

E-Learning Readiness among Faculty Members of Iranian Universities: A Survey of 23 Universities

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ABSTRACT

Background: The aim of this study was to assess the level of e-learning readiness among the faculty members in Iranian universities.

Methods: This is a survey research and the statistical population included all faculty members of 23 selected Iranian universities in March-September 2018. The population of the study included about 750 professors selected through simple random sampling. The instrument of study was a questionnaire titled “Evaluation of Instructors’ Readiness for E-learning in Iranian Universities”. Its content and face validity were verified by professionals, and its reliability was measured through Cronbach’s Coefficient alpha which was (0.72-0.86). To analyze the data, descriptive and mean, SD statistics (independent T-test) were used.

Results: The average e-readiness score of professors from the 23 selected universities amounted to approximately 4.3 out of 10, which is indicative of a relatively “weak” e-readiness status. Also, the score of over 60% of the criteria was “less than average”.

Conclusion: Given the decreasing numbers of e-learning students in Iran, the results of this study show that one of the important reasons for the failure in the development of universities’ e-learning systems can be the lack of e-learning readiness among instructors.

Keywords: E-learning, E-learning readiness assessment, Faculty members, Higher education, Iranian Universities

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Introduction

More than four million students are currently studying in Iran, with less than one percent of them attending “Electronic Learning Systems” (ELSSs), indicating that this educational system is not favored by Iranian students. In the current era, even prominent universities and pioneers such as Shiraz University, Tarbiat Modares University, Amir Kabir University, and Science and Technology University, which have been pursuing e-learning courses for more than a decade, appear to be facing serious challenges. Despite the large investment in technical infrastructure and e-learning systems, their revenues from e-learning are rapidly declining (1).

A review of similar international experiences also shows that despite the high potentials of e-learning in “Higher Education Institutions” (HEIs), investments in this area are still deemed to carry high risks. For example, in Nelson’s study about the reasons for e-learning systems success or failure, 36 common misconceptions have been identified in four main categories: “human resource”, “process”, “product” and “technology” (2). Another study identified 43 success factors for e-learning projects, more than half of which are related to human resources readiness (3). Therefore, although creating the right network infrastructure with the right hardware and software components is a prerequisite for e-learning success, human resource readiness is a sufficient condition (4).

The term “e-learning readiness” (e-readiness), which is defined as users’ competence to “use” an ELS and its technological tools, has resulted from the need to assess the technological, social and organizational readiness levels among users for implementing ELS (5). At the very least, an e-ready online instructor should be capable of efficiently and effectively applying the technology they require for ELS (5-8). Few studies have been conducted on assessing the readiness of online instructors (including lecturers, teachers or professors) in ELSSs across a university system (8).

E-readiness is the extent to which instructors are prepared to apply their e-learning experience to an ELS (9, 10). E-readiness measures have been widely researched, from Australia (11), Egypt (12), Nigeria (13), Iran (6), Myanmar (14), South Africa (15), Turkey (16), Kenya (17) to the United Kingdom (18), and USA (4, 19). One of the most important e-learning readiness dimensions identified in all of these studies is the dimension of instructors’ readiness. Indeed, the implementation of a successful ELS requires instructors to be: trained in terms of technical skills for using online courses and programs, computer literate in hardware and software, and mentally accepting of the move to a digital environment (4, 20, 21). Similarly, other studies have examined the factors affecting instructors’ readiness in e-learning systems, which is summarized in Table 1.

It seems that one of the first steps in the implementation of e-learning systems should be an assessment of the readiness of instructors. Since faculty members are responsible for instruction in universities, this paper has expanded on the measures applied in the assessment of ELSSs by identifying those unique characteristics that describe e-ready online instructors with an effective performance in an ELS. Accordingly, the main question of the research is: what are the abilities and skills of faculty members for the successful implementation of e-learning systems?

Therefore, the purpose of this study is to analyze the factors affecting the readiness of faculty members in Iranian universities and measure their e-learning readiness in order to determine the factors of failure of Iranian HEIs’ e-learning systems in the light of faculty members’ readiness or lack thereof.

Methods

From a philosophical perspective, this research falls into the positivist paradigm and uses the logic of deductive reasoning. In terms of objective, the research is applied and the survey research strategy is used to

Table 1: Instructors' e-learning readiness factors

No.	Researchers	Instructors' e-learning readiness factors	Technical readiness	Network readiness	Technological tool readiness	Cultural readiness
1	McConnel (22)		✓	✓		✓
2	Rosenberg (23)					✓
3	Engholm & McLean (24)		✓	✓	✓	✓
4	Bradbert (25)		✓			✓
5	Anderson (26)		✓			✓
6	Haney (27)					✓
7	Workknowledge (28)		✓	✓		✓
8	Borotis & Poulimenakou (29)		✓			✓
9	Cloete (30)					✓
10	Kaur & Zoraini Wati (12)		✓	✓	✓	✓
11	Chapnick (31)		✓		✓	✓
12	Aydin & Tasci (14)		✓	✓	✓	✓
13	Psycharis (32)		✓			
14	Machado (33)		✓			✓
15	Lopes (34)		✓	✓	✓	✓
16	Akaslan & Law (35)		✓			✓
17	Saekow & Samson (36)		✓			✓

collect first-hand data using questionnaire tools from September to March 2018. The statistical population in this research is all faculty members of 23 selected Iranian universities, including 10200 professors at the time of conducting the research. For sample selection, simple random sampling method is used which considering Cochran's statistical formula in the following relation, the minimum number of samples under study is 370 people.

The statistical sample consists of 746 faculty members of the selected universities, of which: 50 (7%) are professors, 142 (19%) are associate professors, 417 (56%) are assistant professors and 132 (18%) are lecturers. In other words, the rank of Associate Professor is represented the most in the research sample. Also, the sample included professors from the faculties of fundamental sciences (17%), engineering (43%), human sciences (22%), agricultural sciences (14%) and arts (4%) (See [Appendix 1](#)).

In order to extract the e-learning readiness factors and measures of professors, this study was conducted using two complementary approaches: a documentary study and expert opinion. The first approach was applied to

collect factors and measures from previous studies and the second approach was employed to select factors and measures in accordance with the indigenous requirements. It is worth noting that more than 50 experts, including a number of managers and planners at the Ministry of Science, Research and Technology (MSRT) and universities (26 people), professors familiar with e-learning (15 people), and technical experts (12 people), were selected by "Snowball Method" and contributed to determining the relative importance of selected factors and measures.

The acquired responses were then formulated in accordance with Likert's five-option spectrum (i.e. scale 1 for the fully opposed and 5 for the fully agreed), which is considered as one of the most commonly used scales for assessing closed answers (37). A diversified assessment of the research tool (i.e. the questionnaire) is presented in Table 2, covering different aspects, from its reliability (Cronbach's Alpha test) to its construct validity (Explorative Factorial Analysis). The table shows the values of the Cronbach's Alpha index, the KMO measure of sampling adequacy ranges, as well as the variance percentages for the model. Based on

Table 2: Findings of the explorative factorial analysis

No.	Readiness Factors	Cronbach's α	KMO	Total variance (%)
1	Technical readiness	0.77	0.83	40.63
2	Network readiness	0.81	0.8	51.02
3	Technological tool readiness	0.86	0.71	48.32
4	Cultural readiness	0.72	0.71	45.59

Table 3: Assessing the priority of the factors based on the T-test

Rank	Readiness dimension	Average	Standard deviation	T-value > 3		
				T	Level of significance	Mean difference
1	Cultural readiness	3.65	0.61	11.9	0.0001	0.77
2	Technological tool readiness	3.84	0.68	11.87	0.0001	0.86
3	Technical readiness	4.13	0.43	28.85	0.0001	1.31
4	Network readiness	4	0.66	14.3	0.0001	1

the findings ($KMO=0.762$ and $P<0.05$ for the Bartlett's test), the sufficiency and relevance of the proposed factors are confirmed as desirable. The model's predictability is demonstrated in accordance with the variance value as shown for each one of its constructs. Cronbach's Alpha values for all of the constructs scaled above 0.7 which indicated the desirability of the data collection tool applied for the explorative research.

The next section will be focused on determining the priority order of the factors and measures of the model based on one-sample t test. Table 3 shows the findings of the t test (The priority of the selected measures is presented in [Appendix 2](#)). As indicated in the tables, the average for all factors is higher than the mean of the options (i.e. higher than 3). The level of meaningfulness for all of the factors falls below 0.05, which means that the average of the factor is meaningfully greater than 3. In other words, all of the applied factors gain a high priority from the experts' point of view.

As shown in the Table 3, the four factors have high priority for professors' readiness, with the highest priority going to the cultural factor.

In order to compare the e-readiness of professors based on the measures presented in [Appendix 2](#), field surveys were carried out in 23 selected universities. The e-readiness levels of professors in the field of e-learning

in 23 Iranian universities were studied. It is worth noting that the "Interval of Standard Deviation from the Mean" (ISDM) method will be used in the next section to analyze the scores obtained from each measure (considering the qualitative nature of the questionnaire questions) (38). In this way, the data are divided into four levels: "weak", "medium", "good" and "excellent" according to the following formula:

- A = Weak: $A \leq \text{Mean} - Sd$
 B = Medium: $\text{Mean} - Sd < B \leq \text{Mean}$
 C = Good: $\text{Mean} < C; \text{Mean} + Sd$
 D = Excellent: $\text{Mean} + Sd < D$

In this respect, Sd represents standard deviation for each measure.

According to the Institute of Research and Higher Education Planning, in 2018 the number of public universities under the supervision of Iran's Ministry of Science, Research and Technology (MSRT) was 120, of which about 10 percent were located in Tehran and 90 percent were located in other provinces. In addition, about 60% are comprehensive universities and 40% are specialized universities. Based on the Quota Sampling method (38), a total of 23 universities (about 20% of the statistical population) including two specialized provincial universities (Sahand University of Technology and Gorgan University of Agricultural Sciences and Natural Resources), three specialized capital universities (Sharif University of

Technology, Khajeh Nasir Toosi University of Technology and Tehran University of Art), 15 comprehensive provincial universities (Shiraz University, University of Isfahan, University of Sistan and Baluchestan, Shahid Bahonar University of Kerman, University of Zanjan, Semnan University, Urmia University, Azarbaijan Shahid Madani University, University of Kurdistan, Razi University, University of Kashan, University of Mohaghegh Ardabili, Hakim Sabzevari University, Yazd University and University of Birjand), and three comprehensive capital universities (University of Tehran, Tarbiat Modares University and Shahid Rajaee Teacher Training University) were represented in this study. These selected cases have an appropriate geographic, demographic and discipline coverage and provide a relatively accurate picture of Iran's higher education in the field of e-learning. A summary of background information on these selected universities is presented in [Appendix 3](#).

Results

As mentioned earlier, selected measures of technical readiness, network readiness, technological tool readiness and cultural readiness factors were used to evaluate the e-readiness of professors. A summary of the results of the questionnaire responses are given in [Appendix 4](#). The results can be analysed in two levels presented in the next sections.

Analysing Professors' E-Learning Readiness at Each University

In Figure 1, the average e-readiness score of faculty members at each selected institution is shown in the form of a radar chart. As shown in Figure 1, the distribution of e-readiness scores of universities' professors are almost homogeneous, at the "Medium" level; nevertheless, only the scores of four universities including "University of Tehran", "Sharif University of Technology", "Khajeh Nasir Toosi University of Technology" and

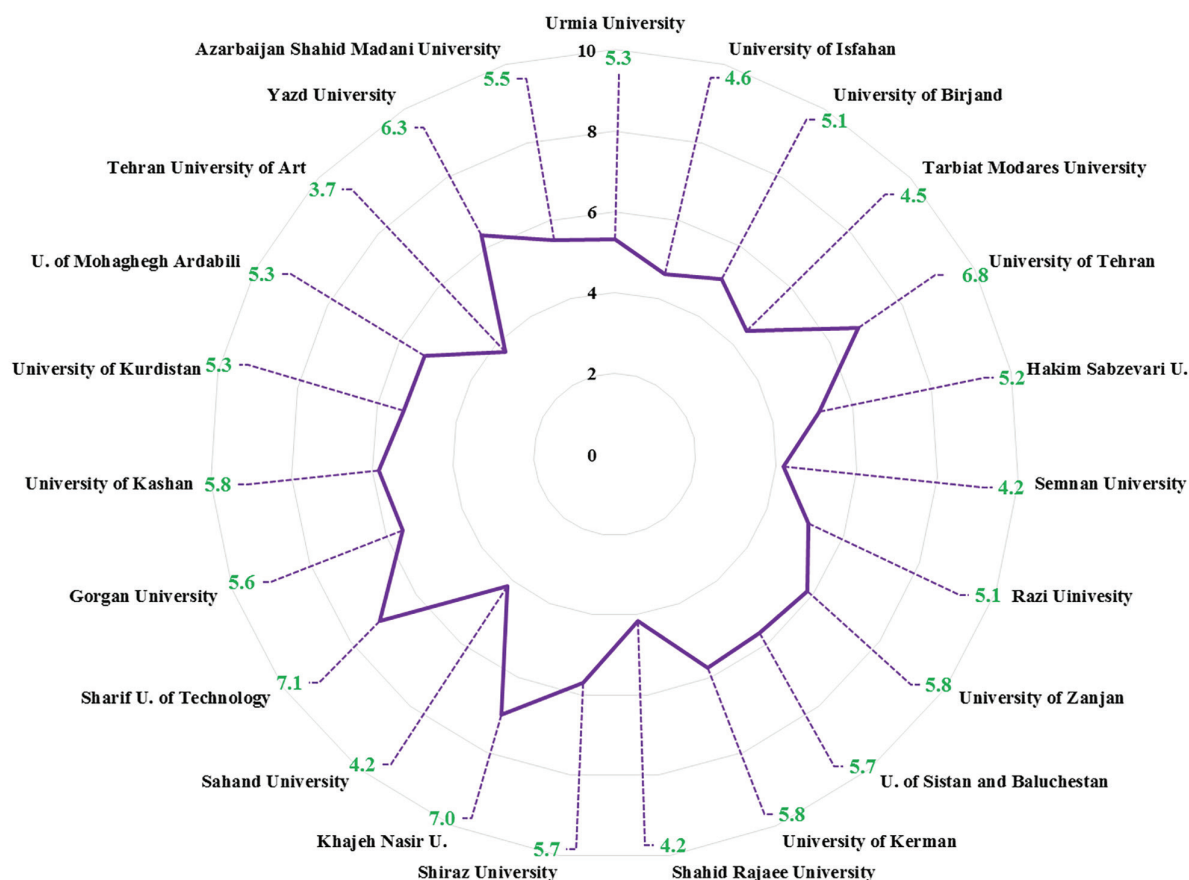


Figure 1: Professors' e-readiness Radar Chart at selected universities

“Yazd University” are rated at the “Good” level (higher than 6 out of 10). Besides, the professors’ e-readiness score of “Tehran University of Art” is at the “Weak” level. The details of the university professors’ readiness scores can be seen in Appendix 4.

Analysing Professors’ E-Learning Readiness Levels in All Universities

The professors’ total e-readiness score was obtained by calculating the average weight of each measure and the average score of the respondents for each measure. In Figure 2, the e-readiness of faculty members for selected universities is shown in the form of a radar chart.

The average e-readiness score of professors from the 23 selected universities amounted to approximately 4.3 out of 10, which is indicative of a relatively “weak” e-readiness status. As shown in Figure 2, the distribution of scores for e-readiness measures is completely heterogeneous, ranging from “weak” to “excellent”; nevertheless, the share of “weak” and “medium” scores are more than 60% (16 out of 25 measures).

In Figure 3, the radar chart portrays the instructors’ e-readiness in terms of the four tested factors (technical skills, network skills,

technological tools and cultural readiness).

The results show that score of only one main factor (“Technological Tools”) is at a “Good” level (about 7.5 out of 10). The lowest score (less than 4 out of 10) was obtained in “Technical Skills”, along with the “Medium” scores (between 4 and 6) in “Cultural Readiness” and “Network Readiness”. According to the classification presented in Figure 3, the analysis of the results is presented separately for each factor.

Professors’ E-Readiness Assessment in Terms of Technical Skills

Examining the technical readiness measures and the frequency of respondents’ responses demonstrated that the scores of more than 75% of the measures (9 out of 12) are “medium” or “weak”. The results show that scores of only three measures (“Ability to use search engines”, “Ability to install software” and “Familiarity with International Computer Driving License [ICDL] skills”) are higher than “medium” level, where the highest score (about 7 out of 10) can be attributed to the “Ability to use search engines”.

The lowest score (approx. 1.3 out of 10) was obtained on the measure “Familiarity with the advanced course development tools”,

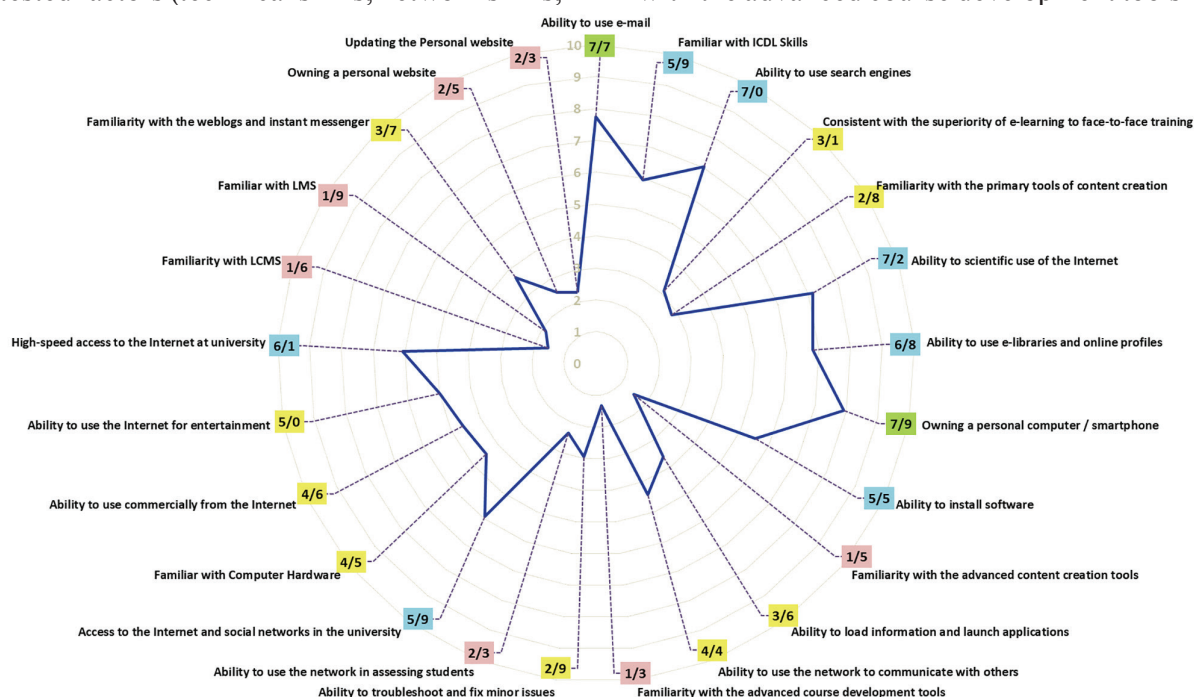


Figure 2: Average scores of e-readiness measures at selected universities

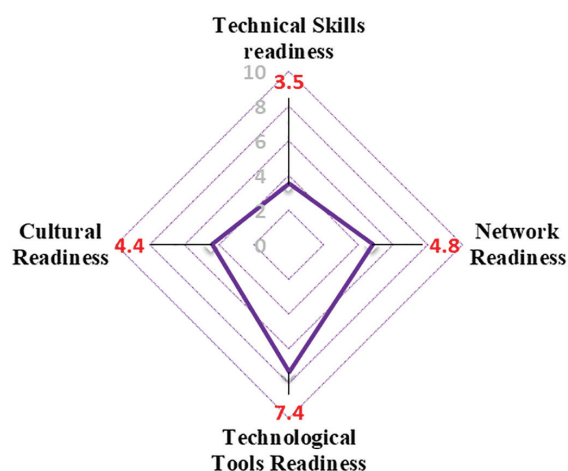


Figure 3: Professors' e-readiness Radar Chart in terms of four main factors studied

along with the “relatively weak” and “weak” scores on the measures of “Familiarity with the primary tools of content creation”, “Familiarity with Learning Management System (LMS)” and “Familiarity with Learning Content Management System (LCMS)”. This indicates the “weak” readiness of the surveyed professors in the area of e-learning content design.

The professors' average technical readiness score was approximately 3.5 out of 10. It can therefore be concluded that the faculty members of selected universities are not prepared enough in terms of having the basic skills and prerequisites for implementing electronic learning programs.

Professors' E-Readiness Assessment in Terms of Network Skills

The average score of the six network measures is approximately 4.8 out of 10, which indicates a “medium” level of readiness in this factor among professors. Meanwhile, the three measures “Ability to use e-mail”, “Access to the internet and social networks in the university” and “Access to high-speed internet at the university” are rated “excellent” and “good.”

Two related measures, including “Owns a personal website” and “Ability to update their personal website”, have the lowest scores in this factor, which confirms the lack of ability among professors to utilize the network proficiently. The “lower than medium” score

of the measure “Ability to use the network to communicate with others” also confirms this conclusion.

Professors' E-Readiness Assessment in Terms of Technological Tools

Based on the results of this survey, the scores of the measures “Owns a personal computer/ smartphone” and “Ability to use e-libraries and online profiles” are approximately 7.9 and 6.8 out of 10 respectively, which positions the professors' e-readiness in terms of technological tools at the highest levels relative to the other factors. In this factor, therefore, the professors of selected universities reached a “good” level.

Professors' E-Readiness Assessment in Terms of Cultural Readiness

The results of the “Cultural Readiness” factor demonstrated that only about 35% of faculty members agree with “the superiority of e-learning to face-to-face training”. In addition, the professors of the selected universities have displayed the highest readiness on the measure “ability to use the internet for academic research purposes” (with a score of 7.2) and the lowest readiness to the measure “ability to use the internet for commercial purposes” (4.6 out of 10). In general, professors' average cultural readiness score is 4.4 out of 10, corresponding to the “less than medium” level.

Discussion

Given the declining number of e-learning students in Iran, the results of this study show that one of the important reasons for the failure of developing universities' e-learning systems can be the lack of instructors' e-learning readiness. Although a comprehensive analysis of the status of only a limited number of Iranian universities cannot warrant a general conclusion, by combining the findings of this study with other similar previous studies (39-40), it can be concluded that the failure of academic e-learning in developing countries such as Iran is due to the lack of attention to the soft aspects of technology

development, especially e-readiness among human resources. Prioritizing ELS in each of these universities requires that the academic officials and planners pay special attention to professors' readiness. This is supported by all three levels of analysis in this study: the macro-level (based on the average scores of all measures), the meso-level (consistent with each factor score), and the micro-level (with each measure taken alone).

In spite of almost identical readiness level in large dimensions (all measures considered), there were significant differences between the four major factors (technical skills, network skills, technological tools and cultural factor). While Professors were at a "good" level in terms of their use and knowledge of "technological tools", the "technical and network skills" and openness to "cultural change" among professors were below the "medium" level. These results are consistent with the results of studies by Kaur and Zoraini Wati (12), Ojo and Ayanda (13), Hung et al. (7), Aydın and Tasci (14), Kashorda and Waema (15), Lou and Goulding (16), Kamalian and Fazel (41) and Aslani et al. (42), which indicate that, in terms of component weights, faculty members' priorities in implementing e-learning are (in descending order of importance) technological tools, network, culture and finally technical skills readiness.

Accordingly, addressing these challenges should be placed on the agenda of officials and administrators of these universities. The following suggestions are presented to provide the foundation for the implementation of e-learning systems:

- Enhancing faculty members' level of readiness by holding specialized training courses in various fields such as familiarizing academic staff with the basic and advanced tools of online course development, fostering the skills of designing and implementing online educational content, and improving computer software and hardware skills;
- Reinforcing technical support infrastructure, which includes hiring computer and network experts, could also

prove beneficial;

- Promoting the benefits of ELSs and sustainable policy development for the engagement of professors in e-learning through intrinsic and extrinsic incentives could also be helpful in terms of promoting the adoption of digital platforms;
- Strengthening the cultural, scientific and educational aspects through seminars, workshops and training courses;
- Providing appropriate training courses for professors on the requirements of an e-learning environment. The content of the training courses may include familiarity with the application of electronic content production, online tests, evaluation of e-learning, etc.

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Ethical Considerations

No ethical issues were found. Participants have attended in this study willingly and data was presented anonymously. Participants were assured that their information will remain confidential.

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Conflict of Interests

No potential conflict of interest relevant to this article was reported.

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