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Quick Response Code:

Website: www.jehp.net
DOI: 10.4103/jehp.jehp_220_21

Investigating the relationship of computerized examination anxiety with other variables at the university level: A case of health college students in Saudi Arabia

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Abstract:

BACKGROUND: In the daily lives of people, the level of anxiety plays a significant role. This applies to students, who experience anxiety when taking examinations referred to as examination anxiety. Majority of the current educational institutions have shifted from a traditional evaluation system to one that is computerized. The present study aim is to identify the computerized examination anxiety (CEA) among college students in the Faculty of Health and to compare the differences among them based on study system and gender.

MATERIALS AND METHODS: The research is a descriptive quantitative design. The research population consists of 138 health college students. CEA scale was used to identify the level of examination anxiety among students. Data were then exposed to analysis, namely the descriptive statistics, independent sample *t*-test, and Chi-square tests, to obtain the answers to the research questions at the level of <0.05 .

RESULTS: Based on the findings, the CEA experienced by the health students was of moderate level. The findings also showed insignificant differences between students' levels of anxiety based on gender and study system at <0.05 value.

CONCLUSION: The study contributed to literature by adding a study related to CEA during COVID-19. The study enumerated implications and recommendations based on the findings.

Keywords:

Anxiety, computer, COVID-19, examination, university

Introduction

It is widely acknowledged that economic and social development depends on the education provided to the youth. In the context of Saudi Arabia, the decades have witnessed considerable strides in the higher education field, and more recently, with the COVID-19 pandemic, issues have arisen in this sector among students around the globe.^[1,2] For instance, Anderson *et al.*^[3] and Tandon *et al.*^[4] revealed the issues that

university students face during the current COVID-19 pandemic throughout the countries of the globe.

Anxiety is, without a doubt, a phenomenon that commonly exists in people's lives, affecting both behavior and performance.^[5] Studies on a global scale indicate that students do suffer from anxiety disorders.^[6] One of the top anxiety types that pervade responses toward stress is test anxiety. This type of anxiety has been extensively researched in literature in recent years.^[5,6] This is particularly true among university

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How to cite this article: Rasheed A. Investigating the relationship of computerized examination anxiety with other variables at the university level: A case of health college students in Saudi Arabia. *J Edu Health Promot* 2021;10:371.

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Received: 17-02-2021
Accepted: 26-03-2021
Published: 29-10-2021

students who display high examination anxiety levels.^[6] Specifically, health students have been reported to experience higher levels of anxiety compared to their peers in other counterpart faculties.^[7] Health students' experience of anxiety should be considered as an issue of significant concern.^[5]

During the recent COVID-19 pandemic proliferation, computer and related technologies have been highlighted as effective tools of assessment in higher education. Several advantages can be reaped from providing computer-based examinations in higher education, including work efficiency, and immediate grading and feedback. We can add to that flexibility in test time and location arrangement, and minimizing the number of items needed by examinees.^[8]

Moreover, computerized examinations generate results with accuracy and reliability in comparison to traditional methods involving paper examinations.^[9,10] Nevertheless, computer-based examinations have their drawbacks, one of which is test anxiety, which could lead to poor outcome.^[1] This can result from the lack of flexibility of the computerized test, such as unable to change answers and overcome technical issues during the examination.^[9,8,11] A related study by^[12] concerning medical students showed that additional noise from the keyboard and missing habits create unattractive incentive for taking computer-based examination.

As a result of including technology in higher education sector, majority of educational institutions have begun shifting from the traditional examination methods to one that is computerized. Consequently, the factors that contribute to examination anxiety in the latter have become the highlight of several studies, with some touching upon computer examination (CE) anxiety. According to McDonald,^[13] when we include statistical equivalence scores in computerized and paper-based test, the examinees' differences have to be taken into consideration.

Similarly, Jamil *et al.*^[14] directed their focus on the perception of teachers concerning computer-based versus paper-based examination. Their findings indicated that female teachers with computer training certificates/degrees and those who are experienced in CE have a positive toward computer-based examinations compared to their peers.

In the two decades, research has shown that females are more disadvantaged and anxious when it comes to learning materials through computer-assisted software. The school's educational system may affect the attitude of students toward computer-based examination as opposed to the traditional paper-based one. This can be

seen in private or rich schools, where students are more familiar with computers and computerized examinations than students in public or poor schools.^[9] In this regard, more exposure to such examination type could assist students in building their experience and in being more accepting of using computer-assisted softwares for their education and learning.^[15]

In addition, students who have lower level of opportunities in taking CE may suffer from higher anxiety levels when they try it for the first time.^[8] However, students who are exposed to computer-assisted learning and examinations can be more familiar with CE administration mode. In other words, familiarity with technology and prior experiences may have significant effects on the students' attitudes and anxiety levels toward CE. Therefore, the purpose of the present study is to examine the examination anxiety level among health college students and to find the mean difference in computerized examination anxiety (CEA) when it comes to students' gender and study types.

Purpose of the study

This study mainly aims at examining the relationship between CEA and other factors (individual and educational) among health college students in Saudi Arabia.

- To examine the CEA level among health college students
- To examine the mean difference in CEA among students based on gender
- To examine the mean difference in CEA among students from different study types.

Materials and Methods

Study design and setting

The research is a descriptive cross-sectional design which adopted a survey data collection method among 138 undergraduate students from the health college at Imam Abdulrahman bin Faisal University from the 1st year classes. Quantitative method is employed to help the researcher get the opinions of the students about the study phenomenon.

Study participants and sampling

The population of the study included all students in health college at Imam Abdulrahman bin Faisal University located in the Eastern region of Saudi Arabia. As mentioned, 138 health college students were selected to be the study sample – students enrolled in a public university in the Eastern region of Saudi Arabia. The study selected the students using purposive sampling method, based on the purpose of the study as recommended by Fraenkel *et al.*^[16] Twenty-four students of the total number were males, while the remaining

114 were female, and 21 of them came from private institutions, while the remaining 117 came from public institutions.

Data collection tool and technique

Before conducting the study, the necessary agreements for the study were conducted from the Scientific Council at the Imam Abdulrahman bin Faisal University, and the scale was administrated to the targeted students using convenient sampling from the health college. The students were sent the demographic questionnaire and the CEA Scale (CEAS) online. Specifically, CEAS was developed in Arabic by Alkhezzi^[17] to gauge the level of anxiety among students toward CE. Twenty questions are contained in the instrument measured on a 5-point Likert scale, ranging from 1 (totally not applicable) to 5 (totally applicable). Added to this, the instrument contained 5 reverse coded items (items 6, 7, 17, 18, and 19). Data collected were analyzed using several statistical test such as mean, standard deviation, and *t*-test through Statistical Package of Social Sciences SPSS program.

Validity and reliability

Several validity and reliability process were used to finalize the study instruments. First, the instrument was given to seven educational experts who reviewed for content validity. The instruments were then adjusted based on the reviewer’s comments. The instrument had an internal consistency value of 0.83, and the test scores are calculated through the summation of the items scores. In this regard, a score of 70 or more shows that students do suffer from anxiety when confronted with CE, while scores from 50 to 70 show that they have moderate anxiety level, and scores of 50 or less show that they have low level of anxiety toward CE.

Ethical consideration

The study followed the ethical guidelines provided by Imam Abdulrahman bin Faisal University Ethics Committee. Proper permissions were obtained from all the participants. In addition, participants were informed that their answers would be used for research purposes only and would never be seen or used by others.

Results

To address the first research question, “What is the level of CEA among health college students in Saudi Arabia?” the study calculated the CEAS and categorized it into three levels based on their scores. The study results show that the study sample mean score is in the moderate level. More specifically, 22 students of the total number of students fell in the low-level category (16%), 19 students fell in the high-level category (14%), while the remaining 97 students fell in the moderate-level category (70%).

The second analysis involved the identification of the different levels of CE anxiety between genders of health college students. The male students obtained a high mean score (mean = 62.08 and standard deviation [SD] = 11.43) on the CEAS compared to their female counterparts (mean = 58.40, SD = 10.15). Refer to Table 1 for the detailed results – where it is evident that there was no significant difference in CEAS between the genders (*t* = 1.578, significant 0.117, *P* > 0.001).

The third analysis involved the identification of the different levels of CEAS between study system types (private or public). The findings show that students who studied in public system had higher mean scores (mean = 59.39 and SD = 10.19) in CEAS compared to their private education system counterparts (mean = 57.09 and SD = 11.79). However, in Table 2, it is evident that there was no significant difference between the study system types (private or public) in CEAS (*t* = -0.929, significant 0.355, *P* > 0.001).

In the fourth analysis/question, a statistical relationship was examined between CEA and study system type using Chi-square tests. Tables 3 and 4 contain the test results, and it is evident from the tables that there is no meaningful relationship between computerized examination anxiety, gender, and study system type.

Table 1: Summary of *t*-test comparison results between genders on computerized examination anxiety

Gender	<i>n</i>	Mean	SD	df	<i>t</i>	<i>P</i>
Male	24	62.08	11.43	136	1.578	0.117
Female	114	58.40	10.15			

SD=Standard deviation

Table 2: Summary of *t*-test comparison results between study types on computerized examination anxiety

Study type	<i>n</i>	Mean	SD	df	<i>t</i>	<i>P</i>
Public	117	59.39	10.19	136	-0.929	0.355
Private	21	57.09	11.79			

SD=Standard deviation

Table 3: Chi-square test results for gender differences

	Value	df	Asymptotic significance (two-sided)
Pearson χ^2	37.235	40	0.595
Likelihood ratio	42.328	40	0.371
Number of valid cases	138		

Table 4: Chi-square test results for study types differences

	Value	df	Asymptotic significance (two-sided)
Pearson χ^2	41.865	40	0.390
Likelihood ratio	43.130	40	0.339
Number of valid cases	138		

Discussion

Health education aims at providing students with knowledge and necessary skills for their future work and life-long learnings.^[2] However, during COVID-19, face-to-face education has been replaced by virtual teaching.^[18] This study seeks to determine the potential determinants of CEA in health college. The results show that students prior experience, familiarity with the examination type, and computer usage play a positive role in decreasing the anxiety level. The results also show equal anxiety levels in both genders, without a significant difference. Past studies indicated that computer use has a key role in decreasing CEA (e.g.,^[19,20]).

In a similar study line, prior studies showed that students that have been previously exposed to computer-based instruction and CE were not anxious toward CE. In this study, some of the students in the sample had come from schools that employ computer-based instruction and CE. As a result, they were not anxious toward CE. There is no significant difference in the CEA level between students who graduated from private or public school secondary educational institutions. In a similar study in literature by Alkhezzi,^[17] mimicking the same educational setting, the level of experience of computer usage was found to decrease the anxiety level toward CE, but in the present study, the participants admitted having prior experience with CE, and thus, this may be attributable to their moderate level of CEA.

Prior literature also supported a significant correlation between taking examination, anxiety, grade relationships, and assessment.^[5,21] This means that the level of anxiety experienced by students is affected by the test importance and the performance outcome. A related study^[22] revealed that test anxiety arises when the student worries over the negative outcomes of the evaluation that could lead to failure and that gender and previous compute use could affect the level of students anxiety to a considerable degree. Thus, it is for higher education institutions to work on decreasing the stereotype threat and providing numerous opportunities for students to be exposed to using computers for lower CEA. CEA may also be reduced through establishing infrastructure and technology that works smoothly without a glitch or any other issue. Institutions opting for CE administration need to be cautious and ensure that students are ready and that the logistics are in place to assess students' performance on a fair basis.

The present study findings are different from the prior studies in literature, in that, there are no significant differences between genders when it comes to CE. Such insignificant result may be related to the stereotypical threat that groups are slotted into to be pressurized to

display high performance, and hence, they deviated from the group stereotypes.^[9] According to prior studies, self-beliefs and perceived ability toward task performance affect the actual performance of the individual.^[15] Aronson *et al.*'s^[23] study of stereotypical threat among American college students revealed that such students had significantly lower grades and are not as engaged in their schooling in comparison to their counterparts. Similarly, Cheryan and Bodenhausen^[22] investigated positive stereotypical identity of Asian students in quantitative skills and revealed with ethnicity emphasis that the students are under pressure to perform well and this leads to lower concentration and higher impaired performance.

Limitations and recommendations

The present study has several contributions to literature, the first of which is the examination of CEA level among health college students, which was largely ignored by past studies in literature. In the context of education, studies of this caliber have generally adopted a quantitative data collection approach, and as such, future studies may adopt a qualitative approach to provide deeper insight into the actual CEA level among university students for their successful performance and outcome. In this study, the sample consisted of health college students, which may limit the generalization of the findings, and in this regard, future studies are recommended to include students from different colleges. The study sample was also obtained in one university in the Eastern region of Saudi Arabia, and as such, future studies may include a larger sample culled from other universities. Moreover, other environmental and social factors that may affect the level of anxiety among the students should be taken into consideration.

Conclusion

The study main purpose is to examine the CEA level among health college students. The results showed that students from health college had a moderate level. Furthermore, results showed that there is no significant difference on the level of CEA between male and females' students. In addition, insignificant difference on the level of CEA between students from different study systems (public and private) was spotted. Thus, the study contributes to literature by investigating examination anxiety using a modern approach which is computerized online assessment, and further studies are needed to include other factors which not included in this study.

Acknowledgment

The authors would like to thank those students who participate in this study.

Financial support and sponsorship

This Research was not supported.

Conflicts of interest

There are no conflicts of interest.

References

1. Lu H, Hu Y, Gao J. The effects of computer self-efficacy, training satisfaction and test anxiety on attitude and performance in computerized adaptive testing. *Computer Education* 2016;100:45-55.
2. Patra S, Khan A, Upadhyay M, Sharma R, Rajoura P, Bhasin S. Module to facilitate self-directed learning among medical undergraduate: Development and implementation. *Journal of Education and Health Promotion* 2021;9:231.
3. Anderson R, Heesterbeek H, Klinkenberg D, Hollingsworth T. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet* 2020;395:931-931.
4. Tandon T, Dubey A, Arora E, Hasan M. Effect of COVID-19 pandemic lockdown on medical advice seeking and medication practices of home-bound non-COVID patient. *J Edu Health Promot* 2021;10:1-8.
5. Rehman F, Saeed I, Khan N, Shahzad H, Janjua A, Ajmal Z. Measuring the level of examination anxiety among students in a private medical college in Lahore. *Pakistan Journal of Medical and Health Sciences* 2018;12:184-7.
6. Duraku Z. Factors influencing test anxiety among university students. *The European Journal of Social and Behavioural Sciences* 2017;206:1-10.
7. Alammari M, Bukhary D. Factors contributing to prosthodontic exam anxiety in undergraduate dental students. *Adv Med Educ Pract* 2019;10:31-8.
8. Al-Samadani K, Al-Dharrab A. The perception of stress among clinical dental students. *World J Dent* 2013;4:24-8.
9. Fritts B, Marszalek J. Computerized adaptive testing, anxiety levels, and gender differences. *Soc Psychol Educ* 2010;13:441-58.
10. Conole G, Warburton B. A review of computer-assisted assessment. *Research in Learning Technology* 2016;13:17-31.
11. Bodmann S, Robinson D. Speed and performance differences among computer-based and paper-pencil tests. *Journal of Education Computer Research* 2004;31:51-60.
12. Hochlehnert A, Brass K, Moeltner A, Juenger J. Does medical students' preference of test format (computer-based vs. paper-based) have an influence on performance? *BMC Med Educ* 2011;11:89.
13. McDonald A. The impact of individual differences on the equivalence of computer-based and paper-and-pencil educational assessments. *Comput Educ* 2002;39:299-312.
14. Jamil M, Tariq R, Shami P, Zakariys B. Computer-based vs paper-based examinations: Perceptions of university teachers. *Turk Online J Educ Technol* 2012;11:371-81.
15. Prisacari A, Danielson J. Rethinking testing mode: Should I offer my next chemistry test on paper or computer? *Comput Educ* 2017;106:1-12.
16. Fraenkel J, Wallen N. *How to Design and Evaluate Research in Education*. New York, NY: McGraw-Hill; 2006.
17. Alkhezzi F. The effect of test anxiety on the performance in exams: A correlational study on Kuwait University Students. *Int J Res Educ* 2013;1:20-31.
18. Mortazavi F, Salehabadi R, Sharifzadeh M, Ghardashi F. Students perspectives on the virtual teaching challenges in the COVID-19 pandemic: A qualitative study. *Journal of Education and Health promotion* 2021;10:59. [doi: 10.4103/jehp.jehp_861_20].
19. Putwain D. Do examinations stakes moderate the test anxiety-examination performance relationship? *Educ Psychol* 2008;28:109-18.
20. Pajares F, Miller M. Role of self-efficacy and self-concept beliefs in mathematical problem solving: A path analysis. *J Educ Psychol* 1994;86:193-203.
21. Zeidner M. *Test Anxiety: The State of the Art*. Switzerland Springer Science & Business Media; 1998.
22. Cheryan S, Bodenhausen G. When positive stereotypes threaten intellectual performance: The psychological hazards of "model minority" status. *Psychol Sci* 2000;11:399-402.
23. Aronson J, Fried, C, Good C. Reducing the effects of stereotype threat on African American College students by shaping theories of intelligence. *J Exp Soc Psychol* 2002;38:113-25.