Using the Ottawa Model of Research Use to Implement a WHO Hypertension Education Interventions in Nurse-Led Hypertension Pilot Program in Uganda

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Abstract

Background: Evidence best strategies to address the burden of disease from hypertension through knowledge translation (KT) in Uganda are lacking. This study aimed at demonstrating the use of the Ottawa Model of research use as a KT model in the pilot study among nurses caring for patients with hypertension. **Methods:** A descriptive and feasibility pilot study using the Ottawa Model of Research Use (OMRU) and involving a convenient sample of nurses was completed in 2013. The six step approach of the OMRU assessed barriers and facilitators, monitor interventions and evaluate outcomes in the study. Primary outcomes data were collected using pre-post interventions tools that assessed nurses' knowledge, skills, and attitudes about hypertension risk assessment and management. Paired t-tests were run on outcomes data and reported. **Results:** There was significant improvement in knowledge, skills, and attitudes after three months of implementing multimodal educational strategies using the WHO/ISH training manual. **Conclusions**: The Ottawa Model of Research Use provided the best framework for implementing a successful nurse-led care intervention in hypertension management with improved knowledge, skills, and attitudes among nurses. Knowledge translation (KT) Models need to be integrated in health professional education to promote the use of evidence based practice for better patient outcomes.

Keywords: Hypertension, Knowledge Translation, Nurses, Ottawa Model of Research Use, Uganda

Background

Cardiovascular disease (CVD) is a rising burden and accounts for 27% of all deaths from non-communicable diseases (NCDs) in Uganda (Guwatudde, Mutungi, Wesonga et al., 2015; WHO, 2014). Recent data show the probability of dying between the ages of 30 and 70 from the four main non-communicable diseases is 21% (WHO, 2014). Hypertension is a major risk factor for CVD ranking 14 among the top 50 causes of death in Uganda (World Health Ranking, 2014). The effects of uncontrolled hypertension may lead to a number of non-communicable diseases (NCDs) including stroke, myocardial infarction, cardiac failure, and renal failure. The current hypertension prevalence rates in Uganda ranging from 23.3% to 28.5% (Guwatudde et al., 2015) along with the prevalence of pre-hypertension at 36.9% represents a public health crisis (Guwatudde et al., 2015).

As Uganda becomes more urbanized, there is an associated increase in risk factors including obesity, smoking, alcohol, sedentary behaviors, and a lower vegetable and fruit intake. These risk factors are often not identified or assessed and treatment and evaluation of interventions are not standardized.

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The World Health Organization (WHO) projects that the number of hypertensive cases in Sub-Saharan Africa (SSA) will increase from an estimated 80 million in 2000 to 150 million in 2025 (WHO, 2013). Uganda is one of the fastest growing developing countries with a total population of 36 million (WHO, 2014). It is envisioned that as the population lives longer without an evidenced based hypertension intervention program, CVD will get closer to being the number one cause of death of adults between the ages of 15 and 64. Currently, based on the World Health statistics, Uganda's age standardized death rate for hypertension and diabetes are ranked at 88th and 46th positions respectively (World Health Ranking, 2014). Uganda's response to NCDs is still a challenge as evidenced by having no operational national policy, strategy, nor action plan to respond to several NCDs affecting the population (WHO, 2014). This has ultimately led to inadequate provision of evidence-based national guidelines, standards and protocols to tackle major NCDs (WHO, 2014).

Uganda continues to face health workforce shortages which affect its capacity to manage both infectious and non-communicable diseases (WHO, 2013). Statistics show that the health work force is estimated to be only 1.2 physicians per 10,000 patients and 13.1 nurses and midwives per 10,000 patients (WHO, 2014; Maher, Waswa, Baisley et al., 2011). In Uganda still, nurses and midwives form the largest health workforce and therefore should be optimally utilized (Bakris, Hill, Mancia et al., 2008). Unfortunately, their capacity to manage non-communicable diseases such as hypertension, diabetes, and cancer without a task shifting policy poses more challenges for nursing practice (Joshi, Alim, Kenge., et al., 2014). Yet there are numerous studies that support nurses' capacity in the management of infectious disease in Uganda (Callaghan, Ford & Schneider, 2010). However, there are few studies that supportnurses' capacity in identifying and managing non-communicable diseases. More studies that support and evaluate task shifting in noncommunicable disease programs need to be conducted (Glynn, Murphy, Moth et al., 2010; Katende, Groves & Becker, 2014; Katende & Becker, 2016).

In Uganda, evidence based practice and knowledge translation (KT) is relatively new concept and evaluation of this method as it relates to health outcomes is very limited. Attempts of incorporating KT in the majority of nurses' and midwives' bachelor's and master's program curricula, in Uganda, are in progress through various nurses and midwifery curricula development and revision. Our study demonstrated the use of the most popular KT model, the "Ottawa Model of Research Use" by Graham and Logan (White & Dudley-Brown, 2012; Graham & Logan, 2004).

The Ottawa Model of Research Use

Translation theory and frameworks are guiding tools that focus on the interrelationships and complex organizational dimensions that are relevant to translating research or new knowledge into practice (White & Dudley-Brown, 2012; Graham & Logan, 2004). Although the development of translational frameworks has been slow, it is noticeable that this approach for introducing evidence, changing behavior and performance are effectively being used to improve the delivery of care and other services (White & Dudley-Brown, 2012; Graham & Logan, 2004). Graham & Logan (2004) assert that research is a dynamic process of decision and actions that are interrelated (Graham & Logan, 2004). These dynamic and interactive processes between research development and use are reflective of the complex nature of a knowledge translation framework that needs to be well described during application. It is imperative to note that the needs of patients or clients must be the primary focus throughout knowledge translation processes while increasing greater utilization of evidence based research in systems of care (White & Dudley-Brown, 2012; Graham & Logan, 2001). This study illustrates the effectiveness of implementing a WHO/ISH education training program among nurses working in an outpatient clinic in Uganda using of the Ottawa Model of Research Use as a knowledge translation model.

Methods

Design

A descriptive and feasibility pilot study involving nurses in a one group pre-post intervention study design was completed in January 2013.

The Ottawa Model of Research Use was used to guide the implementation of evidence based interventions in a nurse led education program (Figure 1). The study was approved by the Mulago Hospital Research and Ethics Committee (MREC: 248).

Sampling frame and sample

A convenient sample of seven nurses working in the Mulagomedical outpatient clinic was employed. Mulagomedical outpatient clinic is part of a large national referral and teaching hospital with 1500 beds. The outpatient clinic receives more than 300 patients per day and operates five days a week. It receives patients referred from across the country who seek medical services ranging from screening, diagnostics, drug treatment, patient education, and referrals. The clinic is managed by three consulting physicians, four physician assistants, one pharmacist, and seven nurses.

Instruments and data collection

Prior to data collection, all the seven nurses completed a consent form agreeing to participate in the study. They were assured of confidentiality and that the information collected was solely used for the study. Demographic data for the participating nurses was collected using a short form demographic survey provided separately from the main outcomes data collection tools. Primary outcomes data was collected using pre-post interventions questionnaire on knowledge, attitudes, and skills. Nurses' knowledge was assessed with the use of the knowledge 10-item multiple choice pre-post interventions tool developed and pretested by the investigator. This tool assessed the participants' knowledge on high blood pressure diagnosis, blood pressure classification, CVD risk factors, and patient education. Participating nurses' attitudes were assessed by the attitudes to assessment strategies for prevention of high blood pressure adapted with permission from Dr. Isioma of Nigeria (Isioma, 2012). The pre-post intervention skills were assessed using a 12-step standardized blood pressure measurement techniques skills checklist (Isioma, 2012).

Analysis

All the pre-post interventions data from knowledge, skills and attitudes were entered and analyzed using the Statistical Package for Social Sciences (SPSS) Version 16. Paired t-sample tests were conducted on all the three outcome variables with confidence interval set at 95%.

Results

The results are presented with the use of the phases from the adapted Ottawa Model of Research Use framework (Figure 1).

Phase 1: Assess barriers and supports

Graham & Logan (2004) noted that the assessment of barriers and supports for a proposed change is the first important phase of all study projects (Graham & Logan, 2004). Although the barriers were identified in the pilot study and included; professional, political, and economic elements: the same elements later became the platform for support in the initiation and conceptualization of the nurse-led hypertension prevention, detection, and treatment (N-HPDT) project. Mulago National referral hospital as a practice environment was assessed. Observational and informal assessments were conducted to ascertain the feasibility of implementing the nurse led hypertension pilot project interventions. It was confirmed that Mulago National Referral hospital was a complex environment with many departments, and therefore a small preliminary study was conducted in order to evaluate feasibility, time, and cost in an attempt to improve upon the study design prior to performance of a full-scale project.

Data from multiple observations also that there were limited or no use of hypertension guidelines leading to variability in practice among health care providers in the identification, assessment and management of patients with hypertension.

In addition, there was no continuing professional development (CPD) procedures for continued nursing education (CNE) conducted at the outpatient department for the nurses to increase their knowledge and skills in the management of hypertension. The nurses who conducted triage and screened patients for hypertension and diabetes on a day-to-day basis were inconsistent in taking accurate blood pressures. Once these barriers were identified, there were reported to management of the hospital. Management responded by assigning the chief nurse to construct strategies to address these issues. Support from management by assigning the chief nurse formed part of organizational support for this pilot project. Consensus was reached among management that an evaluation of strategies should be implemented as a pilot study and that nurses who volunteered from the outpatient clinic should be given the first opportunity to participate.

Other support for this pilot project and the proposed interventions came from documentary review of past medical records, which showed that some patients were discharged home with undetected, poorly managed or under-treated hypertension (Katende, Groves & Becker, 2014). The nurses in the pilot project agreed to participate in this project with enthusiasm. These nurses wanted to become expert nurses in hypertension detection and management while facilitating evidence based practice in their own practice environment, performing newly acquired knowledge and skills.

Phase 2: Monitor interventions and degree of use.

During the intervention phase, a multimodal and multifaceted educational program adapted from the WHO-ISH training Manual for Cardiovascular Risk Assessment and Management (2009) (WHO, 2010) was used. Multiple evidence based strategies were used including: provider education; follow up; feedback and use of reminder system; and one-on-one supervision. The participating nurses were asked to draw up a schedule to complete a 3 months educational program for practice change. Educational strategies included: handouts, hypertension lectures on CDs and algorithms which supplemented the theory and practical sessions. The theory sessions were conducted in the afternoons which allowed the nurses to practice using their new knowledge and skills during screening and admissions in clinic the following morning. Debriefing using self-reflections on the practice of newly acquired knowledge and skills were then shared in the afternoon session with a facilitator.

Phase 3: Outcomes

Participants' demographic characteristics data were analyzed. All the nurses (100%) completed the three month education intervention program. The majority were females and had attained a diploma in nursing (71.4%) and 42.9% were at the level of a nursing officer in professional nursing.

Primary outcomes

Pre-post interventions outcomes data were computed using the paired t-test on all the three outcome measures. The primary outcomes of knowledge, skills and attitudes about hypertension detection, risk assessment, blood pressure monitoring skills were completed. At the end of the three month education interventions study, results showed significant changes in all three primary outcomes from baselines (Figure 2). While there were significant changes in all three primary outcomes (Figure 2), a greatest change was observed in the participating nurses' attitude (76%), p<0.002 (Figure 2). There were upward trends in the mean scores gained in all three primary outcomes after implementing three month intervention education program (Figure 2).

Secondary outcomes

The pilot study was not set to measure any secondary outcomes arising from the education interventions. Although not planned for during the proposal development of the pilot study, other observations emerged during the implementation and evaluation of the education interventions. For example, nurses were able to collect data on new cases of hypertension not previously recognized (an average of 16-19 newly diagnosed hypertensive patients/day).

Another finding was an increase in the number of patients scheduled for follow-up for uncontrolled blood pressures guided by instructions learned in the three month course. Referrals from nearby health centers for hypertension were also documented for the first time by these nurses. Lastly, there was a system modification at the outpatient clinic in which all clients before being assigned to a physician or physician assistant all underwent patient education, involving cardiovascular risk reduction. These education sessions occurred each morning at the outpatient clinic conducted by one of the seven nurses scheduled to work on that day.

Discussion

Knowledge translation (KT) is a relatively new concept for researchers, practitioners, and educators in Uganda. Our pilot study is a valuable example of knowledge translation that demonstrates the feasibility of effecting change using the Ottawa Model of Research Use (OMRU). As noted by various authors, great efforts are needed to enhance the science and practice of knowledge translation as a strategy to improve the quality of care (White & Dudley-Brown, 2012; Graham & Logan, 2004; Graham & Logan, 2004; Field, Both, Ilott et al., 2014). It would not be possible to achieve both primary and secondary outcomes without a formal and systematic process of assessment, planning and evaluation throughout this study. The theoretical underpinnings of the OMRU are based on its use as mechanisms of planned change (White & Dudley-Brown, 2012; Graham & Logan, 2004).

As a guiding framework, the OMRU was used: to select, monitor and evaluate KT strategies based on the situational assessment, to select appropriate strategies and interventions to increase awareness and understanding of the innovation, as well as to provide the skills and training for the nurse to be able to carry out the innovation. (Graham & Logan, 2004; Graham & Logan, 2004). Our study used both informal and formal processes to assess barriers and facilitators as an initial step to advocate for KT interventions in a nurse-led care outpatient model. With the increasing burden of non-communicable diseases occurring in Uganda, and the global challenges on knowledge translation (Graham & Logan, 2004), our pilot study results could be used to strengthen partnerships that enhance knowledge translation processes in the health care delivery system. Fortunately, there is literature that supports the use of conceptual frameworks in various practice environments for organizing and guiding innovation in a systematic manner to improve practice and outcomes (Graham & Logan, 2004; Graham & Logan, 2004; Field et al., 2014; Isioma, 2012); WHO. 2010; Rycroft - Malone, 2004; Rycroft-Malone & Bucknall, 2010). The OMRU is a useful guide for novice researchers with KT interest initiating pilot studies as they build their self-confidence. These pilot studies which use a systematic approach will build the basis for innovative evidence based practice associated with practice improvement and better outcomes (Graham & Logan, 2004).

During the implementation of selected KT strategies for health programs and particularly those that are intended to influence behavior, practice and policy changes, a carefully documented process needs to be followed (Straus, Tetroe& Graham, 2011). In this study, the OMRU provides an opportunity to document all the processes that the study had to undertake before its launch and implementation. Involving top leadership as "champions" of the pilot study to influence other processes in shared governance for a shared vision was a great strategy useful in successful implementation (Graham & Logan, 2004). Continuously, during our pilot study implementation, we observed the willingness to change among the participating nurses, enhanced interrelationships and enthusiasm in developing personal skills (Graham & Logan 2004; Straus, Tetroe & Graham, 2011). It is therefore not surprising that this study strategies effected changes in attitude outcome among participants. One could also argue that working with small number of nurses for attitude change was expected. This therefore infers that changing health care providers' behavior using a knowledge translation model although complex is feasible but requires concerted efforts. Leadership is a crucial component for planned change using a systematic approach to realize better outcomes as their aim is to effect change at the organizational and systems level. (Graham & Logan, 2004; Field et al., 2014).

Similarly, skills acquisition in the KT pilot study showed significant changes. This could be simply because participating nurses at baseline were given an opportunity to assess their own practices before being introduced to the newly available and widely published WHOM guidelines for practice change through self–practice reflections (WHO, 2010). Changing the way a health provider provides care poses a great challenge especially when the practice has been established over years.

Participating nurses were willing to change their own practices and were supported by supervised practice with real patients during the morning day-to-day routine work as they continued to participate in screening and admission of patients in the outpatient clinic. During these practice sessions with supervision, nurses were able to appreciate the use of the WHO/ISH guidelines that included risk assessment of patients with hypertension. It was therefore evident that this pilot study could only be possible with the use of the OMRU in a KT process for health systems change (Straus Tetroe & Graham, 2011). Further studies need to be conducted and published using OMRU especially in low resource environments for non-communicable diseases detection and management to share challenges while providing a framework to implement innovations which are effective. Such studies need to receive support from leadership within organizations and adequate funding for larger studies and successful implementation.

Implications for practice

This pilot study demonstrates an effective use of a knowledge translation model, the OMRU, which guided this process of transferring research into practice in a nurse-led hypertension study. All six steps of the KT model are critical as they form the building blocks to successful implementation and assessment of the innovation or intervention. Nursing education and practice should incorporate use of evidence based practice (EBP) using appropriate and feasible knowledge translation examples to increase use of research into practice in various settings. Emphasis should be put on inter-professional education by integrating KT models into curricula for improved nursing practices and better patient outcomes. For successful KT processes and activities to occur, adequate resources must be allocated and available (Straus, Tetroe& Graham, 2011).

Implications for future nursing Research

Knowledge translation is increasingly being used to improve patient outcomes. This study was limited in the number of participating nurses with a primary focus on primary outcomes. Follow up studies need to be conducted to assess the impact of the intervention studies on other outcomes and whether behavior changes can be sustained. Knowledge translation studies involving larger populations and over longer periods of time need to be conducted to provide stronger evidence on potential benefits including improved health care, quality of life and enhanced productivity (Straus, Tetroe& Graham, 2011).

Conclusions

The Ottawa Model of Research Use provided an approach to guide the implementation of a nurse-led strategy for hypertension detection and management in an outpatient clinic in Uganda which resulted in improved knowledge, skills and attitudes among participating nurses. The identification of facilitators and barriers, the selection, monitoring and evaluation of interventions and outcomes are very important steps in the KT model that are the basis for successful implementation of evidence based innovation into practice. The author recommends the use of KT models in similar complex environments as a starting point to better understand the challenges and opportunities of non-communicable disease programs in Sub-Sahara countries.

Abbreviations

EBP= Evidence based practice
KT= Knowledge translation
N-HPDT= Nurse-led hypertension, prevention, detection and treatment
OMRU= Ottawa Model of Research Use
WHO-ISH= World Health Organization and International Society of Hypertension

Competing interests

The authors declare that there is no competing interest regard this manuscript

Author contribution

Author GK participated in all the design, statistical analysis, drafting and finalizing the manuscript.Author MD participated in the drafting, analysis, and finalizing the manuscript.

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