Journal of Cancer Education (2023) 38:1624–1628
https://doi.org/10.1007/s13187-023-02310-y

Evaluating the Knowledge Change Before and After Continuing Cancer Education in Malawian Nurses

Jennifer Hotchkiss[1] · Agatha Kapatuka Bula[1,2] · Chifundo Zimba[1] · Samuel Bingo[3] · Mabel Chinkhata[4] · Lixin Song[5] · Ashley Leak Bryant[1,6]

Accepted: 7 May 2023 / Published online: 20 May 2023

Abstract

Malawi has a high cancer incidence and mortality. Efforts to train and educate oncology nurses have been identified as an area of need. This study evaluates the educational needs of oncology nurses in Malawi and the effects of a virtual cancer education program on improving the knowledge of cancer epidemiology, treatment, and nursing care of common cancers among oncology nurses in Malawi. The educational programs consisted of four sessions at one-month intervals focused on Cancer Screening, Survivorship, Radiation Therapy, and Complementary and Alternative Therapies. A pretest–posttest design was used. Overall, there was an increase in knowledge at each session: cancer screening (47% vs 95%), survivorship (22% vs 100%), radiation therapy (66% vs 100%), and complementary and alternative therapies (63% vs 88%). Using virtual continuing education sessions is an effective tool to enhance the knowledge of oncology nurses in Malawi. These education sessions can serve as an example of how other Schools of Nursing and cancer centers in high-resource countries can collaborate with hospitals and Schools of Nursing in low- and middle-resource countries to support the advancement of oncology nursing knowledge, and ultimately, oncologic care.

Keywords Malawi · Nurse · Cancer · Education · Virtual · Knowledge

Introduction

The burden of cancer in Sub-Saharan Africa is increasing, particularly in Malawi [1]. The four most common types of cancer in Malawi are cervical, esophageal, Kaposi sarcoma, and non-Hodgkin lymphoma [2, 3]. The most common treatment for cancer in Malawi is chemotherapy. Often, patients are diagnosed at an advanced stage due to lack of or limited access to screening [1, 4–6]. Individuals may not be aware of the signs and symptoms of cancer or whom to notify if signs or symptoms of cancer have been found. Therefore, the treatment of cancer is often aggressive, with unpleasant side effects and symptoms such as nausea, vomiting, infection, and gastrointestinal infections [7–9]. Thus, nursing care is critical

✉ Jennifer Hotchkiss
Jennifer_hotchkiss@dfci.harvard.edu

Agatha Kapatuka Bula
abula@unclilongwe.org

Chifundo Zimba
colleta.zimba@gmail.com

Samuel Bingo
Josephbingo26@gmail.com

Mabel Chinkhata
chinkhatam@gmail.com

Lixin Song
songl2@uthscsa.edu

Ashley Leak Bryant
ashley_bryant@unc.edu

[1] UNC School of Nursing, The University of North Carolina at Chapel Hill, Chapel Hill, USA

[2] UNC Project Malawi, Lilongwe, Malawi

[3] National Cancer Centre, Kamuzu Central Hospital, PO Box 149, Lilongwe, Malawi

[4] Kamuzu Central Hospital, P. O Box 149, Lilongwe, Malawi

[5] School of Nursing UT Health San Antonio, 7703 Floyd Curl Drive, Mail Code 7947, San Antonio, TX 78229, USA

[6] UNC Lineberger Comprehensive Cancer Center, The University of North Carolina at Chapel Hill, Chapel Hill, USA

in educating individuals and families about the signs and symptoms of cancer, as well as cancer treatment and related side-effects and complications. More importantly, oncologic nurses need to provide evidence-based nursing care and education to individuals with cancer and their families on how to manage treatment-related symptoms and side-effects.

Despite the need for competent oncology nurses who can provide quality care for the growing number of cancer patients and the increasingly complex cancer treatment, there is a scarcity of education programs that prepare oncology nurses and provide on-job training in Malawi. Traditionally, systematic training for oncology nursing staff in nursing education programs in Malawi was minimal or non-existent due to their midwifery focus. In addition, most nurses who provide oncologic care have been pulled from other wards or assigned directly to care for individuals with cancer after graduating from a nursing school. Coupled with the lack of education and training in oncologic care, there is a shortage of oncology nurse educators. In addition, Malawian nurses caring for individuals with cancer are also challenged by long working hours and a heavy assignment (e.g., patient: nurse ratio as high as 80:1), making continuing education for Malawian oncology nurses even more challenging. Developing an educational program focused on oncology nursing education is critical for stability and sustainability of the oncologic nurse workforce and the quality of nursing care. The primary objective of this study is to evaluate the change in knowledge of cancer epidemiology, treatment, and nursing care of common cancers in Malawi among oncology nurses in Malawi.

Methods

Design

A pre-posttest design was used to achieve the study aim. Pre-test surveys were completed prior to the start of each education session. Post-test surveys were taken immediately following the presentation (short term effects) and at 6 months and 12 months post-presentation (intermediate and long-term effects). This paper reports on the short and intermediate effects and the long-term effect will be reported in the near future.

Instrument

Utilizing an 11 question oncology nursing needs assessment, the educational needs of oncology nurses in Malawi were evaluated and used by nursing faculty to create four education sessions based on oncology topics reported to have the highest knowledge gap. The responses ranged from none, low, moderate, and high knowledge. The content was delivered via Zoom by oncology nursing faculty. Participants watched the zoom live or through the use of recorded sessions. The sessions were coordinated to reflect the greatest attendance of nurses at these sessions. The education programs consisted of four sessions at one-month intervals focusing on the following topics: Cancer Screening, Survivorship, Radiation Therapy, and Complementary and Alternative Therapies.

Ethical Considerations

Ethical approvals were obtained from the National Health Sciences Research Committee in Malawi and the University of North Carolina at Chapel Hill Institutional Review Board. Informed consent was obtained from participants after explanation of the study. The needs assessment was anonymous and did not contain any personal identifiers. Surveys were coded using numbers on both pre- and post-test for comparison purposes.

Data Analysis

Descriptive statistics were used to summarize the demographic and work experiences of the nurses. Frequency and percentage of pre-test and post-test knowledge and practice scores were calculated.

Setting and Sample

Participants were nurses at the Kamuzu Central Hospital, Kamuzu College of Nursing, and UNC Project Malawi, all in Lilongwe, Malawi.

Results

Twenty-three nurses attended session one, with the majority attending in real-time (61%, $n=14$) compared to pre-recorded sessions (39%, $n=9$). The majority of participants were between the ages of 36 to 45 years (43%) with 1 to 5 years of oncology nursing experience (57%). Most of the participants (57%) had a history of continued education or training programs about oncology. Knowledge of cancer screening was greatly enhanced as a result of the educational sessions. An increase in knowledge was reported for every learning objective for cancer screening (see Table 1).

The topic for the second session was cancer survivorship. Content focused on phases of survivorship; nurses' role in the acute, extended, and permanent survivorship phase; and recommendations to advance cancer survivorship care more equitably in Malawi. Nine nurses attended session two, with all attending in real-time. An increase in knowledge was reported for every learning objective for cancer survivorship (see Table 2).

The topic for the third session was radiation therapy. Content focused on types of radiation therapy, nurses' role in radiation therapy, and management of common side effects. Fifteen nurses attended session three, with all attending in real-time. An increase in knowledge was reported for every learning objective for radiation therapy (see Table 3).

The topic for the fourth session was complementary and alternative therapies (CAT). Content focused on common types of CAT, benefits of CAT, prevalence of CAT in Malawi, and the nurses' role. Nineteen nurses attended session four, with all attending in real-time. An increase in knowledge was reported for every learning objective for CAT (see Table 4).

Table 1 Session 1 – Cancer Screening Pre- and Post-Survey Survey Data

Rate your knowledge about:	Pre-Education (T1)		Immediate Post- Education (T2)		6-month Post- Education (T3)	
	None to Low	Moderate to High	None to Low	Moderate to High	None to Low	Moderate to High
Cancer Screening	47% ($n=11$)	52% ($n=12$)	4% ($n=1$)	95% ($n=22$)	6% ($n=1$)	94% ($n=14$)
Benefits of Cancer Screening	22% ($n=5$)	78% ($n=18$)	9% ($n=2$)	91% ($n=21$)	0% ($n=0$)	100% ($n=18$)
Nurses Role in Screening for Cancer	30% ($n=7$)	70% ($n=16$)	4% ($n=1$)	86% ($n=22$)	0% ($n=0$)	100% ($n=18$)
Advocating for Cancer Screening	39% ($n=9$)	60% ($n=14$)	9% ($n=2$)	91% ($n=21$)	6% ($n=1$)	94% ($n=14$)
Methods of Cancer Screening	41% ($n=9$)	59% ($n=13$)	13% ($n=3$)	87% ($n=20$)	6% ($n=1$)	94% ($n=14$)
Signs and Symptoms of Cervical Cancer, Kaposi Sarcoma, Esophageal Cancer, and Hodgkin Lymphoma	26% ($n=6$)	74% ($n=17$)	4% ($n=1$)	96% ($n=22$)	0% ($n=0$)	100% ($n=18$)

Table 2 Session 2 – Cancer Survivorship Pre- and Post-Survey Survey Data

Rate your knowledge about:	Pre-Education (T1)		Immediate Post- Education (T2)		6-month Post- Education (T3)	
	None to Low	Moderate to High	None to Low	Moderate to High	None to Low	Moderate to High
Cancer Survivorship	22% ($n=2$)	78% ($n=7$)	0% ($n=0$)	100% ($n=9$)	0% ($n=0$)	100% ($n=9$)
Three Phases of Survivorship	100% ($n=9$)	0% ($n=0$)	0% ($n=0$)	100% ($n=9$)	7% ($n=1$)	93% ($n=14$)
Nurses Role in the Acute Survivorship Phase	88% ($n=8$)	11% ($n=1$)	0% ($n=0$)	100% ($n=9$)	7% ($n=1$)	93% ($n=14$)
Nurses Role in the Extended Survivorship Phase	77% ($n=7$)	22% ($n=2$)	0% ($n=0$)	100% ($n=9$)	13% ($n=2$)	87% ($n=13$)
Nurses Role in the Permanent Survivorship Phase	88% ($n=8$)	11% ($n=1$)	0% ($n=0$)	100% ($n=9$)	13% ($n=2$)	87% ($n=13$)
Recommendations to Advance Cancer Survivorship Care More Equitably in Malawi	88% ($n=8$)	11% ($n=1$)	0% ($n=0$)	100% ($n=9$)	13% ($n=2$)	87% ($n=13$)

Table 3 Session 3 – Radiation Therapy Pre- and Post-Survey Survey Data

Rate your knowledge about:	Pre-Education (T1)		Immediate Post- Education (T2)		6-month Post- Education (T3)	
	None to Low	Moderate to High	None to Low	Moderate to High	None to Low	Moderate to High
Radiation Therapy	66% ($n=10$)	33% ($n=5$)	0% ($n=0$)	100% ($n=9$)	18% ($n=3$)	82% ($n=14$)
Types of Radiation Therapy	80% ($n=12$)	20% ($n=3$)	55% ($n=6$)	45% ($n=5$)	24% ($n=4$)	76% ($n=13$)
Nurses Role in Radiation Therapy	85% ($n=12$)	14% ($n=2$)	60% ($n=6$)	40% ($n=4$)	6% ($n=1$)	94% ($n=16$)
Most Common Side Effects of Radiation Therapy	64% ($n=9$)	35% ($n=5$)	50% ($n=6$)	50% ($n=6$)	18% ($n=3$)	82% ($n=14$)
Management of Common Side Effects of Radiation Therapy	74% ($n=11$)	27% ($n=4$)	50% ($n=6$)	50% ($n=6$)	24% ($n=4$)	76% ($n=13$)

Table 4 Session 4 – Complementary and Alternative Therapies in Oncology Pre- and Post-Survey Survey Data

Rate your knowledge about:	Pre-Education (T1)		Immediate Post- Education (T2)		6-month Post- Education (T3)	
	None to Low	Moderate to High	None to Low	Moderate to High	None to Low	Moderate to High
Complementary and Alternative Therapies in Oncology	63% ($n=12$)	31% ($n=6$)	12% ($n=2$)	88% ($n=15$)	0% ($n=0$)	100% ($n=10$)
Most Common Types of Complementary and Alternative Therapies in Oncology	63% ($n=12$)	31% ($n=6$)	12% ($n=2$)	88% ($n=15$)	0% ($n=0$)	100% ($n=10$)
Benefits of Complementary Therapies in Oncology	68% ($n=13$)	26% ($n=5$)	12% ($n=2$)	88% ($n=15$)	0% ($n=0$)	100% ($n=10$)
Prevalence of Complementary and Alternative Therapies Among Patients with Cancer in Malawi	73% ($n=14$)	21% ($n=4$)	6% ($n=1$)	94% ($n=16$)	0% ($n=0$)	100% ($n=10$)
Nurses Role in Complementary and Alternative Therapies in Oncology	63% ($n=12$)	31% ($n=6$)	0% ($n=0$)	100% ($n=17$)	0% ($n=0$)	100% ($n=10$)

Discussion

Our study demonstrated short-term knowledge benefits from the four cancer educational sessions. Previous studies have shown that brief educational interventions can be effective in increasing knowledge [10–13]. One study was completed in Sub-Saharan Africa examining the impact of virtual education sessions taught using a modular approach [14]. This study demonstrated an increase in nursing confidence following the virtual education courses [14]. To our knowledge, this is the first study to explore the use of virtual sessions to increase nurses understanding of adult cancers in Malawi.

Interestingly, we conducted these educational sessions during COVID-19 and did not explicitly provide education on COVID-19 safety measures and protocols, but at the beginning of each session we asked the nurses about their experiences caring for individuals with cancer and COVID. This was an unexpected addition to our programs and an area we have not seen discussed in the literature to date.

Our study had strengths that should be considered. There was a significant knowledge increase from pre to post test, in all sessions. The cancer survivorship topic had the greatest knowledge increase. One plausible explanation is that nurses in Malawi were less familiar with phases of survivorship, survivorship care plans, and survivorship nurse navigators. This topic had a rich and robust discussion about survivorship care, resources, and services in Malawi and other low-income countries. There are limitations of this study. First, we had a small size of nurses and the number who attended each session carried in part due to nursing shortage issues associated with the COVID1-9 pandemic. Second, we created the 11-item educational survey to capture how comprehension of various oncology topics changes from pretest to posttest after the educational intervention. Generalizability is limited because the sample is from a mostly regional population. Lastly, the pretest–posttest design lacked a control group and has limited external validity.

Conclusion

Virtual continuing education is an effective tool that can be used to enhance the knowledge of oncology nurses around the globe. This study demonstrates the effectiveness of this strategy in low-resource settings. The educational sessions described in this study provide a framework to be utilized by other Schools of Nursing and Cancer Centers in high-resource settings to utilize to support the advancement of oncology nursing knowledge in low to middle resource settings.

Declarations

Competing Interest There are no financial or non financial disclosers to disclose relevant to this educational project.

References

1. Gopal S (2017) Cancer trials in sub-Saharan Africa: aligning research and care. PLoS Med 14(7):e1002351
2. World Health Organization (2020) Cancer Country Profile 2020: Malawi. https://www.who.int/cancer/country-profiles/MWI_2020.pdf. Accessed 3 Apr 2022
3. World Health Organization (2020) Malawi Fact Sheets. https://gco.iarc.fr/today/data/factsheets/populations/454-malawi-fact-sheets.pdf. Accessed 3 Apr 2022
4. Walker DK, Edwards RL, Bagcivan G, Bakitas MA (2017) Cancer and palliative care in the United States, Turkey, and Malawi: developing global collaborations. Asia Pac J Oncol Nurs 4(3):209–219
5. Chinula L, Moses A, Gopal S (2017) HIV-associated malignancies in sub-Saharan Africa: progress, challenges, and opportunities. Curr Opin HIV AIDS 12(1):89–95
6. Youngblood VM, Nyirenda R, Nyasosela R et al (2020) Outcomes and prognostic factors for women with breast cancer in Malawi. Cancer Causes Control 31:393–402. https://doi.org/10.1007/s10552-020-01282-4

7. Qan'ir Y, Guan T, Idiagbonya E et al (2022) Quality of life among patients with cancer and their family caregivers in the Sub-Saharan region: a systematic review of quantitative studies. PLOS Glob Public Health 2(3):e0000098. https://doi.org/10.1371/journal.pgph.0000098
8. Sleeman KE, de Brito M, Etkind S et al (2019) The escalating global burden of serious health-related suffering: projections to 2060 by world regions, age groups, and health conditions. Lancet Glob Health 7(7):e883–e892
9. Rowe AK, Rowe SY, Peters DH, Holloway KA, Chalker J, Ross-Degnan D (2018) Effectiveness of strategies to improve health-care provider practices in low-income and middle-income countries: a systematic review. Lancet Glob Health 6(11):e1163–e1175
10. Gill S, Kuwahara R, Wilce M (2016) Through a culturally competent lens: why the program evaluation standards matter. Health Promot Pract 17(1):5–8
11. Ramos-Morcillo AJ, Fernández-Salazar S, Ruzafa-Martínez M, Del-Pino-Casado R (2015) Effectiveness of a brief, basic evidence-based practice course for clinical nurses. Worldviews Evid-Based Nurs 12(4):199–207. https://doi.org/10.1111/wvn.12103
12. Koota E, Kääriäinen M, Kyngäs H, Lääperi M, Melender H (2021) Effectiveness of Evidence-Based Practice (EBP) Education on Emergency Nurses' EBP Attitudes, Knowledge, Self-Efficacy, Skills, and Behavior: A Randomized Controlled Trial. Worldviews Evid-Based Nurs 18(1):23–32. https://doi.org/10.1111/wvn.12485
13. Lee T-Y, Lin F-Y (2013) The effectiveness of an e-learning program on pediatric medication safety for undergraduate students: a pre-test–post-test intervention study. Nurse Educ Today 33(4):378–383. https://doi.org/10.1016/j.nedt.2013.01.023
14. Hockenberry M, Mulemba T, Nedege A, Madumetse K, Higgins J (2020) Distance-based education for nurses caring for children with cancer in Sub-Saharan Africa. J Pediatr Oncol Nurs 37(5):321–329. https://doi.org/10.1177/1043454220938355