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Exploring Faculty Members Perspective on the Implementation of Take-home assessments in Medical Education during the COVID-19 Outbreak: A Qualitative study

Background: In early 2020, due to COVID-19, public lockdowns challenged the academic community by conducting a wide range of remote exams. The current study planned to survey the faculty member's perspective on the challenges and the solution approach ahead of this sudden transmission and the feasible medical education assessments conducted in an online Take-home format.

Methods: The current paper was a cross-sectional and descriptive study. The data were collected through an online interview form consisting of close-ended and open-ended questions completed by faculty members of Iran universities of medical sciences. The received data were analyzed using descriptive, inferential statistics and a thematic analysis approach through SPSS25 and MAXQDA2020 software.

Results: A total of 574 medical faculty members enrolled in this survey. Midterm university exams and internal-university language tests were selected by responders as a suitable option for holding online assessments. Other summative or sensitive assessments were not eligible to use this process. Also 640 codes related to challenges and solution approaches were extracted. The significant difficulties were the problems in the executive infrastructure (124 codes), and improving the implementation of online testing (84 codes) was considered the best feasible solution in faculty members' perceptions.

Conclusion: The results showed that faculty members believed high-stake tests, according to the current technical and cultural infrastructure, are not far from the mind and access. Still, there is a critical need to explore more to provide a stable and reliable online exams environment.

Keywords: Assessments, Take-home exams; COVID-19; Thematic Analysis; Cheating; Medical Education

استکشاف منظور اعضاء هيئة التدريس حول تنفيذ التقييمات المنزلية في التعليم الطبي أثناء اندلاع COVID-19: دراسة نوعية

الخلفية: في أوائل عام ٢٠٢٠، بسبب COVID-19، تحدى الإغلاق العام المجتمع الأكاديمي من خلال إجراء مجموعة واسعة من الاختبارات عن بعد. خططت الدراسة الحالية لمسح وجهة نظر عضو هيئة التدريس حول التحديات ونهج الحل قبل هذا الانتقال المفاجئ وتقييمات التعليم الطبي الممكنة التي يتم إجراؤها بتنسيق Take-home عبر الإنترنت.

الطرق: الورقة الحالية عبارة عن دراسة مقطعية وصفية. تم جمع البيانات من خلال نموذج مقابلة عبر الإنترنت يتكون من أسئلة مغلقة ومفتوحة أكملها أعضاء هيئة التدريس في جامعات العلوم الطبية الإيرانية. تم تحليل البيانات الواردة باستخدام الإحصائيات الوصفية والاستنتاجية ونهج التحليل الموضوعي من خلال برنامجي SPSS25 و MAXQDA2020.

النتائج: تم تسجيل 574 من أعضاء هيئة التدريس الطبية في هذا المسح. تم اختيار امتحانات منتصف الفصل الجامعي واختبارات اللغة الجامعية الداخلية من قبل المستجيبين كخيار مناسب لإجراء التقييمات عبر الإنترنت. لم تكن التقييمات النهائية أو الحساسية الأخرى مؤهلة لاستخدام هذه العملية. كما تم استخراج 640 كود متعلق بالتحديات وأساليب الحلول. تمثلت الصعوبات الكبيرة في مشاكل البنية التحتية التنفيذية (١٢٤ رمزاً)، واعتبر تحسين تنفيذ الاختبار عبر الإنترنت (٨٤ رمزاً) أفضل حل ممكن في تصورات أعضاء هيئة التدريس.

الخلاصة: أظهرت النتائج أن أعضاء هيئة التدريس يعتقدون أن الاختبارات عالية المخاطر، وفقاً للبنية التحتية الفنية والثقافية الحالية، ليست بعيدة عن العقل والوصول. ومع ذلك، هناك حاجة ماسة لاستكشاف المزيد لتوفير بيئة اختبارات مستقرة وموثوقة عبر الإنترنت.

الكلمات المفتاحية: التقييمات، والامتحانات المنزلية؛ كوفيد-١٩ التحليل الموضوعي الغش؛ التعليم الطبي

COVID-19 پهنيلے کے دوران میڈیکل ایجوکیشن میں ٹیک ہوم اسیسمنٹس کے نفاذ پر فیکلٹی ممبران کے نقطہ نظر کی کہرج: ایک کوالٹیٹیو اسٹڈی

پس منظر: ٢٠٢٠ کے اوائل میں، COVID-19 کی وجہ سے، عوامی لاک ڈاؤنز نے دور دراز کے امتحانات کی ایک وسیع رینج کے ذریعے تعلیمی برادری کو چیلنج کیا۔ موجودہ مطالعہ نے اس چیلنج کو ٹرانسمیشن سے پہلے فیکلٹی ممبر کے چیلنجز اور حل کے نقطہ نظر اور آن لائن ٹیک ہوم فارمیٹ میں کیے گئے ممکنہ طبی تعلیم کے جائزوں کا سروے کرنے کا منصوبہ بنایا۔

طریقے: موجودہ مقالہ ایک کراس سیکشنل اور وضاحتی مطالعہ تھا۔ یہ ڈیٹا ایک آن لائن انٹرویو فارم کے ذریعے اکٹھا کیا گیا تھا جس میں ایرانی یونیورسٹیز آف میڈیکل سائنسز کے فیکلٹی ممبران کے ذریعے مکمل کیے گئے قریبی اور کھلے سوالات پر مشتمل تھا۔ SPSS25 اور MAXQDA2020 سافٹ ویئر کے ذریعے حاصل کردہ ڈیٹا کا تجزیہ وضاحتی، تخمینی کے اعدادوشمار اور موضوعاتی تجزیہ کے طریقہ کار کے ذریعے کیا گیا۔

نتائج: اس سروے میں کل 574 میڈیکل فیکلٹی ممبران نے اندراج کیا۔ مڈٹرم یونیورسٹی کے امتحانات اور انٹرنل یونیورسٹی لینگویج ٹیسٹ کو جواب دہندگان نے آن لائن اسیسمنٹ کے انعقاد کے لیے ایک مناسب آپشن کے طور پر منتخب کیا تھا۔ دیگر خلاصہ یا حساس تشخیص اس عمل کو استعمال کرنے کے اہل نہیں تھے۔ چیلنجز اور حل کے طریقوں سے متعلق 640 کوڈز بھی نکالے گئے۔ اہم مشکلات ایگریکنو انفراسٹرکچر (124 کوڈز) میں مسائل تھے، اور آن لائن ٹیسٹنگ (84 کوڈز) کے نفاذ کو بہتر بنانا فیکلٹی ممبران کے خیالات میں بہترین ممکنہ حل سمجھا جاتا تھا۔

نتیجہ: نتائج سے ظاہر ہوا کہ فیکلٹی ممبران کا خیال ہے کہ موجودہ تکنیکی اور ثقافتی انفراسٹرکچر کے مطابق ہائی اسٹیک ٹیسٹ ذہن اور رسائی سے دور نہیں ہیں۔ پھر بھی، ایک مستحکم اور قابل اعتماد آن لائن امتحانات کا ماحول فراہم کرنے کے لیے مزید تلاش کرنے کی اشد ضرورت ہے۔

مطلوبہ الفاظ: اسیسمنٹس، ٹیک ہوم امتحانات؛ COVID-19؛ موضوعاتی تجزیہ؛ دوہرہ ذہنی طبی تعلیم

بررسی دیدگاه اعضای هیأت علمی در مورد اجرای ارزیابی های در منزل در آموزش پزشکی در طول شیوع کووید-19: یک مطالعه کیفی

زمینه و هدف: در ابتدای سال ٢٠٢٠، قرنطینه های عمومی بیماری کرونا ویروس ٢٠١٩، با انجام طیف گسترده ای از آزمون های از راه دور، جامعه دانشگاهی را به چالش کشید. هدف مطالعه ی حاضر پایش دیدگاه اعضای هیأت علمی در مورد چالش ها و راه حل های پیش روی این گذر ناگهانی و بررسی ارزیابی هایی در حوزه آموزش پزشکی است که می توانند به صورت آزمون از منزل انجام شوند.

روش: مطالعه ی حاضر یک مطالعه مقطعی و توصیفی است. داده ها را از طریق فرم مصاحبه آنلاین متشکل از سوالات بسته و باز که توسط اساتید دانشگاه های علوم پزشکی ایران تکمیل شده است، جمع آوری کردیم. داده ها با استفاده از آمار توصیفی، استنباطی و رویکرد تحلیل موضوعی با استفاده از نرم افزارهای SPSS25 و MAXQDA2020 مورد تجزیه و تحلیل قرار گرفت.

یافته ها: در مجموع 574 نفر از اساتید دانشگاه های علوم پزشکی در پایش شرکت کردند. بعد از تحلیل نتایج، آزمون های میان ترم و آزمون زبان درون دانشگاهی از طرف پاسخ دهندگان به عنوان گزینه ی مناسبی برای انجام ارزیابی های برخط، انتخاب شدند. دیگر ارزیابی های تکوینی یا حساس مانند آزمون پایان ترم، آزمون های جامع پزشکی و ارتقاء دستیاران، واجد شرایط استفاده از این روند نبودند. 640 کد مرتبط با چالش ها و رویکردهای حل مشکل استخراج شد. از دیدگاه اساتید، بیشترین چالش، مشکلات زیرساخت اجرایی (124 کد) بود و بهبود اجرای آزمون آنلاین (84 کد) بهترین راه حل قابل اجرا تلقی شد.

نتیجه گیری: اعضای هیأت علمی بر این باورند که برگزاری آزمون های سرنوشت ساز، با توجه به زیرساخت های فنی و فرهنگی موجود، دور از ذهن و دسترس نیست. اما نیازی اساسی در برداشتن گام هایی برای بررسی بیشتر ایجاد محیطی پایدار و قابل اعتماد برای آزمون های برخط، وجود دارد.

واژه های کلیدی: ارزیابی؛ آزمون از منزل؛ کووید-19؛ تحلیل موضوعی؛ تقلب کردن؛ آموزش پزشکی

INTRODUCTION

In early 2020 the sudden mutation to online assessments, with minimal time for curriculum change, placed unprecedented concerns on teaching staff worldwide. New assessment techniques resulted in unfamiliar situations for both staff and students since they had to adapt alternate learning and assessing methods such as Take-home exams. Take-home exams are the same as online exams, except those examinees can take the test at any location of their choice. With their computer that humans do not protect, teachers can extend the response to one day; they are, in fact, an extension of open-book tests. These exams are not new, and exploring different aspects and challenges of conducting this type of assessment attracted the researchers' attention, e.g., (1-3).

Infrastructure problems, coverage of learning outcomes, and commitment of students to submit assessments are the main challenges in online learning and assessing. The most significant disadvantage of unprotected online tests is permitting more facilities for cheating and academic integrity breaches, yet more challenging to detect (4-6). The authors of some articles (7,8) reported evidence of uplift in the number of hearings to address suspected academic integrity breaches during the crisis.

Choosing the proper methodology to prevent cheating in online and computer-based tests is very important due to different types of these dishonest behaviors (8,9). In this vein, educational developers rapidly prepared just-in-time online academic integrity resources, led professional conversations and consultations, and supported central decision-making while seeking to ground practice in established academic integrity evidence-based principles (10-12).

Some evidence shows that mitigating the infringement of academic dishonesty, online presentation, combining various assessment methods, such as report submission with online presentation, or preparing different questions, may be a good option (13, 14). One of the proposed solutions is continuous and online monitoring by online test monitoring systems (15,16). For example, ETS presents a home-based TOEFL test (17). This test is performed on an individual device and is monitored online by a human examiner using ProctorU software. During the exams, a caregiver monitors the candidate and their computer screen through a video camera to ensure that all test steps are performed. The whole test session and the image of the candidate are recorded. The candidate's appearance in the test session will be shared with the institutions as part of the TOEFL score report. Researchers also showed that building a culture of academic integrity is one of the best ways to discourage academic misconduct (18,19).

Authors (20) have developed an experimental method to examine the difference between students' performance in a traditional-classroom test and an online test without an examiner. Differences in student performance have been scanned from two aspects: environmental differences and differences in the opportunity for cheating.

In another study (21), two pilot experimental tests were

evaluated to examine the stockholder views on the difference between typing and handwriting tests. Possibility to choose between handwritten and typed exams, the existence of scheduling in the exam, teaching how to use and work with the software before the exam, holding a test exam, having a technical guide to answer and fix technical problems during the exam, and coordination between members academic and technical team were important points for students. On the other hand, choosing the right software, maintaining data security and confidentiality, providing the right place and equipment, training the support team, and coordinating between members were considered essential.

The outline of one study (22) stated that the issue of time has a crucial role in open booklet tests and will effectively affect the test results, so shortening the test time and possible coverage of the weakness of Internet platforms will deprive the person of the opportunity to cheat. In the study, 110 students were surveyed online for this type of assessment. Almost all of them stated that they would spend the same amount of time studying online and regular exams. But half said they needed more time to answer those questions. The article showed that the type of test and individual capabilities in the results of these tests were very effective.

The contract cheating means using a third party to take the test. This type of cheating can range from paying a company or a third party to complete assignments, a project, and writing a dissertation to take an exam instead of the main person. This study (23) focused on "contract cheating" and maintaining test security. Also, this paper considers the issue of identifying the candidate. The author stated that even the identity card and photo of the candidate alone may not be enough to verify their identity. Paper recommended Training teachers to determine the type of test questions, not using the same questions in multiple tests, the random selection of questions, fingerprint, and an iris scan to determine the identity to prevent contract cheating.

To minimize the subjectivity of grading amid crisis, another study (12) suggested redistributing students' grades towards more objective assessments, and oral examinations were considered. They urged the timer set for the whole exam and each question. They implemented several scenario-based questions focusing on higher-order critical thinking, following Bloom's taxonomy questions; each question was presented on a separate page with forced completion of these questions. Students were not allowed to return to the main facility's previously-submitted questions. For technical difficulties during submission, instructors prepared a backup version of the questions with the same problem index for those students who experienced it.

The main aim of the current paper was to explore the faculty members' opinion on conducting Take-home tests in medical education. In what follow, this study aimed to answer the following questions:

- Do the faculty members agree to hold Take-home assessments in medical science exams in the country?
- In which medical science exams do the faculty members agree to hold the exam from home?

What are the challenges in conducting online home exams from the faculty members' point of view?

- What are the suggested solutions to the mentioned challenges in conducting online exams at home from the faculty members' point of view?

METHODS

Participants and Procedure

This study was a descriptive and cross-section study. The present researchers conducted this study in March 2020, at the beginning of the COVID-19 outbreak in Iran. Participants were the faculty members of Iranian universities of medical sciences. The first aim was to survey the faculty members' point of view on the possible medical education tests conducted in an online format. By employing a needs assessment, seven candidates were chosen with the most feasibility of an online exam format. The candidates were internal-university examinations (Midterm, final, and English). Another choice was the Ministry of health language examination (MHLE), an Iranian national English test. Finally, comprehensive basic sciences and pre-internship exams that assess the students in two stages in the form of training and pervasive processes and resident promotion examinations were selected. Besides, since the faculty members have the most interaction with the students, the present researchers asked for the perception on problems and overcoming approach on conducting online tests.

Measures

An interview form was prepared. The structural questions consisted of both demographic variables of responders and questions related to exams of both close-ended and open-ended questions. The relevant surveys were sent to the sample target group and the questions were filtered out per requirement. Finally, the latest version of the form was distributed to the faculty members of medical universities in the online format to the responders through email and social networks.

Data Analysis

Data and information were analyzed using descriptive, inferential statistical and content analysis techniques. In the descriptive statistics section, the indicators of research variables in the statistical sample were analyzed. In the inferential statistics section, statistics were calculated by Spss25 using data collected from the sample group; then, by test and estimation techniques, the statistics were generalized to community parameters. The Chi-square test was used to investigate the significance level of the degree of agreement or disagreement on holding various exams. For analyzing the open-ended question, the approach of the present study used custom content analysis. The outline of this study was to explain the views of faculty members about holding online exams at home. Considering that in Iranian higher education, holding exams in this way has not existed or has been very little, there is no prior theory and literature in this field; it is natural for categories and titles to be branched from data. The attempt was to draw the dimensions and frameworks of the online exam from the faculty members' point of view in the Iranian universities of medical sciences.

Content analysis is one of the well-known methods in contents related to comments and communication messages, which the result will reveal a larger discourse (24). One of the divisions of content analysis methods is conventional content analysis. This analysis is generally used to design a study that explains a phenomenon. Its application is appropriate when the previous theory or literature on a phenomenon is limited. In this approach, researchers avoid preconceived categories and allow their categories and titles to derive from the data; thus, through induction, types emerge from data (25, 26).

To analyze the content of the answers presented in the introductory part of this study, the thematic analysis approach was employed (see, e.g., 27). All contents were read carefully and the hidden contents were attempted to be discovered in each answer. Then, using MAXQDA2020 software and open coding, a code was assigned to each of the themes, and in re-reading the answers, identifying different themes was a repetitive process. Themes that were synonymous or had similar meanings were placed next to each other, and finally, after patterning, each of them was established in more significant categories called class.

Ethical Considerations

All participants were informed about the details of the study. The participation in this study was anonymous and voluntary, and faculty members could withdraw from the study without any consequences. For data protection reasons, the online survey was open only for faculty members of Iranian medical science schools whose emails were confirmed by the Iranian National center of medical education. Only the researchers had access to the research data.

RESULTS

A total of 574 faculty members completed it. The first part of the interview form was about the respondents' characteristics, including gender and respondents' work experience. Findings related to the demographic characteristics of the respondents are described in Table 1. A review of Table 1 shows that most participants were men, and the frequency of respondents with less than five years of work experience was higher than the others.

Table 1. The demographic distribution of responders

| Index | Group | Frequency | Percentage |
|----------------------|---------|-----------|------------|
| Gender | Male | 344 | 60% |
| | Female | 174 | 30% |
| | Missing | 56 | 10% |
| Teaching experiences | <5 | 160 | 28% |
| | 5-10 | 104 | 18% |
| | 10-15 | 74 | 13% |
| | 15-20 | 65 | 11% |
| | 20-25 | 75 | 13% |
| | >25 | 96 | 17% |
| | Total | 574 | 100% |

The Inferential analysis of close-ended questions

The assumption that faculty members are opposed to holding online exams was the null hypothesis (H0), and the alternative hypothesis was their agreement (H1). Considering that the chi-square test is two-sided and the research hypothesis is one-sided, the condition for confirming the H1 hypothesis, in addition to having a significance level less than 0.05, was the higher frequency (percentage) of those who agreed to hold the online test than those who disagreed. The results are reported in Table 2. Most responders agreed with the online tests for the Midterm University and internal university language tests, and the amount was the same. As a result, from the point of view of the responders, it can be said that it is better to hold midterm university exams and in-university language exams online.

For the final exams of the university, MHLE, basic medical science assessment, pre-internship, and resident promotion examination, faculty members did not want these exams to be online.

The Qualitative Review and Analysis of open-ended questions
After several reviews, the overlap between categories was minimized, and 640 codes were summarized in the Tables 3 and 4, and Figure 1.

- **Problems in the executive infrastructure:** Due to this type of evaluation, these infrastructures are in two dimensions of technical and cultural infrastructures; however, it was critical from faculty members' perspective. The most crucial concern in the technical field was the speed and interruption of the Internet, especially considering the

| Table 2. The descriptive analysis of agreement on holding online | | | | |
|--|------------|------------------------------|----------|--------------------|
| Assessment type | | Conducting online assessment | | Test result |
| | | Agree | Disagree | |
| Midterm (Internal-university) | Frequency | 418 | 156 | $\chi^2 = 119.589$ |
| | Percentage | 72.8 | 27.2 | $P < 0.001$ |
| Final (Internal-university) | Frequency | 221 | 352 | $\chi^2 = 29.949$ |
| | Percentage | 38.5 | 61.3 | $P < 0.001$ |
| Internal-university English test | Frequency | 436 | 136 | $\chi^2 = 157.343$ |
| | Percentage | 76 | 23.7 | $P < 0.001$ |
| MHLE | Frequency | 262 | 310 | $\chi^2 = 4.028$ |
| | Percentage | 45.6 | 54 | $P = 0.045 < 0.05$ |
| Basic medical science | Frequency | 196 | 376 | $\chi^2 = 56.643$ |
| | Percentage | 34.1 | 65.5 | $P < 0.001$ |
| Pre-Internship | Frequency | 193 | 379 | $\chi^2 = 60.483$ |
| | Percentage | 33.6 | 66 | $P < 0.001$ |
| Resident Promotion | Frequency | 150 | 423 | $\chi^2 = 130.068$ |
| | Percentage | 26.1 | 73.7 | $P < 0.001$ |

| Table 3. Thematic analysis of Take-home exam challenges | | |
|---|-------------------|--|
| Extracted Categories | Frequency of code | Sub Categories |
| Problems in the executive infrastructure | 124 | Internet speed (51.61%); Internet outage (32.26%); Student's untrue claims on executive problems (9.68%) Lack of cultural infrastructure (4.03%); Lack of Training in online assessment (1.61%); The need for an emergency leave of the test site by the candidate (0.81%). |
| Unreliability of results | 119 | The prevalence of fraud in online assessment (40.34%); Authentication problems (23.7%); Access to resources (11.76%); Lack of technical ability to provide general security of assessment (10.08%); Use of forbidden electronics devices (9.24%); Problem in network Security (55.88%). |
| Threats to construct validity | 80 | Lack of fairness in evaluation (32.5%); Inaccurate evaluation of the candidate (21.25%); Anxiety of candidate (12.5%); Inadequate of environment (11.25%); Software problems (6.25%) |
| Problems in hardware facilities | 28 | Lack of candidate's hardware facilities (67.86%); General online test infrastructure problems (17.86%); Lack of academic hardware service provider (14.29%); |
| Total codes: | 351 | |

| Table 4. Content analysis results on possible solutions | | |
|--|-------------------|--|
| Extracted Categories | Frequency of code | Sub Categories |
| Improving the implementation of online testing | 84 | Pilot run (25%); Training of professors and students (11.9%); Reduce assessment time (9.52%); Time limitation for questions (9.52%); Improving accuracy of authentication (8.33%); Use the lesson from international experiences (7.14%); Designing online assessment cellphone Apps (5.95%); Do not taking tests in Internet rush hour (4.76%); Oral assessment (3.57%); Programmatic formative assessments (3.57%); Upgrading student hardware infrastructure (3.57%); Use locator and GPS app (2.38%); Proper design of test scheduling (2.38%); Increase the exam cut scores (1.19%); Using Online Observer (1.19%). |
| Canceling the online tests and holding face to face test | 77 | Postponement of the test (33.77%); Decentralized examination (19.48%); Taking test by social distancing (19.48%); Taking in computer-based format (11.69%); Outdoor holding (7.79%); Hold several tests with a smaller population) 5.19%; Reduce face-to-face test time (2.6%). |
| Change in the structure of test and questions | 54 | Increase the assessing level of knowledge (34.04%); Randomizing question (18.52%); Variety format of questions (20.37%); Display one question per page (18.52%); Increase the number of questions (3.7%); Analytical questions (1.852%). |
| Upgrading the Internet | 45 | Upgrading the national Internet platform (40%); Private Internet lines for online testing (33.33 %); Upgrading universities Internet platform (26.67%). |
| Increase the formative assessments rate | 15 | Formative assessment (66.67%); weighting the exam grades (26.67); Reforming admission type (6.67%); |
| Improving the method of test monitoring | 14 | ProctorU software (71.43%); Monitoring through other security promotion agencies (21.43%); Voice recording (7.14%) |
| Total codes: | 289 | |

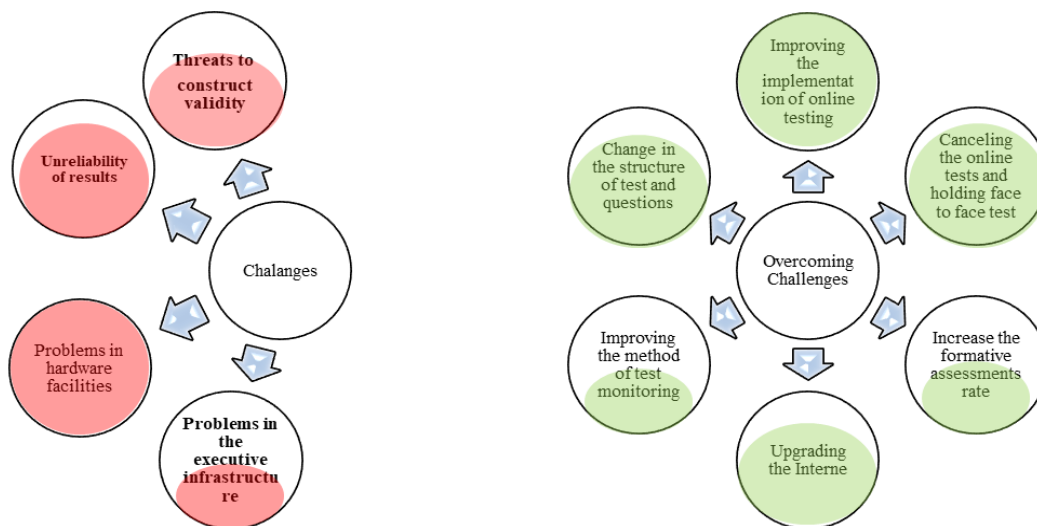


Figure 1. Conceptual model of challenges and overcoming; the higher the frequency of the extracted codes, the more colored the corresponding circles

current structure of the national Internet network in Iran, which would pose a severe challenge to the test. The concerns about the feedback of the candidates were because of a lack of familiarity with this field. This problem would be more pronounced for the candidates who have not had experience in virtual learning so far.

- **Unreliability of results:** Another main concern in-home exams and any exam that has limitations in supervision is cheating; this cheating can have different types that from the viewpoints of faculty members, some were categorized, and many of the comments used the word “cheating”; This shows the concern of the statistical community selected in

the cheating. Access to booklets and books, group cheating, contract cheating, and the use of other electronic devices during the test were among the essential categories read in the comments and codes.

- **Threats to construct validity:** Environmental effects and test conditions will be critical factors in the reliability of the test, which may have the slightest impairment on how the instructor tests the candidate. Not all candidates have access to helpful hardware infrastructure. The poor conditions of the candidates' home, not being familiar with this type of test, the presence of several examinees in one house, lack of concentration, and environmental anxiety seriously threaten

the test's validity. It may not be a good guide for the education system in understanding whether or not to achieve the main goals of the education curriculum and the level of competencies enumerated.

- **Problems in hardware facilities:** Hardware facilities provided by examiners and candidates were among the other issues found in the opinions of professors; these problems also existed in the destination, i.e., the examinees' home made the process difficult from both implementation and security aspects.

Approaches: Overcoming Challenges

- **Improving the online testing implementation:** Faculty members express implementing the pilot test as the essential strategy of faculty members. This experience will highlight the potential problems and help policymakers provide solutions. The next issue will be training the software users, providing the relevant techniques, and preparing them to perform Take-home exams. Shortening the time and increasing the number of tests, not holding the test during peak hours to prevent bandwidth disruption, using a locator, and online test monitoring were among the other things extracted from the answers given.

- **Canceling the online tests and holding face to face test:** The second solution received from reading the poll was to disagree with holding the online exam, which is mostly the executive solution related to the time of writing this article, i.e., the conflict of the international community with the coronavirus pandemic. The reason for presenting these cases in this section is the reverse use of opinions, examining the main concerns and reasons for opposition and using it as a solution. These include decentralization, multiple tests holding and reducing test time.

- **Change in the structure of tests and questions:** Providing conceptual questions that measure the high level of learning so that even with access to resources, students cannot answer the questions, and a variety of questions can be designed, especially in the medical sciences. Descriptive questions and short intervals in which the examinees did not even have the opportunity for cheating and communicating with another person or group were among the codes extracted in this regard.

- **Upgrading the Internet:** Another anticipated thing extracted from the received codes was upgrading the national and university Internet platform, making the Internet available especially for candidates with less financial power and using the support servers.

- **Increase the formative assessments rate:** Making weighted questions, i.e., similar to what is done in the GRE test, applying the group's opinions, especially on the disciplines that deal with the clinical sciences in any way, applying academic records, and using interviews, especially in entrance exams.

Improving the method of test monitoring: Test monitoring via webcam or audio recording, which has been included in the solutions presented in the articles in the research background section, was among the discussed topics.

DISCUSSION

The pandemic has inevitably renovated the traditional methods of assessment. The present researchers elaborated

the faculty members' perspectives on the advantages and disadvantages of taking-home exams in competitive and non-competitive assessments in the higher health education system. After analyzing the obtained data, they found that with the current infrastructure in Iran, there is a high level of dissatisfaction with the quality of online educational services. They only agreed to hold midterm exams and internal-university language tests with this type of assessment. Other sensitive assessments such as end-of-semester and comprehensive medical exams are not currently a good candidate for this type of test.

Thematic analysis of faculty members' opinions is an indicator and a general example in conducting distance exams without spatial limitations. The faculty members' responses were inductively analyzed to two open-ended questions. The frequency of codes showed they believe that problems in the executive infrastructure and unreliability of results are the most challenging problem, so modifying the execution of online testing can be a suitable approach. The extracted challenges and opportunities were discussed in detail and it was found out that despite the novelty of the phenomenon, the extracted codes and categories agreed with exciting studies (1, 22, 28-33).

What can be inferred from the information obtained from the current survey results was that holding Take-home is not far from expectation. In this vein, both the educational systems and the national technology should collaborate to improve the pedagogical, cultural, and technical infrastructure (34-36). Because of problems that may stand in hardware shortages, such as students' computers or poor home conditions, it is necessary to extend this test to spatial limitations and the use of smartphones. Calibrated item bank for these tests to determine the levels of learning in students, the design of questions with the ability to recognize the cognitive taxonomy levels, and verification questions are the items required to take into account by test takers (36-41). Also, developing protocols to clarify and educate learners will considerably reduce the scope of the protests. It seems that the Covid-19 pandemic, in addition to its disadvantages, can effectively facilitate decision-making and take the first steps in the application of new technologies in the field of measurement and evaluation. In 2019 researchers of one study (1) conducted a systematic research on Take-home exams and their effectiveness on high levels of learning. They suggested that its implementation is not suitable at low levels of knowledge; because candidates will be able to easily search for questions on the Internet. On the other hand, this method will encourage examinees to study at higher levels of learning and turn assessment into a learning process.

The present researchers also pointed out that holding Take-home exams in Iran's educational system is almost unknown. Although this method is not suitable for explaining a complete theory that defines an entire phenomenon; however, according to the purpose of this study, which sought to explore the perspective of the study community, it seems appropriate. Determining challenges finding solutions, and achieving a framework, requires phenomenology of codes and categories, and further researches on this issue are necessary. Despite the challenging background, the rapid transformations

compelled by coronaviruses could eventually be a jumping-off point for even more flexible and accessible learning and testing platforms in the future. More precisely, this challenging crisis time can allow reflection and adaptation.

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.

ACKNOWLEDGEMENT

The present researchers would like to thank the anonymous reviewers for their valuable attention in this manuscript.

Financial Support: The research was carried out in the National Center for Medical Education Assessment and did not have financial support.

Conflicts of Interest: The authors declare that there are no conflicts of interest.

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