



Training Evaluation Report on Modified WHO Hypertension Protocol and Simple App Software

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ABSTRACT

Non-communicable diseases (NCDs), particularly cardiovascular diseases (CVDs), pose a significant health challenge globally and in Sri Lanka, contributing to substantial morbidity and mortality. Hypertension, a major risk factor for CVDs, remains underdiagnosed and poorly managed in Sri Lanka. A two-day training programme based on the Modified WHO Hypertension Protocol and the Simple App software was conducted for 23 healthcare professionals (11 medical officers and 12 nursing officers) in the Kalutara district to enhance their knowledge and skills in hypertension management. The training included lectures, practical sessions, and interactive discussions. Pre- and post-training assessments were conducted using a structured questionnaire to evaluate changes in knowledge, attitudes, and practices (KAP). Results revealed a significant improvement in KAP, with average scores increasing from 7.14 pre-training to 18.33 post-training. Awareness and proficiency in using the Simple App for hypertension management increased markedly, from 6 to all 23 participants. These findings demonstrate the effectiveness of structured training and digital tool integration in improving hypertension management. Regular training and evaluation are recommended to sustain and expand these outcomes.

Keywords: Hypertension, Non-Communicable Diseases, Training Evaluation, Simple App, Digital Health Tools

1. INTRODUCTION

Non-communicable diseases (NCDs) have emerged as a major global health challenge, accounting for a significant proportion of morbidity and mortality worldwide. Among NCDs, cardiovascular diseases (CVDs), diabetes mellitus, cancers, and chronic respiratory diseases are the leading causes of death. CVDs, such as heart attacks and strokes, are responsible for a significant proportion of NCD-related deaths, with over 75% occurring in lower and middle-income countries (LMIC). In 2016, CVDs resulted in 17.9 million deaths worldwide, with heart attacks and strokes accounting for 85% of these deaths (Anon., 2025). Furthermore, NCDs accounted for 17 million premature deaths under the age of 70, with 82% occurring in LMICs. Of these premature deaths, 37% were caused by CVDs. These statistics highlight the urgent need for effective prevention and management of NCDs, particularly in LMICs where the burden is disproportionately high.

In Sri Lanka, non-communicable diseases (NCDs) pose a significant public health challenge, as they account for a substantial proportion of total deaths and disability-adjusted life years. Specifically, NCDs are responsible for 83% of total deaths and 77% of disability-adjusted life years in Sri Lanka (Diseases, 2021). Among NCDs, ischemic heart diseases are the leading cause of death, contributing to 34% of all deaths in Sri Lanka in 2016. These statistics reflect the critical need for effective prevention and management strategies to address the burden of NCDs in Sri Lanka.

Hypertension is a crucial intermediate risk factor and a primary contributor to CVDs globally, causing an estimated 9.4 million deaths in 2010. As per the findings of the STEPS survey in 2015, the prevalence of hypertension or increased blood pressure was 25.4% and 26.7% among Sri Lankan men and women aged 18 years and above, respectively (Anon., 2021). However, hypertension still remains largely underdiagnosed, undertreated, and inadequately controlled. The STEPs survey (2015) further revealed that almost 31% of the Sri Lankan population had never undergone blood pressure (Anon., 2021). These findings suggest that the Sri Lankan population is highly susceptible to hypertension and, consequently, to CVDs and associated morbidity and mortality.

Hypertension management requires adequate training and skills among healthcare professionals. One effective strategy to improve hypertension management is to transfer staff who are trained in the management of hypertension to areas where there is a shortage of trained healthcare professionals. This can be done by conducting training programmes for new staff continuously and evaluating the effectiveness of such programmes.

Evaluation of such training programmes is critical to ensure that the training is effective in improving the knowledge and skills of healthcare professionals. The evaluation can be done through pre- and post-training assessments of the participants' knowledge and skills, as well as through follow-up assessments to determine the long-term impact of the training. Feedback from participants can also be collected to identify areas of improvement for future training programmes.

The Simple mobile application

The Simple mobile application, a free, open-source digital information system for large-scale HTN control programmes was launched in October 2018 (Burka, et al., 2022).

Simple App is designed to support large-scale hypertension and diabetes management programs. The app is actively used in 7,805 public health facilities in India, Bangladesh, Ethiopia, and Sri Lanka to manage 3,468,910 patients with hypertension and diabetes (Anon., 2023).

Simple App includes

- (1) a mobile point-of-care app for healthcare workers to record patient visits and review treatment history ([online supplemental figure 1](#));
- (2) a web-based dashboard for system managers to monitor programme performance across facilities and regions ([online supplemental figure 2](#));
- (3) tools that generate lists of patients overdue for care and send automated messages to promote continuity of care.

2. METHODS

2.1. Development of the training programme

The development of the training module for hypertension management was initiated with a comprehensive review of the relevant literature. This review focused on the best practices in hypertension management, including medication adherence, lifestyle modifications, and the use of clinical guidelines. We also consulted with senior clinicians and other experts in the field of hypertension management to ensure that the content of the training module was accurate and up-to-date.

Based on this review, we identified key topics to be covered in the training module, which included hypertension diagnosis and assessment, lifestyle modifications, medication management, and patient education. We then designed the module to include a combination of lectures, practical sessions, case studies, and group discussions, in order to provide a comprehensive and interactive learning experience.

Overall, the development of the training module was a collaborative effort that involved a comprehensive review of the literature, consultation with senior clinicians, and feedback from trainees. The resulting module is a comprehensive and interactive learning experience that is designed to improve the quality of hypertension management in our healthcare system.

2.2. Study population

The study population comprised of medical officers and nursing officers working in Primary Medical Care Institutions (PMCI) located in the Kalutara district.

2.3. Conduct of training module

The training module was conducted over two days in a conference room at the Laya Lesure Hotel, Kukuleganga. The training was led by a team of experienced healthcare professionals, including DDG-NCD, Director NCD, RDHS Kalutara, Consultant physician, Consultant Family physician and Consultant Nutritionist. The training content was based on the modified WHO hypertension protocol.

On the first day, the training began with a series of lectures, including a Zoom lecture conducted by an Indian Physician covering topics such as the epidemiology of hypertension, risk factors for hypertension, diagnosis of hypertension, and pharmacological and non-pharmacological management of hypertension. These lectures were followed by group activities, allowing the participants to apply the concepts they had learned to real-life scenarios.

On the second day, practical sessions were conducted to teach the participants how to measure blood pressure accurately, how to use the "Simple App" software in the management of hypertensive patients, identify and manage hypertensive emergencies, and counsel patients on lifestyle modifications. The practical sessions were conducted in small groups to ensure that each participant had the opportunity to practice and receive feedback from the trainers.

The participants were encouraged to ask questions and share their experiences throughout the training. At the end of each day, a brief quiz was conducted to reinforce the concepts learned during the training.

Overall, the training module was well received by the participants, who reported feeling more confident in their ability to manage hypertension after completing the training.

2.4. Assessment tool

A pre and post-training questionnaire was developed to evaluate the training programme's effectiveness. The questionnaire was designed to assess the knowledge, attitudes and practices (KAP) related to hypertension management among the medical officers and nursing officers working in PMCI of the Kalutara district.

The questionnaire comprised 15 questions covering various aspects of hypertension management, such as risk factors, diagnosis, treatment, and complications. The questions were developed based on the content of the training module and relevant guidelines and literature.

Before the training programme, the pre-training questionnaire was administered to the participants to assess their baseline knowledge, attitudes and practices related to hypertension management. The same questionnaire was administered immediately after the completion of the training programme as the post-training questionnaire to assess the improvement in KAP of the participants.

As the study population consisted of medical officers and nursing officers who are typically well-educated, the questionnaire was developed in the English language.

The questionnaire was pilot tested on a small group of healthcare professionals to ensure the clarity and understandability of the questions. The feedback from the pilot test was used to refine the questionnaire before its administration to the study participants.

2.5. Data management and analysis

The data collected through the pre and post-training questionnaires were entered into a Microsoft Excel spreadsheet and were analyzed using descriptive statistics. The mean scores of the pre and post-training questionnaires were compared to determine the statistical significance of the improvement in KAP.

3. RESULTS

The total number of participants in the study was 23 which consists of 11 medical officers and 12 nursing officers.

Table 1: Results of the training programme

Metric	Value
Average Score (Pre-Training)	7.14
Average Score (Post-Training)	18.33
Score Improvement	11.19
Aware of App (Pre-Training)	10 out of 23
Aware of App (Post-Training)	23 out of 23
Knows App Usage (Pre-Training)	6 out of 23
Knows App Usage (Post-Training)	23 out of 23

The results of the training programme showed a marked improvement in the knowledge, attitudes, and practices (KAP) related to hypertension management among participants.

Knowledge Improvement:

The average pre-training score was 7.14, which increased significantly to 18.33 in the post-training assessment, demonstrating a mean improvement of 11.19 points.

Simple App Awareness and Usage:

Awareness of the Simple App mobile application improved from 10 out of 23 participants pre-training to 23 out of 23 post-training.

Similarly, the ability to use the Simple App increased from 6 out of 23 participants pre-training to 23 out of 23 post-training.

Key Insights

The post-training results indicate a substantial enhancement in participants' knowledge and practical skills in managing hypertension.

All participants demonstrated proficiency in using the Simple App, suggesting the training successfully integrated digital tools into hypertension management practices.

4. DISCUSSION

The findings from this training evaluation highlight the effectiveness of structured, interactive training programmes in improving healthcare professionals' capacity to manage hypertension. The significant improvement in KAP, as evidenced by the pre- and post-training assessments, demonstrates the potential of such initiatives to align with global and national goals for NCD management.

The improvement in the participants' understanding of hypertension management, as well as their confidence in utilizing digital tools such as the Simple App, indicates a successful integration of both clinical and technological aspects into routine care. This aligns with the recommendations of the World Health Organization and other health authorities advocating for the adoption of innovative tools to enhance healthcare delivery.

5. CONCLUSION

The training programme on the Modified WHO hypertension protocol and the Simple App software has demonstrated substantial success in improving healthcare professionals' knowledge and skills in managing hypertension.

Key achievements include are,

Significant improvement in participants' knowledge, as reflected by the increased scores in post-training assessments.

Full adoption and understanding of the Simple App among participants, enabling more effective patient management.

The positive outcomes of this programme highlight the importance of structured training and the integration of digital tools in enhancing healthcare delivery. Regular training sessions and ongoing evaluations are crucial to maintain and further improve these results.

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