

Original Paper

Complementary and Alternative Medicine use: Influence of Patients' Satisfaction with Medical Treatment among Breast Cancer Patients at Uganda Cancer Institute

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ABSTRACT

Introduction: Use of Complementary and alternative medicine (CAM) is high among cancer patients especially breast cancer patients. This study sought to evaluate Complementary and alternative medicine use in breast cancer patients and how its use is influenced by patient's satisfaction with conventional medical treatment among breast cancer patients attending Uganda Cancer Institute. **Patients and Methods:** A cross-sectional study design was used in this study. Participants who were diagnosed histologically with breast cancer at Uganda Cancer Institute took part in the study. A questionnaire was developed and used to interview the participants and medical records of the respondents were also reviewed. **Results:** A total of 235 participants completed the study. The prevalence of CAM use was 77%. CAM therapies used included herbal medicines, prayer for health, vitamins/minerals, native healers, Chinese medicines, massage, yoga, Ayurvedic medicine, Acupuncture, reflexology, Support group attendance, meditation, Magnetic and Bio-field manipulation. Satisfaction with medical treatment was significantly associated with CAM use. Patients who are not satisfied with medical treatment were more likely to use CAM. **Conclusion:** There is a high number of breast cancer patients using CAM, various categories of therapies are being used and patients' satisfaction with medical treatment triggers off a patients decision to use CAM therapies.

INTRODUCTION

Cancer is among the leading causes of mortality in both developed and developing countries (1). Breast cancer is the most common cancer worldwide among women of all ages, representing 16% of all cancer diagnoses in women (1). It also tallies as the second leading cause of death, exceeded only by lung cancer (2).

Cancer is a growing health problem in Uganda, commonest cancers include: cervical cancer, cancer of the prostate, breast cancer, Kaposi's sarcoma, Burkitt's lymphoma, skin cancer, lung cancer, cancers of the bone, eye cancer, colon cancer and blood cancers however to date, the statistics of cancer in Uganda are not well documented.

Despite the known conventional breast cancer treatment modalities, various researchers have reported that use of Complementary and Alternative medicines is exceptionally high among patients with breast cancer relative to other patient sub-populations (3). Findings regarding the features of breast cancer patients utilizing CAM are relatively consistent across different studies. There is a high likelihood that patients with Breast cancer use CAM compared to patients with other gynecological cancers (5) as well as prostate and colorectal cancers (6).

Globally, 25%-50% of people in developed countries use CAM therapies (7). Ernst et al., (1998) reported a steady

rise in CAM use years. This calls for medical, economic and sociological attention. Indeed, 38% in the USA, indicated that they had used CAM therapies, with an approximately \$33.9 billion expenditure in a year, this vividly signifies that CAM use has got an effect on the health of the users (4).

In Europe, CAM use ranges from 14.8% to 73.1%, with Italy and Czech republic having highest CAM users (38% and 30% respectively) and lowest being Greece with 12% use (9). In a study conducted in Canada, almost a third (20%) of patients with Breast cancer use one of the CAM medicines (10). In Asia, 55.0% of cancer patients use CAM (11). almost all (97.0%) cancer patients in China use some category of CAM (12). While in India, its reported at more than half of cancer patients (56.6%) use CAM (13), 98.1% in Taiwan (14) and 14% in Malaysia (15). Among South American countries, CAM use ranges between 40% in Colombia and up to 70% in Chile (16).

In Sub Saharan Africa, CAM use spans up to 80% (16). For instance: 73.5% in Ghana (16), 65% in Nigeria (17) and up to 2.2% in South Africa (18).

In eastern Africa, there is limited data on CAM use, its correlates and patient's satisfaction with treatment among breast cancer patients. In Uganda there is a wide range of CAM therapies accessible domestically and in local markets.

In addition, there is recent emergence of non-indigenous traditional or complimentary practitioners such as the practitioners of Chinese and Ayurvedic medicine (19). However there is limited data on the utilization of complementary and alternative medicine in Uganda and East Africa at large.

Cancer patients turn to CAM practices with hope of finding a cure to their illness and to make them feel better (14). Although many patients use CAM therapies, many therapies have been found not to have any importance coupled with few safety profile studies these therapies

Various reasons have been identified why breast cancer patients supplement conventional treatments with CAM however it is not yet clear how patients' satisfaction with treatment may be related to CAM use. A significant proportion of patients with Breast cancer utilize CAM which may have implications for medical management of these patients (9).

Moreover, it is not known whether patients find that CAM mitigates their treatment-related functional outcomes, or if it's triggered by their satisfaction with conventional therapy therefore this study presents data on CAM use and patient's satisfaction with treatment among breast cancer patients attending Uganda Cancer Institute (UCI).

METHODS

Study Setting

This study was conducted at Uganda Cancer Institute (UCI). UCI is located at Mulago hill in Kampala. It is located in the vicinity of Mulago National Referral Hospital. UCI is a centre for specialized cancer diagnosis, research and comprehensive treatment of cancer patients in Uganda. The institute offers specialized care for gynaecological cancers, leukemias, sarcomas, paediatric cancers, lymphomas, and as the only public referral centre in Uganda for specialized cancer care. It receives a large number of cancer patients from around Uganda and East Africa at large. It's also the only specialized tertiary health facility in Uganda offering treatment to cancer patients, receives the largest number of cancer patients and offers specialized cancer treatment.

Study Design, Population and Procedures

Cross sectional study design and quantitative approaches were used in the study.

Study Population and Study Participants

The accessible population comprised of all cancer patients receiving treatment at UCI. The target population comprised of all cancer patients attending UCI with a histological breast cancer diagnosis, getting treatment from U.C.I both in and out-patients fulfilling the selection criteria

Participants above 18 years of age, with a primary diagnosis of breast cancer and a Karnofsky score of above 60 (ambulatory) were enrolled in the study.

The study excluded breast cancer patients where not mentally healthy and those who declined to consent for the

study. Those who were absent at the time of data collection were excluded.

Sampling Technique

Purposive sampling technique was used. Patients with a histological breast cancer diagnosis were confirmed from the ward register.

Data Collection Procedure and Tools

The researcher introduced himself to the participants and clearly explained the purpose of the study. Those who willingly accepted by giving their consent to participate in the study and fulfilled the eligibility criteria for the study continued to complete the questionnaire. Every breast cancer patient who fulfilled the eligibility criteria was purposively selected and issued a questionnaire. Patients completed the questionnaire while they are waiting at the outpatient clinic to be seen by their physician or during therapy.

The questionnaire used developed according to the objectives of the study. CAM use was assessed using modified questions from NHIS (2002) survey, participants were asked whether they have used any of the listed CAM therapies since diagnosis and a provision for 'other' for participants to report use of a CAM therapy not listed. Categories of CAM will be based on the NCCAM (2012) taxonomy while CAM use was assessed as "users" or "non-users".

The questionnaire had 24 items in total with two sections. Section one assessed demographic data. Section two assesses CAM use and satisfaction with treatment. Therapies used were assessed using an opened question and thereafter tallied from a list of 26 possible therapies, with a provision to add other therapies if appropriate. The questionnaire was translated into Luganda cater for language barrier.

Satisfaction with medical cancer treatment was assessed as either satisfied or not satisfied with medical cancer treatment. Clinical data was extracted from patients' medical records within the clinics patients' files

Data Management

Questionnaires were checked for completeness, coded and data entered in Microsoft excel. Data was then transferred exported and analysed using SPSS version 20.0 statistics for windows (IBM Corp, Armonk, NY).

Data on CAM use was dichotomized into 'USERS' and 'NON USERS'. P-values of less than 0.05 were considered significant. The questionnaire was pre-tested in a pilot study to ensure that the specific questions answered the objectives. Misclassification of non-breast cancer patients as breast cancer patients in this study was minimised by selecting only those patients with a histologically confirmed diagnosis of breast cancer.

Ethical Considerations

The research protocol was approved by the School of Nursing, Research Ethics Committee of International Health

Sciences University, the Institutional Review Board at UCI and the Uganda National Council of Science and Technology (UNCST).

RESULTS

Use of CAM and influence of patients' satisfaction with medical treatment was evaluated among 235 participants.

Socio-demographic Data

The mean age of the respondents was in the category of 21 to 35 years ($S.D=0.662$), most of the respondents were aged above 35 years (60.9%) while more than three quarters of the respondents were female (99.1%). Majority of the respondents were married (59.1%), living in urban areas (51.9%). A fair proportion of respondent held at least tertiary level of education (43.8%) and more than three thirds of them were employed (81.3%) Table 1.

Prevalence of CAM

The prevalence of CAM use was 77% while only less than a third (23%) of the respondents reported that they were non users. Current and past use of CAM was reported by 45.5% and 20 % (respectively, while the future use of CAM was reported by 11.5%. Of those who presently use CAM or used CAM in the past, almost a half of them (46%) reported that they use CAM up to three times a day. A third of them use CAM less than three times a day (29%) while CAM use at an interval of more than three times a day was reported by 25% of the users.

Categories of CAM therapies

The most commonly reported therapies included herbal medicines 22.0 %, prayer for health 20.4 %, vitamins/minerals 13.8% and native healers 8.2% all used in the past, currently and among those planning to use CAM as shown in Figure 1.

Among other therapies reported to be used by respondents included Chinese medicines 5.5%, massage 4.4%, yoga 2.7%, Ayurvedic medicine 1.6%, Acupuncture 3.3%, reflexology 3.8%, Support group attendance 3.8%, meditation 2.2%, Magnetic and Bio-field manipulation 1.1%. Other CAM therapies that don't fall in any of those other groups were reported by 1.6% of the respondents who used CAM in the past, currently or planning to use CAM.

Majority of the respondents were not satisfied with medical treatment 51.5%, while more than a third of the respondents reported that they were satisfied 48.5% as shown in the Table 2 below.

From the Table 2 above, majority of the non-users reported that they were satisfied with medical treatment (29.8%) while most CAM users reported that they were not satisfied with medical treatment (83.5%). CAM use was significantly associated with satisfaction with medical treatment ($P\text{-value} = 0.02$).

Table 2 above illustrates that the respondents who were not satisfied with medical treatment were more likely to use CAM therapies ($Odds\ ratio, 2.146: 95\% CI, 1.148-4.011$) as compared to those who are satisfied with medical treatment

Table 1. Socio demographics characteristics of the breast cancer patients at UCI, Kampala, Uganda (n=235)

Variable	Categories	n	%
Gender	Female	233	99.1
	Male	2	0.9
Age	<20	22	9.4
	21-35	70	29.8
	Above 35	143	60.9
Marital status	Married	139	59.1
	Not married	96	40.9
Place of residence	Urban	122	51.9
	Rural	113	48.1
Level of education	None	12	5.1
	Primary	36	15.3
	Secondary	84	35.7
	Tertiary	103	43.8
Employment status	Employed	191	81.3
	Unemployed	44	18.7

Source: Primary data

Table 2. CAM use and satisfaction with medical treatment among breast cancer patients at UCI, Kampala, Uganda (n=181)

Satisfaction with treatment	CAM Use n (%)	
	Users	None users
Satisfied	80 (70.2)	34 (29.8)
Not satisfie	101 (83.5)	20 (16.5)

DISCUSSION

In this study, the prevalence of CAM use was 77%. This included CAM used in the past, currently and those who reported planning to use at least one form of CAM therapy. This finding shows that there is a high number of breast cancer patients using CAM therapies. This could be attributed to availability of various CAM therapies in the environment such as local herbs or on the market.

This finding is Simililat to those in previous studies that reported that CAM use ranges from 40% to 98% among cancer patients (6,9,15,21,24). Most of the CAM users in our study presently use CAM therapies followed by those who were planning to use CAM. This could be because of fulfilling unmet needs by conventional medical and experiences shared from current users. People are pushed to use CAM therapies due to dissatisfaction with conventional care for a particular health problem.

To the contrary, the prevalence of CAM in this study is slightly lower than that reported from some other studies that showed that prevalence was at 97% (12), however the prevalence in this study is higher than that reported by the national council of traditional and herbalist Association of Uganda (NACOTHA) which indicated that a 50% utilization of CAM in the Ugandan population(23).

Of those who presently use CAM therapies and those who used it in the past, almost a half of them use it up to three times a day while a third of them use CAM less than

three times a day. This indicates a high use of CAM by patients. Therefore, there is need to maintain patient safety and well-being. Further impetus on development of effective interventions to improve the disclosure of CAM use should be an integral part of the future. There is a notable number of breast cancer patients who use CAM therapies, although the safety and efficacy of most therapies is not yet clear. This predisposes patients to drug interactions and delayed attendance to hospitals for cancer care. In addition, those who are on medical treatment may decide to stop treatment to use CAM therapies. This has been emphasized by one of the key informants at UCI.

Use of CAM therapies calls for open communication channels between the patients, their health care providers, scholars and policy makers to formulate means of either integrating the useful therapies into conventional cancer management or carry out more rigorous studies aiming at ascertaining the efficacy of these CAM modalities

This reveals that CAM use could be increasing with time, this could be attributed to increase in the number of patients, increased exaggerated eye catching advertisement through the diverse media houses available today and the increase in non-indigenous CAM therapies like Chinese medicine and spirituality associated with majority of the Ugandan population.

The most commonly used therapy was herbal medicines. This could be partly attributed due to their natural occurrence in the Ugandan environment and low cost of those that are available on the market. This finding is consistent with other studies among breast cancer patients which reported herbals medicine as the most popular therapy (9,24,25,26). This was followed by prayer for health, vitamins/mineral and native healer. The proportion of those who use prayers for health could be attributed to the strong spiritual belief among Ugandans and the uprising of many pastors who preach prayer for health despite any debilitating illness. Vitamin use could be due to the belief that they are needed by the body despite in what amounts.

Among other therapies reported to be used by respondents included Chinese medicines, massage, yoga, Ayurvedic medicine, Acupuncture, reflexology, Support group attendance, meditation, Magnetic and Bio-field manipulation and other CAM therapies that don't fall in any of those other groups. Use of Chinese and Ayurvedic medicine use could be partly attributed to the out burst of new Chinese medicines on the Ugandan and East African market today. The low popularity of therapies such as massage, reflexology and meditation could be due to the perception that they may not be practical for breast cancer.

These ranges of therapies are similar to those from other conducted among breast cancer patients which revealed a heterogeneous group of therapies used by Breast cancer patients globally (9,24,25,26,27). Results of this study agree with the various therapies that are listed according to the NCCAM categorization and from various studies however, there differences in frequencies of the most popular therapies. This could be attributed to the difference in the settings and characteristics of the participants under study.

Most respondents were not satisfied with medical treatment. There are often logistical constrain at the

health facility, poor patient- health worker relationship and the attitude of patients towards the health care team. However it should be noted that the marginal difference between those that are satisfied and non-satisfied is small

Majority of the non-users reported that they were satisfied with medical treatment while most users reported that they were not satisfied with medical treatment. This could probably due to fulfillment of cancer needs that are not met by the conventional medical treatment by the CAM therapies.

In this study, CAM use was significantly associated with satisfaction with medical treatment Therefore a patient's satisfaction with the medical treatment contributes to ones decision to use CAM therapies, this partly solves a question of controversy whether CAM use can be impacted by satisfaction with medical treatment (28). However there is need for more studies in other tertiary cancer care centers on this association.

This finding is similar to other studies that posited that people use CAM therapies due to dissatisfaction with conventional medicine and or because they are pulled to CAM therapies to fulfil unmet areas by conventional medicine (5,26,29,). However this finding contradicts with findings from various studies that reported that satisfaction with medical treatment and CAM use are unrelated (30).

None satisfaction with medical treatment was more likely to use CAM therapies as compared to those satisfied with medical treatment. This is probably due to the unmet needs by medical treatment, need to participate in dealing with the disease therefore patients tend to seek for complementary or alternative solutions to fulfil the needs. This finding is in line with previous study findings that less satisfied breast cancer patients were more likely to use CAM (4). This likelihood is increased by dissatisfaction with the oncologist among women with breast cancer (4). However, this contradicts with findings from a survey that evaluated the association of CAM use and perceived distress or poor compliance with standard treatment but with active coping behaviour among cancer patients were CAM is more frequently used long with conventional cancer treatments other than individual dissatisfaction with conventional cancer treatments as a trigger for CAM use among cancer patients.

Studies have identified various reasons for dissatisfaction with treatment and CAM use, these included, disappointment with conventional treatment, negative experience with conventional treatment, need for more involvement of health workers, disappointment with a conventional practitioner and satisfaction with the treatment decision-making (26,30). Likewise patients at UCI are faced with shortages in drugs which could trigger CAM use and dissatisfaction with conventional medicine and or because they are pulled to CAM therapies to fulfil unmet areas by conventional medicine

CONCLUSIONS

Health care providers need to improve on communication channels with patients regarding CAM use, this will open up channels for disclosure of CAM use. The importance of communication on CAM use not only increases satisfaction with treatment but also disclosure of such use to health care providers.

The ministry of Health and its stakeholders should formulate guidelines that govern the use of CAM and streamline research aimed at ascertaining the safety of such therapies which seem to be on an exponential increase among cancer patients and other general population illnesses.

A holistic management approach that integrates CAM therapies into the conventional cancer management could be formulated. This could be guided by more research yielding evidence supporting the efficacy of some of these therapies. Findings may yield solutions redeeming the effects associated with cancer and medical treatment.

Studies assessing the factors associated with dissatisfaction with medical treatment and how this can influence the decision to use CAM therapies should be carried out, this would aid in identifying factors associated with medical cancer treatment satisfaction and how this would trigger off a decision for CAM use.

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REFERENCES

1. International Agency for Research on Cancer, World cancer report 2014.
2. Greene K, Greenlee H, Kim J.G, Grosshans C., Complementary and alternative medical treatment of breast cancer: a survey of licensed North American naturopathic physicians. *Alternative Therapies Health Medicine.*, 2002, pp. 74-81.
3. Swisher E.M., Cohen D.E., Goff B.A., Parham J., Herzog T.J., Rader J.S., Mutch D.G., Use of complementary and alternative medicine among women with gynaecologic cancers, *Gynaecology oncology*, 2002, pp. 363-367.
4. Ernst, E., & Cassileth, B. R., The prevalence of complementary/alternative medicine in cancer: A systematic review. *Cancer*, 1998, pp. 777-782.
5. Verhoef M.J, Balneaves L.G, Boon H.S., Reasons for and characteristics associated with complementary and alternative medicine use among adult cancer patients: a systematic review, *Journal of integrated cancer therapies*, 2005, pp. 274-286
6. Patterson. R. E, Neuhaus E. M. L., Hedderson. M.M., Types of alternative medicine used by patients with breast, colon, or prostate cancer, predictors, motives, and costs. *Journal of Alternative and Complementary Medicine*, 2002, pp. 477-485.
7. World Health Organization., WHO Traditional Medicine Strategy 2014-2023, 2013.
8. Nahin.R. L, Barnes P.M, Stussman. B.J., "Costs of complementary and alternative medicine CAM and frequency of visits to CAM practitioners: United States, 2007. *National Health Statistics Report*, 2009, pp. 1-14
9. Alexander Molassiotis, Julia A. Scott, Nora Kearney, Dorit Pud, Miriam Magri, Sarka Selvekerova, Ingrid Bruyns, Paz Fernandez-Ortega, Vassiliki Panteli, Anita Margulies, Gudbjorg Gudmundsdottir, Ljiljana Milovics, Gulden Ozden, Nurgun Platin, Elisabeth Patiraki., "Complementary and alternative medicine use in breast cancer patients in Europe", *Support Care Cancer*, 6 september 2005, pp. 260-267.
10. Gray. R.E, Fitch. M, Goel. V, Eranssen e, Labrecque M, Utilization of complementary and alternative services by women with breast cancer. *Journal of Health Social Policy*, 2003, pp 75-84
11. Zhang, 2012. *The importance of traditional Chinese medicine services in health care provision in china. Universities forum*, 2(2) pp.1-8.
12. Elkins, G., Fisher, W., & Johnson, Mind-body therapies in integrative oncology. *Current Treatment Options in Oncology*, 2010, pp 128-140.
13. Gupta. D., Lis. C.G, Birdsall. T.C and Grutsch. J.F., The use of dietary supplements in a community hospital comprehensive cancer center: implications for conventional cancer care. *Support Care Cancer*, 2005, pp. 912-919.
14. Redhwan A. Al-Naggar, Yuri V. Bobryshev, Mahfoudh Abdulghani, Subramariam Rammohan, Muhamed Osman T. and Samiah Yasmin Abdul Kadir, "Complementary/alternative medicine Use among cancer patients in Malaysia", *World Journal of medical sciences*, 2013, pp. 157-164
15. World Health Organisation, *WHO traditional medicine strategy 2014- 2023*, world health organization cataloguing- in publication data: Geneva, 2013.
16. Yarney J., Donkor A., Samuel Y. Opoku, Lily Yarney, Isaac Agyeman-Duah, Alice C Abakah and Emmanuel Asampong., "Characteristics of users and implications for the use of complementary and alternative medicine in Ghanaian cancer patients undergoing radiotherapy and chemotherapy: a crss-sectional study", *BMC Complementary and alternative medicine* 2013, 13:16.
17. Emmanuel Ezeome R. and Agnes Anarado N., "Use of complementary and alternative medicine by cancer patients at the University of Nigeria Teaching Hospital, Enugu, Nigeria", *BMC Complementary and alternative medicine* 12 September 2007, 7: 28.
18. Karl Peltzer, "Utilization and practice of traditional/complementary/Alternative medicine TM/CAM in South Africa", *Afr. J. Traditional, Complementary and alternative Medicines* 6, 2, 2009, pp. 175-185.
19. Nuwaha Fred & Musinguzi Geofery, Use of alternative medicine for hypertension in Buikwe and Mukono Districts of Uganda: a cross sectional study, 2013, 13: 301.
20. Davis.G.E., Bryson. C.L, Yueh. B, 2006. Treatment delay associated with alternative medicine use among veterans with head and neck cancer. *Head Neck journal*, 28: 926-31.
21. Suzan Bauer and Georgia M. Decker, 2012. Integrative oncology imperative for nurses, *seminars in oncology nursing*, 2012, pp. 2-9.
22. Galabuzi C., Agea J.B., Fungo B.L., & Kamoga M.N, Traditional medicine as an alternative form of Health care system: a preliminary case study f Nangabo

- Sub county, Central Uganda, *Afr.J.Trad.CAM*, 2010, pp. 11-16.
23. Klafke. N., Elliott. J. A., Wittert. G. A., Olver. N. I., "Prevalence and predictors of complementary and alternative medicine CAM use by men in Australian cancer outpatients services", *Annals of Oncology*, November 2011, pp. 1571-1578
 24. Wyatt G., Complementary and alternative medicine use, spending and quality of life in early stage breast cancer., *Nursing research*., 2010, pp. 58-66.
 25. Ausanee Wanchai, Jane Armer. M., and Bob Stewart. R., Complementary and Alternative Medicine Use Among Women With Breast Cancer: A Systematic Review, *Clinical Journal of Oncology Nursing* 14, 4, January 31 2010, E45-E55.
 26. Mohsen Marvibaigi, Eko Supriyanto, Neda Amini, Fadzilah Adibah AbdulMajid, and Saravana Kumar Jaganathan., "Preclinical and Clinical Effects of Mistletoe against Breast cancer", *Biomed Research International*, 2014, 785479.
 27. Wang Guofei, Wang Shuhong, Jiang Pinglan, Zeng Chun. "Effect of Yoga on cancer related fatigue in breast cancer patients with chemotherapy". *Journal of Central South University. Medical Science*, 2014, pp.1077-1082.
 28. Janet Smithson, Nicky Britten and Charlotte Paterson, "the experience of using complementary therapies after a diagnosis of cancer: A qualitative synthesis", *Health*, 2010, pp. 19-39.
 29. Scott D. Ramsey, Steven B. Zeliadt, David K. Blough, Catherine R. Fedorenko, Megan E. Fairweather, Cara L. McDermott, David F. Penson, Stephen K. Van Den Eeden, Ann S. Hamilton, and Neeraj K. Arora, "Complementary and Alternative Medicine use, Patient Reported Outcomes, and Treatment Satisfaction among Men with Localized Prostate Cancer", *Urology*, May, 2012, pp. 1034-1041.
 30. Marja J. Verhoef, Laura C. Vanderheyden, and Vinjar Fønnebø, "A whole Systems research approach to cancer care: why do we need it and how do we get started?", *Integrative Cancer Therapies*, 2006, pp. 287-292.