Two years into digital transformation: the lived experiences of Middle Eastern medical students in a problem-based curriculum

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ABSTRACT

OBJECTIVE: To explore the long-term impact of the transformation from face-to-face into online learning on Middle Eastern students enrolled in the medical school at Bahrain having a problem-based curriculum.

METHODS: Colaizzi's phenomenological descriptive method of enquiry and data analysis approach was adopted as the research methodology. Purposive sampling method was used until the stage of data saturation was reached with a total of 13 medical student participants exposed to at least two years (February 2020 to January 2022) of compulsory online learning during the COVID-19 pandemic. The data were collected in English. Responses from the participants were analyzed, and themes were generated after two researchers coded the data and explored patterns within the data.

RESULTS: The data analysis revealed five distinct but interrelated themes from the narratives of medical students' lived experiences. The students considered the shift to online learning as new experience that is extremely convenient. However, they believed that it provided them with more time to study, they had the flexibility of going back to recorded lectures at their own convenience; however, they described that communication was negatively impacted, yet they wanted to continue with online learning.

CONCLUSION: Medical students have adequately adapted to the transformation of their learning from face-to-face into online. However, concerns remain in view of its negative impact on communication and hands-on skills which makes mixed education more appropriate in the post COVID-19 era.

KEYWORDS: Education, Medical (MeSH); Digital transformation (Non-MeSH); Online (Non-MeSH); COVID-19 (MeSH); Problem-Based Learning (MeSH); Students, Medical (MeSH).

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INTRODUCTION

Over the past two academic years, educational institutes all around the world have changed their learning activities into online education as mandated globally by the health authorities in response to the COVID-19 pandemic.[1] This compulsory change in strategy from face-to-face to online education has transformed the learning experience of students at all levels of education, in schools and universities alike.[2] However, this sudden transition has had a major impact on medical education, particularly where problem-based learning (PBL) curricula are in place.[3]

This is because this format of medical education is mainly based on student-led learning.[4] Subsequently, the students in medical schools following PBL are likely to develop stronger social ties with their peers compared to their counterparts in traditional educational institutes.[5] Thus, it would be anticipated that the digital transformation of learning from face-to-face to an online format may have had a greater impact on the experience of learning by students in PBL medical schools.[6] While some studies have pointed out the potential consequences of digital educational strategies on medical students' achievements in problem-based curriculum schools, most such

educational literature was conducted earlier during the first few months of the COVID-19 digital transformation[7] and the long-term effects on the learning patterns of PBL medical students have not attracted significant attention.

Over the past thirty years, there has been a steady increase in the number of medical schools incorporating the PBL curriculum. Therefore, an urgent need exists to document its long-term impact on medical students in PBL medical schools who have been subjected to digital transformation.[8] The Arabian Gulf University (AGU), Kingdom of Bahrain, was established in 1980. The university hosts a diverse population of both male and female students from all Gulf Cooperation Council countries (Bahrain, Saudi Arabia, Kuwait, Oman, United Arab Emirates, and Qatar); and since its inception, it has followed a PBL curriculum as a method of education.[9] In response to the COVID-19 pandemic, education at the university was transformed from face-to-face to a virtual format.[10,11] Such a type of curriculum, along with the ethnic and cultural diversity of its medical students, makes Arabian Gulf University an ideal setting to explore the long-term impact of digital transformation on the lives of medical students in problem-based medical schools. This study aimed to explore the genuine experiences of Middle Eastern medical students and their perceptions of what would be the long-term impact of the mandatory transformation from face-to-face to online learning while enrolled in a medical school with a PBL curriculum at

Table I: Demographic characteristics of the participants

Variables		Participants (n=13)
Gender	Male	9 (69.2%)
	Female	4 (30.8%)
Age (Year)	19	1 (7.7%)
	20	1 (7.7%)
	21	9 (69.2%)
	22	1 (7.7%)
	23	1 (7.7%)
Nationality	Bahrain	7 (53.8%)
	Kuwait	3 (23.1%)
	Saudi Arabia	3 (23.1%)
Medical Year	Year 3	10 (76.9%)
	Year 4	3 (23.1%)
Marital Status	Single	13 (100%)
Accommodation status	Living with family	7 (53.8%)
	Living with friends	1 (7.7%)
	At university hostels	3 (23.1%)
	Living alone	2 (15.4%)

Figure 1: Procedures of Colaizzi's phenomenological descriptive method [15]

Bahrain.

METHODS

Theoretical framework

To understand the direct description of students' lived experiences during the COVID-19 pandemic, a phenomenological approach was adopted. This design was considered as the most suitable approach to address our research question. [12,13] Phenomenology as a type of qualitative method of inquiry was originally suggested by German philosopher Edmond Husserl. [14] The phenomenon under study in this project was the transformation from face-to-face to online learning in a problem-based medical school where the impact of social isolation would be anticipated to be greater than that in traditional curricula. In this study, a qualitative methodological design (Figure 1) was employed in accordance with Colaizzi's phenomenological descriptive method. [15]

Study design

A phenomenological approach was adopted to understand the direct description of students' lived experiences during the COVID-19 pandemic. This design was considered as the most suitable approach to address our research question. [12] Phenomenology as a type of qualitative method of inquiry was originally suggested by German philosopher Edmond Husserl. [14] The phenomenon under study in this project was the transformation from face-to-face to online learning in a problem-based curriculum medical school where the impact of social isolation would be anticipated to be greater than that in traditional curricula. In this study, a qualitative methodological design (Figure 1) was employed in accordance with Colaizzi's phenomenological descriptive method. [15]

Study sample

The data were collected during the period from January 2022 to February 2022. The students who were exposed to the educational changes for the two years (from February 2020 to January 2022) since the education at AGU was transformed into virtual format were eligible to be recruited in this study. The study sample comprised of students from medical years 3 and 4. Data saturation stage was reached with 13 participants who were identified via purposive sampling method (Table I).

Data collection

The data were collected from students online in English language. The participants filled in demographic information sheet sent to them by email and then answered the opening statement: "Please describe to me your thoughts about online learning during the COVID-19 pandemic. Share all your thoughts, feelings and perceptions you
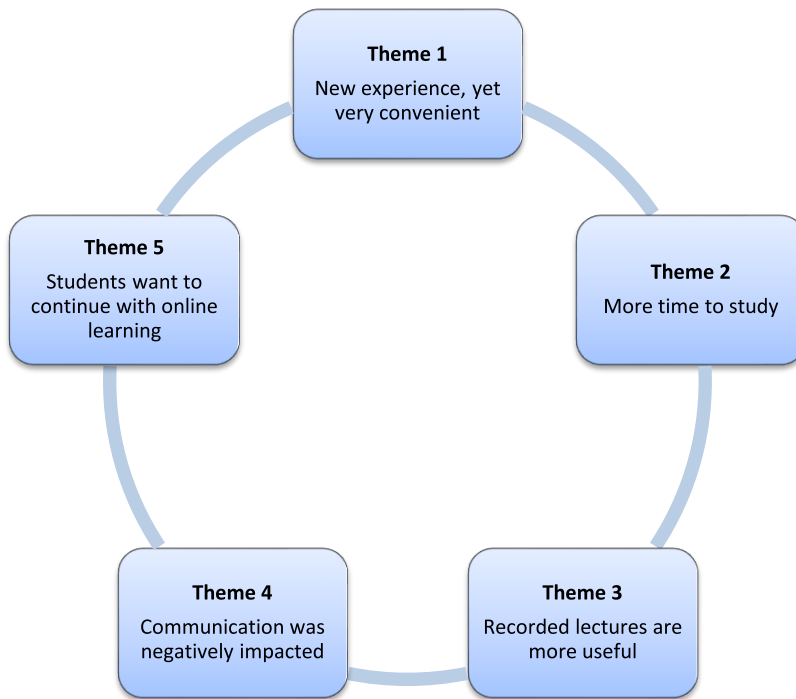
Figure 2: Themes identified from medical students' narratives of their lived experiences of transformation from face-to-face to online learning

can recall until you have no more to say about the experience". Upon the completion of the written description of their lived experiences, the participants submitted the narratives to the first author.

Data analysis

The study used Colaizzi's [15] method of data analysis (Figure 1). Information obtained from the participants were analyzed which generated 5 themes. Two researchers independently coded the obtained data and subsequently explored patterns within that data. Discussion sessions were arranged among those researchers to reach a consensus on minor discrepancies (if any) and solve them accordingly.

Ethical considerations

The Research and Ethics Committee of College of Medicine and Medical Sciences at Arabian Gulf University approved this study (E56-PI-3-22). Written informed consent was obtained from all individual participants involved in the study. All procedures performed in the study were in accordance with the ethical standards of the institutional

research committee and with the 1964 Helsinki Declaration and its later amendments.

RESULTS

Five themes were identified from the data analysis; new experience, yet very convenient, more time to study, recorded lectures are more useful, communication was negatively impacted, and students want to continue with online learning (Figure 2).

Theme 1: New experience, yet very convenient

Students described online learning as a new experience and a desirable alternative to the face-to-face format in similar circumstances. It was stressful at the beginning, however, they adapted to it with time and gradually liked it.

- "Online learning is the best outcome education institutions have come up with in ages. It saves time and effort for both the faculty and students, we can concentrate more on the material due to less distractions." (Male, Year 3 student)

- "Online learning now is something that I got used to and I have seen that many of my colleagues got used to it and prefer it." (Male, Year 4 student)

- "Had to find a way to study at home (it was not a studying environment) so I created a space to study as well as focus on my work. It was hard at first with family around all the time." (Female, Year 3 student)

Most students were in favor of online learning as it is more convenient and comfortable than face-to-face, however they were confident that having a practical session on face-to-face format at the university is better, stating that going to the university for some days of the week is better than full time online learning.

- "There are some classes (the practical sessions) like the demonstrations and professional skills which are better to take at the university campus." (Male, Year 3 student)

- "Having professional skills practical sessions completely online deprived me of developing the practical skills of physical examination. Now, that we are back on campus for most of the professional skills sessions this is good, yet some sessions are still online." (Male, Year 4 student)

- "My educational experiences could be compromised, especially with clinical or practical experiences. However, this concern is not a hundred percent applicable with a hybrid system where we attend classes on campus for these practical lessons." (Female, Year 3 student)

Some students found that face-to-face learning was better for them as it kept them committed to their studies more when they were taught online.

- "I feel that I was more on track when resource sessions were on campus because I used to attend the lectures and study day by day as much as I could. However, with the online resource sessions even though I try to study day by day I lose track quickly and I tend to lag behind by many topics which I did not experience previously when the sessions were delivered on

campus." (Male, Year 4 student)

- "Sometimes having them online makes these sessions seem less important for me to attend, which I do not like since I do not like to miss out on something important (when everything was on campus it was better since I attended all sessions usually)." (Male, Year 4 student)

Theme 2: More time to study

All students expressed that online learning provided them with more time to study, compared to face-to-face format where they wasted a lot of time and energy in commuting to campus, being tired at the end of the day.

- "Online learning was time saving." (Male, Year 4 student)

- "It is one of the best ways for studying as it conserves a lot of time." (Male, Year 3 student)

- "Online learning has saved a great amount of time. Time that had been spent commuting, eating, getting dressed, etc. all had been spared with online learning. This provided me with the extra time I needed to study." (Female, Year 3 student)

- "Another good thing is that we did not have to drive to university so that saved time." (Female, Year 3 student)

Theme 3: Recorded lectures are more useful

Students seemed to be extremely satisfied with the fact that lectures were recorded and kept in the Electronic Learning System (ELS). Students said that recorded lectures were highly useful as they could watch them repeatedly at their convenience. However, it also made it difficult for them to think of having the same lectures face-to-face in the future after resumption of traditional in person education.

- "Resource sessions are better online since the lectures are saved and it is convenient to listen to the recording at my own preferred time and to note when needed." (Male, Year 4 student)

- "I can repeat the lectures as many times I want and that was a struggle

for me in pre-pandemic time." (Male, Year 3 student)

- "Regarding the anatomy demonstrations, it was very useful to make the anatomy videos online since they are way clearer and are very well done. Also, the anatomy demonstration videos gave us the advantage of returning to them and taking note when we needed them, which is very convenient and helpful for the anatomy demos." (Male, Year 4 student)

- "Also having everything recorded a positive difference, sometimes you're tired and can't focus on class so you can go back and watch the lecture again. The same goes for the anatomy demos, I never experienced pre-pandemic anatomy demos, but I can't imagine going there, listening to the demo, going home and having to remember everything that was said." (Female, Year 3 student)

Theme 4: Communication was negatively impacted

Despite all positive additions of online learning that the students described, they believed that online learning had negatively impacted their interaction with their colleagues and faculty members. They had better communication between them and faculty while they attended the campus in person.

- "Being at home all the time and not seeing friends did take a toll on me." (Female, Year 3 student)

- "Not seeing my colleagues much since most of the sessions are online. This is something that I miss." (Male, Year 4 student)

- "It significantly deprives me of social life. I do not get to meet my peers nor my teachers." (Female, Year 3 student)

- "However, it decreases face and human interactions in tutorials, in addition we do not meet each other as students, so we don't have enough interactions to build friendships with each other and with doctors who don't even know our faces (but doctors are not a big

deal)." (Female, Year 3 student)

Some students considered online learning is inappropriate due to the communication difficulties with their teachers

- "Studying in the university will help students to communicate with faculty easily." (Male, Year 3 student)

- "It was tough because they uploaded the slide with a voice only. Some recordings were helpful, but others were not, so I had to search many times especially when the face-to-face meeting was not available, and I do not like to write emails because I understand more by discussing the issues instead of writing and reading." (Female, Year 3 student)

Educational activities like tutorials and laboratory-based teaching were considered by students as enjoyable activities when they were conducted face-to-face, however they described how that joy was lost when online teaching started.

- "As for tutorial sessions, I feel that it is less interactive compared to when it was on campus, thus making it less useful. Tutorials on campus were more fun also since there was more interaction. Having laboratory sessions online also takes the fun doing and seeing the practical work." (Male, Year 4 student)

One student felt that lack of interaction with colleagues and university will affect their feeling of affiliation to the university.

- "I think it is difficult to us to feel belonging to the university or to our colleagues, since there is no feeling of belonging or interacting with except minimal things! We need more activities that gather us. We need to make memories!" (Female, Year 3 student)

Theme 5: Students want to continue with online learning

With all positive and negative accounts of the impact of this educational transformation on their lives, students became gradually comfortable with it and it seemed to become a norm for them. Students believed that they

would like to continue with online learning after the COVID-19 pandemic was over, particularly when offered as part of the hybrid system of education.

- "I hope online learning continues even after the pandemic for it is not just a safer choice but more effective one." (Male, Year 3 student)

- "I really hope that even after the pandemic we can still use the online teaching along with attending to the university." (Male, Year 3 student)

- "I'm very comfortable with the rules now and I hope after this crisis, we continue with the same rules." (Male, Year 3 student)

DISCUSSION

This study offers insight into the perceptions and experience of medical students regarding online learning. This is a pertinent area of research in academic medical education which has already been addressed in several former published reports, either from the Middle Eastern region [7,16] or other parts of the world.[17] However, the importance of the findings of this study arises from the fact that students' views on virtual learning are taken after a long period (two years) of online learning in contrast to the earlier studies which have reported students' opinions after relatively short durations of mandatory digital transformation.[18] Although the digital transformation from face-to-face to online learning was suddenly imposed on students without a preparatory phase, their adaptation was smooth and fast. This reflects that this is a digital native generation of students who probably are comfortable with this medium of education. Similar findings were observed among university undergraduate students in a multicentric study of students from 35 countries who were taught in English language,[19] as well as from Asian student populations.[20]

Online learning was considered convenient by medical students since they appreciated the value of time spent in commuting to university campus and the amount of energy, they preserved by attending to online education. They believed that they could utilize their time and energy better by making the

most appropriate and effective use of their spared time and energy. Moreover, having access to the recorded lectures was considered by the students as a positive outcome of the online format of learning. In addition, while medical students felt that online learning was more convenient and comfortable than face-to-face, they also raised concerns about their practical sessions which students prefer to take through face-to-face format. This is consistent with several other studies such us the published papers by Sharma K, et al.,[21] and Mukhtar K, et al.,[22] as well as a recent meta-analysis by He L, et al.,[23] which assessed the impact of online learning in medical education.[23]

One of the findings of this study according to the students is that the learning process was compromised by online learning despite the online tools provided to them to communicate with each other. In addition, it does not appear to generate the same levels of satisfaction as in face-to-face learning. It is not surprising that the students were keen to continue their educational activities after the COVID-19 pandemic in a hybrid format rather than continuing with the online format. Comparable results were reported from medical students in Saudi Arabia,[24] India and Poland.[25,26]

The main limitation of this research investigation is that it has followed a qualitative research approach which is not usually extended to wider populations with the same degree of certainty as that of results from quantitative analyses. However, we do not believe that this would have affected the quality and the validity of the findings from this study since the results are consistent with those reported from other students' populations.[19-26]

CONCLUSION

Participants in our study seemed to have adequately adapted to changes in educational delivery from face-to-face into online during the COVID-19 pandemic. However, the students also experienced a negative impact on communication with their peers as well as teaching faculty, and hands-on skill building. Hybrid teaching methods including both online and in-person

teaching in medical schools would be more appropriate in the post COVID-19 era.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

SA & KA-R: Concept and study design, acquisition, analysis and interpretation of data, drafting the manuscript, critical review, approval of the final version to be published

JA: Acquisition, analysis and interpretation of data, drafting the manuscript, approval of the final version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
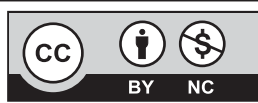
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