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RESEARCH ARTICLE

Faculty Members' Perspectives on E-learning Use during COVID-19 among Teaching Faculty at KSAU-HS, Jeddah, Saudi Arabia

Jihan Turkistani^{1,4*}, Sajida Agha^{2,4}, Muhammad Anwar Khan^{3,4}

¹Department of Dental Services, King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Jeddah, Kingdom of Saudi Arabia;

²Department of Medical Education, College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Ministry of National Guard Health Affairs, Riyadh, Kingdom of Saudi Arabia;

³Department of Medical Education, College of Medicine, King Saud Bin Abdulaziz University for Health Sciences, Ministry of National Guard Health Affairs, Jeddah, Kingdom of Saudi Arabia;

⁴King Abdullah International Medical Research Center, Riyadh, Saudi Arabia.

*dr_jihant@hotmail.com

ABSTRACT

Introduction/Objectives: The COVID-19 pandemic's significant effects could alter education in the future. There was an unexpected but necessary transition to online education. This study aimed to examine faculty members' perspectives regarding e-learning during the COVID-19 pandemic, as well as their level of preparedness for e-learning, considering the epidemic's complete lockdown.

Methods: The study utilized a survey research (cross-sectional) design. The sample size was calculated to be a minimum of 106 faculty members. A validated electronic questionnaire was communicated to faculty members of four colleges at KSAU-HS, Jeddah. Its primary components addressed e-learning preparation, e-learning experience before and after the COVID-19 pandemic, and demographic data.

Results: A total of 112 faculty members, with a response rate of 25%, completed the survey. Females made up 50.9% of the sample, and about 30% were between 36-40 years of age with different academic rankings and teaching experiences. Faculty members revealed that more than half of them were novices with no prior experience in e-learning before the epidemic. Nonetheless, faculty members' perspectives of e-learning were favorable, and they significantly improved after COVID-19 (91.9%) compared to before COVID-19 (45.9%). Most participants were enthusiastic (82.3%) about and confident in using e-learning in teaching and learning. Yet, e-learning was only partially used as a substitute for hands-on skill training and assessment. Regarding the impact of the transition to online education during the pandemic, 87.5% of the participants in the survey expressed increased confidence in the efficacy of online learning and teaching. Additionally, the teaching/learning preference of the participants showed that (61.6%) preferred combining online with traditional face-to-face instruction, (35.7%) preferred traditional face-to-face instruction, and only 3 (2.7%) preferred online instruction alone.

Conclusion: This study delivers informative viewpoints on the importance of e-learning and the teaching staff's willingness and competence with it. It calls for improving our institution's e-learning readiness and participation by addressing several individual and infrastructure issues. This is an excellent chance to remove obstacles in e-learning and teaching in medical and healthcare colleges.

Keywords: E-learning, Online Teaching, Virtual, COVID-19.

Introduction

Health professionals have challenging and stressful jobs as educators, requiring them to use all of their mental, emotional, and physical resources. Their job duties, which include overseeing student instruction, projects, clinical practice, and work evaluation, make them more prone to burnout¹⁻⁴. According to Maslach and Jackson⁵, burnout is characterized by emotional exhaustion, depersonalization, and a loss of personal accomplishment. Individuals who work in human services such as education, social work, police, and emergency services are more likely to develop this condition. However, since the World Health Organization (WHO) proclaimed COVID-19 a pandemic in March 2020, it has negatively impacted education and teaching, the global economy, and social life⁶. Accordingly, many Health Professions Educators (HPEs) are concerned about the burden placed on them during this unprecedented crisis. The likelihood of stress and burnout among educators increases with the length of the pandemic. As a result, in an environment of constant uncertainty, HPEs and their students must modify their educational programs in response to quickly evolving circumstances. It is noteworthy to mention that transitioning to an online learning environment may result in feelings of loneliness and challenges in drawing clear boundaries between personal and professional domains⁷. It might be possible to expand communities of practice to include support personnel and create innovative approaches for staff development.

⁷ The mental health of medical professionals who are directly impacted by the current problem must also be considered⁸.

Seemingly, HPEs seek to keep their educational approach as straightforward as possible while bringing new ideas to the surface, transforming their face-to-face assessments and teaching methods into virtual formats, or frequently providing face-to-face instruction to smaller groups⁷. Moreover, health professional educators (HPEs) are utilizing diverse information and communication technology (ICT) techniques to guarantee the continuation of medical education despite the ongoing epidemic. For instance, social media and online collaboration tools are preferred by educators and students over university websites because they are more user-friendly and entertaining and facilitate group conversations on acute care topics⁸. Conversely, HPEs faced the unanticipated challenges of exclusively teaching online. They faced numerous issues, including frustration, fear, uncertainty, challenges in time management and maintaining students' interest, increased cheating on exams/quizzes, and difficulties in maintaining a healthy work-life balance^{6,11-16}.

Given the findings of earlier studies and an inadequate number of local studies on the challenges in integrating e-learning for faculty members, it is critical to evaluate the pandemic's effects on HPEs in order to apply the lessons learned to other pandemics. This study seeks to describe the level of preparedness for e-learning and the manners in which faculty members at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS)—Jeddah may need to adapt to online learning settings in light of the potential for additional COVID-19 waves. Hence, the objectives of the study were:

- To assess the e-learning preparation among faculty members of KSAU-HS, Jeddah, during the COVID-19 pandemic.

- To investigate challenges towards their adaptations to online teaching arrangements during the COVID-19 pandemic.
- To describe the characteristics of burnout among academic faculty teaching remotely during the COVID-19 pandemic.

Methodology

Ethical approval for this study was obtained from the Institutional Review Board (IRB) of the King Abdullah International Medical Research Center (KAIMRC), National Guard Health Affairs, Riyadh, Saudi Arabia, No. IRBC/2272/21 ([Appendix I](#)).

• STUDY AREA/SETTING

The study was held at KSAU-HS, targeting faculty members of four colleges, namely: College of Science and Health Professions (COSHP), College of Medicine (COM), College of Applied Medical Sciences (CAMS), and College of Nursing (CON) – Jeddah.

• STUDY SUBJECTS

As described below, the study involved the faculty members teaching at KSAU-HS, Jeddah.

Inclusion criteria:

- Professors, Associate Professor, Assistant Professor.
- Lecturer, Teaching Assistant

Exclusion criteria:

- Laboratory Custodian, Laboratory Technician
- Administrative Assistant
- Respondents who still need to complete the two parts of the questionnaire (n=18).

• STUDY DESIGN

- A survey research (cross-sectional) study design was utilized to achieve the aim of the study.

• SAMPLE SIZE

The sample size was calculated using the ClinCalc sample size calculator from <https://clincalc.com/stats/samplesize.aspx>

The required minimum sample size was determined to be 106 faculty members.

• SAMPLING TECHNIQUE

Because only faculty members who responded to the study survey and were involved in teaching during the pandemic were included, a non-probability convenient sampling technique was used.

• DATA COLLECTION INSTRUMENT

An online English survey collected the required data between September and November 2021. The survey comprised an introductory paragraph informing participants about the study's aim. Informed consent was embedded in the survey's web link, so faculty members were consenting to participate by completing the questionnaire. The survey was divided into the following sections:

- Demographic data: age group, gender, college name, education level, academic position, and years of experience group. The individual teacher characteristics were the independent variables.

- Challenges of online teaching questionnaire:

A validated structured closed-ended questionnaire adapted from other studies^{12,13} was used. Participants' experiences before and during the COVID-19 pandemic were explored in the closed-ended questions. Also, there were questions designed to measure faculties' preparedness and acceptance for using online teaching on a five-point Likert scale with a range of answer options that go from strongly agree to strongly disagree.

An introductory e-mail was sent to members of the target population using the institutional e-mail system that requested their participation by accessing the survey's web link. A serial number was given to each faculty. All data collected were password-protected in a workplace PC within National Guard Health Affairs premises until five years after publication. The research team will only access data.

• DATA MANAGEMENT AND ANALYSIS PLAN

Data entry was done on an Excel sheet, and errors were cleaned up before the statistical analysis was done with the statistical program SPSS version 20.0. Descriptive statistical analyses were carried out by calculating the frequencies and percentages for categorical variables such as gender, academic position, and education level. In contrast, numerical data (for example, questionnaire score) were presented as mean ± standard deviation.

Some inferential statistics were done to describe variations among different groups. The study's significance level (α) was 0.05 for all the statistical tests.

Results

A total of 112 faculty members, with a response rate of 25%, completed the survey. Females made up 50.9% of the sample. Age and experience with teaching were distributed across several categories (Table 1). Faculty with a Ph.D. education level comprised most respondents (62.5%), whereas 37.5% had either a master's or bachelor's degree. More than two-thirds of the faculty in the sample (67.9%) were Assistant Professors, while more than one-half of the respondents (53.6%) were from the College of Medicine.

Table 1: Demographic characteristics of respondents

| Demographic characteristics | | n=112 | % |
|-----------------------------|--|-------|------|
| Gender | Male | 55 | 49.1 |
| | Female | 57 | 50.9 |
| Age Group | ≤35 | 21 | 18.8 |
| | 36-40 | 34 | 30.4 |
| | 41-45 | 22 | 19.6 |
| | 46-50 | 20 | 17.9 |
| | ≥51 | 15 | 13.4 |
| Years of teaching | 1-5 | 46 | 41.1 |
| | 6-10 | 37 | 33.0 |
| | 11-15 | 14 | 12.5 |
| | ≥16 | 15 | 13.4 |
| College Name | College of Medicine | 60 | 53.6 |
| | College of Science & Professional Health | 30 | 26.8 |

| Demographic characteristics | | n=112 | % |
|-----------------------------|-------------------------------------|-------|------|
| | College of Applied Medical Sciences | 13 | 11.6 |
| | College of Nursing | 9 | 8.0 |
| Education Level | Bachelor | 8 | 7.1 |
| | Masters' | 34 | 30.4 |
| | PhD | 70 | 62.5 |
| Academic Position | Teaching Assistant / Lecturer | 30 | 26.7 |
| | Assistant Professor | 76 | 67.9 |
| | Associate Professor | 6 | 5.4 |

1. THE E-LEARNING EXPERIENCE AMONG FACULTY MEMBERS DURING THE COVID-19 CRISIS.

This questionnaire section provided details about the faculty members' experience using e-learning/teaching before and after COVID-19. The participants were asked whether they had used e-learning to deliver lectures or sessions before face-to-face teaching was suspended because of the COVID-19

pandemic. Faculty members revealed that more than half (58%) were novices without prior experience before the pandemic. Only 7 (6.3%) had advanced online teaching expertise, while 40 (35.7 %) were intermediate (Table 2).

Table 2: Teaching/learning experiences before and after the COVID-19 pandemic

| | n=112 | % |
|---|-------|------|
| How would you describe your online teaching/learning experience before the Coronavirus Pandemic? | | |
| Beginner (little or no experience) | 65 | 58.0 |
| Intermediate | 40 | 35.7 |
| Advanced | 7 | 6.3 |
| What is your preference | | |
| Face to face teaching/learning only | 40 | 35.7 |
| Blended teaching/learning | 69 | 61.6 |
| Online teaching/learning only | 3 | 2.7 |
| Do you give live or recorded lectures/sessions | | |
| Live lectures/sessions | 67 | 59.8 |
| Both | 45 | 40.2 |

According to statistical analysis utilizing the Fisher exact test, males and females had no statistically significant difference ($P = 0.087$). Age group ($P = 0.666$), teaching experience

categories ($P = 0.068$), academic position ($P=0.291$), and education level ($P = 0.890$) all showed a similar pattern (Table 3).

Table 3: Online teaching/learning experience before the Coronavirus Pandemic

| Demographics | Beginner | | Intermediate | | Advanced | | p |
|----------------------------------|----------|------|--------------|-------|----------|------|--------------|
| | n=65 | 58% | n=40 | 35.7% | n=7 | 6.3% | |
| Gender | | | | | | | 0.087 |
| Male | 28 | 50.9 | 21 | 38.2 | 6 | 10.9 | |
| Female | 37 | 64.9 | 19 | 33.3 | 1 | 1.8 | |
| Age Group | | | | | | | 0.666 |
| ≤35 | 14 | 66.7 | 7 | 33.3 | 0 | 0.0 | |
| 36-40 | 19 | 55.9 | 13 | 38.2 | 2 | 5.9 | |
| 41-45 | 9 | 40.9 | 10 | 45.5 | 3 | 13.6 | |
| 46-50 | 14 | 70.0 | 5 | 25.0 | 1 | 5.0 | |
| ≥51 | 9 | 60.0 | 5 | 33.3 | 1 | 6.7 | |
| Teaching Experience Group | | | | | | | 0.068 |
| 1-5 | 32 | 69.6 | 14 | 30.4 | 0 | 0.0 | |
| 6-10 | 17 | 45.9 | 17 | 45.9 | 3 | 8.1 | |
| 11-15 | 7 | 50.0 | 5 | 35.7 | 2 | 14.3 | |
| ≥16 | 9 | 60.0 | 4 | 26.7 | 1 | 13.3 | |
| Educational Level | | | | | | | 0.890 |
| Bachelor | 6 | 75.0 | 2 | 25.0 | 0 | 0.0 | |
| Masters' | 21 | 61.8 | 11 | 32.4 | 2 | 5.9 | |
| PhD | 38 | 54.3 | 27 | 38.6 | 5 | 7.1 | |
| Academic Position | | | | | | | 0.291 |
| TA/Lecturer | 21 | 70.0 | 8 | 26.7 | 1 | 3.3 | |
| Asst Professor | 40 | 52.6 | 31 | 40.8 | 1 | 6.6 | |
| Asso Professor | 4 | 66.7 | 1 | 16.7 | 1 | 16.7 | |

Fisher exact test * $P < 0.05$

TA: Teaching Assistant, Asst: Assistant, Asso: Associate

Additionally, they were asked about their teaching/learning preference. The responses showed that 69 (61.6%) preferred combining online with traditional face-to-face instruction, 40 (35.7%) preferred traditional face-to-face instruction, and only 3 (2.7%) preferred online

instruction alone (Table 2). According to statistical analysis utilizing the Fisher exact test, males preferred face-to-face teaching/learning (49.1%), while females preferred blended teaching/ learning (71.9%). This difference was statistically significant ($P =$

0.004), although the age group ($P = 0.390$), and education level ($P = 0.560$) were not teaching experience categories ($P = 0.744$), (Table 4).

Table 4: Teaching/Learning preference

| | Face to face only | | Blended teaching/learning | | Online only | | p |
|---|-------------------|-------|---------------------------|-------|-------------|------|---------------|
| | n=40 | % | n=69 | % | n=3 | % | |
| Gender | | | | | | | 0.004* |
| Male | 27 | 49.1% | 28 | 50.9% | 0 | 0.0% | |
| Female | 13 | 22.8% | 41 | 71.9% | 3 | 5.3% | |
| Age Group | | | | | | | 0.390 |
| =<30 | 2 | 40.0% | 3 | 60.0% | 0 | 0.0% | |
| 31-35 | 3 | 18.8% | 12 | 75.0% | 1 | 6.3% | |
| 36-40 | 15 | 44.1% | 18 | 52.9% | 1 | 2.9% | |
| 41-45 | 5 | 22.7% | 17 | 77.3% | 0 | 0.0% | |
| 46-50 | 7 | 35.0% | 12 | 60.0% | 1 | 5.0% | |
| =>51 | 8 | 53.3% | 7 | 46.7% | 0 | 0.0% | |
| How long have you been teaching? | | | | | | | 0.744 |
| 1-5 | 17 | 37.0% | 26 | 56.5% | 3 | 6.5% | |
| 6-10 | 12 | 32.4% | 25 | 67.6% | 0 | 0.0% | |
| 11-15 | 5 | 35.7% | 9 | 64.3% | 0 | 0.0% | |
| 16-20 | 3 | 60.0% | 2 | 40.0% | 0 | 0.0% | |
| >20 | 3 | 30.0% | 7 | 70.0% | 0 | 0.0% | |
| Educational Level | | | | | | | 0.560 |
| Bachelor | 4 | 50.0% | 4 | 50.0% | 0 | 0.0% | |
| Masters' | 10 | 29.4% | 24 | 70.6% | 0 | 0.0% | |
| PhD | 26 | 37.1% | 41 | 58.6% | 3 | 4.3% | |

Fisher exact test * $P < 0.05$

The participants were again asked how they used e-learning after all face-to-face meetings were banned. The results showed that about 60% of faculty members utilized live lectures, while 40% used a combination of live and recorded lectures/sessions (Table 2). According to statistical analysis using the Chi-square test, there was no statistically significant difference in the use of live versus

recorded lectures/sessions by gender ($P = 0.419$) or age group ($P = 0.478$). In addition, the Fisher exact test revealed a similar pattern in terms of teaching experience categories ($P = 0.918$) and educational level ($P = 0.277$). (Table 5).

Table 5: Utilization of live or recorded lectures/sessions

| | Live lectures/sessions | | Both | | p |
|---|------------------------|-------|------|-------|----------------|
| | n=67 | % | n=45 | % | |
| Gender | | | | | 0.419* |
| Male | 35 | 63.6% | 20 | 36.4% | |
| Female | 32 | 56.1% | 25 | 43.9% | |
| Age Group | | | | | 0.478* |
| =<30 | 4 | 80.0% | 1 | 20.0% | |
| 31-35 | 12 | 75.0% | 4 | 25.0% | |
| 36-40 | 21 | 61.8% | 13 | 38.2% | |
| 41-45 | 10 | 45.5% | 12 | 54.5% | |
| 46-50 | 11 | 55.0% | 9 | 45.0% | |
| =>51 | 9 | 60.0% | 6 | 40.0% | |
| How long have you been teaching? | | | | | 0.918** |
| 1-5 | 28 | 60.9% | 18 | 39.1% | |
| 6-10 | 23 | 62.2% | 14 | 37.8% | |
| 11-15 | 8 | 57.1% | 6 | 42.9% | |
| 16-20 | 2 | 40.0% | 3 | 60.0% | |
| >20 | 6 | 60.0% | 4 | 40.0% | |
| Educational Level | | | | | 0.277** |
| Bachelor | 5 | 62.5% | 3 | 37.5% | |
| Masters' | 24 | 70.6% | 10 | 29.4% | |
| PhD | 38 | 54.3% | 32 | 45.7% | |

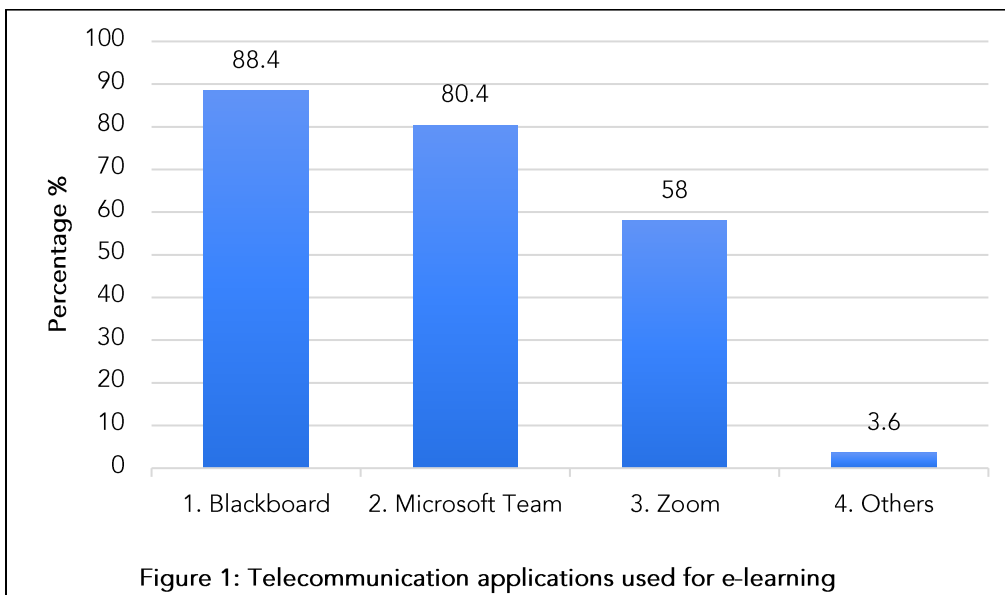
*Chi-square test

**Fisher exact test $P < 0.05$

2. TYPES OF TELECOMMUNICATION APPLICATIONS USED FOR E-LEARNING:

To deliver live and self-paced online lectures, several telecommunication applications were used for e-learning: Blackboard (Blackboard Inc., Washington, USA), Zoom (Zoom Inc., San Jose, California, USA), Microsoft Team (Microsoft Corp., Redmond, Washington,

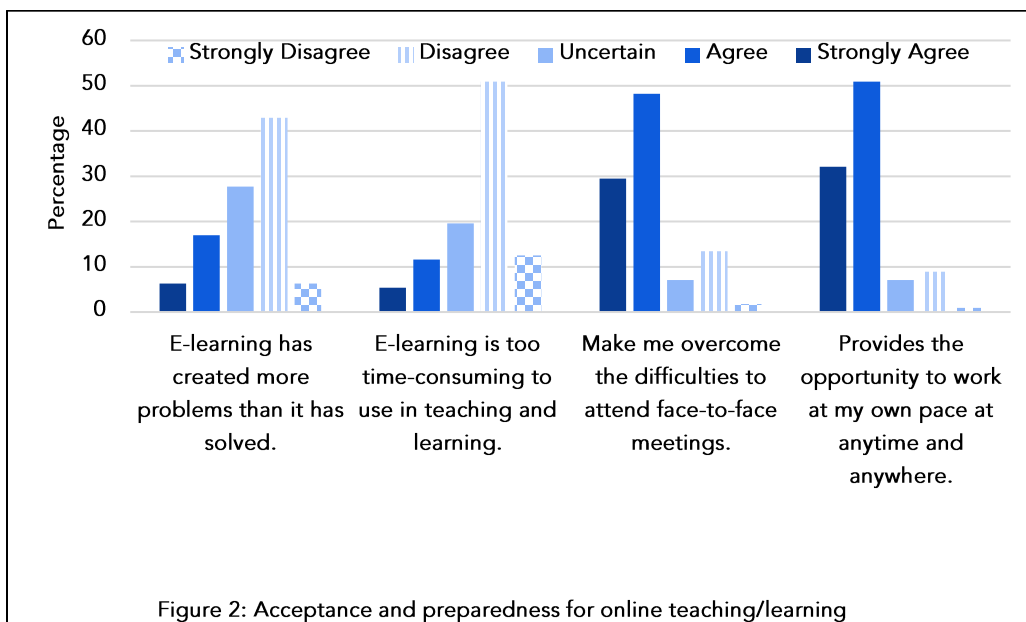
USA), and others. Figure 1 shows the percentage distribution of applications used for e-learning/teaching.



3. ADAPTATION TO ONLINE TEACHING ARRANGEMENTS DURING THE COVID-19 CRISIS.

Most respondents strongly agreed (32.1%) or agreed (50.9%) that e-learning/teaching gives them the opportunity to work at their own pace at any time and anywhere. In line with this, more than two-thirds of the respondents strongly agreed (29.5%) or agreed (48.2%) that e-learning helped them avoid the difficulties of attending formal sessions and physical face-to-face meetings. More than half

of the faculty members strongly disagreed (12.5%) or disagreed (50.9%) that e-learning/teaching is too time-consuming to use in teaching and learning. The remaining respondents were either uncertain (19.6%) or agreed (11.6%). When faculties were asked if e-learning has created more problems (e.g., plagiarism, security issues, and technical issues) than solved, 49.2% strongly disagreed and disagreed, 23.3% strongly agreed and agreed, and 27.7% were uncertain (Figure 2).



4. IMPACT OF A SUDDEN SHIFT TO ONLINE EDUCATION DURING THE PANDEMIC:

Regarding the impact of the transition to online education during the pandemic, 87.5% of the participants in the survey expressed increased confidence in the efficacy of online learning and teaching. According to the

Fisher exact test, this confidence was statistically significant among females compared to males ($P = 0.038$) but not among age groups ($P = 0.237$), teaching experience groups ($P = 0.720$), or educational levels ($P = 0.843$) (Table 6).

Table 6: The impact of the sudden shift to online education during the Pandemic.

| | It delays the adoption of online education by producing doubt about its efficacy | | It advances the adoption of online education by increasing confidence in its efficacy | | p |
|--------------------------|--|------|---|-------|---------------|
| | n=12 | % | n=98 | 87.5% | |
| Gender | | | | | 0.049* |
| Male | 9 | 17.0 | 44 | 83.0 | |
| Female | 3 | 5.3 | 54 | 94.7 | |
| Age Group | | | | | 0.440 |
| ≤35 | 2 | 9.5 | 19 | 90.5 | |
| 36-40 | 2 | 5.9 | 32 | 94.1 | |
| 41-45 | 5 | 22.7 | 17 | 77.3 | |
| 46-50 | 2 | 11.1 | 16 | 88.9 | |
| ≥51 | 1 | 6.7 | 14 | 93.3 | |
| Years of teaching | | | | | 0.495 |
| 1-5 | 5 | 10.9 | 41 | 89.1 | |
| 6-10 | 5 | 14.3 | 30 | 85.7 | |
| 11-15 | 2 | 14.3 | 12 | 85.7 | |
| ≥16 | 0 | 0.0 | 15 | 100.0 | |
| Educational Level | | | | | 0.843 |
| Bachelor | 0 | 0.0 | 8 | 100.0 | |
| Masters' | 4 | 11.8 | 30 | 88.2 | |
| PhD | 8 | 11.8 | 60 | 88.2 | |

| | It delays the adoption of online education by producing doubt about its efficacy | | It advances the adoption of online education by increasing confidence in its efficacy | | p |
|--------------------------|--|------|---|-------|--------------|
| | n=12 | % | n=98 | 87.5% | |
| Academic Position | | | | | 0.750 |
| TA/Lectures | 2 | 6.7 | 28 | 93.3 | |
| Asst Professor | 10 | 13.5 | 64 | 86.5 | |
| Asso Professor | 0 | 0.0 | 6 | 100.0 | |

Fisher exact test *P < 0.05

TA: Teaching Assistant, Asst: Assistant, Asso: Associate

Similarly, over 90% of respondents said they planned to apply online skills learned during the COVID-19 pandemic to their teaching/learning practices at the end of the pandemic. This result was statistically significant among females (P = 0.048) and

faculty between 36 and 40 (P = 0.046). Using the Fisher exact test, no statistical difference was discovered between the teaching experience group (P = 0.937) and educational level (P = 0.473). (Table 7).

Table 7: Adapting online experience into teaching/learning strategies

| | Disagree | | No opinion | | Agree | | p |
|---|----------|-------|------------|-------|-------|-------|---------------|
| | n=8 | % | n=3 | % | n=101 | % | |
| Gender | | | | | | | 0.048* |
| Male | 7 | 12.7% | 1 | 1.8% | 47 | 85.5% | |
| Female | 1 | 1.8% | 2 | 3.5% | 54 | 94.7% | |
| Age Group | | | | | | | 0.046* |
| =<30 | 0 | 0.0% | 1 | 20.0% | 4 | 80.0% | |
| 31-35 | 2 | 12.5% | 1 | 6.3% | 13 | 81.3% | |
| 36-40 | 1 | 2.9% | 0 | 0.0% | 33 | 97.1% | |
| 41-45 | 0 | 0.0% | 1 | 4.5% | 21 | 95.5% | |
| 46-50 | 4 | 20.0% | 0 | 0.0% | 16 | 80.0% | |
| =>51 | 1 | 6.7% | 0 | 0.0% | 14 | 93.3% | |
| How long have you been teaching? | | | | | | | 0.937 |
| 1-5 | 4 | 8.7% | 2 | 4.3% | 40 | 87.0% | |
| 6-10 | 4 | 10.8% | 1 | 2.7% | 32 | 86.5% | |

| | Disagree | | No opinion | | Agree | | p |
|--------------------------|----------|-------|------------|------|-------|--------|--------------|
| | n=8 | % | n=3 | % | n=101 | % | |
| 11-15 | 0 | 0.0% | 0 | 0.0% | 14 | 100.0% | |
| 16-20 | 0 | 0.0% | 0 | 0.0% | 5 | 100.0% | |
| >20 | 0 | 0.0% | 0 | 0.0% | 10 | 100.0% | |
| Educational Level | | | | | | | 0.473 |
| Bachelor | 0 | 0.0% | 0 | 0.0% | 8 | 100.0% | |
| Masters' | 1 | 2.9% | 2 | 5.9% | 31 | 91.2% | |
| PhD | 7 | 10.0% | 1 | 1.4% | 62 | 88.6% | |

5. CHALLENGES OF A SUDDEN SHIFT TO ONLINE EDUCATION DURING THE PANDEMIC:

Table 8, describes the reported challenges to online education during the pandemic. These challenges included issues regarding student engagement (69.6%), use of technology tools (69.4%), inadequate expertise in online

teaching/learning (59.8%), student assessment (39.3%), students' evaluations of faculty (33.9%), pandemic-related anxiety and stress (28.6%), lack of institutional support (27.7%). Learning curve (23.2%), time management (16.1%), and technophobia (16.1%).

Table 8: Challenges to online education during the pandemic at KSAU-HS.

| | n=112 | % |
|--|-------|------|
| 1. Inadequate expertise in online teaching/learning. | 67 | 59.8 |
| 2. Lack of institutional support. | 31 | 27.7 |
| 3. Communication, e.g., student engagement, in-person contact with faculty and classmates. | 78 | 69.6 |
| 4. Technology, e.g., network connections, browser compatibility, etc. | 77 | 69.4 |
| 5. The learning curve for the less technically savvy. | 26 | 23.2 |
| 6. Technophobia. | 18 | 16.1 |
| 7. Time management, e.g., time to prepare. | 18 | 16.1 |
| 8. Continuous assessment, grades, and exam-taking/administration. | 44 | 39.3 |

| | n=112 | % |
|---|-------|------|
| 9. Mental health, i.e., pandemic-related anxiety or stress. | 32 | 28.6 |
| 10. Students' evaluations of faculty. | 38 | 33.9 |
| 11. Others | 2 | 1.8 |

6. THE CHARACTERISTICS OF BURNOUT AT WORK AMONG ACADEMIC FACULTY WHO WERE TEACHING REMOTELY DURING THE COVID-19 PANDEMIC.

The last section of the questionnaire provided details about burnout characteristics among academic faculty teaching remotely during the COVID-19 pandemic (Table 9). At least a few times per month, several faculty members in this study feel entirely exhausted at the end of the working day (M = 3.27, SD = 1.85) and emotionally drained by the experience (M = 2.78, SD = 1.82). Similarly, some faculty members also report that they are more frequently – at least a few times per month-

putting too much effort into their work (M = 3.36, SD = 1.99). Nevertheless, faculty members more frequently feel excited by working with students (M = 2.06, SD = 2.27). Likewise, they deal with emotional problems calmly (M = 4.29, SD = 1.65) and see themselves as influential in helping students solve problems (M = 4.51, SD = 1.61). Therefore, the faculty members perceived that students were blaming them for their problems only a few times during the academic year (M = 0.67, SD = 1.13), and their concern that their teaching role was hardening their emotions was less frequent (M = 1.20, SD = 1.56).

Table 9: Mean scores of respondents on the characteristics of burnout at work.

| Item Description | Mean | SD |
|--|------|------|
| [I feel used up at the end of the workday.] | 3.27 | 1.85 |
| [I feel emotionally drained from my work.] | 2.78 | 1.82 |
| [I feel I'm working too hard on my job.] | 3.36 | 1.99 |
| [I feel exhilarated after working closely with my students.] | 2.06 | 2.27 |
| [In my work, I deal with emotional problems very calmly.] | 4.29 | 1.65 |
| [I deal very effectively with the problems of my students.] | 4.51 | 1.61 |
| [I feel students blame me for their problems.] | 0.67 | 1.13 |
| [I worry that this job is hardening me emotionally.] | 1.20 | 1.56 |

Discussion

Education for the medical and health professions has changed significantly in the last few years. Nonetheless, the most dramatic change happened during the COVID-19 pandemic lockdown when e-learning delivery became necessary¹⁷. Unexpectedly, all HPEs felt driven to accept e-learning as the only learning and assessment method. Since little is known about HPEs' perceptions and competencies regarding e-learning readiness, this research aims to assess the e-learning preparation among faculty members of KSAU-HS-Jeddah during the COVID-19 crisis and their challenges towards online teaching arrangements.

The current research offers insightful information into how faculty members adapted to e-learning and teaching before and after COVID-19. More than half of the respondents had yet to gain prior experience before the pandemic. Comparable results were also found in the Alanazi et al. study, which found that 18.2% of respondents utilized e-learning infrequently and 35.9% never used it¹². During the pandemic, several trends and challenges were observed in online education, such as conducting clinical exams and training practical sessions. Many researchers have suggested blended learning as a successful teaching strategy^{3,11,18-20}. In our research, faculty members were asked about their preference for teaching and learning modes during the pandemic. Despite the challenges, 61.6% of faculty members preferred a blended teaching approach, combining online and traditional face-to-face instruction. Females showed a stronger preference for integrating online and face-to-

face instruction. The choice of blended learning underscores the importance of flexibility and pedagogical innovation. A balanced approach that leverages technology while maintaining the essence of traditional teaching will be crucial as we move forward.

Next, faculty members have quickly transitioned to e-learning, allowing faculties to navigate and utilize several telecommunication applications for teaching live and recorded lectures. The majority of them used Blackboard, Zoom, and Microsoft Teams. About 60% of faculty members utilized live lectures, while 40% used a combination of live and recorded lectures/sessions. Most respondents said they could work whenever and wherever they wanted to with e-learning and teaching. As a result, e-learning allowed them to avoid the difficulties involved in attending formal sessions and face-to-face meetings. According to June & Leong²¹, when technology empowers education, everyone can learn anything, anywhere, anytime. This creates a world of information literacy. While more than fifty percent of the participants thought that using e-learning for teaching and learning does not need much time, Aveiro-Róbaló²² underlined the necessity of continuously modifying teaching methods to stay up to date with developments in the medical and health sciences fields.

Based on the findings of Ahmed et al.¹¹ conditions created by the COVID-19 pandemic proved the effectiveness of online learning and have shown teaching faculty the new dimensions of doing their work. Regarding the impact of the transition to online education during the pandemic, 87.5% of the participants in the survey expressed

increased confidence in the efficacy of online learning and teaching. Similarly, Other studies showed that educators had positive experiences with e-learning and enjoyed engaging with new tools¹¹. Others acknowledged the promotion of self-discipline and responsibility as additional benefits of online learning during the pandemic¹³. Yet, this confidence in online teaching was statistically significant among females compared to males but not among other independent variables. This may result from poor computer literacy skills or resistance to change by some faculty members.

Specific patterns and challenges have emerged in the context of online teaching during the pandemic, such as student engagement, teaching practical sessions, conducting clinical exams, and pandemic-related anxiety and stress. A systematic review of the literature on how students engaged in online learning during the COVID-19 epidemic focused on the behavioral, cognitive, and affective dimensions of the phenomenon and identified its key features. The results have the following implications: (a) to ensure adequate professional training, (b) to enhance Internet connectivity, (c) to ensure high-quality online education, and (d) to offer emotional support. The results of this study will offer significant guidance to educational authorities and policymakers, enabling them to use effective methods to facilitate online learning in higher education institutions²⁵. Likewise, many studies have suggested using blended learning as an effective learning experience^{11,12,18-20}. Hence, the respondents of this study showed that 69 (61.6%) preferred combining online with traditional face-to-face instruction, and they even suggested a post-pandemic blended strategy. In addition, a

comprehensive systematic review to understand the extent to which teacher's psychological well-being has been affected by this global health crisis showed a higher prevalence of stress (62.6%) among teachers²⁶.

The current study highlights a significant level of burnout among faculty members working in KSAU-HS during the pandemic. Based on what has been discussed earlier about the burden placed on faculty members due to the unprecedented shift to online teaching during the COVID-19 pandemic, our study examined the characteristics of burnout at work among faculty members who were teaching remotely during the COVID-19 pandemic. The findings revealed that although the respondents felt excited by working with students, they put too much effort into their work. Hence, faculty members felt exhausted and emotionally drained at the end of the working day. Fortunately, faculty members' stated levels of emotional exhaustion had little effect on their attitudes toward their students since they dealt with emotional problems calmly and saw themselves as influential in helping students solve problems. Similar findings were obtained from a study in Pakistan²⁷. Data extracted from a systematic review of the literature and meta-analysis on teachers' psychological well-being identified the associated factors of these psychological well-being domains. Numerous institutional and sociodemographic factors, such as gender, the nature of online education, job satisfaction, teaching experience, and workload volume, were linked to these psychological issues. Additionally, several protective factors reduced teachers' negative psychologic issues, such as frequent exercise and the availability of technical support for online learning²⁶.

Limitations

Nonetheless, we must acknowledge the limitations of the current study in order to suggest future research approaches. One of our study's limitations is its low generalizability. The findings cannot be extrapolated to other health profession institutes because it is a cross-sectional study at one educational institute. Likewise, the analyses done are associational, and no causal relationships can be predicted based on these findings. It is important to undertake follow-up studies with larger samples in a wider number of medical schools. Moreover, the faculty members who took part were self-selected, and it is possible that those who did not participate would have responded differently. In-depth interviews and qualitative studies are required to understand the burnout problem better. Although there are certain limitations, however, information obtained from the study can be utilized to help faculty members become more engaged in their work.

Recommendations

The findings of this study offer stakeholders useful insights into how faculty members interact with e-learning:

- The rapid shift to e-learning during the pandemic necessitated professional development for faculty members.
- Institutions should continue supporting educators in enhancing their online teaching skills to acquire new technology, develop their abilities, and apply and evaluate practices.

Blended approaches that capitalize on the strengths of both face-to-face and online

instruction can optimize student learning experiences.

Conclusion

Most of the faculty feedback supported online teaching during the pandemic. This study delivers informative viewpoints on the importance of e-learning and the teaching staff's willingness and competence with it. It calls for improving our institution's e-learning readiness and participation by addressing a few apparent individual and infrastructure issues. This is an excellent chance to remove obstacles that stand in the way of e-learning and teaching in medical and healthcare colleges.

Conflict of Interest:

None.

Funding:

None.

Acknowledgements:

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Appendices

Appendix I: Approval from KAIMRC



Kingdom of Saudi Arabia
Ministry of National Guard - Health Affairs

المملكة العربية السعودية
وزارة الحرس الوطني - الشؤون الصحية

IRB NCBE Registration No.:
H-01-R-005

**King Abdullah International Medical Research Center
(KAIMRC)**

(84) 94466 1515 94466 irb@ngha.med.sa

IRB Office Memo Ref.No. **IRBC/2272/21** E-CTS Ref. No. **RYD-21-419812-159634**

Study Number: **SP21R/434/10**
Study Title: **The job demands in predicting emotional exhaustion and stress during COVID-19 among teaching faculty at KSAU-HS-Jeddah, Saudi Arabia**

Study Sponsor: **Non Grant**
IRB Approval Date: **01 November 2021**
IRB Review Type: **Expedited Review** **Full Board**
Study site(s): **Central Region**

Dear **Dr. Sajida Agha**
Associate professor, Department of Medical Education, College of Medicine, KSAU-HS
Ministry of National Guard – Health Affairs

Sub- Investigator/s: Dr. Jihan M. Turkistani, Dr. Mohammed Anwar Khan and Dr. Tarig Mohamed

After reviewing your submitted research proposal/protocol and related documents, the **IRB has APPROVED** the submission. The approval includes the following related documents:

| Document/Title | Version | Date |
|-------------------|---------|------------------|
| Research Proposal | 01 | 01 November 2021 |
| Data Collection | 01 | 01 November 2021 |
| Inform Consent | 01 | 01 November 2021 |

The approval of the research study is valid for **one year** from the above approval to expiration date.

Terms of Approval:

- Annual Reports:** An Annual report must be submitted for approval to avoid termination/suspension of your research.
- Financial report:** If your study is funded project, details financial report should be submitted with the scientific report.
- Final Report:** After completion of the study, a final report must be forwarded to the IRB.
- Retention of original data:** The PI is responsible for the storage and retention of original data pertaining to the project for a minimum of five years.
- Reporting of adverse events or unanticipated problems:** The PI is responsible to report any serious or unexpected adverse events or unanticipated problems, which could involve any risk to participants or others, or any event or incidents that may have impact on the research or participants.
- Biological samples:** No biological samples to be shipped out of the Kingdom of Saudi Arabia without prior IRB approval.
- Participant incentives:** No financial compensation or gifts to be given to participants without prior IRB approval.
- Storage of biological samples:** All biological samples collected for the purpose of this research must be stored in the KAIMRC related repository.
- This IRB approved research study must not contradict with any Saudi law including but not limited to the Saudi Law of Ethics of Research on Living Creatures and its Implementing Regulations.
- You will need to resubmit the proposal to the IRB for review and re-approval before implementing any changes to the approved proposal.
- It is possible that the IRB may decide that the proposed new changes may exclude the proposal from being accepted for exempt review.
- It is your responsibility to safely store the data collected.
- Please note that phone based surveys are not permitted.
- If your approved proposal requires access to Bestcare, please write to the IRB informing them of the name of the designated data collector and exactly define the period requested for collecting data. Do not start the data collection until an approval memo is issued from the IRB giving permission to that collector to start accessing Bestcare for the duration of the project and after signing a confidentiality agreement.
- To submit a copy of your manuscript to the IRB.

Prof. Hamdan Al Jahdali
A/Chairman, Institutional Review Board (IRB)
Ministry of National Guard - Health Affairs
HJ/AJ


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Appendix II: Informed consent for

Informed Consent page 2

**National Guard Health Affairs
King Abdullah International Medical Research Center**
التعاون الصحي بالحرس الوطني
مركز الملك عبدالله العلمي للأبحاث الطبية



Cross-sectional surveys

| | |
|---|--|
| <p>possibility, the risks to your physical, emotional, social, professional, or financial well-being are considered to be 'less than minimal'.</p> <p>If you have any questions about the research, please contact (Dr. Jihan Turkistani) (Email: dr_jihant@hotmail.com). (Mobile: 0559454400).</p> <p>In case you have enquiries related to your rights as a research subject you can contact the Institutional Review Board on Tel. 8011111 Ext. (84) 94457.</p> | <p>إذا كان لديك أي أسئلة حول هذا البحث، يرجى الاتصال بـ: جهان تركستاني (البريد الإلكتروني: dr_jihant@hotmail.com) (الجوال: ٠٥٥٩٤٥٤٤٠٠)</p> <p>في حال كان لديك الاستفسارات المتعلقة حقوقك كموضوع بحث يمكنك الاتصال بمجلس المراجعة التأسيسية على هاتف: 8011111 تحويلة 94457 (84).</p> |
|---|--|

Agree to participate

Disagree to participate

موافق على المشاركة

غير موافق على المشاركة



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Version No. (Please change according to your study) Version date: (please change as appropriate) Page 2 of 2

KAIMRC-RO/ ICF SURVEYS BILINGUAL VERSION: 01
Date: 15/05/2013 CROSS-SECTIONAL SURVEYS

Informed Consent Page 1

**National Guard Health Affairs
King Abdullah International Medical Research Center**
التعاون الصحي بالحرس الوطني
مركز الملك عبدالله العلمي للأبحاث الطبية

Cross-sectional surveys

Informed Consent Form

Study Title: The job demands in predicting emotional exhaustion and stress during COVID-19 among teaching faculty at KSAU-HS-Jeddah, Saudi Arabia

Principal Investigator: Dr. Sajida Agha **Study No.:** **SP21R/434/10**

| | |
|--|--|
| <p>You are requested to participate in research that will be supervised by (Dr. Sajida Agha) in (King Saud bin Abdulaziz University for Health Sciences).</p> <p>This study is about (This study aims to describe the association of job-related demands, such as emotional exhaustion and stress, that may affect the faculty members of College of Science and Health Professions and College of Medicine, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) - Jeddah during the COVID-19 crisis and their adaptations to online teaching arrangements. This description is vital to examine the pandemic's psychological consequences on HPEs, so that the knowledge acquired may be applied in future pandemics).</p> <p>Your participation is voluntary, and you have the right not to accept filling this survey without giving any reason and this will not affect your current or future medical care in MNGHA</p> <p>You don't have to sign this information sheet only you can choose to agree/disagree; your acceptance to complete the survey will be interpreted as your informed consent to participate.</p> <p>Your responses will be kept anonymous. However, whenever one works with email/the internet there is always the risk of compromising privacy, confidentiality, and/or anonymity. Despite this</p> | <p>انت مدعو للإضطلاع طوعاً لدراسة بحثية سوف يشرف عليها (د. ساجدة أغا) في (جامعة الملك سعود بن عبدالعزيز للعلوم الصحية بجدة).</p> <p>هذه الدراسة تهدف إلى (تهدف هذه الدراسة إلى وصف ارتباط المتطلبات الوظيفية، مثل الإجهاد العاطفي والتوتر، التي قد تؤثر على أعضاء هيئة التدريس بكافة العلوم والمهن الصحية وكلية الطب، جامعة الملك سعود بن عبدالعزيز للعلوم الصحية - جدة خلال أزمة COVID-19 وتكيفها مع ترتيبات التدريس عبر الإنترنت. هذا الوصف حيوي لفحص العواقب النفسية للوباء على أعضاء هيئة التدريس، بحيث يمكن تطبيق المعرفة المكتسبة في الأونة المستقبلية).</p> <p>إن مشاركتك في هذه الدراسة طوعية و لك الحق التام في عدم قبول تعبئة الاستمارة أو الإضطلاع في أي وقت تشاء بدون إبداء الأسباب، وإن يؤثر ذلك على العناية الطبية المقدمة لك حالياً أو في المستقبل في الشؤون الصحية بوزارة الحرس الوطني.</p> <p>لا يجب عليك التوقيع على ورقة المعلومات هذه، فقط عليك الاختيار موافق/غير موافق فمجرد قبولك تعبئة هذا الاستبيان يعتبر بمثابة إقرارك بالموافقة على المشاركة في هذا البحث.</p> <p>ستبقى الردود على الأسئلة سرية. ومع ذلك، فإن العمل عن طريق البريد الإلكتروني والإنترنت يبقى هناك احتمال لاختراق خصوصية البيانات وسريه المعلومات ولكن وبالرغم من هذه الاحتمالية تبقى الاخطار البدنية والعاطفية والاجتماعية والمهنية والمالية المترتبة عليك ضمن الحد الأدنى من الخطورة.</p> |
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