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Abstract

Background: The education sector is one of the major sectors adversely affected by the COVID-19 pandemic globally, and education of health professionals is no exception. Thousands of health professional institutions in the Eastern Mediterranean Region were closed abruptly to ensure the safety of students and staff.

Aims: This study aims to describe the situation of health professionals' education in the EMR during COVID-19 and review strategies adopted by institutions to ensure continuity of education.

Methods: A qualitative, exploratory, key informant-based survey involving 50 institutions was conducted in 13 Member States of the EMR. The survey included medicine (n=23), dentistry (n=9), nursing (n=13), and pharmacy (n=5) colleges. The questionnaire included 40 open-ended questions about the challenges facing health professionals' education during the COVID-19 lockdown and strategies adopted for the continuation of education. Data were analysed and summarized to reach meaningful conclusions.

Results: Almost all institutions in the EMR were closed during February and March 2020 as the number of cases increased. Most institutions, with few exceptions, in resource-constrained countries switched to online learning through emergency remote teaching mechanisms. COVID-19 caused delays in the completion of academic sessions and modifications to the curricula to cover courses within a short time.

Conclusion: COVID-19 may continue to impact health professionals' education. However, countries with better IT infrastructure and support will likely continue to develop their online educational capacities to reap the benefits of e-learning in the future.

Keywords: Health, education, Mediterranean, EMR, pandemic, COVID-19

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Background

The COVID-19 pandemic has had detrimental effects on global healthcare systems with a ripple effect on every aspect of human life (1), including the education sector (2). Health professionals' education has also been impacted by the pandemic (3,4). To ensure the safety of students and staff, health professional institutions were closed, learning was suspended and examination schedules were disrupted, forcing students to continue their studies remotely (5,6).

In the WHO Eastern Mediterranean Region (EMR), the pandemic caused unplanned, abrupt closure of almost all institutions, and as the pandemic continued, most institutions progressively moved to online learning. A plethora of challenges was associated with this unanticipated transition to online learning. There is limited information about how education was managed in most institutions in EMR during the pandemic lockdown. Very few studies have been conducted to explore the distressing impact it had on health professionals' education. A study conducted in Jordan identified poor internet coverage, lack of suitable digital devices, and variation in educational digital platforms as major challenges facing the promotion of online learning (7). Another study conducted in Pakistan identified the shortage of IT staff and infrastructure, lack of teacher and student training on the use of digital technologies, inability to maintain online learner engagement, difficulty in marking online attendance, and inability to maintain work-life balance while working from home as the major challenges (8). Research conducted in Egypt

identified poor staff development, lack of continuity of clinical training, poor security and reliability of online assessment, cheating during online examinations, and a high number of student enrolment as major challenges (9).

This qualitative exploratory study was initiated to understand the situation of health professionals' education in the EMR during the COVID-19 lockdown, identify challenges with the continuity of education, and recognize the impact of the pandemic on health professionals' education. The study explores strategies to deliver education in a more efficient and effective manner while ensuring the safety and security of students and staff as the pandemic continues.

Methods

A qualitative, key informant-based, exploratory study was conducted, involving institutions from 13 Member States of the WHO EMR. This was an institutions-based survey from selected countries, as it was difficult to approach all countries in the Region due to time and resource constraints. As the intent of the study was to explore the response of the institutions to continue education disrupted by the COVID-19 pandemic and the challenges faced by them in adopting digital technologies, a non-probability based purposive sample of 70 institutions was taken from 4 major disciplines, including medicine, dentistry, nursing, and pharmacy. Institutions were selected from the database of institutions available at the health workforce unit of WHO/EMRO and in consultation with WHO country offices. Fifty institutions accepted the invitation and responded. The primary criteria for the selection of a respondent were that they should be well-informed and actively involved in online learning in the institution and should be willing to participate in the study. Respondents were sent the questionnaire through an online link.

The questionnaire, mainly consisting of qualitative questions, was prepared and content validated through consultations with expert teachers and administrators involved in learning during the COVID-19 pandemic lockdown. The questions focused on the closure of institutions due to COVID-19 lockdown, use of digital technologies to resume learning activities, challenges faced by institutions in continuing learning, and strategies adopted to adjust curricula, teaching, learning, and assessment to the changing scenario. The online questionnaire was shared through SurveyMonkey during August and September 2020. All respondents provided written responses. In case of insufficient answers, additional information was requested through individual queries. Respondents were encouraged to consult other local information sources if they did not have sufficient information.

Qualitative content data analysis was performed by two independent researchers and data were summarized to reach meaningful conclusions. Researchers developed a data validation and analysis strategy to improve data credibility and make meaningful conclusions. Member

checking and triangulation were done by inviting respondents to review their responses and by collecting additional information about institutions. Accuracy and rigour of the findings were ensured by using Lincoln and Guba's evaluation criteria for establishing the trustworthiness of qualitative research. 'Trustworthiness' involves establishing: 'credibility' (confidence in the 'truth' of the findings), 'transferability' (applicability of findings in other contexts), 'dependability' (consistency and repeatability of findings), and 'confirmability' (a degree of neutrality or the extent to which the findings of a study are shaped by the respondents and not researcher bias). Lincoln and Guba mentioned several techniques to establish the trustworthiness of qualitative research (10).

Results

Fifty institutions from 13 EMR countries responded to the survey and completed the questionnaire. The health professional institutions included schools of medicine (23), dentistry (9), nursing (13), and pharmacy (5). Table 1 presents a list of participating countries and the number of institutions.

Health professional institutions in EMR experienced several challenges in managing the continuity of learning as the pandemic continued. EMR comprises a diverse range of Member States, including those facing protracted crises (e.g. Afghanistan, Iraq, Libya Somalia, Sudan, Syria, Yemen) and the high-income Gulf Cooperation Council countries. Several challenges were cross-cutting among the institutions and countries. These challenges are briefly described in the following sections.

The abrupt closure of institutions and their transition to online learning

As the virus spread quickly, institutions in Iran, Iraq, and Bahrain were among the first to close (in February 2020). Closure of institutions in most countries was a national-level decision, beyond the control of the institutions. Most institutions remained physically closed, at least for some weeks between March and May 2020. Revival and continuity of learning emerged as daunting tasks. Transitioning to online learning was the only option, however, switching to online learning in the shortest possible time, especially for resource-constrained institutions, was full of challenges. These challenges included general constraints due to poor IT infrastructure, unavailability of appropriate bandwidth and speed, and the cost of the internet connection to support learning.

Five institutions (in Sudan, Yemen, and Afghanistan) could not start online learning primarily due to weak IT support. Few countries commonly reported general challenges during this transitional phase, including untrained faculty (Bahrain, Egypt, Pakistan, United Arab Emirates), internet-related problems (Egypt, Iraq, Afghanistan), financial constraints, limited electricity

supply, harsh weather, unavailability of software packages, internet and electronic devices (Sudan), lack of access to online servers and student overload (Jordan), financial and human resources issues (Saudi Arabia), and the lack of digital technical support (Egypt).

Timely completion of the academic 2019-2020 year and on-time admissions for the following year (2020-2021) were major administrative challenges, especially in countries that had hundreds of institutions (Pakistan, Sudan, Egypt, and Iraq). Delays ranging from 3–4 months were reported in these countries for the completion of the academic year and for new admissions.

Clinical or practical training

Although the theoretical part of the curriculum was somehow covered through online learning, there were delays in clinical or practical training. Institutions needed to be at least partially open for skills training, making them to adopt unique opening strategies. An institution in Egypt was opened for examinations only, few others in Egypt, Iran, and Pakistan opened partially for clinical training. Students in Bahrain managed to complete the academic year by July 2020, while institutions in Iran extended the semester to compensate for the lost periods.

The completion of practical or clinical training remained a major challenge to institutions, especially those with large enrolments. Few institutions, especially in the public sector, had large class sizes, up to 350 students per class (for example, Pakistan, Sudan, Egypt) and resuming practical or clinical activities was a big challenge for them. Those institutions took several steps to continue learning. Students were divided into smaller groups and their practical or clinical activities were rescheduled with additional safety measures. Strategies such as the use of videos, skills laboratories, and simulations to resume practical or clinical activities were promoted. Institutions reported using roleplays, virtual cases, and videotaped clinical procedures to minimize the need for mandatory clinical or laboratory exposure (Egypt, Sudan, UAE, Iran, Pakistan). Yet few other institutions postponed clinical training to the later part of the year (Iraq, Egypt).

Introduction of new teaching and learning tools

A significant number of institutions, especially in countries with high-quality internet and IT infrastructure (hardware, software, and support staff) started minimal online activities within 1-2 months after the closure of institutions, and expanded the activities progressively. Most institutions reported initiating online classes, progressively expanding to small group discussions, interactive lectures, online assignments, and later the use of IT for student assessment. At the early stage of online classes, communication software packages (mainly video conferencing packages) became very useful. Commonly reported packages included

Zoom (Pakistan, Egypt, UAE, Jordan, Oman), Google Drive (Pakistan), Microsoft Teams (Egypt, UAE, Jordan, Saudi Arabia, Lebanon), Yammer (Egypt), Cisco Webex (Egypt, Saudi Arabia, Oman), WhatsApp (Egypt), Sky room (Iran), Webinar Jam (Pakistan), Adobe Connect (Iran), Skype (Iran), Go To Meeting (Oman), Go To Webinar (Oman), and Google Meet (Pakistan).

Later, learning management systems (LMS) gained popularity for managing a wider range of educational activities. Commonly reported LMS included Moodle (Pakistan, Egypt, UAE, Iraq), Blackboard Ultra (UAE, Saudi Arabia, Egypt), National LMS (Iraq), Google Classroom (Pakistan), and WIZ IQ (Sudan). In the initial phase, most institutions relied on free software packages to manage online education. Only 16 (32%) institutions reported having their own custom-built software programmes for educational management. As institutions became more acquainted with online learning, the use of LMS increased.

Adjustments to curricula due to online learning

Online learning required the adjustment of curricula to the new model of education. Almost 64% (32/50) of institutions reported that they had to adjust their curricula (including reductions in content) because of delays in sessions and align them with online teaching methodologies. These curricular modifications also involved minimizing redundant materials, encouraging interactive discussions (Iraq), revising the curriculum to prioritize materials that could be taught easily online, rescheduling of practical and clinical content (Pakistan, Iran, Egypt), the introduction of virtual laboratories, simulator-based clinical teaching, use of videos (Saudi Arabia, Oman), use of recorded lectures, and online assignments (Egypt).

Online assessment

Conducting online assessment was a relatively novel area due to limitations in digital technologies, weak institutional and staff capacity, and lack of regulatory support. However, few institutions (Jordan, Pakistan, and Bahrain) immediately started developing online assessment capacity. Forty institutions out of 45 (90%) managed to conduct some form of online assessment, mostly within 2–3 months after their closure. Commonly reported online assessment methods included online tests, quizzes, assignments (Pakistan), I-Cloud form quizzes (Egypt), online examinations, student presentations, case studies, open-book exams (Jordan), use of custom-built national software such as 'Faradid' (Iran), online viva voce (Iraq), poster presentations, problem-solving skills, self-learning, student presentations and assignments (Egypt).

Assessment of practical or clinical skills using online technologies was a major challenge. Few institutions used online interviews (oral), slides, and photos (like passive stations in Objective Structured Clinical Examination) as well. Few institutions mentioned conducting online Objective

Structured Clinical Examination/Objective Structured Practical Examination (OSCE/OSPE) (Bahrain), virtual ward rounds, using live, virtual, and simulated patients, although their use was limited, as it required a lot of logistics, preparation, and staff training. Several institutions postponed the assessment of clinical or practical skills until they were able to open because of the logistic and regulatory challenges.

Faculty development and training

Capacity development of faculty in the use of online digital technologies was another major challenge for most institutions. Few institutions in Sudan, Pakistan, Afghanistan, and Yemen, did not conduct any training; both teachers and students mostly learned through trial and error. Few others conducted only minimal training (Egypt, Pakistan), while some countries (Oman, Bahrain, Saudi Arabia, Sudan) reported conducting specialized workshops for teachers with well-structured training programmes.

Institutions used several strategies to provide training to teachers and students on the use of online learning management systems. These strategies included preparing short videos on how to use software packages (Bahrain, Egypt), developing orientation programmes on the use of IT for teachers and students (Pakistan, Egypt, Sudan), and effective use of social media for education (Egypt). Iran, Egypt, and UAE reported using emails, sharing documents and questions, and arranging facilities for 'on-the-job' online sessions where nurses could not leave duty stations. Training in online assessment included how to conduct mock examinations (Bahrain, Iraq, Saudi Arabia, Oman), teacher orientation sessions on online assessment (Pakistan, Jordan, Egypt, Saudi Arabia), preparing weekly quizzes (Egypt), training through virtual sessions (Egypt), orientation videos, written instructions, and the use of online discussion groups for assessment (Egypt, Pakistan, UAE). Table 2

Discussion

The abrupt closure of the institutions in most EMR countries disrupted learning and threatened timely completion of the 2019/2020 academic year. Online learning technologies emerged as the only option to urgently resume learning. The term 'Emergency Remote Teaching' (ERT) connotes a sudden interim transition of instructional delivery to online model because of an imminent catastrophe (such as COVID-19), irrespective of the online courses that had been originally planned and designed to be delivered virtually (11). Unlike a purpose-built online learning management system, ERT comprises the use of available remote teaching tools for delivering curricula that would otherwise be delivered physically. As soon as the emergency abates, instructional delivery may revert to its original format. Thus, due to urgency, providing reliable, temporary, fast, and durable access to educational instruction during a crisis would be more efficient than reconstructing a sophisticated educational system (12).

Appropriate use of digital technologies in health professionals’ education is not free from challenges that should be considered for the realization of its desired impact. In different institutions, a wide range of challenges were reported, including technical issues such as inadequate technical infrastructure, unreliable internet connectivity, absence of institutional strategies to facilitate online teaching, increased financial costs, pedagogical insecurity, insufficient preparedness of faculty for effective use of online teaching tools, time constraints, lack of appropriate tools for clinical teaching, and lack of direct contact between teachers and learners (13). Many organizational barriers to technology integration arise from competing tensions between institutional policy and practice and faculty beliefs or abilities. University administrators may view technology as a tool to attract and retain students, whereas faculty may struggle to create harmony between digital technologies and traditional pedagogy (14). The unavailability of essential infrastructure and inefficient institutional strategies represent major challenges for integrating online learning in education (15).

In the EMR, COVID-19 provided an opportunity for educational institutions to explore the potential of digital technologies and assess their capacities to integrate these technologies into routine teaching and learning. The term ‘e-learning or online education has a broad meaning. Several institutions in the EMR simply provide the instructional material to students on their institution’s website which they can access through the internet (16). Others view online learning as means to deliver lectures through some video conferencing software. While a sizeable part of face-to-face education is inevitable for ensuring the development of psychomotor skills of students, rational use of online education, especially for delivering theoretical components of the curriculum, can improve student-centeredness and save time and cost of education (17,18). A study conducted in a medical school in Bahrain suggests that up to 30% of the curriculum could be delivered online post-COVID-19 because it saves a lot of time and effort (19). For health professionals’ training, Muthuprasad et al. propose a hybrid or blended curricular approach with an appropriate mix of face-to-face and online learning methods to achieve cognitive and practical skills (20).

The range of online learning activities may include taking online classes, conducting small group discussions, sharing learning experiences with students through videos, virtual patients, case-based or team-based learning, and conducting online formative and summative assessments.

During the early stage of the pandemic, many institutions in the EMR were resilient enough to quickly resume, at least basic education, through online systems. As the pandemic continues in the Region, the use of online digital technologies is progressively being integrated with traditional pedagogy. The pace of integration is however variable from one institution to another, depending on the availability of resources and local educational regulations. During the post-COVID-19 era, it is expected that most institutions will require major curricular revisions

and redesign as they progressively move to blended learning models.

A particularly challenging aspect of education during the pandemic was the substantial restriction of clinical or practical learning experiences for students (21,22). Resumption of clinical and laboratory-based activities proved to be a major challenge for most institutions. The pedagogical principles of competency-based, time-variable education were quickly operationalized to enable schools to shorten traditional time-bound block training without lowering performance standards (23). A nursing school in Hong Kong used flipped classroom, demonstration of nursing change-of-shift handover in a simulated clinical environment, and developed simulated training ward to enhance nursing students' ability to provide care to patients competently and safely (24,25).

Increased use of educational technologies exclusively for assessment purposes has been observed during COVID-19, the term named 'Technology Enhanced Assessment' (TEA) (26). Online assessment can support knowledge-based assessment (e.g. multiple-choice or extended matching items), performance-based assessment (e.g. OSCE stations or virtual patient cases), practice-based assessment (e.g. portfolios or logbooks), or behaviour or attitude-based assessment (contributions to discussion boards or peer assessment of project work) and these can all be modified into formative or summative assessments to document student learning based on the purpose and needs of the educational experience (27).

The assessment of clinical competencies, however, remains a difficult area that needs innovative solutions and adaptations (28). Synchronous methods of assessment (online, real-time assessment) can be done through Multiple Choice Questions (MCQs) (and other items), open-book exams (29), and the use of online OSCE/OSPE. Due to the specific nature of conducting OSCE, it becomes a difficult form of examination to conduct, in terms of investment of time, efforts and resources. Since physical distancing became the norm during COVID-19, OSCEs have posed an even bigger challenge, requiring further investment in designing stations, selecting suitable software, and training staff. Researchers at Arabian Gulf University (Bahrain) have developed a toolbox that provides step-by-step guidance on effectively planning and conducting an online OSCE (30).

Large-scale student assessment of MCQs (well-timed) is done through Google Forms (31). Moodle can be used for advanced assessment settings for different question types, such as shuffling the items and their options, using sequential or free navigation (32). Relatively advanced technologies such as simulated patients, simulated operation theatres, and Mini-Clinical Evaluation Exercises (Mini-CEX) have been used to guide and assess clinical performance (33). Student assignments and assessment portfolios can be used effectively as

asynchronous methods of assessment in an online setup (34).

Online examinations face several challenges in the form of resource intensity, academic integrity, student and teacher training, examination validity, and their acceptance by the regulatory institutions. Students and teachers must be well-trained for online assessment and must be well-informed about cheating, impersonation, and plagiarism issues to assure the integrity of the whole examination system. Online proctoring systems are becoming common. Educational institutions in the EMR face challenges of developing online assessment systems and building capacities of teachers and students on the effective use of these systems.

Online teaching and learning require not only the availability of online educational resources but also the training of both teachers and students to effectively use the resources, at times, complex technologies. Some faculty may be hesitant to use them due to the lack of technical knowledge and/or scepticism about the efficacy of technology to improve student learning outcomes (35). Creating the conditions that foster student engagement (36), success, and retention remains a perennial issue within the higher education sector (37). Teachers must be well-trained to use online interactive tools for enhancing student engagement (38,39). Few commonly used tools for online student engagement include Padlet, Socrative, DialedIn, Quizlet, Clicker, etc. Gamification packages such as Kahoot, Gimkit, Book Widgets, and Classcraft have the potential to enhance student interest and keep them engaged in the learning process. Similarly, quiz developing apps such as Quizlet, Quizziz, and Socrative can be used effectively to develop quizzes to ensure that learning takes place as desired. Online poll apps such as Easypolls and Poll Everywhere can be used effectively to engage students in the learning process even while delivering lectures online.

It is the responsibility of the institutions to develop robust capacity-building and professional development programmes for both teachers and students to train them on the effective use of online educational technologies. Departments of medical education in the institutions can play a significant role in conducting such training.

This study is limited to a snapshot of health professionals' education during the COVID-19 pandemic in 13 Member States of the EMR. We could only include information from 50 institutions, majority of which were medical and dental colleges. The sample may not be representative of other health professionals and for all countries. It is highly recommended that each EMR country perform detailed analysis of the situation of its educational institutions and develop strategies to bring transformative changes in education during the post-COVID-19 era.

Conclusion

EMR consists of a diverse range of countries, almost half of them suffering from protracted crises. Countries face diverse challenges in managing education during the COVID-19 pandemic and blend online education with traditional pedagogy. Few challenges are cross-cutting (for example, revisions and adaptation of curricula, faculty development, and student engagement) while others are specific to the socio-economic situation of the country (for example, the availability of IT infrastructure, education policies, and the availability of resources to institutions). It is encouraging to see that despite having limited resources, weak technical capacities, and constrained IT infrastructure, most EMR countries managed to take advantage of digital technologies and resumed educational activities within a short period. Initially, institutions that used digital technologies for relatively simple educational activities progressed to more complex functions as additional resources and expertise were gained. The direction of change is towards adopting blended learning strategies, the pace of change, however, may vary, depending on the local digital infrastructure and the availability of resources. The new norms set by the pandemic for the use of digital technologies are likely to continue in the future and have a significant impact on the future of health professionals' education. To bring transformative and sustainable changes, EMR countries must ensure that the educational technologies are contextualized to the socio-economic and political situation of their countries, and adequately supported by the prevailing IT infrastructure and appropriate regulations.

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Impact de la COVID-19 sur la formation des professionnels de santé dans la Région de la Méditerranée orientale

Résumé

Contexte : Le secteur de l'éducation est l'un des principaux secteurs touchés par la pandémie de COVID-19 dans le monde, et la formation des professionnels de la santé ne fait pas exception. Des milliers d'établissements pour la formation des professionnels de la santé dans la Région de la Méditerranée orientale ont été fermés brusquement pour assurer la sécurité des étudiants et des personnels.

Objectifs : La présente étude vise à décrire la situation concernant la formation des professionnels de la santé dans la Région de la Méditerranée orientale pendant la pandémie de COVID-19 et à examiner les stratégies adoptées par les institutions pour assurer la continuité de leur formation.

Méthodes : Une enquête qualitative, exploratoire, basée sur des informateurs clés et impliquant 50 institutions, a été menée dans 13 États Membres de la Région de la Méditerranée orientale. L'enquête incluait des facultés de médecine (n = 23), de médecine dentaire (n = 9), de soins infirmiers (n = 13) et de pharmacie (n = 5). Le questionnaire comprenait 40 questions ouvertes sur les défis liés à la formation des professionnels de la santé pendant le confinement dû à la COVID-19 et sur les stratégies adoptées pour la poursuite de l'éducation. Les données ont été analysées et synthétisées pour parvenir à des conclusions significatives.

Résultats : Presque tous les établissements de la Région de la Méditerranée orientale ont été fermés en février et mars 2020 du fait de l'augmentation du nombre de cas. La plupart des institutions, à quelques exceptions près, dans les pays aux ressources limitées, sont passées à l'apprentissage en ligne par le biais de mécanismes d'enseignement à distance d'urgence. La COVID-19 a entraîné des retards dans l'achèvement du calendrier académique et la modification des programmes d'enseignement pour assurer les cours sur une courte période.

Conclusion : La COVID-19 pourrait continuer d'avoir un impact sur la formation des professionnels de la santé. Cependant, les pays disposant d'une meilleure infrastructure et d'un meilleur soutien en matière de technologies de l'information continueront probablement à renforcer leurs capacités d'enseignement en ligne afin de profiter des avantages liés à ce mode d'enseignement à l'avenir.

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