1: 5- Point Likert Scoring of Items of Achievement Anxiety Test (AAT).

Item Subscale	Item #	5-point Likert Scoring				
Facilitating (AAT+) Subscale	2, 6, 9, 15, 16, and 18	5	4	3	2	1
	8, 10, and 12	1	2	3	4	5
Debilitating (AAT-) Subscale	1, 5, 7, 11, and 14	5	4	3	2	1
	3, 4, 13, 17, and 19	1	2	3	4	5

FCHS is a governmental college in Al Ain City, Abu Dhabi, Ajman, and Al Dhafra across the UAE that was established in 2006. The FCHS has six health professions' departments in addition to a general requirement department that offers general courses to the students who are already enrolled in one of the six professional departments. The FCHS was originally a female student college until one year ago, and very few male students were accepted for enrollment in the nursing and emergency health departments. The current study included only female students, and the target population was recruited from five of the FCHS departments, namely, Physiotherapy, Radiology and Medical Imaging, Pharmacy, Nursing, and Emergency Health.

Data Collection Methods

A questionnaire pretesting was applied through a pilot study to ascertain the wellness of the questionnaire. Researchers disseminated hard and soft copies of the first version to students in their departments. Students selected to be included in the pilot study were those who agreed to voluntarily participate and who are known to be responsible and objective. Students were asked to respond to the questionnaire and to report the time required to complete, as well as to record any unclear, confusing, or repeated questions, items, or words. Upon receiving ethical approval, the pilot study took place for one week from March 21st- 24th, 2023. The number of students included in the pilot study was 32 (8 students from Physiotherapy department, 2 from Radiology and Medical Imaging, 15 from Pharmacy, 3 from Nursing, and 4 from Emergency Health department). The average response time as reported by students was 10 minutes, and a few modifications were made in the second section of the questionnaire according to the students' report to provide greater clarity to the questionnaire. The word "number" was added to question number nine, and the word "your" was added to questions number ten and eleven. Then, the final version of the questionnaire was prepared accordingly.

Sample Characteristics

The target population for this study was undergraduate female students who agreed to voluntarily participate in the study. Convenience sampling was used to recruit them from the five FCHS health professions' departments, including Physiotherapy, Radiology and Medical Imaging, Pharmacy, Nursing, and Emergency Health departments. The Psychology

department was not included in the study because it was recently launched, and only a few students were enrolled in their first academic year. As reported by the college students' service department, the total number of students in the five included departments was 593. An electronic sample size calculator [33] was used to calculate the needed number of participants. Using a confidence level of 95%, a margin of error of 5%, a population proportion of 68.5% (the range between the minimum 25% and maximum 93.5% of literature-reported TA prevalence), and a population size of 593, the recommended sample size was 213 participants.

Survey Administration

The questionnaire was self-administered, and its final version was available in a hard, soft word document and a google electronic form version. The electronic version is available at . The questionnaire was disseminated to eligible students using different methods: 1- through the college students' services department email to students of the five included departments, 2- by researchers in their corresponding departments through direct contact, email, and What's App, and 3- hard copies of the questionnaire were also available at the librarian's desk. Researchers verbally invited students to participate before or after class time or while students were in their break times, and they also sent them group and personal emails as well as texted them in WhatsApp groups. Students visiting the college library were invited to participate in the study through the librarian. Both researchers and the librarian notified students that they did not need to respond if they had responded to the questionnaire electronically. Students were also notified in the email of the students' service department that they could ignore the email if they already responded to the hard copy of the questionnaire. The data collection took place from March 27th, and it was suspended on April 24th, 2023, as students were two weeks away from final examinations. Suspending data collection aimed to avoid any bias that may affect the students' responses. Data collection resumed on May 22nd, 2023, at the beginning of the summer semester, and the students' service department sent a reminder email to the students, emphasizing that if the students previously responded to the questionnaire, they could ignore the email and asked the students not to duplicate their response. Meanwhile, the researchers and librarian continued participants' recruitment until June 2nd, 2023, when the students' recruitment ended. The principal researcher applied data coding and was assessed by another researcher for data entry on the Excel sheet. Random revision of the entered data was completed by a third researcher to approximately 10% of collected questionnaires, confirming that there was no human error in the data entered.

Study Preparation

Before the study was launched, the principal researcher met with all the study researchers in personal and in groups to ensure standardization of survey administration.

Ethical Considerations

The study obtained ethical approval from the FCHS ethical approval committee (Reference No: FECE-20-03-23-PT-Salwa.) on March 21st, 2023. The first section of the questionnaire included the participant's information sheet, in which all the information about the study was introduced to the participants, including the study title and aim and how to respond to the questionnaire. It also assured confidentiality, as it was mentioned that information regarding this study is purely limited to research, publication, and improvement purposes. All identities would be protected, and the participant's name is not even requested. All the collected data and information would be handled carefully, and only researchers would be able to access the collected information that would be kept confidential and would be destroyed after the study publication. The first section of the questionnaire also included a consent form stating that responding to the questionnaire would be considered an agreement to participate in the study.

Statistical Analysis

The questionnaire-collected data and information from sections two and three were entered into the PSPP statistical program, and both descriptive and inferential statistics were calculated in accordance with the study aim. Means, standard deviations, and medians were used to describe continuous variables, while frequencies were used to describe categorical variables. One-way ANOVA and Tukey post hoc tests were used to compare the AAT scores as dependent variables against different independent variables of the department. Two-tailed bivariate correlation was used to correlate the ATT mean percentage scores with the demographic and academic variables. In addition, the demographic and academic variables that showed significant correlation with the AAT scores were studied for association with the student's department through the chi-square test. The 0.05 was used as a significant P value. The mean value of the AAT columns is used to replace the very few missing data (32 values). The Checklist for Reporting of Survey Studies (CROSS) [34] was used to report this study's findings.

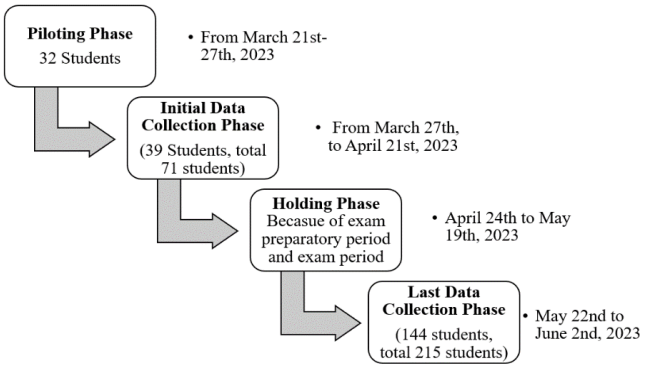
Results

Based on the online sample size calculator used, the target population for the current study was 213, and the number of students who participated was 215 from the five departments included in the study. The response rate was calculated by dividing the number of participating students (215) over the number of the target population (213) and multiplying by 100, which was a 100.9% response rate. Their numbers and percentages are presented in Table (2), and flow diagram (1) reports the students' number at each stage of the study.

Descriptive characteristics of the participants are shown in Table (3). The median age of the participants was 21 years.

Table 2: Numbers of Enrolled, and Participant Students for Each of the Included Five Health Professions' Departments at Fatima College of Health Sciences- AL Ain Campus- UAE.

Department	Enrolled Students #	Participants		
		#	Percent	Valid Percent
Physiotherapy	35	23	14.90%	15%
Emergency Health	63	26	12.10%	12.10%
Nursing	332	101	47.00%	47.20%
Pharmacy	59	31	14.40%	14.50%
Radiology and Medical Imaging	104	24	11.20%	11.20%
Missing	-	1	0.50%	-
Total	593	215	100%	100%



Flow Diagram 1: Students' Number at Each Stage of the Study.

Table 3: Description of Health Profession Participants Students' Demographic and Academic Factors- Fatima College of Health Sciences- AL Ain Campus- UAE.

Participants' Descriptive Characters	N	Median	Minimum	Maximum
Age (year)	213	21	18	37
	N	**Mean ± SD**	**Minimum**	**Maximum**
Previous Semester GPA (out of 4)	201	2.8 ± 0.61	1.6	4
Cumulative GPA (out of 4)	183	2.8 ± 0.61	1.2	4
College Entergy Grade Percentage	123	90.2% ± 4.4	73	99.3
Average Course Load per Regular Semester (not summer semester)	200	14.1 ± 2.03	8	18

Participants' Descriptive Characters	N	Median	Minimum	Maximum
		Frequency	**Percent**	**Valid Percent**
Social Status	Single	183	85.10%	85.90%
	Engaged	15	7%	7%
	Married	9	4.20%	4.20%
	Married and has kids	5	2.30%	2.30%
	Divorced	1	0.50%	0.50%
	Divorced and has kids	0	0%	0%
	Missing	2	0.90%	-
	Total	215	100%	100%
Study Level	Junior	72	33.50%	34%
	Senior	140	65.10%	66%
	Missing	3	1.40%	-
	Total	215	100%	100%
Father Education Level	Non-Educated	14	6.50%	6.50%
	Primary/ Middle School	37	17.20%	17.30%
	Secondary School	60	27.90%	28%
	University	94	43.70%	43.90%
	Post-Graduate	9	4.20%	4.20%
	Missing	1	0.50%	-
	Total	215	100%	100%
Mother Education Level	Non-Educated	21	9.80%	9.90%
	Primary/ Middle School	38	17.70%	17.80%
	Secondary School	69	32.10%	32.40%
	University	80	37.20%	37.60%
	Post-Graduate	5	2.30%	2.30%
	Missing	2	0.90%	-
	Total	215	100%	100%

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Participants' Descriptive Characters	N	Median	Minimum	Maximum
Accommodation	Rented	30	14%	22.90%
	Owned	101	47%	77.10%
	Missing	84	39.10%	-
	Total	215	100%	100%
	Flat	10	4.70%	6.30%
	Villa	149	69.30%	93.70%
	Missing	56	26%	-
	Total	215	100%	100%
	Has a Separate Room	73	34%	68.20%
	Has a Joined Room	34	15.80%	31.80%
	Missing	108	50.20%	-
	Total	215	100%	100%
Family Social Support	Low	12	5.60%	5.60%
	Moderate	72	33.50%	33.60%
	High	130	60.50%	60.70%
	Missing	1	0.50%	-
	Total	215	100%	100%
Interest in Study	Highly interested	93	43.30%	43.30%
	Moderately interested	97	45.10%	45.10%
	Seldomly interested	20	9.30%	9.30%
	Not interested at all	5	2.30%	2.30%
	Missing	0	0.00%	-
	Total	215	100%	100%

The median age was used instead of the mean and standard deviation as there were two students with extreme ages of 30 and 37 years. Two-thirds (66%) of the participants were senior students, had a high college entry grade percentage (90.2% ± 4.4) and were of average academic level based on their GPA and CGPA (2.8 ± 0.61 for both). It also demonstrates that the mean course load for the regular semester was 14. 1 credit hours, which is an average course load. The table also indicates that most (85.9%) of the students were single, and the most frequent percentage for their fathers' and their mothers' education level was university level (43.9% and 37.6%, respectively). A high percentage of students reported living in a separate room (68.2%) in an owned (77.1%) villa (93.7%), which might indicate their high economic level. Almost two-thirds of students (60.7%) reported high social support from their families, while (43.3%) of them reported a high interest level in their studies.

Tables (4) and (5) show the results of AAT and indicate that out of the 95-point total scores of the test, the participants' mean score was 57.2 (60.2%), which can be considered a medium intensity level of TA. The debilitating independent subscale had (31.9%), and the facilitating independent subscale had (28.3%) of the total test percentage score.

Although there was no significant difference (P= 0.247) in the AAT mean total score percentage among the departments (Table 6-A), there was a significant difference (P= 0.001) among departments for the mean sum percentage score of the debilitating AAT^- (Table 6-B). According to the post hoc test, the Nursing department had a significantly lower score than the Emergency Health (P= 0.013) from one side and the Pharmacy department (P= 0.005) from the other side. In addition, there was a significant difference (P= 0.003) between departments for the sum mean score percentage for facilitating AAT^+ (Table 6-C). The Emergency Health department had a significantly lower AAT^+ score (25.4%) than the Nursing department (P= 0.018) and the Radiology and Medical Imaging department (P= 003), which had the highest score (30.8%).

In Table (7), the percentages of AAT^- and AAT^+ from the total AAT for each department are presented, and it demonstrates that although the Pharmacy department has the highest (62.4%) sum percentage of AAT total score, the Emergency Health department has the highest (58.0%) AAT^- and the lowest (42.0%) AAT^+ percentage scores.

As presented in Table (8), there is a negative significant correlation between both the total mean percentage score of ATT and its debilitating mean percentage score and academic factors of entry grade, previous semester GPA, CGPA, and average class load in regular semester. In addition, a significant correlation (P= 0.017) was found between being a senior student and having a high facilitating AAT^+ mean percentage score. Meanwhile, the more the students are interested in their studies, the greater their total AAT mean percentage score (P= 0.021).

As indicated in Table (9), student age has no correlation with AAT scores, but living in a villa has a significant (P= 0.029) correlation with the total mean percentage score of AAT. In terms of the debilitating subscale, the only factor that showed a significant correlation was family social support (P= 0.010). Having a high level of family social support significantly reduces the debilitating AAT^-. None of the studied demographic factors showed a significant correlation with the facilitating subscale. The academic and demographic factors that showed a significant correlation

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Table 4: Distribution of Health Professions' Students' Responses on Achievement Anxiety Test- Fatima College of Health Sciences- Al Ain Campus- UAE (N= 215)

Item		Scale (Frequency and Valid Percent)				
1	Nervousness while taking an exam or test hinders me from doing well.	Always	Often	Sometimes	Rarely	Never
		49 (22.8%)	52 (24.2%)	65 (30.2%)	42 (19.5%)	7 (3.3%)
2	I work most effectively under pressure, as when the task is very important.	Always	Usually	Sometimes	Hardly ever	Never
		55 (25.6%)	71 (33.0%)	58 (27%)	23 (10.7%)	8 (3.7%)
3	In a course where I have been doing poorly, my fear of a bad grade cuts down my efficiency.	Never	Hardly ever	Sometimes	Usually	Always
		25 (11.6%)	32 (14.9)	83 (38.6%)	40 (18.6%)	35 (16.3%)
4	When I am poorly prepared for an exam or test, I get upset, and do less well than even my restricted knowledge should allow.	This never happens to me	This hardly ever happens to me	This sometimes happens to me	This often happens to me	This practically always happens to me
		19 (8.8%)	42 (19.5)	89 (41.4%)	46 (21.4%)	19 (8.8%)
5	The more important the examination, the less well I seem to do.	Always	Usually	Sometimes	Hardly ever	Never
		9 (4.2%)	25 (11.6%)	78 (36.3%)	54 (25.1%)	49 (22.8%)
6	While I may (or may not) be nervous before taking an exam, once I start, I seem to forget to be nervous.	I always forget	Usually	Sometimes	I often feel some	I am always
		52 (24.2%)	71 (33.0%)	62 (28.8%)	Nervousness	nervous during an exam
					18 (8.4%)	12 (5.6%)
7	During exams or tests, I block on questions to which I know the answers, even though I might remember them as soon as the exam is over.	This always happens to me	This often happens to me	This sometimes happens to me	This hardly ever happens to me	I never
			23 (10.7%)	75 (34.9%)	36 (16.7%)	block on questions to which I know the answers
		47 (21.9%)				34 (15.8%)
8	Nervousness while taking a test helps me do better.	It never helps	It usually doesn't help	Now and then it helps	It generally helps me a little	It often helps
		67 (31.2%)	33 (15.3%)	44 (20.5%)	55 (25.6%)	16 (7.4%)

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Item		Scale (Frequency and Valid Percent)				
9	When I start a test, nothing is able to distract me.	This is always true of me	This is often true of me	This is sometimes true of me	This is hardly ever true of me	This is never true of me
		29 (13.5%)	43 (20.0%)	73 (34.0%)	42 (19.5%)	28 (13.0%)
10-	In courses in which the total grade is based mainly on "one" exam, I seem to do better than other people.	Never	Hardly ever	Sometimes	Usually	Always
		36 (16.7%)	51 (23.7%)	77 (35.8%)	37 (17.2%)	14 (6.5%)
11	I find that my mind goes blank at the beginning of an exam, and it takes me a few minutes before I can function.	I almost always blank out at first	I usually blank out at first	I sometimes blank out at first	I hardly ever blank out first	I never blank out first
		23 (10.7%)	44 (20.5%)	67 (31.2%)	45 (20.9%)	36 (16.7%)
12	I look forward to exams.	Never	Hardly ever	Sometimes	Usually	Always
		37 (17.2%)	40 (18.6%)	64 (29.8%)	46 (21.4%)	28 (13.0%)
13	I am so tired from worrying about an exam, that I find I almost don't care how well I do by the time I start the test.	I never feel this way	I hardly ever feel this way	I sometimes feel this way	I often feel this way	I almost always feel this way
		35 (16.3%)	40 (18.6%)	68 (31.6%)	44 (20.5%)	28 (13.0%)
14	Time pressure on an exam causes me to do worse than the rest of the group under similar conditions.	Time pressure always seems to make me do worse on an exam than others	Time pressure often seems to make me do worse on an exam than others	Time pressure sometimes seems to make me do worse on an exam than others	Time pressure hardly ever seems to make me do worse on an exam than others	Time pressure never seems to make me do worse on an exam than others
		40 (18.6%)	39 (18.1%)	76 (35.3%)	44 (20.5%)	16 (7.4%)
15	Although "cramming" under pre examination tension is not effective for most people, I find that if the need arises, I can learn material immediately before an exam, even under considerable pressure, and successfully retain it to use on the exam.	I am always able to use the "crammed" material successfully	I am usually able to use the "crammed" material successfully	I sometimes can use the "crammed" material successfully	I hardly ever use the "crammed" material successfully	I am never able to use the "crammed" material successfully
		23 (10.7%)	39 (18.1%)	93 (43.3%)	38 (17.7%)	22 (10.2%)
16	I enjoy taking a difficult exam more than an easy one.	Always	Often	Sometimes	Rarely	Never
		7 (3.3%)	17 (7.9%)	51 (23.7%)	50 (23.3%)	90 (41.9%)
17	I find myself reading exam questions without understanding them, and I must go back over them so that they will make sense.	Never	Hardly ever	Sometimes	Usually	Always
		18 (8.4%)	30 (14.0%)	75 (34.9%)	53 (24.7%)	39 (18.1%)

Citation: Salwa B. El-Sobkey, Shaik Balkhis Banu, Emne Hammoud, Suliman Salih, Monika Sachdeva, Noon Kamil, Aisha Namshan Aldawsari, Scott Cottam. Test Anxiety Among Health Profession Students: A Cross-Sectional Survey at Fatima College of Health Sciences in Al Ain, United Arab Emirates. Fortune Journal of Health Sciences. 7 (2024): 76-94.

Item		Scale (Frequency and Valid Percent)				
18	The more important the exam or test, the better I seem to do.	This is true of me	This is true of me much of the time	This is sometimes true of me	This is rarely true of me	This is not true of me
		30 (14.0%)	49 (22.8%)	86 (40.0%)	29 (13.5%)	21 (9.8%)
19	When I don't do well on difficult items at the beginning of an exam, it tends to upset me so that I block on even easy questions later on.	This never happens to me	This very rarely happens to me	This sometimes happens to me	This frequently happens to me	This almost always happens to me
		27 (12.6%)	56 (26.0%)	77 (35.8%)	36 (16.7%)	19 (8.8%)

Table 5: Sum Scores of Achievement Anxiety Test (AAT) for Students at Fatima College of Health Sciences- Al Ain Campus- UAE (N= 215)

AAT Scores	Mean	SD	Minimum	Maximum
Sum (Points) of Debilitating Subscale (out of 50 points)	30.3	6.85	15	48
Sum (Points) of Facilitating Subscale (out of 45 points)	26.9	5.07	13	40
Sum (Points) of total AAT (out of 95 points)	57.2	7.24	32	77
Percentage (%) of Sum of Debilitating Subscale (out of 95 points)	31.9	7.21	15.8	50.5
Percentage (%) of Sum of Facilitating Subscale (out of 95 points)	28.3	5.33	13.7	42.1
Percentage (%) of Sum of AAT (out of 95 points)	60.2	7.63	33.7	81.1

Table 6: Results of Achievement Anxiety Test Among Different Departments at AL Ain Campus- Fatima College of Health Sciences- UAE

A) Mean Sum Percentage (%) of Total Score (AAT)						
Department	**N**	**Mean**	**SD**	**Minimum**	**Maximum**	**P**
Pharmacy	31	62.4	7.92	49.5	77.9	0.247
Radiology and Medical Imaging	24	61.6	5.1	49.5	67.4	
Emergency Health	27	60.5	6.43	44.2	70.5	
Physiotherapy	32	60	6.49	42.1	70.5	
Nursing	101	59.1	8.53	33.7	81.1	
Total	215	60.2	7.63	33.7	81.1	
B) Mean Sum Score Percentage (%) of Debilitating Subscale (AAT-)						
Department	**N**	**Mean**	**SD**	**Minimum**	**Maximum**	**P**
Pharmacy	31	35.3*	7.14	22.1	48.4	0.001*
Emergency Health	27	35.1*	7.04	22.1	50.5	
Physiotherapy	32	31.8	6.11	21	47.4	
Radiology and Medical Imaging	24	30.8	5.88	21.1	40	
Nursing	101	30.3*	7.36	15.8	47.4	
Total	215	31.9	7.21	15.8	50.5	
Post hoc test: Nursing and Pharmacy (P= 0.005), Nursing and Emergency Health (P= 0.013)						

Citation: Salwa B. El-Sobkey, Shaik Balkhis Banu, Emne Hammoud, Suliman Salih, Monika Sachdeva, Noon Kamil, Aisha Namshan Aldawsari, Scott Cottam. Test Anxiety Among Health Profession Students: A Cross-Sectional Survey at Fatima College of Health Sciences in Al Ain, United Arab Emirates. Fortune Journal of Health Sciences. 7 (2024): 76-94.

C- Mean Sum Score Percentage (%) of Facilitating Subscale (AAT+)						
Department	**N**	**Mean**	**SD**	**Minimum**	**Maximum**	**P**
Radiology and Medical Imaging	24	30.8	3.73	23.2	40	0.003*
Nursing	101	28.8	5.02	15.8	41.1	
Physiotherapy	32	28.3	5.42	20	40	
Pharmacy	31	27.1	6.19	15.8	42.1	
Emergency Health	27	25.4	5.32	13.7	35.8	
Total	215	28.3	5.33	13.7	42.1	
Post hoc test: Emergency Health and Nursing (P= 0.018), Emergency Health and Radiology and Medical Imaging department (P= 003). *** Significant p value (0.05)**						

Table 7: Percentage of Debilitating Subscale (AAT-) and Facilitating Subscale (AAT+) from Total Achievement Anxiety Test Among Different Departments at AL Ain Campus- Fatima College of Health Sciences- UAE.

Department	**N**	**Total AAT**	**Debilitating Subscale (AAT-)**		**Facilitating Subscale (AAT+)**	
			AAT- Subscale	**AAT- subscale/AAT total X 100**	**AAT+ portion**	**AAT+ portion/AAT total X 100**
Pharmacy	31	62.40%	35.30%	56.60%	27.10%	43.40%
Radiology and Medical Imaging	24	61.60%	30.80%	50.00%	30.80%	50.00%
Emergency Health	27	60.50%	35.10%	58.00%	25.40%	42.00%
Physiotherapy	32	60.00%	31.80%	53.00%	28.30%	47.00%
Nursing	101	59.10%	30.30%	51.30%	28.80%	48.70%
Total	215	60.20%	31.90%	53.00%	28.30%	47.00%

Table 8: Correlation Between the AAT Scores and Students' Academic Factors at AL Ain Campus- Fatima College of Health Sciences- UAE

Academic Factor	**Total AAT Mean Percentage Score**			**Debilitating AAT- Mean Percentage Score**			**Facilitating AAT+ Mean Percentage Score**		
	N	**r**	**P**	**N**	**r**	**P**	**N**	**r**	**P**
College Entry Grade	123	-0.216	0.016*	123	-0.234	0.009*	123	0.004	0.964
Previous Semester GPA	201	-0.257	0.0001*	201	-0.334	0.001*	201	0.078	0.268
CGPA	183	-0.272	0.0001*	183	-0.328	0.0001*	183	0.036	0.652
Average Class Load	200	-0.198	0.005*	200	-0.268	0.0001*	200	0.081	0.164
Study level	200	0.002	0.973	215	-0.12	0.82	212	0.253	0.017*
Interest in the Study	215	0.158	0.021*	215	0.114	0.096	215	0.072	0.295
* Significant p value (0.05)									

Citation: Salwa B. El-Sobkey, Shaik Balkhis Banu, Emne Hammoud, Suliman Salih, Monika Sachdeva, Noon Kamil, Aisha Namshan Aldawsari, Scott Cottam. Test Anxiety Among Health Profession Students: A Cross-Sectional Survey at Fatima College of Health Sciences in Al Ain, United Arab Emirates. Fortune Journal of Health Sciences. 7 (2024): 76-94.

with the AAT scores were studied for association with the student's department.

As shown in Table (10), among academic factors, categories of CGPA (Table 10-A) presented a significant association (P=0.026) and indicated that (15.8%) of the Emergency Health students had a CGPA less than 2, and more than one-quarter (26.3%) of them had a CGPA of 2- less than 3. The departments with the highest significant (P= 0.001) percentage for an average course load of more than 14 credit hours (Table 10-B) were Radiology and Medical Imaging (83.3%), Pharmacy (79.3%), and Emergency Health (65.2%). Table (10-C) demonstrates that there is also a significant association between the student's study level and their departments. The highest percentage of senior students was for the Physiotherapy and Radiology and Medical Imaging departments (87.5% for both). The lowest percentage was for the Pharmacy (48.4%) and Emergency Health (52.0%) departments. All students in the Physiotherapy, Pharmacy, and Radiology and Medical Imaging departments were moderately or highly interested in their studies (Table 10-D), while in the Emergency Health and Nursing departments (7.7% and 20.8%), students were not or seldom interested in their studies (P= 0.0001). The factors of college entry grade and previous semester GPA did not show a significant association with departments (P= 0.184 and 0.076, respectively). None of the demographic factors showed a significant association with departments.

Table 9: Correlation Between the AAT Scores and Students' Demographic Factors at AL Ain Campus- Fatima College of Health Sciences-UAE.

Demographic Factor		Total AAT Mean Percentage Score			Debilitating AAT - Mean Percentage Score			Facilitating AAT + Mean Percentage Score		
		N	r	P	N	r	P	N	r	P
Age		213	0.028	0.684	213	-0.047	0.5	213	0.103	0.134
Marital Status		213	0.03	0.665	213	-0.008	0.905	213	0.055	0.427
Father's Educational Level		214	-0.134	0.051	214	-0.094	0.169	214	-0.064	0.352
Mother's Educational Level		213	-0.014	0.842	213	0.006	0.936	213	-0.027	0.694
Accommodation	Rented/Owned	131	0.047	0.591	131	0.106	0.226	131	-0.074	0.403
	Flat/Villa	159	0.173	0.029*	159	0.138	0.084	159	0.069	0.385
	Separate/Shared Room	107	-0.149	0.125	107	-0.176	0.07	107	0.026	0.79
Family Social Support		214	-0.1	0.145	214	-0.176	0.010*	214	0.098	0.155

* Significant p value (0.05)

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Table 10: Association Between Student's Department and Academic Factors at AL Ain Campus- Fatima College of Health Sciences – UAE.

A- Cumulative Grade Point Average							
Categories of CGPA		Departments					P
		Physiotherapy	Emergency Health	Nursing	Pharmacy	Radiology & Medical Imaging	
Less than 2	Count	0	3	5	0	0	0.026*
	Column %	0.00%	15.80%	5.40%	0.00%	0.00%	
2 and less than 3	Count	5	11	46	14	10	
	Column %	20%	57.90%	50.00%	58.30%	45.50%	
3 and less than 4	Count	19	5	39	10	12	
	Column %	76%	26.30%	42.40%	41.70%	54.50%	
4	Count	1	0	2	0	0	
	Column %	4.00%	0.00%	2.20%	0.00%	0.00%	
Total	Count	25	19	92	24	22	
	Column %	100%	100%	100%	100%	100%	
B- Average Regular Semester Course Load							
Categories of Average Regular Semester Course Load		Departments					P
		Physiotherapy	Emergency Health	Nursing	Pharmacy	Radiology & Medical Imaging	
Less than or 14	Count	20	8	44	6	4	0.001*
	Column %	64.00%	34.80%	47.30%	20.70%	16.70%	
More than 14	Count	11	15	49	23	20	
	Column %	35.50%	65.20%	52.70%	79.30%	83.30%	
Total	Count	31	23	93	29	24	
	Column %	100%	100%	100%	100%	100%	
C- Study Level							
Study Level		Departments					P
		Physiotherapy	Emergency Health	Nursing	Pharmacy	Radiology & Medical Imaging	
Junior	Count	4	12	37	16	3	0.001*
	Column %	12.50%	48.00%	37.00%	51.60%	12.5	
Senior	Count	28	13	63	15	21	
	Column %	87.50%	52.00%	63.00%	48.40%	87.50%	
Total	Count	32	25	100	31	24	
	Column %	100%	100%	100%	100%	100%	

Citation: Salwa B. El-Sobkey, Shaik Balkhis Banu, Emne Hammoud, Suliman Salih, Monika Sachdeva, Noon Kamil, Aisha Namshan Aldawsari, Scott Cottam. Test Anxiety Among Health Profession Students: A Cross-Sectional Survey at Fatima College of Health Sciences in Al Ain, United Arab Emirates. Fortune Journal of Health Sciences. 7 (2024): 76-94.

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D- Interest in the Study							
Categories of Students' Interest in Their Study		Departments					P
		Physiotherapy	Emergency Health	Nursing	Pharmacy	Radiology & Medical Imaging	
Not or Seldomly Interested	Count	0	2	21	0	0	0.0001*
	Column %	0.00%	7.70%	20.80%	0.00%	0.00%	
Moderately or Highly Interested	Count	32	24	80	31	24	
	Column %	100.00%	92.30%	79.20%	100.00%	100.00%	
Total	Count	32	26	101	31	24	
	Column %	100%	100%	100%	100%	100%	
* Significant p value (0.05)							

Discussion

The present study was carried out to identify the intensity of TA of HPSs at FCHS, Al Ain Campus, UAE and to display the correlative and associated demographic and academic factors. The HPSs who participated in the study had a very satisfactory response rate (100.9%), which assured the validity of the study results. The participants' median age was 21 years, they had a GPA and CGP of 2.8 out of 4, and their average course load was 14.1 credit hours per semester. These descriptive characteristics represent the average HPSs and consequently support the results' generalization. To organize the discussion presentation, it is divided into the following three sections:

Intensity of TA: Achievement Anxiety Test (AAT) Scores

Most previous studies conducted on HPSs were more concerned with the prevalence of TA, and only some of them considered TA intensity. As TA became a global incremental phenomenon, studying its intensity became more valuable than studying its prevalence. This study focused on TA intensity and selected an assessment tool, AAT, that not only measures the total score of TA but also measures the independent debilitating AAT^- and facilitating AAT^+ aspects. The total AAT score was 95 points, and the calculated mean total score for HPSs at the FCHS al Ain campus was 57.2 points (60.2%). The mean of the AAT total score percentage varied between departments but was not significantly different. It ranged from 59.1% for the Nursing department to 62.4% for the Pharmacy department. This score can reflect a medium intensity of TA among the HPSs and place FCHS at a comparatively lower TA intensity than other health colleges in the UAE and Gulf region. In the UAE, 43% and 82.6% of HPSs at Gulf Medical University showed high levels of TA in 2015 [6] and 2022 [20], respectively. In the Gulf region, 14.4% of nursing students at King Saud Bin Abdulaziz University for Health Sciences demonstrated severe TA [5]. The AAT total score at FCHS is divided into two subscale scores; the first one is for the debilitating subscale AAT^- (31.9%), and the second one is for the facilitating subscale AAT^+ (28.3%). These independent AAT scores add to the advantageous situation for the FCHS, as the two subscale scores are close to two halves. In other words, TA at FCHS is not only of medium intensity, but more, almost half of this TA is of the good facilitating type of AAT^+ that encourages and motivates the students to study and to prepare well for the exams. Different factors associated and correlated with TA have been reported in the literature, and it should be noted that female gender is considered a factor associated with TA, and it has been reported that females tend to have TA and have higher levels of TA than males [4, 9, 17]. The results of the current study are not in line with this female gender association with TA, as all the students who participated in the study were female, showed a medium level of TA intensity and had a considerable portion of this TA as facilitating AAT^+ as well. In addition, the literature review reported other factors to be related to the TA, including parental educational level, student's interest in study, family responsibilities, family income, parental pressure, and lack of social support, among other factors [5, 7, 8, 20-25, 27-29]. In the present study, the majority (85.9%) of the students were single, and only (2.3%) of them were married and had children, which might indicate low family responsibilities. Additionally, (43.9%) of their fathers and (37.6%) of their mothers had a university educational level, (77.1%) of them were living in an owned accommodation, (93.7%) of them lived in a villa, and (68.2%) of them had a separate room. This accommodation might indicate a high family income and high economic level and refer to a good environment that might enhance the study of the students. There are two other advantages the HPSs at FCHS exhibit: the first was their interest in their studies (43.3% are highly interested and 45.1% are moderately

interested), and the second is that they were receiving family support (60.7% high and 33.6% moderate). These advantageous factors might be responsible for having a lower TA intensity to the medium level at the FCHS-Al Ain campus. Moreover, it is known that one of the sources of parental pressure is when the parents are paying for their children's education, which may result in pressure for their children to study well and to succeed in their courses, as student failure means course repetition and further education costs. Parents might even pressure their children more to have high academic achievement to be eligible for discounts or scholarships. Because FCHS is a governmental college, no fees are needed from national students. As the majority (86.3%) of the students are nationals and receive free education, they are deprived of any parental pressure related to educational fees. In addition, the UAE government generous provides national students with a significant monthly stipend subject to the student's GPA ranging between 1000 and 5000 AED, with Nursing students awarded the highest. This stipend may encourage students to study harder to achieve a greater GPA to benefit from a higher stipend. In other words, this would enhance the AAT^+ subscale, and this is the case for FCHS departments, especially for the Nursing department, which has the lowest ATT score as well as a high AAT^+ subscale score and a low AAT^-subscale score. Possibly as they are receiving the highest monthly stipend in the college. Another observable factor that might also have a great role to play is the environmental status of Al Ain city and the FCHS. Al Ain city is famous for its green and calm environment, and the same can be said for the FCHS. This healthy environment would reduce anxiety for all and the TA for the students. This study's results indicate that it is not only the total AAT score percentage that is important but also the score percentages of AAT^- and AAT^+ portions. As if the total AAT identifies the quantity of the TA and the AAT^- and AAT^+ portions shape its quality or its pattern. The departments with the highest total score percentages were Pharmacy (62.4%), followed by Radiology and Medical Imaging (61.6%), and the Emergency Health (60.5%) department. Even though the Pharmacy department has the highest total score, its AAT^- portion (56.6%) is less than that of the Emergency Health department, which has the highest AAT^- portion (58.0%). Meanwhile, the Pharmacy department's AAT^+ portion (43.4%) is more than that of the Emergency Health department, which has the lowest AAT^+ portion (42.0%). Therefore, based on the above hypnotized concept of portions, the Emergency Health department could be said to have a more considerable situation than the Pharmacy department. The Radiology and Medical Imaging department had the highest AAT^+ portion (50.0%), which reduces the impact of being the department with the second highest total AAT score. The importance of AAT^- and AAT^+ portions is particularly increased as there were significant differences between departments scores' percentages for both portions. This significance was especially between the AAT^- portion of the Nursing department (lowest score) and both the Emergency Health and Pharmacy departments (highest score) as well as between the AAT^+ portion of the Emergency Health (lowest score) and both the Nursing and Radiology and Medical Imaging departments (highest score). Echoing what had been mentioned earlier, the Emergency Health department had the significantly highest AAT^- portion and the lowest AAT^+ portion. The highest total score of the Pharmacy department might be hypothesized by its (166) credit hours, which is the highest among the other departments, ranging from 127 credits to 138 credits. This hypothesis is accepted from one side, as the Nursing department that has the lowest AAT score also has the lowest credit hours (127). Conversely, this hypothesis is rejected by the fact that both the Radiology and Medical Imaging and the Emergency Health departments, which occupy the second and third highest total scores, have 137 and 133 credit hours, respectively. An additional hypothesis that might partially provide further explanation is that both the Pharmacy and the Emergency Health departments had the highest percentage of credit hours allocated for practical sessions (23.5% and 35.3%, respectively), while the range for other departments was 7.1% to 18.8%, again with the lowest percentage for the Nursing department. Practical and clinical parts for any health profession program require more effort and time for the students to study than the theoretical parts because they are based not only on cognitive skills but also on psychomotor and affective skills. It might be said that this hypothesis provides a partial explanation, as it can be applied for the Pharmacy and Emergency Health departments but not for the Radiology and Medical Imaging department, which has only 13.1% of practical credit hours. On the other hand, reviewing the teaching and assessment methodologies adopted by the different departments at the FCHS indicated that these methodologies are all the same except for Emergency Health department, in which the assessment instruments for theoretical courses include mid-semester and end-semester exams, reflective reports, poster presentations and oral defense. Other departments' assessment instruments mainly include quizzes, assignments, and mid- and final semester exams. The inclusion of quizzes throughout the semester, which usually assess fewer learning outcomes, include less content of the course topics, and have a lower percentage of the total course mark, might encourage students to study, induce less TA, and enhance better academic achievement. The opposite is true for the mid- and final-semester exams, in which the learning outcomes, content, and mark percentage are greater and consequently more effort and time are needed from students. Accordingly, there is a higher possibility of inducing more TA and negatively affecting the academic performance of the students. In other words, the inclusion of quizzes might enhance the AAT^+, while mid- and final-

semester exams induce AAT-. Although reflective reports, poster presentations and oral defense are valid assessment instruments that address the higher intellectual abilities of the students, exaggerated use of such instruments might result in an opposite effect on the students' performance and stimulate the AAT- portion and hinder the AAT+ portion. This could explain why the Emergency Health department has the highest AAT- score and the lowest AAT+ score. Another factor that may explain the results of the Emergency Health Department is the type of cases the students face while studying in this program. All the cases are serious life-threatening emergency cases that logically can place considerable stress and anxiety on the students, including the TA.

Academic Factors Correlated to AAT Scores and Associated with Departments

The current study assessed the correlation of six academic factors with AAT scores. These factors are college grade entry, GPA of the previous semester, CGPA, average course load in a regular semester, study level, and HPSs' interest in their studies. The results revealed significant correlations between these six factors and AAT scores. In addition, the association of these factors with departments was studied and showed that all factors indicated significant associations except college entry grade and previous semester GPA. The results showed that students with high college entry grades, high GPA in the previous semester, high CGPA, and lower average course load per semester demonstrated significantly lower total ATT scores. As the total score is composed of AAT- and AAT+ scores, it raises the question of whether the quality of TA is a debilitating or a facilitating factor. The significant correlation between those factors and AAT- answers the question and indicates that the debilitating TA is dominant. Therefore, low entry grades, low GPA and CGPA, and high course load have a negative effect on students and induce debilitating TA. These results raise a red flag and highlight the importance of proper assignment of course load to the students and hence the importance of academic advising, not only for students' academic achievement but also for their physical and mental wellbeing and to reduce their TA. Quality academic advice can act as a preventive measure against TA. When the academic advisors carefully study the students' academic files and transcripts, they can advise the students on the appropriate number of credit hours that they need to register per semester and balance between completion of the study plan in the standardized duration and minimize stress and anxiety on students, particularly the TA. The total AAT score also showed a positive significant correlation with the students' interest in their studies, which means that students with higher interest would have a higher level of TA. A claim might be raised that students with high interest would be at the same time invested in their academic achievement and this might lead to a high AAT+ but this claim is not confirmed by the current results as neither AAT+ nor AAT- is significantly correlated to this factor. Saravanan et al. (2014) also reported that TA is positively correlated with students' motivation in their studies that were conducted on medical students in Malizia [24]. They explained their results that although the students experience TA, their internal motivation and external motivation to learn from their lecturers is unaffected, as they think motivation is imperative for achieving success. This motivation is developed based on demographics, university atmosphere, lecturing method, parental guidance, and students' perceptions about their future [24]. These demographics claimed by Saravanan et al. to support the students' internal and external motivation might also be applicable to HPSs at FCHS. Highly equipped and resourced with qualified faculties and staff and a safe, comfortable environment such as the FCHS is an empowering atmosphere for students' motivation. Additionally, the employment rate of FCHS graduates is high, which positively affects students' perceptions about their future. Moreover, senior HPSs demonstrated significantly higher AAT+ which can be explained by their increased experience with their departments' assessment methodology and by their improved accommodation than junior HPSs which might make exams an opportunity to encourage them to study to achieve and to develop AAT+ rather than AAT-. Similar results were reported in previous studies. Examples are the correlation between high TA and low GPA and CGPA for pharmacy, dental, and medical students in KSA [7] and reducing TA with senior nursing students in KSA [5]. Additionally, medicine, dental, pharmacy, nursing, and physiotherapy students at Gulf Medical College in UAE reported higher TA as they increased their academic level [20]. Three explanations are offered for these opposing results. The first is that the assessment tool used to assess the TA is different from that used in the two KSA studies as well as in the current study. The second is that the current study and the KSA studies included students from across all academic levels, while in the study conducted at Gulf Medical College, only students from levels 1-3 were included. The third reason is that the Gulf Medical College is a private university, while the FCHS and the 2 colleges of the KAS are governmental. Any overwhelming factor that is known to be specific to private universities might cause a cumulative negative effect on students as they progress through their academic levels, e.g., educational fees, and consequently increase the TA as the students grow in their studies. Of note, the current study did not confirm any significant correlation between the total AAT and the students' study level, but it is only the AAT+. Among the six academic factors that showed a significant correlation with TA, four factors (CGPA, average course load per semester, study level, and interest in the study) demonstrated a significant association with the student's department. The Nursing department showed a normal distribution, as a few percentages of the students were in the extreme categories of

CGPA, which were less than 2 and 4. However, the Pharmacy and Radiology and Imaging departments were similar; both had a concentration of the students' percentages in the middle CGPA categories, which were more than 2 and less than 3 and more than 3 and less than 4. Meanwhile, the Physiotherapy department has a different pattern in that three-quarters of the students (76%) are in the category of more than 3 and less than 4. The Emergency Health department has a unique pattern as well; it is the department with the highest percentage in the category of less than 2 CGPA and the lowest percentage in the category of 2 and less than 3. These results can indicate a comparatively lower CGPA among Emergency Health students and can add to the previously hypothesized reasons for the high TA among students in this department. It could be claimed that too many assessments result in TA that led to unsatisfying CGPA; then, this unsatisfied CGPA would repeat the cycle of high TA and low CGPA, which can turn into a never-ending negative cycle. A second red flag is raised, and the number and type of assessments should be carefully designed for any course to motivate and drive student learning rather than to increase their TA and reduce their CGPA. The association between the departments and the average course load per regular semester was also studied. The range of the average semester course load was 8 to 18, and the average was 14.1 credit hours. Therefore, to study the association between course load and department, the course load was categorized into less than or 14 and more than 14 credit hours, and the results indicated a significant association between those two factors, department, and course load. Three departments had the highest percentage of their students in the category of more than 14 credit hours course load; these departments are Emergency Health, Pharmacy, and Radiology and Imaging departments. Echo that these three departments were the departments with the highest AAT scores raises the same red flag that was previously raised about the importance of registering students in a manageable number of credit hours to mitigate TA. Although the Radiology and Imaging Department was the highest in the facilitating AAT^{+} score, this association between course load and department places the facilitating TA under suspicion, and in the end, it is anxiety. Another association was found between the department and the study level of the students. The two departments with the highest percentage of junior students were the Pharmacy and Emergency Health departments. The significant association between the study level and departments strengthens the previously mentioned results that senior students had less TA. It can be said that as the study level is correlated with the TA with the advantage to the senior students and most of both Pharmacy and Emergency Health students were junior students, explains why these two departments had the highest level of TA. The academic factor of students' interest in their study was uncertain because, as mentioned earlier, it showed a significant correlation with total AAT but with no evidence if this TA is of debilitating or facilitating type. A significant association between student interest in study and department added to this query because the Nursing department had the lowest AAT scores and had the lowest percentage of students in the category of moderately or highly interested in study. Meanwhile, the Radiology and Medical Imaging and Pharmacy departments had 100% of students in this category, as did the Emergency Health department, and almost all (92.3%) of its students were in this category as well. As if the students are interested in their programs, other factors hinder their academic achievement and cause their high TA. Factors such as poor studying skills, inability to manage time, or poor English language level might be causative factors. Admission requirements to the FCHS include the level of English language of students, and one of the courses offered by the general requirement department is English writing to assure a high English language level of students. However, it should not be forgotten that the senior students had lower TA than the junior students, and one factor could be their improved English skills that facilitated their study.

Demographic Factors Correlated to the AAT Scores and Associated with Departments

The current study was concerned not only with students' academic factors but also with their demographic factors. Thus, six demographic factors were assessed in terms of correlation with the ATT scores. These factors are the students' age, marital status, father's educational level, mother's educational level, accommodation, and family social support. Out of these six factors, only accommodation and family social support showed a correlation with AAT scores, but none revealed any association with the students' departments. Although the senior students, who are generally older students, had a significant correlation to the AAT^{+}, the student's age does not have any correlation to any of the ATT scores. This might be interpreted as follows: senior students had more AAT^{+}, not because they were older but because they had more experience in the college, and they were more familiar with the teaching and assessment methods in their departments. In addition, they might be more concerned about their academic achievement, GPA and CGPA as they are closer to graduation. In other words, the factor of student's study level seemingly relates to the factor of student's age, but practically, they should be treated differently. A recent study by Alkowatli (2022) on HPSs reported that the TA is higher among students who are older than 20 years of age [20], but it should be noted that the assessment tool and the academic levels of students included in his study are different from those of the current study, as explained earlier, and these differences can provide clarification for the different findings between the two studies. The present study included three questions about the students' accommodation in a trial

to estimate their economic level and the environment they study in at home. The three questions were about whether their accommodation is rented or owned, whether they live in a flat or villa, and whether they have a separate or shared room. The results indicated that students who were living in villas, which might indicate a high economic level, had a significantly higher total AAT, but there was no correlation with either AAT^- or AAT^+, which led to uncertainty; however, economic level has a debilitating or a facilitating TA effect. The second demographic factor that had a correlation with TA was family social support. The results indicated that family social support empowered the students and significantly reduced their debilitating TA. This result highlights how social support is effective in reducing students' TA, as if family social support is a shield against TA. Being supported by the family provides the students with security, confidence, and assurance against TA. A green flag is raised regarding the role of family in students' academia, not only young students in primary or secondary schools but also adult students in health profession schools.

In conclusion, HPSs at the FCHA, Al Ain, UAE have a moderate level of TA, as demonstrated by the total AAT score, with no significant differences between departments. Academic factors that reduced the students' TA were high college entry grades, high previous semester GPA, high CGPA, and lower average course load per semester. The students' interest in their study increased their TA, and being a senior student increased their facilitating TA. This study emphasized the importance of family social support to reduce students' debilitating TA. Some of the studied academic factors showed an association with the students' department, and none of the studied demographic factors showed any association with the students' department.

Conclusion

In conclusion, HPSs at FCHA- Al Ain campus- UAE have a moderate level of TA as demonstrated by the total AAT score with no significant differences between departments. Academic factors that reduced the students' TA were high college entry grade, high previous semester GPA, high CGPA, and lower average course load per semester. The students' interest in their study increased the TA and being a senior students increased their facilitating TA. On the other hand, this study emphasized the importance of family social support to reduce the students' debilitating TA. Some of the studied academic factors showed association with the students' department and none of the studied demographic factors showed any association with the students' department.

Educational Implications

The findings of the current study highlight the following educational implications:

1- The eagerness of the academic advisor to help students complete their study plan in the standardized duration might induce TA to students. The semester course load should be carefully decided to enable students to complete their study in the most appropriate duration and at the same time with the minimal intensity of TA.

2- The number and type of assessment instruments should be considered not only as a tool to measure students' achievement in learning outcomes but also as a source of TA. That is why the instructors should handle these instruments with a delicate approach to design an assessment protocol that balances the assessment educational purpose and, at the same time, the student's physical and mental well-being.

3- Students at FCHS go through a sort of orientation before encountering patients to prepare them for their first clinical practice. This approach should be emphasized for Emergency Health students, as most of the cases they deal with during clinical practice are critical cases, and they need to be prepared and learn coping mechanisms to reduce their psychological stress and anxiety in general and TA in particular.

4- Family social support is one of the protective mechanisms against TA, and the provision of orientation to family in this regard would be so precious as to reduce TA.

Delimitation

Although this study assessed 12 demographic and academic factors, there are many other factors that might affect students' TA. Among these factors are the student's personality type, physical activity level, self-esteem, previous failure, study skills, time management and history of medical or mental illness. It is difficult for one study to address all these factors, as this would prove time-consuming and inconvenient for the participants. In addition, it might not be visible from a statistical analysis perspective to include too much data.

Areas of Future Work

Future research work might study other factors that might affect the HPSs TA that are not included in the current study, such as the students' type of personality, physical activity level, and nutrition style. Studying the physiological negative impact of TA is also necessary.

Declaration

Ethical Approval and consent to participate

The study obtained ethical approval from the FCHS ethical approval committee (Reference No: FECE-20-03-23-PT-Salwa.) on March 21st, 2023.

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The first section of the questionnaire used in the study included a consent form which was signed by the students in case of using the hard copy and for students who responded to the electronic version of the questionnaire, it was mentioned that responding to the questionnaire would be considered an agreement to participate in the study.

Consent to Publication

Not applicable.

Data Availability statement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

All authors declare that there were no potential conflicts of interest.

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Author contribution

Salwa B. El-Sobkey initiated the research idea.

Salwa B. El-Sobkey, Shaik Balkhis Banu, Emne Hammoud, Suliman Salih, Monika Sachdeva, Noon Kamil, Aisha Namshan Aldawsari, and Scott Cottam designed the methodological procedure and collected the research data.

Salwa B. El-Sobkey analyzed the collected data and wrote the manuscript.

All the authors have read and approved the manuscript.

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