Development and Implementation of an e-Learning Program on Glasgow Coma Scale

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Abstract

Background With the advancement in technology, e-learning is an attractive platform to facilitate online continuing medical education. The aim of the study was to develop a web-based nursing education program on the Glasgow coma scale (GCS) and to assess the effectiveness of this module in improving the knowledge of nurses.

Methods   A one-group pretest posttest study was conducted among nurses working in a tertiary care hospital in New Delhi, India, from November 2015 till July 2016. Before administering the GCS module, an online questionnaire was used to assess the baseline knowledge. After the completion of the module, a posttest questionnaire was administered and assessed.

Results   A total of 3500 users completed the e-learning GCS module. The mean pretest score was 4.2 ± 2.1, and the mean posttest score was 7.3 ± 2.5. The mean difference in the score was statistically highly significant ($p < 0.05$).

Conclusion   The e-learning module is an effective means of providing continuing online education to the nurses, so that they can update their knowledge.

Keywords
► e-learning
► knowledge
► glasgow coma scale
► nurses
► evaluation

Introduction

With the advancement in technology, the field of health care is always evolving and improving. As a result, health care providers must stay current to provide great care to their patients.[1] Continuing education (CE) ensures that nurses are up to date with the newest innovations in nursing care and can use them while providing quality care to the patients. CE can take many forms, including conferences, workshops, journals, research articles, and online learning.[1]

Nurses in India are formally enhancing their knowledge and skills to accomplish their day-to-day activities and meet the requirements of the state nursing councils. According to the revised guidelines, a registered nurse (RN) must obtain 30 continuing nursing education (CNE) credit points per year for the next 5 years, for a total of 150 credit points in 5 years, to renew their registration.[2] But for the Indian setting, considering a large number of RNs, it is difficult for all the RNs to receive CNE credits through conferences, seminars, and classroom-based education.[1] Online CNEs can address this significant concern and could be one of the first steps toward addressing this critical problem.

e-learning is an attractive platform to facilitate online continuing medical education (CME) and CNE. It can enhance educational reforms for today's computer-literate generation and keep health care professionals up to speed in a rapidly changing world.[3] Information technology has dramatically changed the way health care staff teaches, learns, and works. With the introduction of newer technologies, there is an increased need for effective and scalable methods of

conducting continuing professional and continuous education.[4] e-learning is a new strategy that may enable teaching to become more effective and multisensory in nature. e-learning, also known as online computer (web)-based educational training, maybe the solution to keeping health care staff abreast of new technologies, information, and regulations. Compared with traditional classroom teaching, e-learning can deliver content faster to the entire staff, and be individualized to meet pace, language and reading level. Meta-analyses have shown that Internet-based CNE programs are just as effective in imparting knowledge as traditional formats of CNE. The purpose of the present study was to develop a web-based nursing education program on the Glasgow coma scale (GCS) and assess the effectiveness of this module in improving the knowledge of nurses.

Methodology

A one-group pretest posttest study was conducted in a tertiary care hospital in India among nursing professionals who were employed in the hospital from November 2015 to March 2016. The participants were recruited using a total enumeration technique. The study was conducted in two phases:

Phase I: development and implementation of an e-learning module on GCS.
Phase II: assessment of the effectiveness of this module in improving the knowledge of nurses regarding GCS.

Phase I: Development and Implementation of an e-learning Module on GCS

e-learning using moodle platform helps in providing a personalized learning atmosphere to the users. Through this platform, e-learning could be accessible to users both on the intranet facility of the hospital and the Internet. Users can access it through their laptops, smartphones, tablets, etc. The individual user identities of all nursing professionals working in the hospital were created in e-learning, and users were given training by nurse informatics specialists.

The content on the GCS was developed by nurses and validated by the senior author. The study material included both PowerPoint presentations as well as video demonstrations. This material is further enriched with images, short videos, and links to websites and source documents for further study. Users had access to a flexible online platform that is easy to navigate and allows them to exchange and study with communities of colearners. The modularity also enabled the users to progress at their own pace wherever in the world they were located.

Phase II: Assessment of the Effectiveness of this Module in Improving the Knowledge of Nurses regarding GCS

All nursing staff who completed the course were selected for the study. The module has a pretest, content and posttest, and the user had to complete the pretest before moving on to the content (chapters). The time taken to complete the pretest questionnaire was 10 minutes. The study procedure and protocol were reviewed and approved by the Ethics Committee of the hospital.

The scores of the pretest and posttest were retrieved from the database. A score of 1 was given for every correct answer, and 0 for an incorrect answer, with the maximum possible score being 10.

Results

The data was analyzed using SPSS v.20.Out of the total 5000 users enrolled for the course, 3500 nurses completed the study and comprised the study group. A paired t-test was done to assess for differences in the mean pretest and posttest scores. The mean pretest score of the subjects was 4.2 ± 2.1 and the mean posttest score was 7.3 ± 2.5. The mean difference in the score was statistically significant ($p < 0.05$).

Discussion

In medical teaching, e-learning facilitates a revolutionary shift toward contemporary adult learning theory, in which educators no longer serve as mere distributors of content but as facilitators of learning and assessors of competency.[5] In this new paradigm, adult learning is goal-oriented, and they learn by relating it to past experiences. A previous study found that e-learning is most effective when health care professionals are allowed to learn at their own time and select topics that are most relevant to their professional practice, accommodating just-in-time learning.[6] Thus, e-learning results in more effective and efficient learning experiences.

e-learning helps users to have access to a flexible online platform that is easy to navigate and allows them to exchange and study with communities of colearners. The modularity also enables users to progress at their own pace wherever in the world they are located. Users have the flexibility to determine what, where, and when to learn. They can repeat learning units as often as required and control the duration of learning sessions, and the organization can realize significant benefits in reduced travel, thereby saving time and cost.

In our opinion, the results of the present study suggest that the e-learning approach can be used for providing training and also be used for CME programs. The findings of the study were in congruence with previously published literature.[3,7,8]

Limitations

As this was a cross-sectional study, we did not address knowledge retention over time, or the ability of its participants to convert the theoretical knowledge gained into practical knowledge, which could be applied at the bedside; however, efforts were made to make the questionnaires more relevant to practical aspects. The participant's demographic variables are not reported and were not correlated with the knowledge scores, as it was not available in the system.

Conclusion

The e-learning module is an effective means of providing continuing online education to the nurses, so that they can update their knowledge. We believe that this approach is worthy of consideration for various settings of continuing professional education—from residency programs and advanced specialist training to nursing education.

Conflict of Interest
None declared.

References

1 Balamurugan G. Online learning – Are Indian nurses ready? Indian J Psy Nsg 2019;16(02):129
2 Kumari K. Indian Nursing Council (Continuing Nursing Education) Regulations. 2019- Amendment Notification Dtd 6 Nov 2020 | Central Govt Employees – 7th Pay Commission - Staff News. Accessed August 14, 2021 at: https://www.staffnews.in/2020/11/indian-nursing-council-continuing-nursing-education-regulations-2019-amendment.html
3 Wutoh R, Boren SA, Balas EA. eLearning: a review of Internet-based continuing medical education. J Contin Educ Health Prof 2004;24(01):20–30
4 Mariani AW, Terra RM, Pêgo-Fernandes PM. E-Learning: from useful to indispensable tool. Sao Paulo Med J 2012;130(06): 357–359
5 Ruiz JG, Mintzer MJ, Leipzig RM. The impact of E-learning in medical education. Acad Med 2006;81(03):207–212
6 Pullen DL. An evaluative case study of online learning for healthcare professionals. J Contin Educ Nurs 2006;37(05):225–232
7 Curran VR, Fleet L. A review of evaluation outcomes of web-based continuing medical education. Med Educ 2005;39(06): 561–567
8 Kolb S, Reichert J, Hege I, et al; NetWoRM group. European dissemination of a web- and case-based learning system for occupational medicine: NetWoRM Europe. Int Arch Occup Environ Health 2007;80(06):553–557