

Abstract

Introduction: Dengue is a public health concern in Sri Lanka. Centre for Clinical Management of Dengue and Dengue Haemorrhagic Fever, Negombo is a dengue treatment facility where patients in the critical phase of dengue haemorrhagic fever are managed successfully. The traditional paper-based critical phase monitoring chart can be digitized into an electronic monitoring chart adding the necessary calculation formulas and theories to automate the graphical presentations in real time. This could save time, aid in decision making and ensure minimal errors in calculations compared to the paper-based monitoring chart.

Objectives: Primary objective of this study is to develop an electronic monitoring chart to supersede the traditional paper-based monitoring chart to manage the critical 48 hours of Dengue Haemorrhagic Fever, at the Centre for Clinical Management of Dengue and Dengue Haemorrhagic Fever, Negombo. Requirement elicitation and analysis, design and development, testing, and the usability assessment are the specific objectives.

Methods: This research study follows action research methodology with a component of qualitative data analysis. Problem formulation in a clinical setting, design, development of software iteratively, intervention in the clinical setting and evaluation of the software has been done and learning outcomes have been formalized. A software was designed for the formulated problem after the requirement analysis and specification. Development of the prototype software was done in Microsoft 365 Access environment using the available software development tools and graphical user interface development forms of Microsoft Access. The developed software was introduced to the clinical setting after hands on training for testing and to evaluate the usability. In-test and post-test semi-structured interviews have been successfully conducted for the software acceptance testing and evaluation purpose. Qualitative data thematic analysis was done to identify different codes and themes.

Results: As a result of this study, according to the principles of action design research, a prototype of the software was designed and developed. The analysis of data gathered in the testing and evaluation phase revealed that the staff had a positive attitude

towards integration of an electronic DHF critical phase monitoring chart. As the study participant had the opportunity to use the system to get practical experience and obtain knowledge regarding the software, satisfactory appreciative comments have been stated regarding the software prototype. Participants also identified and highlighted issues of the system and there were suggestions to improve the future advancement in software development.

Conclusion: The patient monitoring activities in relation to the DHF critical phase monitoring chart are repeated tasks which can be efficiently done with the help of an electronic monitoring chart which consists of automated fluid volume calculations, which would be beneficial for the staff by saving time, minimizing errors, and facilitating timely decision making to improve patient care. It is necessary to iteratively develop prototypes with target functionality with the help of a professional expertise including software engineers and biomedical informatics experts in development of advance prototypes in future for integration.