ORIGINAL ARTICLE

Social Anxiety of Online Learners: Social Anxiety Scale in E-Learning Environments (SASE)

Background: During the COVID-19 pandemic, over 1.5 billion learners worldwide were deprived of access to in-person learning. Consequently, there was a significant shift towards e-learning. Social anxiety is a limiting barrier to e-learning. This study aimed to examine the level of social anxiety in e-learning environments among medical students.

Method: In this descriptive-analytical cross-sectional study, 150 medical students from Mashhad University of Medical Sciences, selected through convenience sampling, completed the Social Anxiety Scale in E-Learning Environments (SASE) questionnaire. The collected data were analyzed using descriptive statistics and inferential statistics by SPSS20 software.

Results: The results of this study showed that the social anxiety of students in e-learning environments was not high, with a range of (1-6). Additionally, the levels of social anxiety were higher in students without academic progress during e-learning (p=0.887) compared to students with academic progress (p=0.702), but this difference was not statistically significant. Furthermore, there was no statistically significant relationship between the level of social anxiety in e-learning environments and variables such as gender, semester, and type of study.

Conclusion: Despite the lack of a statistically significant relationship between the variables of present study and social anxiety, and changes in social interaction environments, efforts to reduce the level of social anxiety among medical students and enhance learning are essential. The SASE is a valid and reliable tool for assessing social anxiety in e-learning environments.

Keywords: Social anxiety, Medical students, e-learning environment, Academic progress, Gender

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القلق الاجتماعي للمتعلمين عبر الإنترنت: مقياس القلق الاجتماعي في بيئات التعلم الإلكتروني (SASE)

الخلفية: خلال جائحة كوفيد-19، حُرم أكثر من 1.5 مليار متعلم في جميع أنحاء العالم من الوصول إلى التعلم الشخصي. ونتيجة لذلك، كان هناك تحول كبير نحو التعلم الإلكتروني. القلق الاجتماعي يشكل عائقاً أمام التعلم الإلكتروني. هدفت هذه الدراسة إلى التعرف على مستوى القلق الاجتماعي في بيئات التعلم الإلكتروني لدى طلاب الطب.

الطريقة: في هذه الدراسة الوصفية التحليلية المقطعية، أكمل 150 طالب طب من جامعة مشهد للعلوم الطبية، تم اختيارهم من خلال أخذ العينات الملائمة، استبيان مقياس القلق الاجتماعي في بيئات التعلم الإلكتروني (SASE). وقد تم تحليل البيانات المجمعة باستخدام الإحصاء الوصفي والإحصاء الاستدلالي بواسطة برنامج SPSS20.

النتائج: أظهرت نتائج هذه الدراسة أن القلق الاجتماعي لدى الطلاب في بيئات التعلم الإلكتروني لم يكن مرتفعا، حيث يتراوح بين (1-6). بالإضافة إلى ذلك، كانت مستويات القلق الاجتماعي أعلى لدى الطلاب الذين لم يحققوا تقدمًا أكاديميًا أثناء التعلم الإلكتروني (p=0.887) مقارنة بالطلاب ذوي التقدم الأكاديمي (p=0.702)، لكن هذا الاختلاف لم يكن ذا دلالة إحصائية. كما أنه لا توجد علاقة ذات دلالة إحصائية بين مستوى القلق الاجتماعي في بيئات التعلم الإلكتروني ومتغيرات مثل الجنس والفصل الدراسي ونوع الدراسة.

الاستنتاج: على الرغم من عدم وجود علاقة ذات دلالة إحصائية بين متغيرات الدراسة الحالية والقلق الاجتماعي، والتغيرات في بيئات التفاعل الاجتماعي، إلا أن الجهود المبذولة لخفض مستوى القلق الاجتماعي لدى طلاب الطب وتعزيز التعلم ضرورية. تعتبر SASE أداة صالحة وموثوقة لتقييم القلق الاجتماعي في بيئات التعلم الإلكتروني.

الكلمات المفتاحية: القلق الاجتماعي، طلاب الطب، بيئة التعلم الإلكتروني، التقدم الأكاديمي، الجنس.

آن لائن سیکھنے والوں کی سماجی پریشانی: ای لرننگ ماحول میں سماجی اضطراب کا پیمانہ (SASE)

پس منظر: COVID-19 وبائی مرض کے دوران، دنیا بھر میں 1.5 بلین سے زیادہ سیکھنے والے ذاتی طور پر سیکھنے تک رسائی سے محروم تھے۔ نتیجتاً، ای لرننگ کی طرف نمایاں تبدیلی آئی۔ سماجی اضطراب ای لرننگ میں ایک محدود رکاوٹ ہے۔ اس مطالعہ کا مقصد میڈیکل طلباء میں ای لرننگ ماحول میں سماجی اضطراب کی سطح کا جائزہ لینا تھا۔

طریقہ: اس وضاحتی تجزیاتی کراس سیکشنل اسٹڈی میں، مشہد یونیورسٹی آف میڈیکل سائنسز کے 150 میڈیکل طلباء، جن کو سہولت کے نمونے لینے کے ذریعے منتخب کیا گیا، نے SASE (E-Learning Environments) سوالنامہ میں سماجی اضطرابی اسکیل مکمل کیا۔ جمع کردہ ڈیٹا کا تجزیہ SPSS20 سافٹ ویئر کے ذریعے وضاحتی اعدادوشمار اور تخمینہ شماریات کا استعمال کرتے ہوئے کیا گیا۔

نتائج: اس مطالعے کے نتائج سے پتہ چلتا ہے کہ ای لرننگ ماحول میں طلباء کی سماجی بے چینی زیادہ نہیں تھی، جس کی حد (1-6) تھی۔ مزید برآں، ای لرننگ (p=0.887) کے دوران تعلیمی پیشرفت کے بغیر طلبہ میں سماجی اضطراب کی سطح تعلیمی پیشرفت (p=0.702) والے طلبہ کے مقابلے میں زیادہ تھی، لیکن یہ فرق اعداد و شمار کے لحاظ سے اہم نہیں تھا۔ مزید برآں، ای لرننگ ماحول میں سماجی اضطراب کی سطح اور جنس، سمسٹر اور مطالعہ کی قسم جیسے متغیرات کے درمیان کوئی شماریاتی لحاظ سے اہم تعلق نہیں تھا۔

نتیجہ: موجودہ مطالعہ اور سماجی اضطراب کے متغیرات کے درمیان اعدادوشمار کے لحاظ سے اہم تعلق کی کمی اور سماجی تعامل کے ماحول میں تبدیلیوں کے باوجود، طبی طلباء میں سماجی اضطراب کی سطح کو کم کرنے اور سیکھنے کو بڑھانے کی کوششیں ضروری ہیں۔ ای لرننگ ماحول میں سماجی اضطراب کا اندازہ لگانے کے لیے SASE ایک درست اور قابل اعتماد ٹول ہے۔

کلیدی الفاظ: سماجی اضطراب، طبی طلباء، ای لرننگ ماحول، تعلیمی ترقی، صنف۔

اضطراب اجتماعی یادگیرندگان آنلاین: مقیاس اضطراب اجتماعی در محیط‌های یادگیری الکترونیکی (SASE)

زمینه و هدف: در طول همه‌گیری کروناویروس 2019، بیش از 1/5 میلیارد فراگیر در سراسر جهان از دسترسی به یادگیری حضوری محروم شدند و یک تغییر فوق‌العاده به سمت آموزش الکترونیکی مشاهده شد. اضطراب اجتماعی از موانع محدود کننده آموزش الکترونیکی می‌باشد؛ این مطالعه با هدف بررسی سطح اضطراب اجتماعی در محیط‌های یادگیری الکترونیکی در دانشجویان پزشکی انجام شد.

روش: در این مطالعه مقطعی توصیفی–تحلیلی 150 دانشجوی پزشکی دانشگاه مشهد که با روش نمونه گیری در دسترس انتخاب شده بودند، پرسشنامه اضطراب اجتماعی محیط‌های یادگیری الکترونیکی (SASE) را تکمیل نمودند. داده‌های جمع‌آوری شده با استفاده از روش‌های آمار توصیفی و استنباطی، از طریق نرم افزار SPSS20 مورد تجزیه و تحلیل قرار گرفت.

یافته‌ها: نتایج نشان داد اضطراب اجتماعی دانشجویان در محیط‌های یاگیری الکترونیکی دارای دامنه (6–1) بالایی نمی‌باشد، سطوح اضطراب اجتماعی در دانشجویان بدون پیشرفت تحصیلی در طول یادگیری الکترونیکی (p=0/887) در مقایسه با دانشجویان با پیشرفت تحصیلی (p=0/702). بیشتر بود، اما این تفاوت از نظر آماری معنی‌دار نبود. علاوه بر این، بین سطح اضطراب اجتماعی با متغییرهای جنسیت، نیم‌سال و نوع‌تحصیل رابطه آماری معنی‌داری وجود نداشت.

نتیجه‌گیری: با وجود معنی‌دار نبودن رابطه آماری متغیرهای پژوهش حاضر با اضطراب اجتماعی، و تغییر در محیط‌های تعامل اجتماعی؛ تلاش برای کاهش سطح اضطراب اجتماعی دانشجویان پزشکی و تقویت یادگیری ضروری است و SASE ابزاری روا و پایا برای ارزیابی اضطراب اجتماعی در محیط آموزش الکترونیکی می‌باشد.

واژه های کلیدی: اضطراب اجتماعی، دانشجویان پزشکی، محیط یادگیری الکترونیکی، پیشرفت تحصیلی، جنسیت

INTRODUCTION

Students, as one of the social groups that play an important role in shaping the future of society, are more exposed to psychological pressures than other groups. Medicine is considered one of the professions that requires very good mental health (1). Many individuals lack the motivation to pursue academic life due to social cooperation concerns such as social anxiety (2).

According to the American Psychiatric Association (1980), as cited by Keskin (2020), social anxiety is defined as a persistent fear of negative evaluation and avoidance of performance in social interactions (3). Individuals with this disorder tend to be quiet, interact less, and avoid speaking and expressing their views in situations where there is a possibility of being noticed and analyzed by others (2). McGonagle's (1994) research showed that the prevalence of social fears is increasing among younger individuals (4). Due to the high occurrence of this disorder among young people(5), students often experience anxiety because universities are social settings where they must communicate, be observed, and give presentations.

Zargar et al (2014) introduced social anxiety as the most common psychiatric disorder in the student population in a study (6). This disorder, in addition to its high prevalence due to its occurrence during youth (18-29 years), significantly interferes with the development of adaptation skills and, if not identified and followed up in the long term, will cause numerous problems in the personal and social functioning of individuals (7). Furthermore, social anxiety is associated with several comorbidities, including depressive disorder, other major anxiety disorders, and substance abuse (8). Numerous studies have been conducted to assess social anxiety among university students (9-11). A study in traditional learning environments showed that more than 50% of students experienced social anxiety in their academic life (9). Castella (2014) showed in his study that 85% of socially anxious individuals exhibit impairments in their academic and professional performance due to deficiencies in establishing and maintaining interpersonal relationships and difficulties in meeting social needs (12). Other problems related to social anxiety identified during the student period include dropping out and inability to pass courses (7). Studies, in this regard, have shown that students with social anxiety have lower academic progress. For example, for every 10-point increase in the score obtained from the Liebowitz Social Anxiety Scale, the likelihood of graduation decreases by 1.8%, indicating that facing multiple stressors affects the academic and professional success of this group (13). Therefore, social anxiety has always been one of the concerns of traditional education.

During the COVID-19 pandemic, more than 1.5 billion learners worldwide were deprived of access to traditional learning (14). This situation necessitated the use of social distancing-based educational methods, resulting in a significant shift towards e-learning.

The new generation of e-learning technologies was designed with social learning perspectives in mind, emphasizing that knowledge is constructed through learners' experiences in group social interactions (15). Interaction is a crucial component of e-learning. The expansion of electronic technologies in education highlighted the difference between interaction and social sharing in e-learning environments compared to real environments (4). Given that social anxiety is a barrier to interaction and affects mental health, but has not yet been studied in e-learning environments, these factors have led psychology and technology researchers to design an appropriate scale to identify the level of social anxiety among learners in these environments. In this regard, Keskin and colleagues (2020) designed a specialized tool aimed at identifying the level of social anxiety experienced in e-learning environments (SASE) based on various interactions in these environments.

The changes in the teaching-learning field and the replacement of e-learning systems instead of social learning environments in our country also led most educational institutions to conduct online programs and use technology as a basis for knowledge dissemination (16). During this time, the need for proper adaptation and the importance of mental health among students received more attention. Given the importance of the topic and the lack of similar studies, researchers decided to, for the first time in Iran (according to the researcher's investigations up to that time), use the SASE scale to examine the level of social anxiety in these environments among medical students. This was done to introduce a useful tool for revealing the level of social anxiety among learners in e-learning environments and to help educational environment designers in preparing and creating better quality in educational environments.

METHODS

This research was conducted in two stages to examine the level of social anxiety in e-learning environments among medical students. In the first stage, the English version of the tool was translated into Persian, and its validity and reliability were assessed. In the second stage, the relationship between gender, academic progress, type of study (full-time, part-time), and semester with levels of social anxiety during e-learning among medical students was examined. This stage was conducted in the academic year 2020-2021 with medical students from Mashhad University of Medical Sciences. A total of 150 male and female students who started their classes with e-learning in the fall and winter semesters participated in this study through convenience sampling.

During the COVID-19 pandemic, the university adopted a unified approach to conducting the e-learning process. Through these environments, students could participate in necessary educational tasks such as problem-based learning sessions, presentations, and discussions.

Tools

In this research, the researchers collected data using the SASE tool. SASE was developed and validated by Keskin and colleagues in 2020 in Turkey. It is a 7-point scale consisting of 46 items, scored from 1 (strongly disagree) to 7 (strongly agree). A higher score indicates higher social anxiety. Since the scale was in English, it was adapted into Persian and its translation validity was assessed through the following steps:

1. First, the questionnaire was translated from English to Persian by two translators. After consensus and integration of opinions, differences and contradictions were corrected. Then, to achieve a unified translation, a final questionnaire was prepared in a session with researchers and translators and was reviewed again by the research group for conceptual consistency. To increase accuracy at this stage, review forms were used.
2. The final version obtained was then back-translated into English by two translators proficient in both the source and target languages who had not participated in the previous stages. After approval by the researchers, the translated questionnaire was tested on a small group of students to assess face validity. The information obtained about the questionnaire was analyzed and necessary revisions were made to the translated version.

Validity and Reliability of the Tool

The following steps were taken to ensure validity and reliability:

Content Validity Assessment

To ensure that the most important and correct content (item necessity) was selected, the Content Validity Ratio (CVR) index was used. For this purpose, the opinions of 10 experts in the fields of basic sciences, psychology, and electronic technology (6 medical education experts, 3 psychology experts, and 1 electronic technology expert) were utilized. Each item of the tool was rated based on a three-point scale: "essential," "useful but not essential," and "not essential," and the results were calculated based on the CVR formula.

$$\text{CVR}= \frac{(ne-\frac{n}{2})}{\frac{n}{2}}$$

(In this formula, N is the total number of experts, and "ne" is the number of experts who selected the "essential" option.)

Based on the number of experts (10) who evaluated the questions, the minimum acceptable CVR value for each question was determined to be 0.62. The analysis results showed that, according to the experts' opinions, items 18, 22, and 23 in the "interaction avoidance" subscale in both the learner-learner and learner-instructor subscales did not achieve the minimum acceptable score due to cultural discrepancies with the Iranian society and were removed. Finally, the number of items in this scale was reduced to 40 items (9 items for negative evaluation, 4 items for physical symptoms, and 7 items for interaction avoidance).

To ensure that the items of the tool were optimally designed to measure the content, the Content Validity Index (CVI7) was used. To calculate this index, evaluators rated each item of the tool on three criteria: relevance or specificity, simplicity and fluency, and clarity or transparency, based on a 4-point Likert scale (1 = not relevant, 2 = somewhat relevant, 3 = relevant, and 4 = highly relevant). The Content Validity Index (CVI) was then calculated using the formula.

$$CvI = \frac{\text{The ratio of the number of evaluations that gave the item 3 and 4 marks}}{\text{Total number of assessors}}$$

Based on a survey of 10 experts in the fields of basic sciences, psychology, and electronic technology (6 medical education experts, 3 psychology experts, and 1 electronic technology expert), the results showed that all items scored above 0.79, indicating that the questionnaire items were suitable and approved for measuring the intended content.

Face Validity Assessment

In this study, both quantitative and qualitative methods were used to assess face validity. Qualitative validity was determined by 6 experts (3 medical education experts and 3 psychology experts) and 22 target group members (medical students from the 2020-2021 academic year) to identify difficulties in understanding phrases and words, the appropriateness and relevance of items, potential ambiguities, and misinterpretations of phrases, or deficiencies in word meanings. Their feedback resulted in minor changes to the questionnaire. To determine quantitative face validity, the impact score of each question was calculated. Initially, a 5-point Likert scale was used for each item: strongly agree (5 points), agree (4 points), neutral (3 points), disagree (2 points), and strongly disagree (1 point). The questionnaire was then given to 22 target group members to determine validity. After the target group completed the questionnaire, face validity was calculated using the item impact method formula.

(Impact Score = Frequency (%) × Importance)

Reliability Assessment

To assess the reliability of the questionnaire, Cronbach's alpha and test-retest methods were used. For the test-retest method, the questionnaire was administered twice, one week apart, to 30 target group members. The resulting scores were compared, and the correlation of responses for each question was examined, yielding Cronbach's alpha and ICC values above 0.99.

After confirming validity and reliability, the questionnaire was administered to the selected sample, and the results were analyzed using SPSS20 software with central tendency and dispersion indices and frequency percentages. Independent t-tests and Mann-Whitney tests were used to examine variables, and the normality of data distribution was assessed using the Shapiro-Wilk test. A significance level of less than 0.05 was considered in this study.

Examination of Important Factors

In the second phase of this study, based on existing literature, the factors affecting the level of social anxiety in e-learning were examined, and the relationship between social anxiety and the variables of gender and academic achievement was investigated. In this study, the academic achievement variable was assessed through the GPA of two consecutive semesters of students. Additionally, the variables of educational status (full-time, part-time) and semester (fall vs. winter) were considered interesting factors in this study. The variables of age and marital status were not examined because most students were in the same age group and were single.

RESULTS

The statistical analysis showed that 80 participants (53.3%) were male and 70 (46.7%) were female. 88 participants (58.7%) had academic progress, while 62 (41.3%) did not. 72 participants (48%) started studying in fall, and 78 (52%) in winter. There were 103 participants (free education) while

47 (31.3%) (paid education).

The results of the social anxiety questionnaire in e-learning environments showed that the mean and standard deviation for the learner-learner domain were 3.73 ± 1.19 with a range of 1 to 6.42, and for the learner-instructor domain were 3.68 ± 1.25 with a range of 1 to 6.34. Comparing the dimensions of the questionnaire in both the learner-learner and learner-instructor interaction scales showed that the highest social anxiety among the students was related to the "negative evaluation" dimension (4.01 ± 1.32, 3.95 ± 1.32).

The results of the Mann-Whitney and independent t-tests between the mean social anxiety scores of male and female students in the overall learner-learner and learner-instructor domains, despite higher scores for females compared to males, did not show a statistically significant relationship (p=0.164, p=0.849, respectively).

In this study, the results of the Mann-Whitney and independent t-tests between the mean scores of social anxiety in students with and without academic progress in the overall learner-learner and learner-teacher domains, despite higher scores in students without academic progress, did not show a statistically significant relationship (p=0.702, p=0.887, respectively).

Results of the Mann-Whitney and independent t-tests showed no statistically significant relationship between the average social anxiety score and the variables of type of education (p=0.590) and academic semester.

DISCUSSION

The aim of this study was to determine the level of social anxiety in e-learning environments among medical students. The validity and reliability of the Persian version of the SASE scale were tested, and social anxiety levels were compared based on gender, academic achievement, type of education (free vs. paid), and academic semester.

The findings of this study showed no statistically significant difference in the average social anxiety score in e-learning environments on the overall SASE scale and its subscales (learner-learner and learner-teacher interaction) between male and female students. This is consistent with the results of Parvin Khan's study (2021) and the study by Al-Hazmi et al. (2020) on students. The studies by Shahrabi et al(17). (2018) and Qazalbash et al. (2015) also showed no statistically significant difference between gender and social anxiety. On the other hand, the results of Al-Saudi's study (2022) showed that women's social anxiety was significantly higher than men's.

Recent research suggests that an individual's interpretation of themselves plays a crucial role in understanding concerns arising from social evaluation (18). It appears that each

Table 1. Comparison of negative evaluation scores of interaction, physical symptoms, avoidance of interaction and the whole learner-learner domain between women and men

Variable		Number	Mean ± Standard deviation	(Interquartile range) median	Domain (highest lowest)		Test result Man- Whitney
Negative evaluation	Male	80	4.00±1.25	4.06(1.83)	1.00	6.33	T=0.10 P*=0.916
	Female	70	4.03±1.41	4.22(2.22)	1.00	7.00	
Physical symptoms	male	80	3.15±1.37	3.00(2.25)	1.00	6.50	Z=1.37 P=0.172
	Female	70	3.42±1.34	3.50(2.19)	1.00	6.25	
Avoid interaction	Male	80	3.74±1.33	3.64(1.86)	1.00	6.86	Z=1.55 P=0.120
	Female	70	4.09±1.55	4.43(2.43)	1.00	7.00	
Total	Male	80	3.63±1.12	3.76(1.55)	1.00	6.42	Z=1.39 P=0.164
	Female	70	3.85±1.27	4.11(1.79)	1.00	6.33	

* The result of independent t test

Table 2. Comparison of negative evaluation scores of interaction, physical symptoms, avoidance of interaction and the entire learner-teacher domain between women and men

Variable		Number	Mean ± Standard deviation	(Interquartile range) median	Domain (highest lowest)		Test result Man- Whitney
Negative evaluation	Male	80	4.06±1.24	4.00(1.18)	1.33	6.56	Z=0.78 P=0.437
	Female	70	3.83±1.41	3.89(2.00)	1.00	6.33	
Physical symptoms	Male	80	3.45±1.25	3.25(1.75)	1.00	6.25	Z=0.00 P>0.99
	Female	70	3.39±1.42	3.25(2.96)	1.00	6.00	
Avoid interaction	Male	80	3.55±1.55	3.43(2.96)	1.00	6.71	Z=1.18 P=0.238
	Female	70	3.82±1.51	3.71(2.00)	1.00	6.43	
Total	Male	80	3.68±1.20	3.64(1.74)	1.44	6.34	Z=1.90 P=0.849
	Female	70	3.68±1.31	3.71(1.79)	1.00	6.00	

Table 3. Comparison of negative evaluation scores of interaction, physical symptoms, avoidance of interaction and the whole learner-learner domain between individuals with and without academic achievement.

Variable		Number	Mean ± Standard deviation	(Interquartile range) median	Domain (highest lowest)		Test result Man- Whitney
Negative evaluation	No progress	62	4.09±1.46	4.28(2.22)	1.00	7.00	Z=0.74 P=0.459
	With progress	88	3.96±1.22	4.00(1.97)	1.00	6.11	
Physical symptoms	No progress	62	3.40±1.43	3.38(2.31)	1.00	6.50	Z=0.91 P=0.363
	With progress	88	3.19±1.30	3.00(2.25)	1.00	6.50	
Avoid interaction	No progress	62	3.83±1.54	3.64(2.43)	1.00	7.00	T=0.50 P*=0.617
	With progress	88	3.95±1.38	4.14(1.96)	1.00	7.00	
Total	No progress	62	3.78±1.32	3.85(1.73)	1.00	6.42	T=0.38 P*=0.702
	With progress	88	3.70±1.10	3.83(1.58)	1.00	5.72	

* The result of independent t test

Table 4. Comparison of negative evaluation scores of interaction, physical symptoms, avoidance of interaction and the entire learner-teacher domain between people with and without academic progress.

Variable		Number	Mean ± Standard deviation	(Interquartile range) median	Domain (highest lowest)		Test result Man- Whitney
Negative evaluation	No progress	62	3.92±1.36	4.00(2.00)	1.00	6.56	T=0.21 P*=0.832
	With progress	88	3.97±1.30	4.06(2.00)	1.00	6.44	
Physical symptoms	No progress	62	3.58±1.35	3.25(1.75)	1.00	6.25	Z=0.91 P=0.242
	With progress	88	3.30±1.31	3.25(2.00)	1.00	6.00	
Avoid interaction	No progress	62	3.59±1.47	3.29(2.36)	1.00	6.43	Z=0.50 P=0.417
	With progress	88	3.74±1.58	3.64(2.61)	1.00	6.71	
Total	No progress	62	3.70±1.24	3.66(1.59)	1.00	6.34	T=0.14 P*=0.887
	With progress	88	3.67±1.26	3.64(1.98)	1.00	5.88	

* The result of independent t test

person's self-interpretation and beliefs affect their social anxiety, and gender is not a significant determinant. When individuals with social anxiety are placed in social-performance situations, they become sensitive to their surroundings and any feedback they receive, which is accompanied by cognitive processing. In this state, the subjective feeling of anxiety overwhelms them. In other words, instead of thinking about improving their performance in the future, they worry about not meeting others' social criteria and ultimately failing.

Today, we observe that women's presence in social roles is more prominent than before. Increased social participation of women leads to more social interactions and the acquisition of experiences and skills in this area. This suggests that improving women's communication skills helps reduce the difference in social anxiety between men and women. It is important to note that the results of this study were conducted among students, who are considered active and educated members of society.

Although no statistically significant difference was observed in the level of social anxiety between male and female students in this study, it should not be overlooked that the average social anxiety scores of female students were generally higher in both subscales (learner-learner and learner-teacher) and in the subscales of negative evaluation, physical symptoms, and avoidance of interaction in the learner-learner subscale and the avoidance of interaction subscale in the learner-teacher subscale. This could be a warning sign of an existing relationship that has not yet been revealed.

Additionally, no statistically significant relationship was observed between social anxiety scores of students with and without academic progress. One important point in this study is that the target group was in their first year of using e-learning environments, which might mean the relationship exists but has not yet been revealed. Furthermore, the criterion for assessing the academic progress variable in this study was the average GPA of the past two semesters, reported based on self-assessment, which could introduce response bias. Most students who responded had very good or excellent GPAs, which might affect the significance of this relationship. Considering diverse learning criteria, such as a combination of final exam grades, participation in online discussions, and class projects, would be a better identifier for determining students' social anxiety levels. However, this study only used final exam grades as the judgment criterion.

Few studies have examined the impact of social anxiety levels

on academic progress during e-learning, while many studies have evaluated the relationship between these two elements in traditional education settings. For example, studies by Parvin Khan (2021) and Qazalbash et al. (2015) in traditional settings reported no statistically significant relationship between academic progress and social anxiety. On the other hand, findings from the study by Al-Hazmi et al. (2020) showed a significant negative correlation between social anxiety levels and academic progress. The only existing study examining social anxiety levels in e-learning environments using appropriate tools was Al-Saudi's study (2022) in Saudi Arabia, which aligns with the results of the present study. Therefore, given that this topic has often been discussed in traditional education settings, further research is needed to examine social anxiety in e-learning environments and its impact on academic performance.

LIMITATION

- The inability to compare students' anxiety levels in face-to-face and online learning environments.
- The use of self-reporting, which may introduce bias in the results.
- The inability to examine other variables affecting students' social anxiety levels, such as age, marital status, learning environment, course nature (theoretical-practical), and self-efficacy.

CONCLUSION

Despite existing research on evaluating social anxiety in face-to-face learning environments, this study appears to be the first to examine the impact of the shift to e-learning on social anxiety and related socio-demographic factors among medical students. There seems to be a need to introduce this concept to individuals in new learning environments and for future research on the consequences of social anxiety in these settings. Using the SASE may indicate the start of a new line of research on social anxiety in virtual learning environments, providing useful information on the outcomes of this disorder. Additionally, the observed differences in social anxiety levels among students offer evidence to leaders in medical education to integrate strategies that reduce students' anxiety levels, hopefully leading to better-designed educational and clinical environments.

Ethical considerations

Ethical issues including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc. have been completely observed by the authors.

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