frontiers | Frontiers in Education

Teaching faculty perceptions, attitudes, challenges, and satisfaction of online teaching during COVID-19 pandemic in Saudi Arabia: A national survey

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Background: The COVID-19 pandemic and associated preventative measures introduced a shock to the teaching paradigm in Saudi Arabia and the world. While many studies have documented the challenges and perceptions of students during the COVID-19 pandemic, less attention has been given to higher education staff. The aim of the present investigation is to evaluate the staff's perception and experiences of online teaching during the COVID-19 pandemic.

Materials and methods: A validated survey was conducted between December 2021 and June 2022 in Saudi Arabian Universities to assess the status of online teaching during the COVID-19 pandemic among faculty members. The collected responses were exploratively and statistically analyzed.

Results: A total of 1117 response was received. About 66% of the respondents were male and 90% of them hold postgraduate degree. Although rarely or occasionally teach online pre-COVID-19, only 33% of the respondents

think the transition was difficult and 55% of them support the move. Most respondents received adequate training (68%) and tools (80%) and 88% of the respondents mentioned that they did not accrue additional workload in online study design. While the perception of online teaching was mostly positive (62%) with high satisfaction (71%). However, 25% of the respondents reported that a poor internet bandwidth was an obstacle and 20% was unable to track students' engagement. Respondents with more years of experience, previous training, support, or perceived online transition as easy were also more likely to be satisfied with the process. Also, older respondents, those who support the transition and those with previous training were less likely to report barriers (all $p < 0.001$).

Conclusion: The perception and experience of transition to online teaching during the COVID-19 pandemic in Saudi Arabia were positive. Low internet bandwidth and inability to track students' limited effective online teaching. Work experience, previous training, and positive perception are the main factors that influence staff online teaching satisfaction.

Introduction

The COVID-19 pandemic remains one of the major public health emergencies in the last century resulting in over 500 million confirmed infections and over six million deaths globally (Pokhrel and Chhetri, 2021; World Health Organization [WHO], 2021). The pressure on healthcare systems around the world due to the rapid spread resulted in various measures and a hurried search for effective vaccines and therapies (Nuevo-Chow, 2021). To reduce the spread and corresponding healthcare pressure, governments around the world implemented various measures including national lockdown and social restrictions resulting in the closure of various industries and institutions with resulting economic and welfare issues (Nuevo-Chow, 2021; Pokhrel and Chhetri, 2021). One sector especially affected is educational institutions which faced an unprecedented challenge of sustaining learning while ensuring the safety of students and staff members, thus moving to an online mode of teaching delivery (Adedoyin and Soykan, 2020; Nuevo-Chow, 2021). Indeed, around 1.6 billion educators and learners around the world were affected and had to adapt quickly to a different modes of teaching and learning, respectively (Adedoyin and Soykan, 2020; Pokhrel and Chhetri, 2021).

The Education in Emergency (EiE) initiative was introduced by the united nations children fund (UNICEF) to ensure global access to safe and quality education during the global lockdown by aiding mostly developing countries in transition to accommodate the disruption of traditional learning paradigm (Pokhrel and Chhetri, 2021). In incredible fits of innovation, various platforms and corridors were developed to accommodate disruptions and provide uninterrupted access to training modules and material (Lepp et al., 2021; Pokhrel and Chhetri, 2021). However, learners were especially faced with various challenges which are well documented in the literature (Al-Nofaie, 2020; Hassounah et al., 2020; Khalil et al., 2020). One aspect that escaped scrutiny is the challenges faced by teachers and staff members supporting teaching with little to no comprehensive study documenting the various challenges faced during the lockdown when they had to adapt rapidly to moving teachings online.

Transitioning to online teaching mode exposed teachers to different including poor access to the required technology, internet connections, and increased workload from redesigning training modules suited for online delivery. In essence, most staff members were conceivably unprepared and untrained for the swift shift in delivery mode (Lepp et al., 2021). Further, the inability to effectively track students' engagement in an online learning environment (Aldhafeeri and Alotaibi, 2022), or deliver modules that are experimentally based are major challenges that have been reported (Cuschieri and Calleja Agius, 2020). A study by Rapanta et al. (2020), involving teachers from Switzerland, Australia, Spain, and Canada, reported challenges to include increased workload and inadequate technology. Hassan et al. (2020) findings corroborated this by reporting that around 50% of teachers reported transitioning to online teaching as "very difficult" due also to poor internet bandwidth and inadequate equipment. Similar challenges have been reported in Saudi Arabia and seem to be global (Alqurshi, 2020; Aldakheel, 2021).

Indeed, reports of positive aspects of online teaching are available. For instance, various studies have reported that online learning allowed prior, repeated, and unlimited access to educational materials and recorded lessons, improving satisfaction and outcomes (Agormedah et al., 2020; İilmaz Ince et al., 2020). Indeed, post lockdown, many institutions continue to employ some of the innovative and positive techniques used during the lockdown where suitable. Thus, while the transition to online teaching could not be avoided, improving on the positive aspects, and mitigating the negative perception is a balance that may help in future pandemics.

The COVID-19 pandemic introduced various challenges to physical teaching due to measures implemented to curtail the spread of the SARS-CoV-2 including movement and gathering restrictions and national lockdowns around the world. Indeed, to keep the educational sector running educational institutions around the world had to restrict teachings to remote/online only. Thus, while the use of online teaching in higher education is not new, it was the first time that all teachings were delivered fully online. This resulted in various limitations which is well documented especially in low- and middle-income countries where preparations were not especially adequate for managing the magnitude of the task. For instance, studies have aptly described challenges faced by faculty members in delivering teaching during the COVID-19 pandemic restrictions in China (Tsegay et al., 2022), India (Hassan et al., 2020), Indonesia (Hermanto and Srimulyani, 2021), Pakistan (Akram et al., 2021; Aslam et al., 2021), and among English as Foreign Language learners in Saudi Arabia (Mahyoob, 2020) to mention but a few. These challenges affected all subjects of teaching and cut across all levels of learning including primary and secondary schools (Parveen et al., 2022) and is mainly exemplified by inadequate technical training or equipment exacerbated by poor internet bandwidth (Noor et al., 2020; Gurung, 2021). These challenges have been well studied and comprehensively discussed in literature (Parveen et al., 2022; Tang, 2022).

Although the challenges of online teaching due to the COVID-19 lockdown in the kingdom of Saudi Arabia (KSA) is well documented for students (Al-Nofaie, 2020; Hassounah et al., 2020; Khalil et al., 2020), the challenges faced by teachers and staff members that support the rapid movement of all teaching online has not received due attention especially in the KSA. Thus, we present here the perception, expectations, and challenges of higher education institution teachers and staff that support moving teaching online during the COVID-19 lockdown. The aim is to provide a platform for improved experience in future pandemics and stimulate discussion around the topic in Saudi Arabia and around the world.

Materials and methods

Study design

Between December 5th, 2021, and June 5th, 2022, a cross-sectional survey was performed online using (Survey Monkey) platform.

Questionnaire tool

The survey is composed of four sections including demographics data, experience and perceptions of online teaching before COVID-19, current practices and tools, expectations, satisfaction, and barriers to online teaching during COVID-19. A panel of experts in the fields of education collaborated to develop the framework, define, and verify it based on the available data from the literature. Survey content and face validity were conducted by the panel of experts and have been piloted with 15 faculty experts who have expertise in teaching in higher education before its first dissemination.

There were four parts to the two-page survey, each with a set of multiple-choice questions. Part one collected demographic data from respondents, such as regions, gender, age, academic qualification, specialty, years of teaching experience, size of the student cohort, and type of institution. Part two included three questions concerning experience and perceptions regarding online teaching before COVID-19 pandemic. Part three consisted of 13 questions regarding current practices and tools of online teaching during COVID-19. The last part asked three questions about the faculty's expectations, satisfaction, and barriers to online teaching during COVID-19. Using the Cronbach's alpha reliability coefficient, we observed that the instrument's internal consistency was 0.84.

Study population and sampling strategy

A convenience sampling technique was used to recruit the study participants from different specialties. The major areas of specialization: Professions and applied sciences, Formal sciences, Humanities and social sciences, and natural sciences from major universities and colleges in Saudi Arabia were included. Professional networks and different social media platforms (Twitter, LinkedIn, WhatsApp) were used to distribute and promote the survey to reach a larger number of educators and faculty members.

TABLE 1 Demographic data and characteristics of the respondents (n = 1,117).

Variable	N (%)
Gender	
Male	739 (66%)
Region	
Central region	249 (22%)
Western region	243 (22%)
Eastern region	211 (19%)
Southern region	220 (20%)
Northern region	194 (17%)
Age groups	
20–30	88 (7.9%)
31–40	363 (32.5%)
41–50	388 (34.7%)
51–60	219 (19.6%)
> 60	59 (5.3%)
Size of the student cohort	
1–20	68 (6%)
21–40	291 (26%)
41–60	342 (31%)
61–80	238 (21%)
81–100	61 (5.5%)
> 100	117 (10.5%)
Type of institution	
Government	1088 (97%)
Private	29 (3%)
Academic qualification	
Diploma	9 (1%)
Bachelors	102 (9%)
Masters	473 (42%)
Ph.D.	533 (48%)
Area of specialization	
Professions and applied sciences	337 (30%)
Formal sciences	290 (26%)
Humanities and social sciences	237 (21%)
Natural sciences	194 (17.5%)
Other	59 (5.5%)
Years of teaching experience	
0–2	61 (6%)
3–5	169 (15%)
6–10	361 (32%)
> 10	526 (47%)

Data are presented as frequencies (n) and percentages (%).

Power calculation for the sample size

Based on the latest statistical summary of teaching staff by ministry of education in KSA (General Authority for Statistics, 2022), there was a total of 76,599 university teaching staff in the KSA. Thus, with a confidence interval of 95%, a margin

TABLE 2 Experience and perceptions regarding online teaching before COVID-19.

Variable	N (%)
How often did you use online/remote teaching before COVID-19?	
Frequently used	294 (26%)
Occasionally used	332 (30%)
Rarely used	360 (32%)
Never used	131 (12%)
What is your overall perception of moving teaching online?	
Very easy	126 (11%)
Easy	287 (26%)
Neutral	359 (32%)
Somewhat difficult	313 (28%)
Very difficult	32 (3%)
How willing were you to support moving teaching online?	
Strongly support	190 (17%)
Somewhat support	419 (37.5%)
Neutral	310 (27.5%)
Somewhat opposed	145 (13%)
Strongly opposed	53 (5%)

Data are presented as frequencies (n) and percentages (%).

of error of 3%, and assuming a response rate of 50%, the minimum sample size will be 1,053, which would allow a national representative sample.

Ethical approval

This research was approved by Institutional Review Board from Prince Sultan Military College of Health Sciences, reference number (IRB-2022-RC-004).

Statistical analysis

The Statistical Package for Social Sciences was used to gather and analyze data (SPSS software, Version 28). The categorical variables were provided in percentages and frequencies. The Chi-square test was employed to determine if there was a statistically significant difference between categorical variables. We did logistic regression to determine the predictors for satisfaction and barriers to online teaching during COVID-19. If the $p < 0.05$, statistical significance was considered.

Results

Demographic characteristics

A total of 1,117 participants were recruited. The male represents 66% of the total sample. Almost 35% of the

FIGURE 1
Use of online teaching before COVID-19 stratified by age **(A)** and the willingness of moving teaching online stratified by age **(B)**.
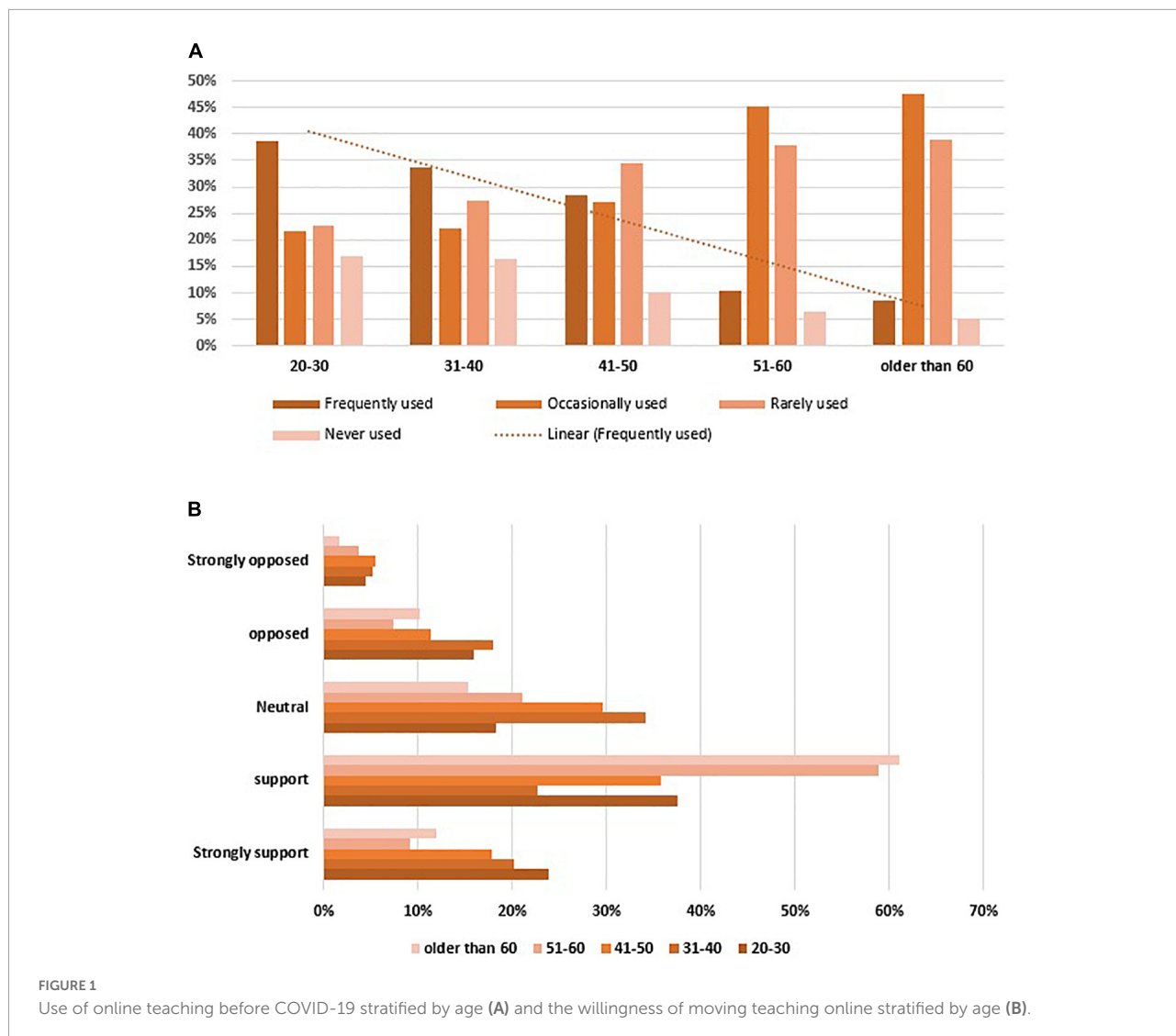
participants were between the ages of 41–50. A total of 533 (48%) and 473 (42%) hold a doctorate and master's degree, respectively, and mostly specialized in applied and formal sciences. Almost 47% of the respondents have 10 or more years of working experience. Overall, only about 11% of respondents teach classes of over 100 students and most respondents teach in government/public educational institutions. Table 1 presents the demographic and characteristics of the participants.

Practice and perceptions regarding online teaching before COVID-19

Before COVID-19, approximately (360) 32% of the participants rarely used online platforms for teaching, with only 294 (26%) frequent users. Regarding the overall perception of moving to teach online, most of the respondents 413

(37%) perceived this transition as an easy process, while 345 (32%) found it difficult to move to online teaching. A total of 609 (54%) supported the move to online teaching with only 198 (18%) of the respondents opposed to the process. Table 2 presents the experience and perceptions of the participants regarding the online teaching before COVID-19 pandemic.

Factors that influenced experience and perception of online teaching

As expected prior experience of online teaching and age groups showed a statistically significant difference (p-value < 0.001) whereby younger teachers used online platforms for teaching more frequently before COVID-19. However, there was a significant difference in the overall perception of moving

teaching online between age groups, where older staff supported moving teachings online more strongly than younger staff (*p*-value < 0.001). **Figure 1A** illustrate the use of online teaching before COVID-19 among the age groups, while **Figure 1B** illustrate the use of online teaching before COVID-19 stratified by the age and the willingness of moving teaching online.

Current practices and tools of online teaching during COVID-19

About 80% of respondents indicated that they were provided relevant tools for online teaching with 20% indicating otherwise. A total of 67.5% of staff members stated that they received adequate training for online teaching; online courses represents 43% of the training mode. The Blackboard was the most popular online teaching platform. This was reported by 52% of the respondents while it was used in combination with Zoom by 34.5% of respondents.

A total of 61% of the respondents spent less the 2 h on average preparing for a single online session, while only 8% of the respondents spent more than 4 h preparing. Further, 47% of respondents spent the same time needed for a face-to-face class, with teaching materials more likely distributed within a week of online classes on 71% of occasions. **Table 3** presents the current practices and tools of online teaching during COVID-19.

A combination of assignments, quizzes, and examinations was frequently used as an evaluation method for the online teaching classes by 469 (42%) respondents. The most-reported evaluation instrument for an online class was Blackboard (77%), and Google forms (17.5%).

A total of 52.5% of the respondents deliver teaching that involve practical skills. To maintain continuum during the lockdown, 69% of the respondents distributed practical teaching materials by post while 31% of the respondents requiring students to collect them from campus. Evaluation for practical skills was mainly performed *via* live and recorded presentation on 35% of the occasions.

Expectations, satisfaction, and barriers of online teaching during COVID-19

The expectations of moving to online teaching due to COVID-19 lockdown was generally positive among 62% of the respondents while 30% of them were uncertain whether moving online will be effective. Indeed, 71% of respondents were satisfied with the process for transitioning to online teaching. Regarding the limitations, 25% of the respondents cited poor internet strength (bandwidth) as the main barrier to effective online teaching during COVID-19 lockdown followed by the inability to track students' engagement on 20% of the occasions. Childcare and family responsibilities was also reported as a

main barrier with 9% of respondents. **Table 4** presents the expectations, satisfaction, and barriers of online teaching during COVID-19.

Predictors for satisfaction and barriers for online teaching during COVID-19

Logistic regression was used to analyze the relationship between satisfaction and age, experience, perception, and training. Age, experience, and training were positively and significantly correlated with satisfaction. Indicating older age, more experienced and adequately trained staffs are more satisfied with transitioning to online teaching. On the other hand, responders who perceived moving teaching online as difficult and those who opposed moving teaching online were less satisfied. **Table 5** presents the multivariable logistic regression analysis of predictors for satisfaction and barriers.

The relationship between observed barriers and age or willingness to support moving teaching online and training are also presented. Age and training were negatively associated with barriers. Furthermore, people who were opposed moving to online teaching were more likely to have more barriers. **Figure 2** illustrates the main barriers for online teaching by age groups.

Discussion

The current data presents the perception, attitude, challenges, and satisfaction of 1,117 educators with online teaching during COVID-19 pandemic. Our results show that training and experience in online teaching are crucial factors that influence the perceptions of online teaching during the COVID-19 pandemic. Although, most educators supported the move to online teaching and were mostly positive in terms of perception, various challenges such as poor internet bandwidth, the limited ability to follow up or track students' engagements, and family commitments were highlighted as barriers to effective online teaching delivery during the national lockdown. These obstacles persisted even though relevant teaching tools and training were provided. Our findings align with a previous study from India that assessed the challenges of online teaching and learning during COVID-19 which found that the main barriers were lack of technical skills and low internet bandwidth (Hassan et al., 2020).

The frequency of using the online teaching platforms before the COVID-19 pandemic is a major driver of perception and observed barriers. Indeed, a significant difference in the online teaching experience before the pandemic has been reported worldwide (Bolliger and Halupa, 2022). A previous report assessed teachers' prior engagement in online teaching has shown that 67% of faculty members had frequently used online teaching platforms before the SAR-CoV-2 pandemic

TABLE 3 Current practices and tools of online teaching during COVID-19.

Variable	N (%)
Were relevant tools (software, hardware, etc.) provided for online teaching?	
Yes	895 (80%)
Somewhat	170 (15%)
No	52 (5%)
Was adequate training provided for online teaching?	
Yes	756 (67.5%)
Somewhat	277 (25%)
No	84 (7.5%)
How was training provided?	
Online course	474 (42.5%)
Interactive online meetings	318 (28.5%)
One-on-one sessions	147 (13%)
Live broadcasts	105 (9.5%)
Online course and one-on-one sessions	73 (6.5%)
Which online teaching tools do you mostly use for online teaching?	
Blackboard	578 (52%)
Blackboard and zoom	385 (34.5%)
Zoom only	57 (5%)
Microsoft teams	29 (3%)
MS teams and zoom	42 (4%)
Three tools or more	26 (2%)
On average, how much time you spend on preparing for a session of online class?	
< 2 h	679 (61%)
2–4 h	344 (31%)
> 4 h	94 (8%)
Time you spend to prepare a session of an online class is:	
The same time spend for a session of offline class	527 (47%)
Less than time spend for a session of offline class	454 (41%)
More than spend for a session of offline class	136 (12%)
How do you distribute your teaching material?	
Blackboard	587 (52%)
Combination of Microsoft teams and email	219 (19.5%)
Combination of blackboard and email	209 (18.5%)
Cloud storage	54 (5%)
Microsoft teams	35 (3%)
Email	13 (1%)
Social media apps	5 (0.5%)
When do you usually distribute teaching materials?	
Less than a week before class	796 (71%)
More than a week before class	303 (27%)
During or after class	18 (2%)
How did you conduct evaluation for your online class?	
Assignment, quiz, and examination	469 (42%)
Assignment and quiz	235 (21%)
Assignment and examination	114 (10%)
Quiz	101 (9%)
Examination	82 (7.5%)
Quiz and examination	61 (5.5%)

(Continued)

TABLE 3 (Continued)

| Variable	N (%)
Assignment	55 (5%)
What instrument do you use for evaluation?	
Blackboard	879 (77%)
Google forms	196 (17.5%)
Kahoot	37 (3%)
In campus exam	3 (0.3%)
Email	2 (0.2%)
Does your course include practical skills teaching?	
Yes	588 (52.6%)
No	529 (47.4%)
For practical skill materials, how do you distribute them during the COVID-19 lockdown?	
Collected from campus	28 (31%)
Sent by post	63 (69%)
How do you conduct evaluation for practical skill?	
Live and recorded presentation	206 (35%)
Live student presentation	112 (19%)
Reports	105 (18%)
Recorded student presentation	100 (17%)
Postponed for in-person	65 (11%)

Data are presented as frequencies (*n*) and percentages (%).

TABLE 4 Expectations, satisfaction, and barriers of online teaching during COVID-19.

Variable	N (%)
What was your general expectations of moving to online teaching during COVID-19?	
Positive	697 (62%)
Uncertain	333 (30%)
Negative	87 (8%)
What is your overall satisfaction of online education?	
Very dissatisfied	65 (6%)
Dissatisfied	105 (9%)
Unsure	158 (14%)
Satisfied	712 (64%)
Very satisfied	77 (7%)
What are the main barriers of online teaching based on your experience?	
Poor internet	279 (25%)
Inability to track students' engagement	227 (20%)
No barriers	190 (17%)
Childcare and family responsibilities	104 (9%)
Lack of technical skills	63 (6%)
Lack of training	31 (3%)
Lack of adequate hardware	30 (3%)
Lack of adequate software	18 (1.5%)
Creating online teaching contents	11 (1%)
Long teaching time	8 (0.5%)

TABLE 5 Multivariable logistic regression analysis of predictors for satisfaction and barriers.

	Model 1			Model 2		
Predictor	OR	95% CI	P	OR	95% CI	P
Satisfaction						
Age	1.213	1.056–1.382	0.004	1.020	0.863–1.207	0.813
Experience	1.512	1.312–1.742	< 0.001	1.528	1.269–1.840	< 0.001
Perception of moving teaching online (from easy to difficult)	0.548	0.477–0.630	< 0.001	0.528	0.453–0.614	< 0.001
Support moving teaching online (from support to oppose)	0.769	0.682–0.867	< 0.001	0.752	0.657–0.861	< 0.001
Previous training	2.308	1.765–3.019	< 0.001	2.344	1.754–3.133	< 0.001
Barriers (from no barrier to multiple barriers)						
Age	0.584	0.477–0.715	< 0.001	0.612	0.495–0.758	< 0.001
Support moving teaching online	1.520	1.213–1905	< 0.001	1.391	1.093–1.770	0.007
Prior training	0.258	0.158–0.422	< 0.001	0.332	0.198–0.556	< 0.001

FIGURE 2
Age groups barriers of teaching online.
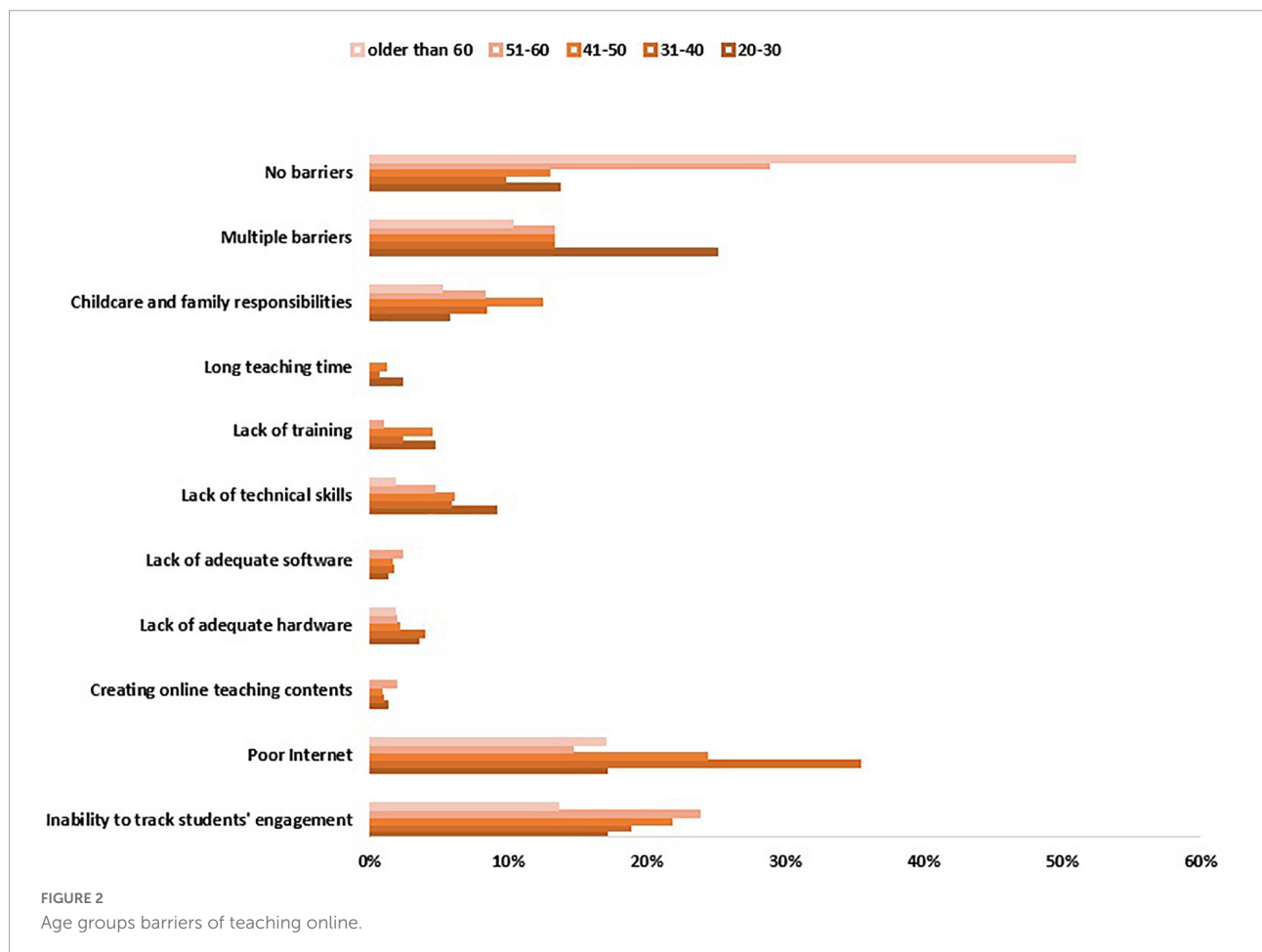
(Jaschik and Lederman, 2019). This is comparatively higher compared to 26% observed in the present study. This lack of preparedness or prior exposure to an online teaching environment is a major limitation, especially in developing countries where educational resources are not as abundant. The sudden nature of the transitioning to online teaching did not help either, resulting in a significant shock to educational paradigm and equilibrium (Brooks and Grajek, 2020).

Most of our respondents perceived the transition to online education as an easy process with mostly positive expectations and satisfaction and mostly supported the transition. This indicates that respondents thought that moving teachings

online was a useful step to avoid interruption to learning during the COVID-19 lockdown despite the various challenges. A previous study on the perception of online teaching of teaching staff and students reported similar findings where although respondents perceived that online teaching could not achieve a similar learning experience offered *via* face-to-face teaching, it was a useful tool giving the global COVID-19 pandemic circumstance (Rajab et al., 2020; Almahasees et al., 2021).

Our data show that older staff faced less challenges, but age was not a predictor of satisfaction with online teaching in the multivariable analysis. However, staff who had more prior training, years of experience, positive perceptions, and supported transitioning to online teaching were more likely to be generally satisfied with the process. Also, older respondents were more supportive of the transition to online teaching. We hypothesize that this may be due to the general belief and acceptance that online teaching is a better alternative than no teaching at all and the understanding that teaching had to be moved online to avoid SARS-CoV-2 infection and associated risk of hospitalization and mortality which is especially higher in older adults (Mesas et al., 2020). Indeed, the fear of COVID-19 is a well-researched topic that has been strongly linked with compliance and perception of COVID-19 preventative measures globally (Demirtaş-Madran, 2021; Håkansson and Claesdotter, 2022; Melki et al., 2022).

Expectedly, younger respondents were more likely to have used online teaching platforms more frequently before the COVID-19 pandemic. Our result is in line with previous studies where age was reported as a major factor associated with increased digital teaching skills (Cruz and Díaz, 2016; Mirķe et al., 2019). Although, Elliott et al. (2015) reported increased workload due to more time needed to prepare online teaching materials, our results show otherwise with only 12% of respondents reporting spending relatively more time preparing for online teaching than they would need for face-to-face teaching. This is intuitive as online learning standards for higher education in the KSA were built according to the best standards that include the provision of cutting-edge technology, training and support, and accessibility (Al Zahrani et al., 2021). However, the current system has a room for improvement which could improve students' and staff's perception and experience as well as the effectiveness of online teaching.

Our study further highlights the need to integrate technological training and retraining into the continued professional development of teachers to improve competence in the use of online teaching platforms in the KSA and around the world (Hassan et al., 2020). This is crucial not only in preparation for future pandemic but as teaching-learning technologies continues to advance globally. It seems that post-COVID-19, online teaching will remain an integral part of future education delivery, and continued assessments will be needed to bring to fore the various challenges to both teachers and students in this ever-evolving field. Decision-makers should focus on improving teachers' technological skills to improve online learning outcomes and readiness for future events.

Importantly, the challenges faced by faculty members regarding moving teaching online during the COVID-19 pandemic is not unique to KSA alone. Indeed, while the level of each challenge may vary depending on the level of infrastructures available in countries, most countries had similar limitations resulting in subpar movement of teaching fully online. For instance, Akram et al. (2021) in a case study of public studies in the Pakistan state of Karachi reported lack of experience, inadequate equipment and technical support as the main barriers to online teaching during the COVID-19 pandemic. This report was also corroborated in a review by Aslam et al. (2021) on the readiness of Pakistan for online teaching and learning during COVID-19 pandemic. The cross-sectional design of this study and recall bias of respondents are the main limitations. However, the relatively higher sample size provides a strong collective perspective that is reflective of the study population. In general, our finding builds on previous work on the topic and pushes the case for improved information and communication technological (ICT) training as part of continued professional development (CPD) of teaching staffs as well as provision of adequate equipment and support. This will provide adequate learning environment and serve as buffer against any future disruption to learning in educational institutions in KSA and globally.

Conclusion

In summary, although limited by poor internet bandwidth and low technological skills, the perception and experience of transition to online teaching during the COVID-19 pandemic in Saudi Arabia were positive. Low internet bandwidth and inability to track students limited the delivery of effective online teaching. More experienced staffs and those who receive adequate training are more likely to be satisfied with the transition to online teaching.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the Institutional Review Board from Prince Sultan Military College of Health Sciences, reference number (IRB-2022-RC-004). The patients/participants provided their written informed consent to participate in this study.

Author contributions

JA and TO contributed to the study conception and design. JA, ShA, and TO helped to prepare the manuscript. All authors have contributed to the methodology section including data collection and analysis, revised the manuscript, read, and approved the final manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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