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Original Article

Role of e-Health in Imparting Continuing Medical Education to General Practitioners of Rural Areas of Sindh

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ABSTRACT

Objective: To determine the effectiveness of e-Health in imparting continuing medical education to general practitioners of rural areas of Sindh.

Study Design: Prospective comparative study

Place and Duration of study: Department of Path, Indus Medical College, Tando Muhammad Khan, Pakistan from Feb to Jul 2021.

Methodology: General Practitioners of any age group gender and working experience, presently practising in rural areas of Sindh, attended all five e-Health Continuing Medical Education sessions organized by the Department of Pathology. Before each online session, pre-tests and post-tests were conducted on completing each of the five online sessions. Scores of all pre- and post-session tests were calculated for analysis for each participant.

Results: One hundred participants were included in the study, of which the majority (73%) were male compared to their counterparts. There was a statistically significant difference (p<0.05) between the pre and post-test scores of all study participants (24.92±6.98 and 30.91±6.19), respectively. While a statistically significant difference (p<0.05) between pre and post-test scores of male and female participants (24.47±6.43 and 26.11±8.31) and (30.64±5.62 and 31.62±7.59) respectively.

Conclusion: Continuing e-Health medical education sessions revealed a significant improvement in general practitioners' medical knowledge and professional competency, as reflected in the testing score.

Keywords: Continuing medical education, General Practitioners, Online learning, Telemedicine.

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INTRODUCTION

The e-Health has proved to be a valuable professional and academic tool that has proved its importance, worth, and academic value, especially in the remote rural areas of countries where logistic facilities are lacking and expensive and the benefitting medical professionals are proportionately fewer.[1] Imparting continuing medical education (CME) is possible through e-health services involving interactive online sessions by highly qualified medical professionals.[2] It is a time-saving emerging mode of information transfer for general practitioners (GPs) and/or physicians to improve their clinical knowledge and update their clinical skills without leaving their place of practice.[3,4]

The e-Health-based CME enriches the academic knowledge of general practitioners and other health care providers.5 In a country like Pakistan, many healthcare professionals practice in remote and rural areas, detached from medical institutions and thus deprived of the required current knowledge.[6] In this perspective, physically attending the CME programs to acquire requisite professional expertise is impossible due to the high cost of travelling to the cities where CME programs are traditionally conducted.[7] Moreover, face-to-face learning could be more time-effective and time-efficient. For improving the skills of GPs working in remote and rural areas of developing countries like Pakistan and keeping them up to date with recent advances in medicine, electronically-assisted healthcare training is the better choice to be adopted using limited resources in need of time.[8] Revalidating e-Health practice and licensing is urgently required in Pakistan to fill the legal and ethical lacunae associated with this medical practice. Moreover, raising awareness and familiarization of GPs with e-Health by conducting regular online sessions of CME but qualified consultants, health managers, and universities in different subjects will not only improve the skills of GPs but also benefit the patients.[9,10] Keeping this in view, the present study was designed to determine the effectiveness of e-Health in imparting continuing medical education to general practitioners of rural areas of Sindh.

METHODOLOGY

The prospective comparative study was conducted at the Department of Pathology, Indus Medical College, Tando Muhammad Khan, Sindh Pakistan

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from February to July 2021, after the approval from the Ethical Review Committee (ERC). The sample size was calculated using the Raosoft online sample size calculator keeping single population proportion at 50% as per the GPs willingness in rural areas to use e-health or telemedicine.[10]

Inclusion Criteria: General Practitioners of any age group, gender, working experience and presently practising, registered for the online CME sessions organized by Indus Medical College, were included.

Exclusion Criteria: All registered or unregistered medical practitioners with specialized degrees who did not attend all 5 CME sessions were excluded.

Written informed consent was also obtained from the selected participants after the purpose of the study was explained. GPs registered for CME sessions and meeting the inclusion criteria of the study were selected through a consecutive sampling technique. The feasibility of faculty members' awareness was seriously considered before conducting the CME sessions. It was anticipated that the users might need more familiarity and appropriate competency to use this electronic technology and hinder the study. To overcome this anticipated issue by the participants, a detailed session was held wherein the participants were briefed regarding the introduction of telemedicine/e-Health, the use of electronic media, the use of computer hardware/software as well as pre and post–tests formats of evaluation.

Before each online session, a pre-test was conducted, while a post-test was conducted on completion of each of the five Zoom sessions. All the e-Health sessions were conducted within one month. Participants were informed about the schedule of all five CME e-Health sessions through emails, WhatsApp messages or mobile texts.

For both pre and post-tests, pre–a structured questionnaire consisting of ten online multiple-choice questions (MCQs) with the same weightage to each one, i.e., a maximum score of 10, was used and answered by all participants. At the end of all five sessions, the total marks of each participant (attained in pre and post-sessions) were calculated and compared. A cumulative score of five sessions of 50 MCQs was 50.

Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 22:00. Qualitative variables were presented as frequencies and percentages. At the same time, quantitative variables are presented as mean ± standard deviations. Paired sample t-test was used for the comparative analysis of pre and post–test scores. The *p*-value of ≤ 0.05 was considered statistically significant.

RESULTS

A total of 100 participants were included in the study, of which the majority were male compared to their counterparts. The mean age of study participants was 35.2±3.7 (age range 26-43 years). Most of the participants belong to the 35-39 age group. Table-I demonstrates the comparison of participants' pre and post-test scores. The mean score was raised by 5.99 after online CME sessions, which was statistically significant ($p<0.05$).

On comparing the pre and post-test scores of both genders, there was a significant difference ($p<0.05$) in pre and post-test scores among both male and female participants. While among males, this difference was significantly higher compared with their counterparts. Moreover, a significant difference ($p<0.05$) was demonstrated among participants belonging to the age group (30-34 and 35-39 years) (Table-II).

Table-I: Comparison of Pre and Post Test Score in Study Sample (n=100)

Test Scores	Mean±SD	*p*-value
Pre–Test	24.92±6.98	0.001*
Post–Test	30.91±6.19	

Table- II: Gender and Age Groups Comparison of Pre and Post Test Score (n=100)

Baseline Characteristics	Test Score		*p*-value
	Pre-Test	Post-Test	
Gender			
Male	24.47±6.43	30.64±5.62	0.001*
Female	26.11±8.31	31.62±7.59	0.014*
Age Groups			
<30 years	25.55(9.63)	32.33(7.22)	0.11
30-34 years	25.71(6.55)	31.10(6.30)	0.002*
35-39 years	24.01 (6.73)	30.37(6.08)	0.001*
40 and above	26.9 (7.21)	31.9(6.13)	0.11

DISCUSSION

The e-Health is a cost-effective and secure mode of application of information technology for communications supporting health, health care, health education, health literature, health surveillance and research for healthcare professionals, including medical practitioners.[11,12] The present study was conducted to determine the effectiveness of e-health in imparting CME through online sessions to improve the skills of GPs in rural areas of Sindh. Different studies were

conducted worldwide using the online platform of e-health alone or mixed online as well as face-to-face sessions to compare the effectiveness of both approaches for CME in improving the skills of GPs and/or physicians.[13]

In our study, 100 GPs from different rural areas of Sindh were registered and participated in our study. Over two-thirds (73%) of participants were male and 27% were female. A similar proportion of study participants was reported in an Indian study by Gupta *et al*.[14] Nazim *et al*. also reported the same ratio of male and female participants in their two-day CME session.[15]

In the present study, we used a pre-and post-test assessment model to evaluate the effectiveness of e-health services in imparting the CME in rural areas GPs. The post-intervention model in the form of CME scoring was used to study the effectiveness and perceived educational value of e-health services and face-to-face and interactive sessions.[16,17] This learning model has sometimes been deemed to have limited utility because of the likelihood of various external factors swaying the results. These factors include the Hawthorne effect (Knowing that one is being tested may have an impact on the outcome), the halo effect (human proclivity to react positively or negatively to an instructor), and the practice effect (of a pre-test on a subsequent post-test). These constraints are inherent in most social research initiatives measuring knowledge acquisition.[18,19] To counteract these effects, quasi-experimental studies are frequently employed in educational research to assess the benefits of various interventional activities when randomization is not possible due to ethical concerns, difficulty in randomization and scarcity of or small available sample sizes.[14,18] Several studies have demonstrated that the CME and other related educational activities potentially improve the participants' understanding. Most of them used this pre- and post-test scoring method.[19-20]

The present study found significant and convincing improvement in medical knowledge after five CMEs online sessions and evaluation of score testing the GPs working in rural districts of Sindh province. Gupta *et al*. reported the significance of online medical education to health professionals.[14] The mean pre and post-test scores after online sessions in their study participants were (24.88 and 31.90) respectively. Our study's results also reflect the significant improvement in comparing the mean pre- (24.92±6.98) and post (30.91±6.19) test scores after online sessions. Moreover, another Pakistani study reported the mean gain in knowledge after CME session for healthcare providers between post-test and pre-test scores was 12.7%±6.8.15

The current study also demonstrated a statistically significant improvement (p<0.05) in pathology-related knowledge of male and female GPs after online CME sessions. The pre and post–test scores gained by male (24.47±6.43 and 30.64±5.62, p<0.05) and female participants (26.11±8.31 and 31.62±7.59, p<0.05) in this study, respectively. Our study's findings revealed a significant improvement in GPs' proficiency in practising in rural areas of Pakistan through online CME sessions. It will make a valuable addition to the existing medical knowledge and understanding of the GPs practising in rural districts of Sindh. To our knowledge, no similar work on e-health-based CMEs in Pathology has been carried out previously in our setting. Hence, the availability of relevant literature and data could be more extensive. Another constraint was the data on the number of registered GPs in rural areas of Sindh. This study involved only GPs practising in rural areas of Sindh province due to there will be a generalizability issue of our data across the country. Moreover, due to internet connectivity issues, most GPs did not get registered or could not continue all CME sessions.

CONCLUSION

Based on the findings, the study concluded that e-Health CME sessions revealed a significant improvement in general practitioners' medical knowledge and professional competency, as reflected in the testing score.

Further studies on a broader scale involving GPs in rural areas nationwide are recommended. At the same time, medical universities and stakeholders must focus on improving the access, quality, feasibility, credibility, and appropriateness of virtual modes of healthcare delivery.

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Conflict of Interest: None.

Authors' Contribution

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

IUM & AU: Data acquisition, data analysis, data interpretation, critical review, 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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