NARRATIVE REVIEW

# Teaching strategies for rehabilitation curriculum: Coping with the Covid-19 situation

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## Abstract

The novel corona virus pandemic culminated in a global emergency shutting down educational institutions with recommendations of distant learning. Developing countries like Pakistan faced challenges in terms of keeping the education stream running. The current narrative review was planned to discuss the teaching strategies adopted by various institutes for coping with the situation created by the coronavirus disease-2019. Literature search was done using search engines and databases with key words 'Academics', 'Coping strategies', 'Covid-19', 'Online learning', 'Rehabilitation curriculum' and their combinations. As a result, 37 articles were analysed for education involving conformation of curricula to social distancing protocol, and use of video-conferencing software, practical rehabilitation curriculum delivery, and evaluation methods. Developing countries, like Pakistan, should upgrade and revise their rehabilitation curriculum at theoretical and practical levels and try to convert the adversity of the pandemic into an opportunity to develop standardised e-learning programmes and compatible software.

**Keywords:** Academics, Coping strategies, Covid-19, Online teaching/learning, Rehabilitation curriculum.

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## Introduction

The novel corona virus created a pandemic and a global emergency was declared after confirmed deaths reached 8000.[1] First reported in Pakistan on 26th February 2020, it spread rapidly and, on 13th March 2020, all educational institutions across the country were shut down to prevent the spread of the virus.[2] With global institutional closure involving 191 countries and 91.3% of global student population, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) recommended distance learning softwares as well as platforms to facilitate educational delivery.[3] The Higher Education Commission (HEC), following the directives issued by the federal government of Pakistan, facilitated similar actions,[4] allowing use of a variety of distance learning approaches. Subsequently, revision of educational plans, teaching methodologies and assessment policies to accommodate better learning and teaching environment, to ensure smooth running of the academic calendar during the coronavirus disease-2019 (Covid-19) took place.

Online is now a critical educational lifeline with institutions seeking to minimise the potential for community transmission of virus.[5] A framework has been designed to guide an education response by the Organisation for Economic Cooperation and Development (OECD) to Covid-19 for maintaining social distance while facilitating learning and e-assessments.[6] However, with no prior training, practical work related to laboratory, preclinical and clinical subjects of specific skills of rehabilitation came to a halt. This sudden transit of academic activities from physical to online distressed the students as well as academicians in handling the rehabilitation curricula, which was further marred by the absence of a national rehabilitation framework.[7] From rehabilitation teaching point of view, traditional hands-on experiences of clinical training in favour of more virtual didactic experiences are facing challenges with relocation from the traditional in-classroom experience to a more technology-based virtual learning experience. The already fragile educational system in Pakistan struggled to convert to online academics to establish a reliable, economical and safe online academic system.[8]

Thus, it is imperative to highlight the coping mechanism adopted by higher education institutions (HEIs) in Pakistan following the Covid-19 crisis to deal with the challenges faced by the education system to create new pedagogical models or curriculum that promote a student's creativity. In view of the current scenario, HEIs identified numerous barriers in the implementation of e-learning, with several institutions finding online mode of learning to be inadequate to deliver rehabilitation curriculum, especially with content pertaining to practical component. There is also lack of proper guidelines regarding roadmap for transition or implementing e-

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learning in these challenging times.

The current narrative review was planned to discuss teaching strategies adopted by various institutes for coping with the situation created by Covid-19. This review is of great importance due to the dearth of literature on the subject from Pakistan[9] and the fact that it can invoke debate on the pros and cons of possible coping mechanisms and help improve the future of rehabilitation curriculum delivery.

To meet the objective, publications of the last 16 years from June 2005 to June 2021 were searched using key words 'Academics', 'Coping strategies', 'Covid-19', 'Online learning', 'Rehabilitation curriculum' and a combination of words using Boolean operators 'AND' and 'OR'. Data was searched using search engines, like Google and Science Direct, as well as databases, like Medline. Two reviewers scrutinised the literature for relevance to the research objective.

A total of 300 articles and publications were identified. Screening excluded 150(50%) duplicate articles as well those that were either irrelevant or not in the English language. Finally, 37(12.33%) articles were abstracted and used for literature review (Figure-1). Since the review did not involve human subjects and interventions, ethical approval was not required.

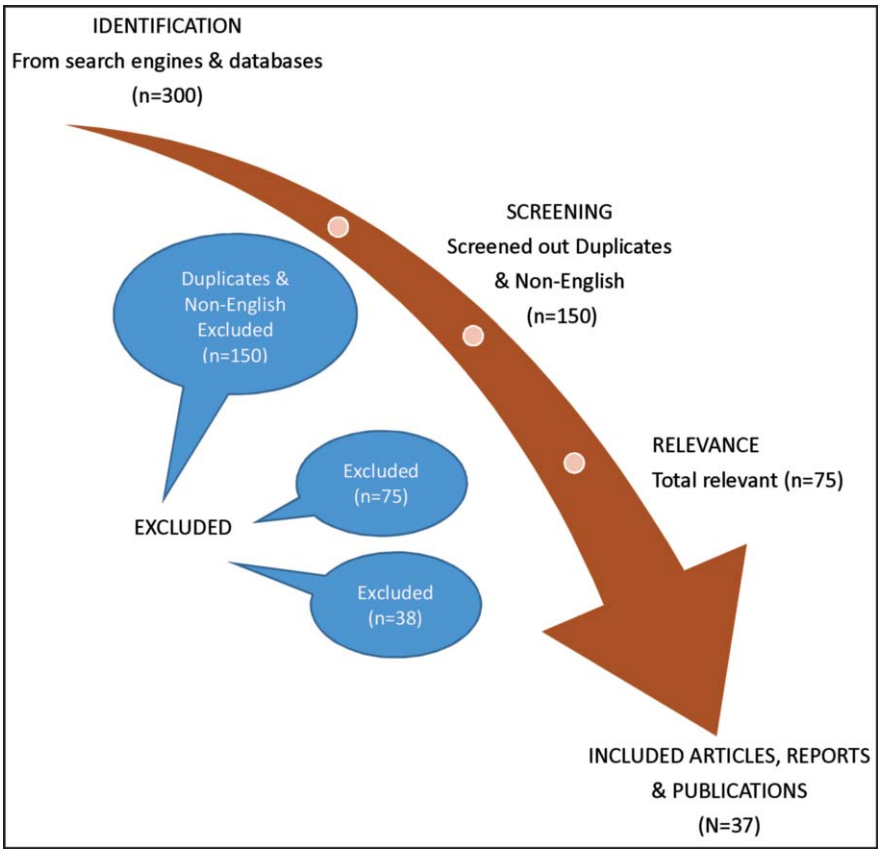


**Figure:** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow-chart.

Literature revealed that before the first case of Covid-19 was diagnosed, technological innovations had already begun to change education, to rethink, re-visualise and reinvent the environment of learning, with availability, exposure and speed of internet-based computer technology.[10] In Covid-19, a holistic approach was mandated with the introduction of centralised management system to ensure trust and proper sharing of the required information with the safety of learners, employees and patients even if they were standardised to avoid contamination, proper trusted information dissemination and to ensure quality of learning.[11]

Many universities replaced traditional classrooms with flipped classrooms. According to Hew & Lo, compared to conventional lectures, good learning outcomes were possible for students in the flipped classrooms[12] where, instead of just memorising, students could think and reason critically using their cognitive skills in online sessions.[13] Hence, online learning, as well as web-based programmes can all be used effectively regarding rehabilitation curriculum. The field of e-leaning is versatile which can be utilised synchronously as well as asynchronously to mimic a live classroom, being easy to access, budget-friendly and flexible in application.[14] Covid-19 has provided developing economies, like Pakistan, a chance to convert from conventional education to an online system.[8] A local study during the Covid-19 pandemic revealed convenience was felt by 58.5%, and acceptance of the concept of online education by 65.6% of faculty members, and 66.9% students were attentive during online education,[15] indicating that online learning was a feasible option in the long run.

## Education

According to a study, pre-clinical training should engage students from simple knowledge to clinical problem-solving approach, and, hence, Covid-19 made educators conform the curricula to the social distancing protocols with a problem-solving approach,[16] adopting a student-centred approach which should engage students in clinical

problem-solving, and provide the true essence of learning. This can be achieved in class discussions, improving clinical problem-solving skills, integrating their previous knowledge with the present clinical scenario and by guiding them as and when required. During conventional classroom lectures, teachers are usually unable to point out and explain the deficit in critical reasoning. By giving the whole time to the lecture, we are just misusing the proficiency of the teacher and also hindering the process of evidence-based learning. This is evident from the fact that online problem-solving technique was utilised by a Chinese medical institution which proved beneficial and became popular, illuminating a ray of hope for difficult and hard times. The world is still waiting to see what this tough time of the Covid-19 pandemic will bring for the medical field in the near future.[17]

Skill-based learning along with already known steps for achieving success have completely changed the process of assessment with syllabus of Basic Sciences reduced to 12-15 months in many medical schools with more time assigned to the site of care and assessment, thus shifting from time spent at the site to proven competencies.[18] By using the right analytical methods, online classrooms can help acquire maximum knowledge by utilising the extensive study material and other relevant data present on the internet, which was never possible in conventional classrooms, with video-conferencing softwares like Zoom, BlueJeans and Microsoft (MS) Teams having replaced face-to-face classes.[19]

## Practical Rehabilitation Curriculum Delivery

In rehabilitation curriculum, like medical curriculum, the most important part is the practical course work. Simulator-enhanced education was on the cards in the pre Covid-19 era in the field of rehabilitation.[20] During online learning, hands-on practice can be done virtually by using different softwares, like Virtual Blades, but in some courses there is difficulty in the applicability of this virtual practice. Discussions can enhance learning and improve communication skills and relations with the fellows and mentors. Other than verbal discussions, different virtual softwares, like Kahoot! Mentimeter and Quizizz (games), can also be used for interaction purposes. Also, rehabilitation education online has been found to be feasible and has received a boost following the Covid-19 pandemic.[21] But in Pakistan, undergraduate rehabilitation students need to have physical spaces for practice till the availability of reliable virtual reality (VR) platforms and simulators.

The advancement in the VR technology has led to the creation of multiple opportunities for healthcare (HC) education. VR is a strong tool for specific learning objectives in HC, but success lies in embedding them into the curricula, allowing the sharing of similar clinical experiences.[22] Being a promising tool, VR has previously been used in experimental work.[23] Since the VR technology is a source of constant and consolidated feedback for the users, it makes them feel as if the situation was real. With technological advancements, it has now become possible for the students to virtually feel the texture of body tissues. Also, skills like fine movements of hand are improved among doctors and surgeons during operating procedures incorporating VR.[24] Investment is required in order to incorporate this technology in the curriculum. A study reported an evaluation of evidence-based learning programme in Taiwan, based on mobile and flipped classrooms, and revealed good results in knowledge, skills as well as self-efficacy.[25] Hence, effectiveness of this technology is undeniable and can be a game-changer in the near future that will make distant learning more productive and impactful during the period of the pandemic and in successive years.[26] Another study reported improved results for students in rehabilitation curricula with simulated standardised cases for skill development in musculoskeletal assessments and treatment.[27]

Hence, it is the responsibility of medical and rehabilitation faculty to devise innovative teaching methodologies that will help the students in developing clinical skills.

## Evaluation

Some institutions have now opted for online assessments based on multiple choice questions (MCQs). Now we have different online options for assessing the students, each with their own pros and cons. For instance, Google Forms is good for evaluation using MCQs, while learning management systems (LMS) include Moellim, Moodle, A Tutor, Dokeos and Olat.[28] This, in fact, has improved the evaluation system with minimised possibility of cheating by techniques like altered question sequence for each student. Some online supervision options are also in use, but these softwares are very expensive.

A paradigm shift in evaluation methodology has taken place in medical education. These include asynchronous methodologies, like assignments involving critical thinking as well as ability to solve problems, and evaluation portfolio, which is actually evidence of tasks conducted by the student with reflection to assess skills. On the other hand, synchronous evaluation, which is online, real-time evaluation including MCQs, open-book evaluations to see the ability of candidates' cognitive

skills, including critical thinking and creative skills, objectively structured evaluations, including practical as well as clinical evaluation applied online via LMS and viva etc.[29]

Even before the pandemic, most of the institutes in the United States were delivering education through online sources, while, with the exception of a small number of information technology (IT) institutes, Pakistan could not make much progress in the field of e-learning. During the pandemic, maintaining the educational activities became a challenge for educational institutions, with distance learning being the only reliable option. Zoom and MS Teams are now being used for e-learning by many universities in Pakistan, with most colleges and schools using recorded video lectures, WhatsApp, Facebook Live and YouTube as sources of distance learning due to lack of trained IT and teaching staff.

While platforms like Moodle are commonly used by educational institutions internationally, few Pakistani medical institutions have utilised it[9] owing to barriers like electricity and network problems as well as financial issues being faced by developing countries, like Pakistan and Bangladesh. As such, e-learning is a challenge for students who live in villages, resulting in a large number of students who could not effectively pursue their educational goals during the pandemic.[30]

During this pandemic, medical and allied education is more affected because the teaching staff is not trained for online education in Pakistan, meaning unavailability of IT facilities and trained staff.[31] The government of Pakistan is trying its best to develop e-learning programmes with the Virtual University, sponsored by the government. A consolidated form of classroom environment and online learning experience is provided by this institute.[32] In order to make online education effective in the country, teachers should undergo training courses. These free online platforms and resources are also helpful in learning about different online student evaluation procedures.[33] Institutes that are already delivering effective online education and experienced IT and medical teaching staff should guide those facing problems in online education.

In this era of modern technology, students can be evaluated academically by using different online platforms.[28] Educational institutions should develop IT departments and have the teaching staff trained. These universities can also use cost-effective and free-of-cost software, like Moodle.[34]

To prepare for each critical situation before its happening is the main lesson which we have learnt from the Covid-19 pandemic. Low-income countries, like Pakistan, are facing challenges like deficient faculty training, connectivity problems, online assessments, lack of institutional support as well as difficulty in recognising the dynamics of education provided online.[35] It is the need of the hour to update our medical and allied educational system, including rehabilitation. Rehabilitation students need technological help to convert to online learning with online relevant therapeutic sessions designed innovatively to cater to the reduction in practical training sessions.[36] Teachers should adopt IT technologies keeping in view students' exposure to improved learning.[37] Higher education institutes must dedicatedly develop their own IT departments. Cost-effective student and teacher-friendly softwares and internet can improve and elaborate the standard of e-learning.

## Conclusion

Educational institutions, under the umbrella of the HEC, in Pakistan used different coping mechanisms to deliver rehabilitation curriculum. Lack of VR and simulators is one of the hurdles in the way. For evaluations also, various online assessment techniques have been adopted. The government as well as health educationist and institutions should upgrade and revise the rehabilitation curriculum at theoretical and practical levels, and must try to convert the adversity of Covid-19 into an opportunity to develop standardized e-learning programmes and softwares to ensure a practical training environment.

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## References

1. Spinelli, A. Pellino G. COVID-19 pandemic: perspectives on an unfolding crisis. Br J Surg 2020; 107: 785-7.
2. Nasir N, Habib K, Khanum I, Khan N, Muhammad ZA, Mahmood SF. Clinical characteristics and outcomes of COVID-19: An Experience from a tertiary care center in Pakistan. J Infect Dev Ctries 2021; 15: 480-9.
3. Setiawan AR. Scientific Literacy Worksheets for Distance Learning in the Topic of Coronavirus 2019 (COVID-19). [Online] 2020 [Cited 2021 May 22]. Available from: URL: ttps://edarxiv.org/swjmk/
4. Ali A, Ramay MI, Shahzad M. Key Factors for Determining Student Satisfaction in Distance Learning Courses: A Study of Allama Iqbal Open University (AIOU) Islamabad, Pakistan. Turkish Online J Distance Educ 2011; 12: 114-27.
5. Murphy MPA. COVID-19 and emergency eLearning: Consequences of the securitization of higher education for post-pandemic pedagogy, Contemp Secur Policy 2020; 41: 492-505.
6. Kuppers B, Kerber F, Meyer U, Schroeder U. Beyond Lockdown: Towards Reliable e-Assessment. In: Igel C, Ullrich C. Bildungsräume 2017, Gesellschaft für Informatik, Bonn, 2017; pp 191-6.
7. Mumtaz N, Saqulain G, Mumtaz NM. National Rehabilitation

Framework- Covid-19 Perspective: A Narrative Review. Pak Armed Forces Med J 2020; 70 (COVID-19): 394-8.
8. Mumtaz N, Saqulain G, Mumtaz N. Online Academics in Pakistan: COVID-19 and Beyond. Pak J Med Sci 2021; 37: 283-7.
9. Memon AR, Rathore FA. Moodle and Online Learning in Pakistani Medical Universities: An opportunity worth exploring in higher education and research. J Pak Med Assoc 2018; 68: 1076-78.
10. Groff JS. Technology-Rich Innovative Learning Environments. OECD Innovative Learning Environments Project. [Online] 2013 [Cited 2021 April 10]. Available from: URL: http://www.oecd.org/edu/ceri/50300814.pdf
11. Samarasekera DD, Goh DLM, Lau TC. Medical School Approach to Manage the Current COVID-19 Crisis. Acad Med 2020; 95: 1126-7.
12. Hew KF, Lo CK. Flipped classroom improves student learning in health professions education: a meta-analysis. BMC Med Educ 2018; 18: 38.
13. Chen KS, Monrouxe L, Lu YH, Jenq CC, Chang YJ, Chang YC, et al. Academic outcomes of flipped classroom learning: a meta-analysis. Med Educ 2018; 52: 910-24.
14. Cook DA. The research we still are not doing: an agenda for the study of computer-based learning. Acad Med 2005; 80: 541-48.
15. Rahim A, Ali S, Ali S, Fayyaz H. Online education during covid -19 pandemic; an experience of riphah International university faculty of health and medical sciences. Pak Armed Forces Med J. 2020; 70: S506-12.
16. Chen CH, Mullen AJ. COVID-19 Can Catalyze the Modernization of Medical Education. JMIR Med Educ 2020; 6: e19725.
17. Ahmed H, Allaf M, Elghazaly H. COVID-19 and medical education. Lancet Infect Dis 2020; 20: 777-8.
18. Emanuel EJ. The Inevitable Reimagining of Medical Education. JAMA 2020; 323: 1127-8.
19. Hilburg R, Patel N, Ambruso S, Biewald MA, Farouk SS. Medical Education During the Coronavirus Disease-2019 Pandemic: Learning From a Distance. Adv Chronic Kidney Dis 2020; 27: 412-7.
20. Pottle J. Virtual reality and the transformation of medical education. Future Healthc J 2019; 6: 181-5.
21. Chaplin E, Hewitt S, Apps L, Bankarat J, Pulikottil-Jacob R, Boyce S, et al. Interactive web-based pulmonary rehabilitation programme: a randomised controlled feasibility trial. BMJ Open 2017; 7: e013682.
22. Pottle J. Virtual reality and the transformation of medical education. Future Healthc J 2019; 6: 181-5.
23. Radianti J, Majchrzak TA, Fromm J, Wohlgenannt I. A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. Computers Educ 2020; 147: 103778.
24. Gutiérrez JM, Mora CE, Diaz BA, Marrero AG. Virtual Technologies Trends in Education. Eurasia J Math Sci Technol 2017 13: 469-86.
25. Hsieh PL, Chen SH. Effectiveness of an Evidence-Based Practice Educational Intervention among School Nurses. Int J Environ. Res Public Health 2020; 17: 4063.
26. Spanemberg JC, Simões CC, Cardoso JA. The impacts of the COVID-19 pandemic on the teaching of dentistry in Brazil. J Dent Educ 2020; 84: 1185-7.
27. Hecimovich M, Volet S. Simulated learning in musculoskeletal assessment and rehabilitation education: comparing the effect of a simulation-based learning activity with a peer-based learning activity. BMC Med Educ 2014; 14: 253.
28. Aydin CC, Tirkes G. Open source learning management systems in distance learning. Turkish Online J Educ Technol 2010; 9: 175-84.
29. Khan RA, Jawaid M. Technology Enhanced Assessment (TEA) in COVID 19 Pandemic. Pak J Med Sci 2020; 36: S108-10.
30. Mridha M, Nihlen G, Erlandsson B, Khan AA, Islam MS, Sultana N. et al. E-learning for empowering the rural people in Bangladesh opportunities and challenges. 2013 Second International Conference on E-Learning and E-Technologies in Education (ICEEE). 2013; 323-8.
31. Farooq F, Rathore FA, Mansoor SN. Challenges of Online Medical Education in Pakistan During COVID-19 Pandemic. J Coll Physicians Surg Pak 2020; 30: 67-9.
32. Hussain I. Study on instructional paradigms of virtual education in Pakistan: a learners' perspective. Turkish Online J Educ Technol 2012; 11: 178-86.
33. Ferri F, Grifoni P, Guzzo T. Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations. Societies 2020; 10: 86.
34. Memon AR, Rathore FA. Moodle and Online Learning in Pakistani Medical Universities: An opportunity worth exploring in higher education and research. J Pak Med Assoc 2018; 68: 1076-8.
35. Farooq F, Rathore FA, Mansoor SN. Challenges of Online Medical Education in Pakistan During COVID-19 Pandemic. J Coll Physicians Surg Pak 2020; 30: 67-9.
36. Quek N, Alexanders J. 'Physiotherapy in a Post-Covid World'. Med Ed Publish 2020; 9: 279.
37. Sahu P. Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. Cureus 2020; 12: e7541.