



**Development of a Tool to Assess Knowledge, Awareness and Perception of Prostate Cancer
amongst Women in Ghana**

By
EBENEZER WIAFE

A dissertation submitted to the School of Health Sciences,
University of KwaZulu-Natal, in fulfillment for the degree of Master of Pharmacy

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220108585

A dissertation submitted to the School of Health Sciences,
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Submission Date: October 2020

Supervisor: Prof. Frasia Oosthuizen

Co-supervisors: Dr. Varsha Bangalee/ Dr. Kofi Boamah Mensah

CERTIFICATION

This is to confirm that the contents of this dissertation are the original work of **Ebenezer Wiafe (220108585)**

Student's signature:  Date: 5th October, 2020

As the supervisor/co-supervisors of the student, we have approved this dissertation for submission.

Supervisor: Prof. Frasia Oosthuizen

Signed: _____ Date: _____

Co-supervisors: Dr. Varsha Bangalee/ Dr. Kofi Boamah Mensah

Signed: _____ Date: _____

Signed: _____ Date: _____

PREFACE

This dissertation is presented in a manuscript format following the College of Health Sciences guidelines for thesis/dissertation submissions at the University of KwaZulu-Natal. The study's main findings are presented as two manuscripts in chapters 2 B and 3 of this dissertation. Chapter 2 A, presented as a manuscript, was developed to guide the conduct of chapter 2 B. Chapter 2 A, 2 B, and 3 have respectively been submitted to *Systematic Reviews (SYSR)*, *Value in Health Regional Issues (VIHRI)*, and *European Journal of Cancer (EJC)*. The references used in the manuscripts were cited according to the instructions/guidelines for authors as required by the journals. A complete reference list is presented at the end of each manuscript chapter, following the journal's reference style.

The dissertation consists of four (4) chapters as follows:

Chapter 1: This chapter presents the introduction/background, problem statement, justification, aim, specific objectives, and the theoretical and conceptual framework of the study. The chapter further explains the study's general methodology, data analysis, management, ethical considerations, and finally includes chapter conclusions.

Chapter 2 A: The first manuscript for publication presents an original review protocol entitled “The Awareness of Women about Prostate Cancer: A Mixed-Methods Systematic Review Protocol,” which was submitted according to SYSR authors' guidelines.

Chapter 2 B: The second manuscript for publication presents an original review entitled “Prostate Cancer Awareness among Women: A Mixed-methods Systematic Review,” which was submitted according to VIHRI authors' guidelines.

Chapter 3: The final manuscript for publication presents an original study entitled “An Akan Translation, Validation and Reliability of a Questionnaire for assessing the Awareness of Ghanaian women about Prostate Cancer,” which was submitted according to EJC authors' guidelines.

Chapter 4: This chapter concludes the study. The chapter elaborates on the key findings, study significance, strengths, limitations, recommendations for further studies, and a summary of the study.

DECLARATION I - PLAGIARISM

I, Ebenezer Wiafe, declare that:

1. The research reported in this dissertation, except where otherwise indicated, is my original work.
2. The work described in this dissertation has not been submitted to UKZN or other tertiary institutions for purposes of obtaining an academic qualification, whether by myself or any other party.
3. This dissertation does not contain other persons writing unless specifically acknowledged as being sourced from other researchers. Where other written resources have been quoted, then:
 - a) Their words have been re-written but the general information attributed to them has been referenced.
 - b) Where the exact words of other people have been used, their writing has been placed inside quotations and referenced.
4. This dissertation does not contain text, graphics, or tables copied and pasted from the Internet unless specifically acknowledged, and the source being detailed in the dissertation and the reference sections.

Signed:  _

Date: __5th October, 2020__

DECLARATION II – ETHICS APPROVALS AND STUDY REGISTRATIONS

1. A local ethics approval was obtained from the Committee on Human Research, Publications and Ethics (CHRPE) of the Kwame Nkrumah University of Science and Technology (KNUST)/Komfo Anokye Teaching Hospital (KATH), Ghana. CHRPE reference number: CHRPE/AP/127/20 (Appendix 3). This approval applies to the submitted manuscript indicated in chapter 3.
2. A final ethics approval was obtained from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal (UKZN), South Africa. BREC reference number: BREC/00001292/2020 (Appendix 1). This approval applies to the submitted manuscript indicated in chapter 3.
3. All studies were registered at Open Science Framework. Below are the various study chapters and their respective registration DOIs;

Chapter 2 A: <https://doi.org/10.17605/OSF.IO/EYHF2>

Chapter 2 B: <https://doi.org/10.17605/OSF.IO/BR456>

Chapter 3: <https://doi.org/10.17605/OSF.IO/9GZTD>

RESEARCH OUTPUTS AND AUTHORS' CONTRIBUTIONS

LIST OF SUBMITTED MANUSCRIPTS

1. The Awareness of Women about Prostate Cancer: A Mixed-Methods Systematic Review Protocol. **Manuscript ID: SYSR-D-20-00428.** Preprint available at <https://doi.org/10.21203/rs.3.rs-40585/v1>
2. Prostate Cancer Awareness among Women: A Mixed-methods Systematic Review. **Manuscript ID: VIHRI-CEEWAA-2020-0169.**
3. An Akan Translation, Validation and Reliability of a Questionnaire for assessing the Awareness of Ghanaian women about Prostate Cancer. **Manuscript ID: EJC-D-20-02059.**

MANUSCRIPT ONE AND TWO

ORDER OF AUTHORS	CONTRIBUTIONS
Ebenezer Wiafe (EW)	Study conception, review coordination, search strategy development, search and selection of studies to be included in the review, data extraction and management, methodological quality assessment, reference filtering, data integration and interpretation, and manuscript drafting.
Kofi Boamah Mensah (KBM)	Study conception, search strategy development, search and selection of studies to be included in the review, data extraction and management, methodological quality assessment, reference filtering, data integration and interpretation, manuscript review, and co-supervision.
Adwoa Bemah Boamah Mensah (ABBM)	Search strategy review, manuscript review, and settlement of disagreements between EW and KBM.
Varsha Bangalee (VB)	Manuscript review, and co-supervision.
Frasia Oosthuizen (FO)	Manuscript review, and supervision.

MANUSCRIPT THREE

ORDER OF AUTHORS	CONTRIBUTIONS
Ebenezer Wiafe	Study conception, data collection, analysis and interpretation of data, study coordination, statistical analysis, drafting of the manuscript, and material support.
Kofi Boamah Mensah	Study conception, statistical analysis, and critical review of the manuscript for important intellectual content, and supervision.
Varsha Bangalee	Critical revision of the manuscript for important intellectual content, and supervision.
Frasia Oosthuizen	Critical revision of the manuscript for important intellectual content, and supervision.

DEDICATION

I dedicate this study to all women who are supporting men battling prostate cancer. This dedication is not to remind these women of their pain, resulting from the loss of loved ones to prostate cancer, but to make them aware that their sacrifices are recognized.

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To my supervisor, I thank you so much for seeing the potential in me and making me one of your students. The journey was not easy but you were there as a mother.

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Dr. Kofi Boamah Mensah

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Dr. Adwoa Bemah Boamah Mensah

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Dr. Richard Ofori-Asenso

You have been instrumental in my growth and development. I am honored to be associated with you.

Prof. Charles Marfo

The Head, Department of Language and Communication Sciences, Kwame Nkrumah University of Science and Technology, Ghana. I am grateful for the commitment you have shown towards the success of this study.

My Family

I thank the following family members for their support: my mother, Miss. Florence Owusu Afriyie; my sisters, Miss. Emmanuella Temah and Miss. Lois Mirekua; and my fiancée, Miss. Victoria Naa Amerley Akua Nyamadie. Words cannot express my gratitude.

University of KwaZulu-Natal College of Health Sciences, research office.

The effort you put into making the study possible cannot be overlooked. I say a very big thank you to the team.

Staff and Management of the Kejetia Market, Ghana.

If you had not supported me, where would my research team have sited this study? Thank you for prioritizing research in this Coronavirus era.

Study Participants.

To my mothers on the Kejetia Market, Ghana, it was wonderful interacting with and learning from you. Thank you for supporting me during the data collection period. God bless you all.

LIST OF ABBREVIATIONS

BREC	Biomedical Research Ethics Committee
CDC	Centers for Disease Control and Prevention
CHRPE	Committee on Human Research, Publications and Ethics
CSEntry	Census and Survey Entry
CVI	Content Validity Index
DRE	Digital rectal examination
EAU	European Association of Urology
FDG	Focused group discussions
GLOBOCAN	Global Cancer Incidence, Mortality and Prevalence
JBH	Joanna Briggs Institute
KATH	Komfo Anokye Teaching Hospital
KCM	Kejetia Central Market
KNUST	Kwame Nkrumah University of Science and Technology
LGBTQ	Lesbian, Gay, Bisexual, Transsexual/transgender, and Queer/questioning
LMIC	Low and Middle-income Countries
MRI	Magnetic resonance imaging
OSF	Open Science Framework
PCa	Prostate cancer
PSA	Prostate-specific antigen
RAPC	Rapid Access Prostate Clinic
SEER	Surveillance, Epidemiology, and End Results
SSA	sub-Saharan Africa
US	United States
UKZN	University of KwaZulu-Natal
WHO	World Health Organization

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ABSTRACT

Background and Objectives: The incidence of prostate cancer in developing countries is less than 30%, yet it has the disease's highest mortality. To address the mortality, strategies to increase awareness of the disease have been proposed, including the recommendation for women's active involvement. This is because women act as family health advocates, advisors, managers, and promoters. Therefore, it is essential to gather evidence on women's awareness of prostate cancer. Also, in Ghana, there is a lack of evidence about women's awareness of prostate cancer. However, there are about 50 indigenous Ghanaian languages, with Akan been the most spoken language. Providing a valid and reliable Akan version of a modified tool for assessing Ghanaian women's awareness of prostate cancer is vital. The study aim was (1) to conduct a mixed-methods systematic review on the awareness of women regarding prostate cancer, and (2) to translate, validate, and conduct a reliability assessment of a questionnaire for studying the knowledge, awareness, and perception of prostate cancer in Ghanaian market women.

Methods: The Joanna Briggs Institute manual was employed in the development of a mixed-methods systematic review protocol. The protocol was then used to conduct a systematic review of the awareness of women on prostate cancer. MEDLINE (EBSCOhost), CINAHL (EBSCOhost), PsycINFO (EBSCOhost), Web of Science, and EMBASE (Ovid) were searched based on the inclusion criteria for studies conducted between 1999 to 2019. Also, questionnaires on prostate cancer awareness were adopted from other studies, modified, and translated to Akan using the forward and backward translation protocols. The Akan questionnaire was certified, validated, and a reliability assessment was performed by measuring average scores, content validity index, and Cronbach's alpha, respectively. Study participants for the validation and reliability study were recruited using a simple random sampling technique.

Results: A total of 2201 articles were identified from the search, of which seven were included in the review. The selected studies' results indicated moderate knowledge on signs and symptoms; and causes and risk factors of prostate cancer. An inadequate level of knowledge about prostate cancer screening tools was recorded among women. An Akan questionnaire was adequately developed and certified. The average scores for all parameters employed in the face validation were greater than 4. The content validity index was within the range of 0.90 - 0.99 whilst Cronbach's alpha within the range of 0.7808 - 0.9209.

Conclusion: The selected studies indicated moderate awareness about prostate cancer among women. The selected studies for the review were few; hence this hinders the generalizability and transferability of the results. More studies should be conducted on prostate cancer awareness among women to promote their role in disease prevention. The Akan questionnaire for assessing women's awareness of prostate cancer was adequate, reliable, and valid for the Ghanaian or Akan-speaking people.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Prostate cancer (PCa) emerges when cells found in the prostate gland, present in men, set off on a path of unregulated growth (Saleh, Fooladi, Petro-Nustas, Dweik, & Abuadas, 2015). The malignant disease is usually present without warning signs at the initial stages, often resulting in late diagnosis (Cancer.Net., 2019; Saleh et al., 2015). The disease diagnosis in terminal stages is the major setback in management and hence accounts for increased mortality in Africa (Chu et al., 2011; Magoha, 2007). The high burden of cancers in Ghana has led to the conception of a national document entitled National Strategy for Cancer Control (Ministry of Health [MoH], 2011) to control various cancers in the country.

1.1.1 EPIDEMIOLOGY

The Global Cancer Incidence, Mortality and Prevalence(GLOBOCAN, 2018) epidemiological report documented 18.1 million new cases of various cancers of which prostate cancer accounted for 1.3 million (7.1%) (Bray et al., 2018). Regarding the status in Ghana, 2,132 prostate cancer cases, representing 9.9% of all cancer cases, were diagnosed (GLOBOCAN, 2018).

1.1.2 DISEASE BURDEN

Although all men are at risk for developing prostate cancer, men of African descent account for the highest incidence (Bennett & Badger, 2005). The World Health Organization (WHO) estimates an increased burden of various malignancies in sub-Saharan Africa (SSA) (Kingham et al., 2013). It is imperative to note that the late diagnosis of prostate cancer in sub-Saharan Africa has been speculated to be about 80% (Kingham et al., 2013). The late diagnosis of prostate cancer in Africa accounts for the increased mortality rate (Chu et al., 2011; Magoha, 2007). This is evident as 64% of patients were found to have reported for care at advanced stages and hence, died within two years (Magoha, 2007).

Chu et al. (2011) further stressed the situation of PCa in Ghana where 75% of newly diagnosed prostate cancer patients were already at advanced stages (Chu et al., 2011). Therefore, the significantly unacceptable burden of prostate cancer, as established by mortality records, is mainly due to late diagnosis.

1.1.3 CLINICAL MANIFESTATIONS

According to Saleh et al. (2015) prostate cancer is usually asymptomatic (Saleh et al., 2015). Signs and symptoms, which usually present at terminal stages, include reduced sexual performance, fatigue, pain, and urinary discomfort (Bennett & Badger, 2005). Urinary symptomatology includes painful urination, interrupted urine flow, hematuria, urinary urgency, and urinary frequency (Cancer.Net., 2019; Saleh et al., 2015).

1.1.4 CAUSES AND RISK FACTORS

All men are at risk of developing prostate cancer (Gupta & Guin, 2010; Hayat, Howlader, Reichman, & Edwards, 2007; Surveillance, Epidemiology, and End Results Program [SEER], 2019).

The disease has been linked to a man's racial background, and a genetic link to Africa, following careful statistical analysis (SEER, 2019). Further study findings show that several factors predispose a man to develop PCa. According to the National Cancer Institute, a family history of prostate cancer - specifically, the presence of a first-degree relative - significantly increases a man's risk (PDQ Screening and Prevention Editorial Board, 2020). Also, exposure to carcinogenic chemicals and drugs; the consumption of foods with carcinogenic contents; and medical conditions such as prostatitis; are causes of PCa (PDQ Screening and Prevention Editorial Board, 2020).

1.1.5 SCREENING RECOMMENDATIONS

The benefits of early diagnosis through screening have been highlighted by Schröder et al. (2009) who revealed that a 20% reduction in mortality rate could be achieved through early screening and diagnosis (Schröder et al., 2009). Prostate-specific antigen (PSA) and the digital rectal examination

(DRE) are amongst the most widely utilized techniques for PCa screening (Andriole et al., 2009; Qaseem, Barry, Denberg, Owens, & Shekelle, 2013; Schröder et al., 2009).

The concomitant use of the PSA and the DRE has been useful in PCa detection (Schröder et al., 2009). The addition of ultrasonographic investigations to PSA-DRE combination has also proven to be extremely beneficial in improving the quality of PCa detection (Schröder et al., 2009). Results obtained from the routine screening with PSA alone, DRE alone, PSA-DRE combination, or PSA-DRE-Ultrasonography combination have informed the need for pathological investigations in an attempt to arrive at a certified diagnosis which often informs the treatment approach to select (Schröder et al., 2009).

Also, there is the potential of magnetic resonance imaging (MRI) for the diagnosis and characterization of PCa (Dickinson et al., 2011). It is recommended that men screen for the disease as they age (Qaseem et al., 2013).

1.1.6 MANAGEMENT APPROACHES

The approaches to the management of PCa are guided by government policies on health and regional treatment recommendations (Schröder et al., 2009). According to the European Association of Urology (EAU), modalities for the management of PCa include; delayed management; surgical management; radiotherapy, and pharmacotherapy (European Association of Urology [EAU], 2020). In addition to the conventional treatment options, investigations are still ongoing to evaluate the efficacy of cryotherapy, high-intensity focused ultrasound, and focal therapy (EAU, 2020).

1.2 PROBLEM STATEMENT

The 2018 incidence of cancers in Ghana had been determined to be 22,823 and prostate cancer accounted for 2,132 (9.9%) (GLOBOCAN, 2018). A previous study by Chu et al. (2011) highlighted the troublesome nature of the late diagnosis of PCa in Ghana (Chu et al., 2011). Hence, PCa is a significant public health threat to the Ghanaian community. There are no national policies dedicated to the early detection and control of prostate cancer in Ghana. The cancer document published in 2011 by the Ministry of Health, Ghana, was to be employed in the control of various

cancers from 2012 to 2016 (MoH, 2011). Therefore, the unavailability of an updated national cancer control document and the total absence of a prostate cancer control document are national concerns.

Over the years, much attention has been placed on other types of cancers, mainly breast cancer, ignoring the prostate (Fitzpatrick, Kirby, Brough, & Saggerson, 2009). An assessment of cancer publications revealed that breast cancer had 40% more articles than prostate cancer (Fitzpatrick et al., 2009). Furthermore, the findings from the international survey by Fitzpatrick et al. (2009) reported a lower media publicity of prostate cancer as compared to other cancers (Fitzpatrick et al., 2009). On the part of clinical research to investigate newer and more advanced ways of screening, diagnosing, and managing cancers, prostate cancer has also suffered a great degree of neglect (Fitzpatrick et al., 2009). Although these figures might have changed, in an attempt to reduce mortality it is imperative to throw more light on prostate cancer with attention on exploiting ways of increasing early detection as recommended by the WHO (World Health Organization [WHO], 2019). Therefore, the research and publicity deficits plighting prostate cancer require closure.

In exploiting a cost-effective approach to enhance the early detection of prostate cancer with the sole aim of reducing mortality, this study seeks to develop an Akan questionnaire to contribute to the identification of gaps in the knowledge, awareness, and perception of women towards the early detection of prostate cancer. The study, upon conclusion, will propose recommendations to identify and address knowledge gaps.

1.3 JUSTIFICATION

The development of a tool to investigate women's awareness of prostate cancer would contribute to the early detection of the disease. It has been proven that prostate cancer diagnosis at advanced stages is associated with increased mortality and poor quality of life in survivors. The publicity of prostate cancer is significantly low in the global context where studies involving women were low (Fitzpatrick et al., 2009). Therefore, this study would contribute to awareness creation in the global community.

In Ghana, there has been a call for innovative ways to promote the early detection of prostate cancer (Chu et al., 2011). This call has been a result of the increased mortality associated with late diagnosis. The Akan language is spoken by the majority of Ghanaians, and the Ghanaian population is composed of over 50% of women. Hence, the development of an Akan tool aimed at positioning women at the center of the strategy to promote the early detection of prostate cancer by exploiting their health promotion and protection qualities is essential (Karim, Lindberg, Wamala, & Emmelin, 2018; Somani, 2017).

According to a study by Mensah et al. (2020), members of the Community Pharmacy Practitioners Association of the Pharmaceutical Society of Ghana have a positive attitude towards the promotion of cancer health (Mensah, Oosthuizen, & Bangalee, 2020). Pharmacists have been useful in improving the quality of life of cancer patients through counselling (Periasamy et al., 2020). Hence, practitioners of pharmacy could exploit their counselling skills to encourage women to push their male significant others to screen for prostate cancer. Also, community pharmacists could make use of a prostate cancer knowledge assessment tool to assess the knowledge of women who visit their facilities and further educate these women to close knowledge gaps.

A literature search before the conception and initiation of this study did not discover any studies that developed a Ghanaian tool to investigate women's awareness of prostate cancer. Hence, the uniqueness of this study.

1.4 AIM

The core aim of this research was to develop a tool to be used specifically in Ghana to study the knowledge, awareness, and perception of women about prostate cancer.

1.5 SPECIFIC OBJECTIVES

- 1) To conduct a mixed-methods systematic review on the awareness of women about prostate cancer.
- 2) To translate, validate, and conduct a reliability assessment of a questionnaire for studying the knowledge, awareness, and perception of prostate cancer in Ghanaian market women.

1.6 THEORETICAL AND CONCEPTUAL FRAMEWORK

The theory underpinning this study is the attachment theory (Figure 1) also referred to as the relationship theory (Pietromonaco, Uchino, & Dunkel Schetter, 2013). The theory describes the effect of closed bonds in nature as observed in wives-husbands relationships and parents-children relationships (Bowlby, 1973; Collins & Feeney, 2010; Mikulincer & Shaver, 2007). This theory, exhibited in the adult population as illustrated in this study, has presented the scientific community with a powerful explanation of terms in addition to having a clear-cut significant impact on health outcomes (Mikulincer & Shaver, 2007; Pietromonaco et al., 2013). In wellness domains such as obstetrics (Buka, Brennan, Rich-Edwards, Raudenbush, & Earls, 2003; Dunkel Schetter, 2011); psychology (Dunkel Schetter, 2011; Feeney, Peterson, Gallois, & Terry, 2000); weight management (Dailey, Romo, & Thompson, 2011); diabetes management (Stephens, Rook, Franks, Khan, & Iida, 2010); HIV control (Burton, Darbes, & Operario, 2010); smoking cessation and cardiac health (Lewis & Butterfield, 2007; Vilchinsky et al., 2011), cancer management (Belcher et al., 2011; Manne et al., 2004); chronic pain management (Cremeans-Smith et al., 2003; Meredith, Ownsworth, & Strong, 2008); and geriatric care provision (Karantzas, Evans, & Foddy, 2010; Pinguart & Sörensen, 2007), the attachment theory has been very useful.

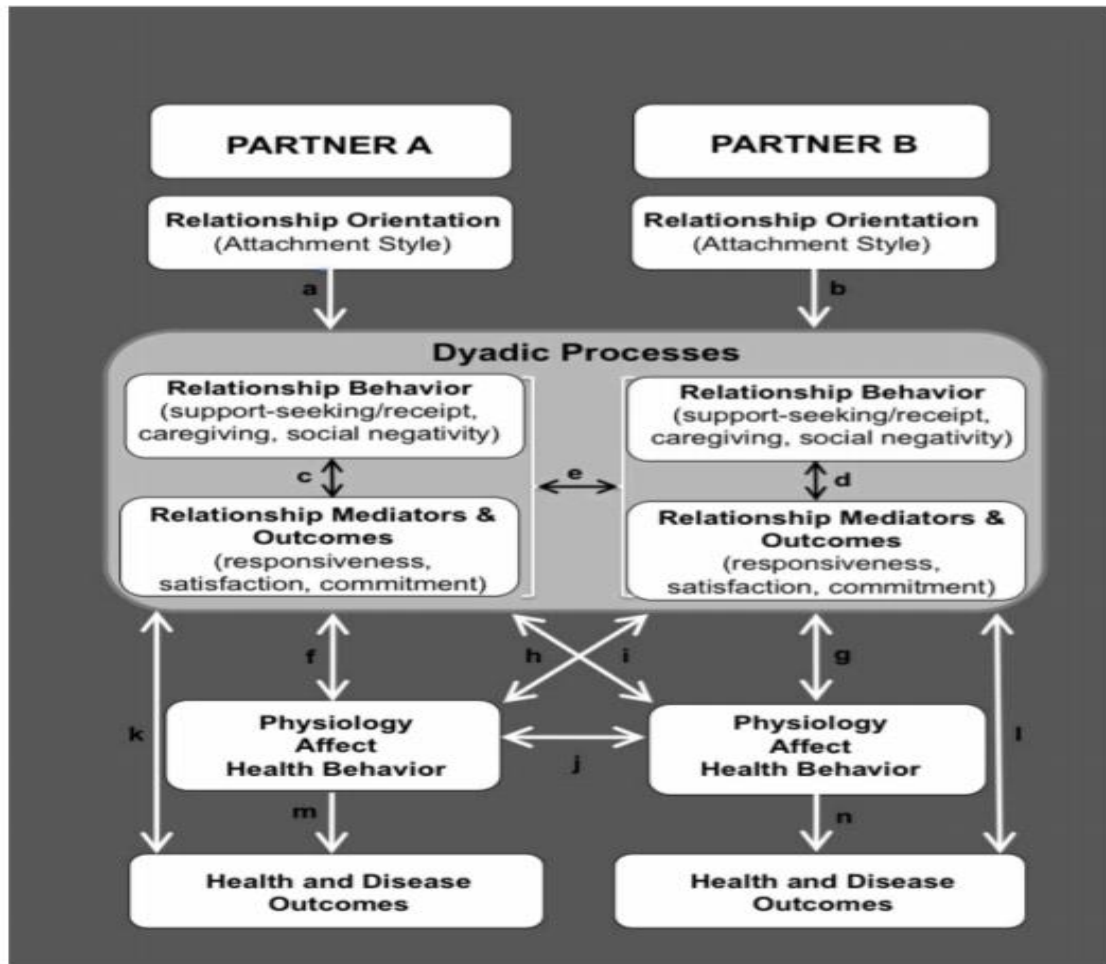


Figure 1: Theoretical framework illustrating attachment theory (Pietromonaco et al., 2013).

The study is also rooted in the concept of social networks and social support (Figure 2) (Glanz, Rimer, & Viswanath, 2008) as there is enough evidence establishing a link between the theory and concept guiding this study (Glanz et al., 2008; Pietromonaco et al., 2013). Historically, the social network was researched and presented as a theory until Barnes presented it as a concept in the 1950s (Barnes, 1954). Social support could be emotional, instrumental, informational, or appraisal (Glanz et al., 2008). This study, amongst the aspects of social support, will mainly utilize informational support by testing the knowledge and awareness of women on prostate cancer with a focus on making recommendations aimed at equipping women to transmit information about the disease to men. In discussing women's perception about prostate cancer, the study will focus on utilizing emotional and instrumental support as men will benefit from recommendations addressing negative perceptions that may be discovered in women. With respect to appraisal

support, the study will benefit women as their knowledge, awareness and perception on the disease will be assessed. Hence, the study seeks to satisfy the four dimensions of social support.

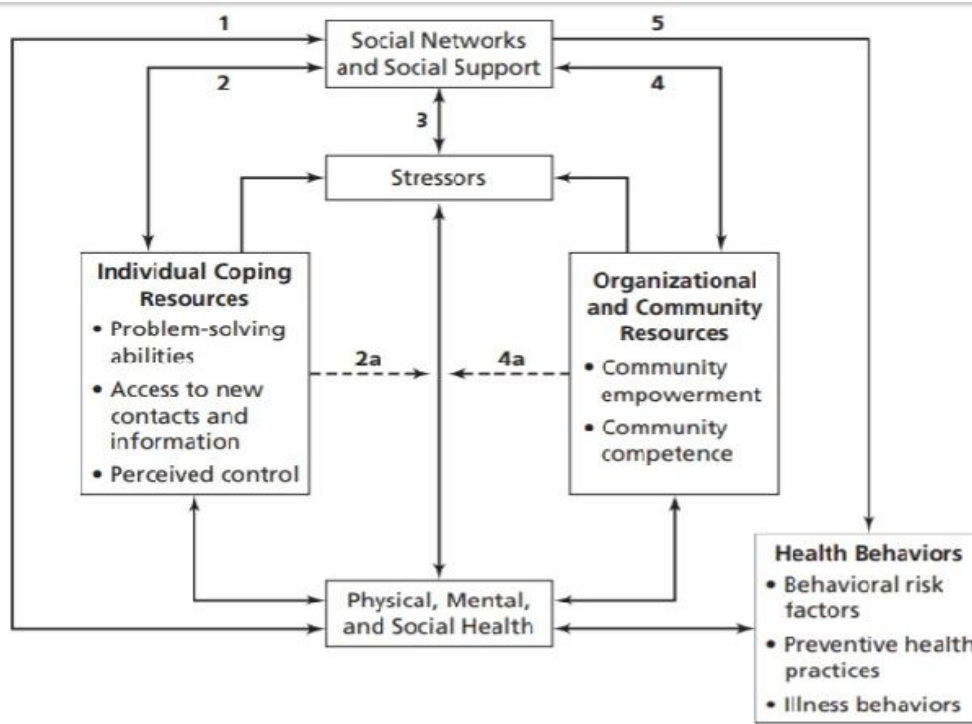


Figure 2: Conceptual framework illustrating Social Networks and Social Support (Glanz et al., 2008).

1.7 GENERAL METHODOLOGY

1.7.1 STUDY DESIGN

A cross-sectional, quantitative, descriptive study design was employed in this research project.

1.7.2 STUDY SETTING

The research was conducted on the Kumasi Central Market (KCM). The Kejetia Market (popularly known as KCM) is located in the Ashanti Region of Ghana (Kumasi as the capital town). The market was designed to hold about 300,000 individuals who could be evacuated, in times of emergencies, within an estimated 12-minute duration. The facilities in the market include; shops (over 8,400), a crèche, canteen/food court, clinic, transport section, and others.

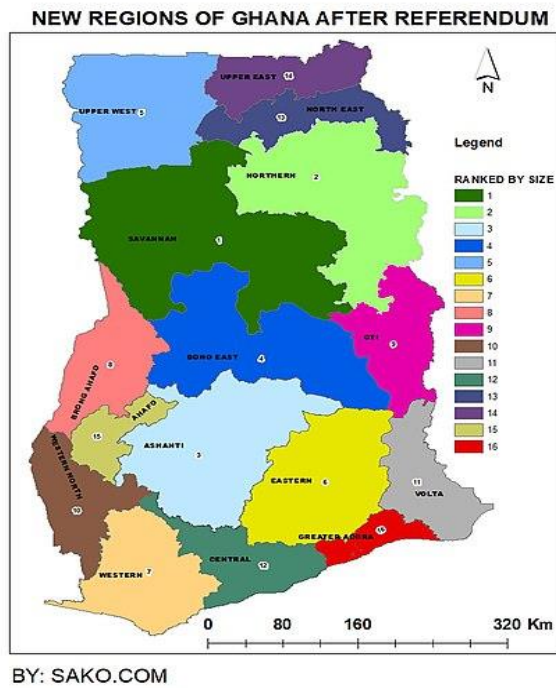


Figure 3: Map of Ghana illustrating the 16 administrative regions.

Source: https://commons.wikimedia.org/wiki/File:NEW_GHANA_REGIONS.jpg



Figure 4: A partial map of the Ashanti region of Ghana with a focus on the location of the Kejetia Central Market.

Source: https://en.wikipedia.org/wiki/Kejetia,_Kumasi,_Ghana



Figure 5: A side view of the Kejetia Market.

Source: <https://www.graphic.com.gh/news/general-news/ghana-news-kma-begins-allocation-of-stores-at-new-kejetia-market.html>



Figure 6: Internal view of the Kejetia Market illustrating the layout of shops.

Source: <http://archpose.com/the-new-kejetia-market-project-update/>

1.7.3 STUDY SUBJECTS

The category of individuals at KCM recruited for this study was females who offered items for sale at the market. According to the administrative manager, the estimated number of potential study subjects, from which the appropriate sample size was calculated, was 25,000.

1.7.3.1 INCLUSION CRITERIA

- Female sellers at the Kumasi Central Market. This was due to their availability for the test and retest stages of the study as compared to female buyers.
- Female sellers who consented to the study.

1.7.3.2 EXCLUSION CRITERIA

- Supporting female staff, including female head porters, of recruited participants. This category of market women moves from one point to another. Hence, their inclusion would have posed significant challenges in the retesting of the questionnaire. This is because it would be difficult to track such participants.
- Female sellers who did not consent to the study.
- Women who were on the market as relatives and friends of study subjects.
- Women who were below 18 years at the time of sampling.

1.7.4 SAMPLE SIZE AND SAMPLING TECHNIQUE

The developed prostate cancer awareness tool was subjected to a reliability assessment by testing and retesting the tool in a sample of women on the Kumasi Central Market. The reliability study was to determine the ability of the tool to effectively measure the study domains over some time. In determining the sample size for the reliability study, a confidence level (c) of 95% was set. Other parameters included a precision level (e, sampling error) of +/-5% and a degree of variability (p) of 50%. The sample size obtained using a published table (Figure 7) by Israel (1992), considering the estimated 25,000 market women, was 394 (Israel, 1992). Therefore, for a

conventional study, approximately 400 women are appropriate. However, 25% (i.e. 100 women) of the required sample size was employed in the reliability assessment of the questionnaire to obtain an intra-class correlation coefficient (ICC) of not less than 0.75 ± 0.1 at a 95% confidence interval (Rogers et al., 2016). This is supported by the evidence that some studies recruited a lesser sample size (Sowtali, Yusoff, Harith, & Mohamed, 2016) and relatively higher sample sizes (Nahad et al., 2014; Rogers et al., 2016). The market women were sampled according to the simple random sampling technique.

Size of Population	Sample Size (n) for Precision (e) of:			
	$\pm 3\%$	$\pm 5\%$	$\pm 7\%$	$\pm 10\%$
500	a	222	145	83
600	a	240	152	86
700	a	255	158	88
800	a	267	163	89
900	a	277	166	90
1,000	a	286	169	91
2,000	714	333	185	95
3,000	811	353	191	97
4,000	870	364	194	98
5,000	909	370	196	98
6,000	938	375	197	98
7,000	959	378	198	99
8,000	976	381	199	99
9,000	989	383	200	99
10,000	1,000	385	200	99
15,000	1,034	390	201	99
20,000	1,053	392	204	100
25,000	1,064	394	204	100
50,000	1,087	397	204	100
100,000	1,099	398	204	100
>100,000	1,111	400	204	100
a = Assumption of normal population is poor (Yamane, 1967). The entire population should be sampled.				

Figure 7: Sample size for selected population sizes (Israel, 1992).

1.7.5 DATA COLLECTION TOOL AND METHOD

The data extraction tool was originally developed in the English language and later translated into the Akan language. The tool was made of six (6) sections comprising forty-five (45) items. Data collection for the reliability assessment commenced on June 8, 2020, and ended on June 19, 2020. The certified Akan version of the questionnaire was read to participants after obtaining informed consent and answers, provided by participants, were entered with the Census and Survey Entry (CSEntry) mobile application for easy data handling.

1.8 DATA COLLECTION PROCEDURE

An English version of the prostate cancer awareness tool was adopted and modified. The English tool then went through a translation procedure into the Akan language by three English and three Akan translators. The translation method employed was the forward (translation from English to Akan) and backward (translation from Akan to English) translation techniques. The final English document was compared to the original English document for textual equivalence. The Akan tool was approved, certified, and subjected to a validity and reliability assessment.

The face and content validity analysis was performed utilizing six (6) non-experts (market women) and six (6) experts (healthcare professionals), respectively. These individuals voluntarily scored the variables of the tool according to set criteria.

The reliability assessment of the tool, which employed the test-retest method, recruited 100 market women at the Kumasi Central Market. The women were randomly recruited and guided to respond to the tool after informed consent was obtained. The interval between the test and retest periods was seven days, and the process was completed in 14 days. During the random sampling stage, the market ground floor was divided into four (4) sections. Each section was sub-sectioned into five (5). Four (4) women were selected per sub-section to make 100 women for the reliability study. The selected women were revisited after a week to complete the data collection procedure.

1.9 DATA ANALYSIS AND MANAGEMENT

CSEntry mobile application was used for the data entry, and the STATA software was used for the statistical analysis. A summary of the descriptive data was presented as tables. The average validity score was calculated to assess the questionnaire face validity, and the Content Validity Index (CVI). Cronbach's alpha was employed for the determination of internal reliability.

To secure the participants' interest, the highest standard of confidentiality, gathered data has been secured in an enclosed compartment and will remain so for five years and discarded after that.

1.10 ETHICAL CONSIDERATION

The study was granted two ethics approvals. The primary, local ethics, approval was obtained from the Committee on Human Research, Publications and Ethics (CHRPE) of the Kwame Nkrumah University of Science and Technology (KNUST), Ghana. CHRPE reference number: CHRPE/AP/127/20 (Appendix 3). The secondary and final ethics approval was obtained from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal (UKZN), South Africa. BREC reference number: BREC/00001292/2020 (Appendix 1). These ethical approvals enabled the conduct of the study indicated in chapter 3. The Kumasi Metropolitan Assembly, through the Kejetia administrative manager, granted permission for the use of the market as the research site.

Informed consent was obtained from respondents and witnessed. Each participant was given a non-monetary gift after the successful completion of the questionnaire as an appreciation.

1.11 CONCLUSIONS

This chapter highlighted the burden of prostate cancer and the need for increased awareness in an attempt to promote the early detection of the disease. The chapter also emphasized the need to explore cost-effect ways to address the knowledge deficits of prostate cancer in women. The relevance of a Ghanaian tool to study the awareness of women about prostate cancer was highlighted.

REFERENCES

- Andriole, G. L., Crawford, E. D., Grubb III, R. L., Buys, S. S., Chia, D., Church, T. R., . . . Reding, D. J. (2009). Mortality results from a randomized prostate-cancer screening trial. *New England Journal of Medicine*, 360(13), 1310-1319.
- Barnes, J. A. (1954). Class and committees in a Norwegian island parish. *Human Relations*, 7(1), 39-58.
- Belcher, A. J., Laurenceau, J.-P., Graber, E. C., Cohen, L. H., Dasch, K. B., & Siegel, S. D. (2011). Daily support in couples coping with early stage breast cancer: Maintaining intimacy during adversity. *Health Psychology*, 30(6), 665.
- Bennett, G., & Badger, T. A. (2005). *Depression in men with prostate cancer*. Paper presented at the Oncology Nursing Forum.
- Bowlby, J. (1973). *Attachment and Loss, Volume II: Separation, Anxiety and Anger* (pp. 1-429). London: The Hogarth Press and the Institute of Psycho-Analysis.
- Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R. L., Torre, L. A., & Jemal, A. (2018). Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*, 68(6), 394-424.
- Buka, S. L., Brennan, R. T., Rich-Edwards, J. W., Raudenbush, S. W., & Earls, F. (2003). Neighborhood support and the birth weight of urban infants. *American Journal of Epidemiology*, 157(1), 1-8.
- Burton, J., Darbes, L. A., & Operario, D. (2010). Couples-focused behavioral interventions for prevention of HIV: systematic review of the state of evidence. *AIDS and Behavior*, 14(1), 1-10.
- Cancer.Net. (2019). *Prostate Cancer*. Retrieved from <https://www.cancer.net/cancer-types/prostate-cancer>
- Chu, L. W., Ritchey, J., Devesa, S. S., Quraishi, S. M., Zhang, H., & Hsing, A. W. (2011). Prostate cancer incidence rates in Africa. *Prostate Cancer*, 2011.
- Collins, N. L., & Feeney, B. C. (2010). *An Attachment Theoretical Perspective on Social Support Dynamics in Couples: Normative Processes and Individual Differences* (pp. 89-120). London: Oxford University Press.
- Creameans-Smith, J. K., Stephens, M. A. P., Franks, M. M., Martire, L. M., Druley, J. A., & Wojno, W. C. (2003). Spouses' and physicians' perceptions of pain severity in older women with osteoarthritis: dyadic agreement and patients' well-being. *Pain*, 106(1-2), 27-34.
- Dailey, R. M., Romo, L. K., & Thompson, C. M. (2011). Confirmation in couples' communication about weight management: An analysis of how both partners contribute to individuals' health behaviors and conversational outcomes. *Human Communication Research*, 37(4), 553-582.
- Dickinson, L., Ahmed, H. U., Allen, C., Barentsz, J. O., Carey, B., Futterer, J. J., . . . Padhani, A. R. (2011). Magnetic resonance imaging for the detection, localisation, and characterisation of prostate cancer: recommendations from a European consensus meeting. *European urology*, 59(4), 477-494.

- Dunkel Schetter, C. (2011). Psychological science on pregnancy: stress processes, biopsychosocial models, and emerging research issues. *Annual Review of Psychology*, 62, 531-558.
- European Association of Urology. (2020). *Prostate cancer*. Retrieved from <https://uroweb.org/guideline/prostate-cancer/#5>
- Feeney, J. A., Peterson, C., Gallois, C., & Terry, D. J. (2000). Attachment style as a predictor of sexual attitudes and behavior in late Adolescence. *Psychology & Health*, 14(6), 1105-1122.
- Fitzpatrick, J., Kirby, R., Brough, C., & Saggerson, A. (2009). Awareness of prostate cancer among patients and the general public: results of an international survey. *Prostate Cancer and Prostatic Diseases*, 12(4), 347.
- Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: theory, research, and practice*: John Wiley & Sons.
- GLOBOCAN. (2018). *GLOBOCAN 2008: Ghana Fact Sheets*. Retrieved from file:///C:/Users/user-pc/Downloads/288-ghana-fact-sheets.pdf
- Gupta, I., & Guin, P. (2010). Communicable diseases in the South-East Asia Region of the World Health Organization: towards a more effective response. *Bulletin of the World Health Organization*, 88(3), 199-205.
- Hayat, M. J., Howlader, N., Reichman, M. E., & Edwards, B. K. (2007). Cancer statistics, trends, and multiple primary cancer analyses from the Surveillance, Epidemiology, and End Results (SEER) Program. *The Oncologist*, 12(1), 20-37.
- Israel, G. D. (1992). *Determining sample size (Fact sheet PEOD-6)*. Gainesville, FL: University of Florida.
- Karantzas, G. C., Evans, L., & Foddy, M. (2010). The role of attachment in current and future parent caregiving. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 65(5), 573-580.
- Karim, R., Lindberg, L., Wamala, S., & Emmelin, M. (2018). Men's Perceptions of Women's Participation in Development Initiatives in Rural Bangladesh. *American Journal of Men's Health*, 12(2), 398-410.
- Kingham, T. P., Alatisé, O. I., Vanderpuye, V., Casper, C., Abantanga, F. A., Kamara, T. B., . . . Denny, L. (2013). Treatment of cancer in sub-Saharan Africa. *The Lancet Oncology*, 14(4), e158-e167.
- Lewis, M. A., & Butterfield, R. M. (2007). Social Control in Marital Relationships: Effect of One's Partner on Health Behaviors 1. *Journal of Applied Social Psychology*, 37(2), 298-319.
- Magoha, G. (2007). Overview of prostate cancer in indigenous black Africans and blacks of African ancestry in diaspora 1935-2007. *East African Medical Journal*, 84(9), S3.
- Manne, S., Sherman, M., Ross, S., Ostroff, J., Heyman, R. E., & Fox, K. (2004). Couples' support-related communication, psychological distress, and relationship satisfaction among women with early stage breast cancer. *Journal of Consulting and Clinical Psychology*, 72(4), 660.

- Mensah, K. B., Oosthuizen, F., & Bangalee, V. (2020). Cancer health promotion in Ghana: A survey of community pharmacists' perception and barriers. *Journal of Oncology Pharmacy Practice*, 26(6), 1361-1368.
- Meredith, P., Ownsworth, T., & Strong, J. (2008). A review of the evidence linking adult attachment theory and chronic pain: Presenting a conceptual model. *Clinical Psychology Review*, 28(3), 407-429.
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. Guilford Press.
- Ministry of Health. (2011). *National strategy for cancer control in Ghana 2012–2016*. Accra: Ministry of Health.
- Nahad, H. A., Rouzbahani, M., Jarollahi, F., Jalaie, S., Pourbakht, A., Mokrian, H., . . . Zadeh, A. N. (2014). Translation, validity, and reliability of a persian version of the iowa tinnitus handicap questionnaire. *Iranian journal of otorhinolaryngology*, 26(75), 79.
- PDQ Screening and Prevention Editorial Board. (2020). *PDQ Cancer Prevention Overview*. Retrieved from <https://www.cancer.gov/about-cancer/causes-prevention/hp-prevention-overview-pdq>
- Periasamy, U., Sherina, M. S., Akhtari-Zavare, M., Rampal, L., Ismail, S. I. F., & Mahmud, R. (2020). Effects of Counselling on Quality of Life among Cancer Patients in Malaysia: A Randomized Controlled Trial. *Iranian journal of public health*, 49(10), 1902.
- Pietromonaco, P. R., Uchino, B., & Dunkel Schetter, C. (2013). Close relationship processes and health: Implications of attachment theory for health and disease. *Health Psychology*, 32(5), 499.
- Pinquart, M., & Sörensen, S. (2007). Correlates of Physical Health of Informal Caregivers: A Meta-Analysis. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 62(2), 126-137.
- Qaseem, A., Barry, M. J., Denberg, T. D., Owens, D. K., & Shekelle, P. (2013). Screening for Prostate Cancer: A Guidance Statement From the Clinical Guidelines Committee of the American College of Physicians. *Annals of Internal Medicine*, 158(10), 761-769.
- Rogers, K. D., Pilling, M., Davies, L., Belk, R., Nassimi-Green, C., & Young, A. (2016). Translation, validity and reliability of the British Sign Language (BSL) version of the EQ-5D-5L. *Quality of Life Research*, 25(7), 1825-1834.
- Saleh, A. M., Fooladi, M. M., Petro-Nustas, W., Dweik, G., & Abuadas, M. H. (2015). Enhancing Knowledge, Beliefs, and Intention to Screen for Prostate Cancer via Different Health Educational Interventions: a Literature Review. *Asian Pacific Journal of Cancer Prevention*, 16(16), 7011-7023.
- Schröder, F. H., Hugosson, J., Roobol, M. J., Tammela, T. L., Ciatto, S., Nelen, V., . . . Zappa, M. (2009). Screening and prostate-cancer mortality in a randomized European study. *New England Journal of Medicine*, 360(13), 1320-1328.

- Somani, T. (2017). Importance of Educating Girls for the Overall Development of Society: A Global Perspective. *Journal of Educational Research and Practice*, 7(1), 10.
- Sowtali, S. N., Yusoff, D. M., Harith, S., & Mohamed, M. (2016). Translation and validation of the Malay version of the Stroke Knowledge Test. *Journal of arrhythmia*, 32(2), 112-118.
- Stephens, M. A. P., Rook, K. S., Franks, M. M., Khan, C., & Iida, M. (2010). Spouses use of social control to improve diabetic patients' dietary adherence. *Families, Systems, & Health*, 28(3), 199.
- Surveillance, Epidemiology, and End Results Program. (2019). *Cancer Stat Facts: Prostate Cancer*. Retrieved from <https://seer.cancer.gov/statfacts/html/prost.html>
- Vilchinsky, N., Dekel, R., Leibowitz, M., Reges, O., Khaskia, A., & Mosseri, M. (2011). Dynamics of support perceptions among couples coping with cardiac illness: The effect on recovery outcomes. *Health Psychology*, 30(4), 411.
- World Health Organization. (2019). *Cancer*. Retrieved from <https://www.who.int/cancer/detection/en/>

BRIDGING DOCUMENT

In chapter 1, the study's introduction, the general methodology employed, and the study's ethical consideration was presented. The literature reviewed in this study is described in chapter two in the form of manuscripts. This is presented in two sub-chapters (Chapter 2 A and 2 B). Chapter 2 A presents the development of a mixed-methods systematic review protocol that was used to guide the mapping up of current evidence of women on prostate cancer. The manuscript was prepared following the Journal authors' guidelines.

CHAPTER 2 A

SUBMITTED MANUSCRIPT

The Awareness of Women about Prostate Cancer: A Mixed-Methods Systematic Review Protocol

Abstract

Background: Prostate cancer accounts for about 10% of cancers affecting and claiming the lives of men. Studies have reported that women are better than men in recognition of the early manifestations of various cancers. Furthermore, women have been recognized to show a profound interest in their partners' health and hence, make observations that men don't know. Several studies have reported on the knowledge gaps of prostate cancer among patients and the general population. It is vital to comprehensively review the available evidence and identify research gaps in our current understanding of knowledge of women on prostate cancer.

Methods: A search of bibliographic databases, MEDLINE (EBSCOhost), CINAHL (EBSCOhost), PsycINFO (EBSCOhost), Web of Science, and EMBASE (Ovid) will be undertaken from January 1999 to December 2019. The search will be limited to studies published in the English language. Duplication of studies will be removed using the EndNote citation manager. After deduplication, citations will be screened independently by two authors according to prespecified criteria. Data extraction and quality assessment of the selected studies will be done independently by two authors. Meta-analytic methods will be used where appropriate. The convergent segregated method of synthesis will be adopted in this review.

Ethics and dissemination: Primary data collection will not be involved in this study, hence formal ethical clearance will not be needed. The results of the study will be presented through a peer-reviewed journal and conference presentation.

Patient and public involvement: Patients or the public will not be engaged in the conduct of this study.

Trial registration number: Open Science Framework (OSF) registration DOI: <https://doi.org/10.17605/OSF.IO/EYHF2>

Background

Prostate cancer is a common neoplasm in men, and its occurrence keeps rising in many countries [1]. It is number three on the global list of the most common cancers that claim the lives of men [2,3]. The incidence rate, mortality rate, and the rate of diagnosis of prostate cancer have been documented to be 0.5 million per year, a man per 2 minutes, and almost 2000 men per day, respectively [2,4]. In addition to the global burden of the disease, prostate cancer accounts for about 10% of cancers affecting men [2]. Thus, prostate cancer is of significant public health interest.

A study conducted by Quinn and Babb (2002) indicated a reduction in prostate cancer mortality from early detection [2]. Other studies have also indicated the importance of the early detection of the disease to reduce mortality [5,6]. In North America, the establishment of Rapid Access Prostate Clinic (RAPC) and more extensive advocacy of prostate cancer to the general population, with global campaigns such as Movember (ie.movember.com), has decreased the mortality of the disease [7]. Hence, measures to improve the early detection of the disease among the general population can have a significant impact on the disease.

There are scientific shreds of evidence to support the claim that women can be trusted with family health [5,8]. Blanchard et al. (2005) reported that women are better than men in the following aspects of cancers; the recognition of the early manifestations of various cancers, the timely perception of the barriers to seeking help, and the timely report of the identified barriers [5]. Women have reported on breast cancer and cervical cancer, where education has equipped them to be in control of their health [9]. Also, women have been recognized as individuals who show a profound interest in their partners' health. Hence, they can make observations that men themselves do not observe about their health [9]. Much evidence exists on the critical role of women in decision-making in the treatment of their spouse or partner diagnosed with prostate cancer [10,11]. Similar studies have also explored their potential role in screening the disease. Scant data exist on the knowledge of women about prostate cancer. Therefore, it is essential to map up evidence to determine women's knowledge about prostate cancer as a public health means of reducing the disease.

A survey conducted by Fitzpatrick et al. (2009) concluded that the public and patients are aware of prostate cancer but with certain knowledge gaps. It concluded that measures have to be taken to address the identified knowledge gaps [4]. It is essential to gather information on the current knowledge of prostate cancer in the general population. However, this review focuses on women, as public health care largely depends on women's contributions, particularly in health education [12]. The study aims to map up existing evidence about the awareness of women about prostate cancer.

Review question

Do women have adequate knowledge about prostate cancer?

Objectives of the study

1. To assess the knowledge-base of women on the signs and symptoms of prostate cancer.
2. To determine the awareness of women on the risk factors and causes of prostate cancer.
3. To ascertain the knowledge of women on the availability of screening guides for the early detection of prostate cancer.

Methods and Analysis

The mixed-methods approach will be employed in this systematic review. The Joanna Briggs Institute (JBI) reviewer's manual, with a focus on mixed methods systematic reviews, will be utilized [13]. The mixed-methods approach to research, which is among the first three widely used research approaches, has gained popularity due to its ability to analyze data obtained from quantitative, qualitative, and primary mixed-methods research papers [14,15]. The mixed-methods approach is also appropriate to permit data triangulation to enhance the study validity [16]. In addition to this benefit, the use of mixed-methods has proven to be useful in comparing and contrasting quantitative and qualitative research findings. This results in either the quantitative findings supporting the qualitative findings or vice versa [16]. To ensure that findings that have the highest recognizable strength are obtained at the end of the systematic review, the role of the mixed-methods approach in this review is important [13]. This critical appraisal and synthesis is

registered with Open Science Framework and can be accessed through <https://doi.org/10.17605/OSF.IO/EYHF2> and will commence in July 2020.

Eligibility criteria

Population of interest

The population of interest is women who are 18 years of age or above. The review will include research papers that involve women who are 18 years of age or above as part of the study population. In addition to the description of the interest population (women who are 18 years and above), the features of women in included studies will not be restricted to cultural/sub-cultural backgrounds and geographical locations.

Interest phenomena

The phenomenon of interest for this review is the awareness of women on prostate cancer. Therefore, this review will involve studies that evaluated the knowledge of women aged 18 years and above on prostate cancer.

Context of interest

The context of interest will include but not limited to all studies conducted in women of all cultural/sub-cultural backgrounds and geographical locations.

Outcome

The review will consider research papers that have the knowledge of women on the signs and symptoms, causes and risk factors, and screening recommendations of prostate cancer as the outcome measures.

Types of studies to be included

This critical appraisal and synthesis would involve primary research papers that are qualitative, quantitative, and mixed-methods in nature. Focused group discussions (FGD), observation of study subjects (follow-up studies), in-depth interviews, and other forms of interviews will constitute the qualitative studies to be included in this systematic review without ignoring other

studies that meet the criteria of qualitative studies. Quantitative studies will constitute descriptive studies, descriptive cross-sectional studies, and other studies that meet the requirements of quantitative studies. Studies that combined qualitative and quantitative designs will constitute the mixed-methods arm of this study on a condition that the qualitative and quantitative data can be explicitly extracted. This review will also include studies that have been published in the English language. To be able to map up current evidence, studies dating January 1999 - December 2019 will be included in this review.

Exclusion criteria

The following will be grounds for excluding papers for this review:

- Studies that were published before January 1999 or after December 2019.
- Studies that were not published in the English language.
- Studies that include women below the age of 18 years.
- Studies in which the age of included women cannot be established.
- Studies that did not indicate the number of included women.
- Studies that exclusively included male without any female gender (18 years and above).
- Studies conducted amongst women who were previously given education on prostate cancer.
- Studies involving lesbian, gay, bisexual, transsexual/transgender, and queer/questioning (LGBTQ) participants.
- Studies that included healthcare professionals.
- Studies that included healthcare and college/university students.
- Studies that do not include the outcome of interest.
- Book chapters.
- Reviews and overviews.
- Abstracts and conference papers.
- Dissertations and thesis.
- Commentaries and letters to editors.
- Studies published without abstracts.

Information sources and search strategy

A comprehensive search strategy will be developed by the primary author (EW) to identify various publications related to the study. The following databases will be searched; MEDLINE (EBSCOhost), CINAHL (EBSCOhost), PsycINFO (EBSCOhost), Web of Science, and EMBASE (Ovid). The searched period will be from January 1999 to December 2019.

A triple stage approach to searching published literature will be adopted in developing the preliminary search strategy [13]. Firstly, MEDLINE (EBSCOhost) will be searched for articles relevant to this review. Subject terms (identified from the title and abstract of the relevant papers) and free text terms (identified from the description of the relevant papers) will be employed in the development of the preliminary search strategy. The preliminary search strategy, using MEDLINE (EBSCOhost), has been affixed (Appendix 1). Secondly, the preliminary search strategy will be adopted in the search for relevant studies from CINAHL (EBSCOhost), PsycINFO (EBSCOhost), Web of Science, and EMBASE (Ovid), respectively. The citation list of the selected studies for the review will be scanned for additional studies. Search findings, which will be in the English language, will be compiled independently by two authors (EW and KBM).

The total search findings of EW and KBM will be compiled and duplicate papers, removed with the help of the EndNote X8 software, to generate a final list of search findings for the review.

Screening and selection of studies

The final list of search findings will be independently screened by two reviewers (EW and KBM). The titles and abstracts of the selected studies will initially be screened for inclusion and exclusion in the review. Studies that are selected after the screening of the titles and abstract will undergo full-text reading by the same independent reviewers. The selection for data extraction will be done by a careful comparison of papers that successfully passed the screening stage to the established inclusion and exclusion criteria. Search findings that present disagreements between the independent reviewers, during the screening and selection stages, will be resolved through discussions with the third reviewer (ABBM). Cohen's kappa will be used to measure inter-rater agreement between the two independent reviewers in each screening phase. Reference management will be done by EW.

Data extraction

The JBI quantitative and qualitative data extraction tools, appendix 2 [17-19] will be adopted to extract data from search findings. The convergent segregated approach to data synthesis and data integration recommends using separate data extraction tools for this review [13]. Data that will be extracted from the included studies will not be restricted to the study title, principal investigator (lead author), year of publication, the country in which the study was conducted, the study sample size, the study design, ethnic background of study participants, key discoveries of the study, the limitations of the study and conclusions made by authors. Two reviewers (EW and KBM) will independently extract both quantitative and qualitative data. The outcome of the individual data extracted by these two authors will be merged to generate a final pool of data for the review. Disagreements that may arise when building the final pool of data will be resolved through discussions with ABBM.

Assessment of methodological quality

The quality assessment of the review will adopt and adapt a quality appraisal tool employed in a review conducted by Mensah et al., (2018) appendix 3 [20]. The tool has 5 general quality assessment criteria and 3 specific quality assessment criteria to be scored over 100%. The design of the tool will permit the comparison of scores obtained by individual literature to the scoring benchmark of weak (0 – 33.9%), moderate (34% – 66.9%), and strong (67% – 100%) (20). This quality appraisal stage will be done independently by two authors (EW and KBM). It is recommended that a minimum of two reviewers be involved in the appraisal of the quality of studies to be considered for data extraction and subsequent synthesis [19,21]. Hence, the need for EW and KBM to independently conduct a quality assessment of search findings that passed the screening and selection stage of the review. The results obtained from the quality assessment stage will inform the final inclusion or exclusion of a research paper in the review. Disagreements arising from the results of EW and KBM will be addressed through discussions with ABBM.

Data synthesis and integration

The convergent segregated approach will be employed in data synthesis and integration [13]. Quantitative data and qualitative data will be synthesized separately. The evidence that will be generated from the separate synthesis of quantitative and qualitative data will be integrated [13].

Quantitative and Qualitative data synthesis

The synthesis of quantitative data will be done through a meta-analysis or narrative synthesis depending on the feasibility of the pool of data to be analyzed statistically [13].

The findings from the pool of qualitative data will undergo meta-synthesis through findings assembly and categorization based on shared meanings [22]. These categorized findings will undergo further analysis in an attempt to generate a wealth of evidence that will be easy to comprehend and will also be a true reflection of the awareness of women on prostate cancer concerning the underpinned review objectives [13].

In the event of the inability to perform a textual pooling, a narrative will be generated [22]. The synthesis by narrative will be performed according to the following approach; the findings obtained from the selected studies will undergo preliminary synthesis, the compiled data will be explored for linkages and the synthesizing process will be assessed for robustness [23].

Integration of quantitative evidence and qualitative evidence

The evidence from the individual analysis of quantitative and qualitative data will undergo configuration [13]. The inability of evidence configuration will result in the narrative presentation of evidence [13].

Discussion

This protocol is a blueprint to be followed for conducting a mixed-methods systematic review to map up evidence on the awareness of women on prostate cancer. To cover a wide range of primary literature, the protocol will employ the mixed-methods approach according to the JBI guidelines. By publishing the study protocol, we strengthen the clarity of the search strategy and reduce the risk of bias, particularly selective outcome reporting.

The wealth of evidence obtained from this systematic review will inform and support the involvement of women as health promoters and educators in the early detection and prevention of prostate cancer. The evidence will also be useful in improving the quality of life and survival rate of men living with prostate cancer.

The potential limitations of this research

The study is confronted with selection bias resulting from the following;

1. The restriction of the literature search to the range of January 1999 to December 2019.
2. The consideration of studies published only in the English language for inclusion.
3. Limiting the literature search to 5 databases.
4. The exclusion of studies conducted in women who have received prior education on prostate cancer, exclusion of healthcare professionals, healthcare students, and college/university students.
5. The exclusion of studies that involved lesbian, gay, bisexual, transsexual/transgender, and queer/questioning (LGBTQ) participants.

Abbreviations

FDG: Focused group discussions; JBI: Joanna Briggs Institute; LGBTQ: Lesbian, Gay, Bisexual, Transsexual/transgender, and Queer/questioning; RAPC: Rapid Access Prostate Clinic.

Competing interests

The authors affirm that they have no competitive benefits.

Authors' contributions

EW is credited with the conception of the review, the coordination of the systematic review, the development of the search strategy, the search and selection of studies to be included in the review, the extraction and management of quantitative and qualitative data, the assessment of methodological quality, the filtering of all reference materials, the integration and interpretation of the data, the drafting of the manuscript and is the principal reviewer. KBM is credited with the conception of the review, the review of the search strategy, the search and selection of studies to be included in the review, the extraction and management of quantitative and qualitative data, the assessment of methodological quality, the integration and interpretation of the data, the review of the manuscript, and as the co-supervisor of the review. ABM is credited with the review of the search strategy, review of the manuscript, and the settling of disagreements between EW and KBM. VB is credited with the review of the manuscript and as the co-supervisor of the review. FO

is credited with the overall supervision of the review. Reviewers will preview and accept the final manuscript of the review for publication in a peer-review journal.

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The review team gives recognition to Dr. Richard Ofori-Asenso.

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The authors did not receive any funding for the development of this review protocol.

Ethical consideration and dissemination of findings

Ethical permission will not be required since this is a systematic review that would be publicized in a peer-review journal. Also, this critical appraisal and synthesis do not involve the enrollment of humans or animals as study subjects.

Patient and public involvement

Patients or the public will not be engaged in the conduct of this study.

Data sharing

No additional data.

Team members

Reviewer 1: Ebenezer Wiafe (EW)

Reviewer 2: Kofi Boamah Mensah (KBM)

Reviewer 3: Adwoa Bemah Boamah Mensah (ABBM)

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REFERENCES

1. Cuzick J, Thorat MA, Andriole G et al. Prevention and Early Detection of Prostate Cancer. *The Lancet Oncology*. 2014;15(11):e484-e92.
2. Quinn M, Babb P. Patterns and trends in prostate cancer incidence, survival, prevalence and mortality. Part I: international comparisons. *BJU International*. 2002;90(2):162-73.
3. Saleh AM, Fooladi MM, Petro-Nustas W et al. Enhancing Knowledge, Beliefs, and Intention to Screen for Prostate Cancer via Different Health Educational Interventions: a Literature Review. *Asian Pacific Journal of Cancer Prevention*. 2015;16(16):7011-23.
4. Fitzpatrick J, Kirby R, Brough C et al. Awareness of prostate cancer among patients and the general public: Results of an international survey. *Prostate Cancer and Prostatic Diseases*. 2009;12(4):347.
5. Blanchard K, Proverbs-Singh T, Katner A et al. Knowledge, attitudes and beliefs of women about the importance of prostate cancer screening. *Journal of the National Medical Association*. 2005;97(10):1378.
6. Niksic M, Rachet B, Warburton F et al. Cancer symptom awareness and barriers to symptomatic presentation in England—are we clear on cancer? *British Journal of Cancer*. 2015;113(3):533.
7. Walsh AL, Considine SW, Thomas AZ et al. Digital rectal examination in primary care is important for early detection of prostate cancer: a retrospective cohort analysis study. *Br J Gen Pract*. 2014;64(629):e783-e7.
8. Karim R, Lindberg L, Wamala S et al. Men's Perceptions of Women's Participation in Development Initiatives in Rural Bangladesh. *American Journal of Men's Health*. 2018;12(2):398-410.
9. Rashid P, Denham J, Madjar I. Do women have a role in early detection of prostate cancer? Lessons from a qualitative study. *Australian Family Physician*. 2007;36(5):375.
10. Owens OL, Friedman DB, Hebert J. Commentary: Building an Evidence Base for Promoting Informed Prostate Cancer Screening Decisions: An Overview of a Cancer Prevention and Control Program. *Ethnicity & Disease*. 2017;27(1):55.
11. Van Bogaert D, Hawkins R, Pingree S et al. The development of an eHealth tool suite for prostate cancer patients and their partners. *The Journal of Supportive Oncology*. 2012;10(5):202.
12. Panchani M. Role of primary health care in the empowerment of women and concern about health issues. *International Journal of Research Studies in Bioscience*. 2014;2(11):27-34.
13. Lizarondo L, Stern C, Carrier J et al. Chapter 8: Mixed methods systematic reviews: The Joanna Briggs Institute. 2017. [Available from: <https://wiki.joannabriggs.org/display/MANUAL/Chapter+8%3A+Mixed+methods+systematic+reviews>].
14. Pluye P, Gagnon MP, Griffiths F et al. A scoring system for appraising mixed methods research, and concomitantly appraising qualitative, quantitative and mixed methods primary studies in Mixed Studies Reviews. *International Journal of Nursing Studies*. 2009;46(4):529-46.

15. Johnson RB, Onwuegbuzie AJ, Turner LA. Toward a Definition of Mixed Methods Research. *Journal of Mixed Methods Research*. 2016;1(2):112-33.
16. Caruth GD. Demystifying Mixed Methods Research Design: A Review of the Literature. *Mevlana International Journal of Education*. 2013;3(2):112-22.
17. Tufanaru C, Munn Z, Aromataris E et al. Chapter 3: Systematic reviews of effectiveness: The Joanna Briggs Institute. 2017. [Available from: <https://wiki.joannabriggs.org/display/MANUAL/Chapter+3%3A+Systematic+reviews+of+effectiveness>].
18. Lockwood C, Porritt K, Munn Z et al. Chapter 2: Systematic reviews of qualitative evidence: The Joanna Briggs Institute. 2017. [Available from: <https://wiki.joannabriggs.org/display/MANUAL/Chapter+2%3A+Systematic+reviews+of+qualitative+evidence>].
19. Yiwen K, Hegney D, Drury V. A comprehensive systematic review of the nurses' perceptions of risk from exposure to emerging acute respiratory infectious diseases and the effectiveness of strategies used to facilitate healthy coping in acute hospital and community healthcare settings. *JBI Evidence Synthesis*. 2009;7(24):1-27.
20. Mensah KB, Oosthuizen F, Bonsu AB. Cancer awareness among community pharmacist: a systematic review. *BMC Cancer*. 2018;18(1):299.
21. Hong QN, Pluye P, Fàbregues S et al. Mixed Methods Appraisal Tool (MMAT) version 2018. *Canadian Intellectual Property Office, Industry Canada*. 2018.
22. Lockwood C, Porritt K, Munn Z et al. Chapter 2: Systematic reviews of qualitative evidence: The Joanna Briggs Institute. 2017. [Available from: <https://wiki.joannabriggs.org/display/MANUAL/Chapter+2%3A+Systematic+reviews+of+qualitative+evidence>].
23. Popay J, Roberts H, Sowden A et al. Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC Methods Programme. Lancaster: Lancaster University. 2006 Apr;10(2.1):1018-4643.

BRIDGING DOCUMENT

The mixed-methods systematic review protocol developed in chapter 2 A was employed to gather evidence, from January 1999 to December 2019, about prostate cancer awareness among women. The details of the critical appraisal and synthesis are elaborated in chapter 2 B.

CHAPTER 2 B

SUBMITTED MANUSCRIPT

Prostate Cancer Awareness among Women: A Mixed-methods Systematic Review.

ABSTRACT

Objectives: This systematic review seeks to gather evidence from studies that investigated women's knowledge about; (1) the signs and symptoms, (2) causes and risk factors, and (3) the screening modalities of prostate cancer.

Methods: The convergent segregated approach to the conduct of mixed-methods systematic reviews was employed. Five databases namely; MEDLINE (EBSCOhost), CINAHL (EBSCOhost), PsycINFO (EBSCOhost), Web of Science, and EMBASE (Ovid) were searched from January 1999 to December 2019 for studies conducted with a focus on the knowledge of women on the signs and symptoms; the causes and risk factors; and the screening modalities of prostate cancer.

Results: Of 2201 titles and abstracts screened, 22 full-text papers were retrieved and reviewed, and 7 were included: 3 quantitative, 1 qualitative, and 3 mixed-methods studies. Both quantitative and qualitative findings indicate that women have moderate knowledge of the signs and symptoms; and the causes and risk factors of prostate cancer. However, women recorded poor knowledge about prostate cancer screening modalities or tools.

Conclusion: Moderate knowledge of women on the signs and symptoms, and the causes and risk factors of prostate cancer were associated with education. These findings provide vital information for the prevention and control of prostate cancer and encourage policy-makers to incorporate

health promotion and awareness campaigns in health policies to improve knowledge and awareness about prostate cancer globally.

Trial registration number: Open Science Framework (OSF) registration DOI: <https://doi.org/10.17605/OSF.IO/BR456>

Keywords: Awareness, Signs and symptoms, Causes and risk factors, Screening recommendations, Prostate cancer, Women.

Abbreviations: CDC: Centers for Disease Control and Prevention; DRE: digital rectal examination; GLOBOCAN: Global Cancer Incidence, Mortality and Prevalence; JBI: Joanna Briggs Institute; LGBTQ: Lesbian, Gay, Bisexual, Transsexual/transgender, and Queer/questioning; OSF: Open Science Framework; LMIC: low and middle-income countries; PCa: Prostate cancer; PSA: prostate-specific antigen; SSA: sub-Saharan Africa; US: United States.

Introduction

Prostate cancer (PCa) is the most common non-skin cancer occurring in men and is accountable for 3.8% of all mortality caused by cancer in men.^{1,2} According to the GLOBOCAN, 2018 database, it is estimated that it is the fifth primary cause of cancer death in men globally. It further reported that the highest mortality rate is found in the Caribbean and Southern African men worldwide.^{1,3} A recent study by Yeboah-Asiamah et al. (2017) reported that PCa was the second most common cancer in areas such as Australia, the United States, and New Zealand.⁴ Though fewer than 30% of all incidence of PCa are from developing countries, these countries have previously been estimated to have the highest mortality from PCa due to late diagnosis.^{5,6} Although sub-Saharan Africa (SSA) has a low rate of the disease, the incidence is projected to increase if screening is encouraged.⁷ Hence, PCa remains a vital public health concern in both developed and developing countries.

The Centers for Disease Control and Prevention (CDC) in North America, organized a workshop with the motive to explore strategies to control and prevent the disease based on the increasing incidence and mortality rate of PCa.⁸ To address mortality rates related to the disease, participants recommended strategies to improve PCa awareness.⁸ Also, as documented by many studies, PCa incidence is a direct reflection of the rate at which high-risk groups screen for the disease.^{4,9} In Europe, early screening was attributed to a 20% reduction in PCa mortality rate.¹⁰ Although there is evidence suggesting a reduction in PCa mortality due to early screening, a United States (US) study did not highlight a reduction in mortality.¹¹ The prostate-specific antigen (PSA) test and the digital rectal examination (DRE) are useful screening tools, although initial controversies were surrounding the use of these tools.¹² Because of overlap in PSA levels in men with prostatitis,

benign prostatic hyperplasia, and PCa, it was assumed that PCa cannot be screened using the PSA test.¹³ Catalona et al. (1991) demonstrated that PSA could be utilized as a screening tool for PCa and it has widely been adopted.¹⁴ DRE is the only procedure whereby physicians can examine part of the prostate gland.¹⁵ The findings are only based on the physician impression, hence poor inter-rater reliability and also a limitation to the palpable region of the prostate gland.¹⁵ However, DRE sometimes detects PCa in men with PSA, 4.0 ng/mL.¹⁶ Regardless of the controversial nature of screening and the potential for early screening to reduce mortality, studies support the need to encourage screening.^{4,15}

Women have essential characteristics that make them better managers of family health as compared to men. Therefore, it is not surprising that there is evidence positioning women as individuals who make adequate observations about the health of their partners.^{9,17} In promoting the early detection of PCa, women have been documented to observe the slightest symptoms presented by their partners and push them to seek medical attention.^{9,18} In a study conducted by Blanchard et al. (2005) it was recommended that efforts must be made to actively involve women in improving the timely detection of PCa through the closure of knowledge-gaps.¹⁹

Also, men admit seeking out their wives' opinions as sources of health information.²⁰ In the context of the early detection of PCa, women can play various roles such as information seekers, advocates, health advisors, and support persons.²¹ Therefore, there is the need to gather current evidence about women's knowledge of PCa as the findings will be vital in equipping women to contribute towards the early detection of the disease.

In light of the availability of limited evidence addressing the awareness of women on prostate cancer, this review will seek to combine quantitative and qualitative data to increase the validity

of findings through data triangulation as recommended by Caruth (2013) and supported by Lizarondo (2017) and colleagues.^{22,23} Thus, this review seeks to map out current evidence regarding women's awareness of PCa under the scopes of: 1) signs and symptoms, 2) risk factors and causes, and 3) screening guidelines.

Methodology

The Joanna Briggs Institute (JBI) reviewer's manual for the conduct of mixed-methods critical appraisal and synthesis formed the backbone of the study.²³ With guidance from the JBI manual, a protocol was developed to guide the review process according to the convergent segregated approach.²³ The respective DOIs of the review protocol and review, registered with the Open Science Framework (OSF), are <https://doi.org/10.17605/OSF.IO/EYHF2> and <https://doi.org/10.17605/OSF.IO/BR456>.

Inclusion criteria

We considered studies that were published in English and peer-reviewed journals between January 1999 and December 2019. Included studies were selected from primary research of any methodology; and explored awareness on signs and symptoms, causes and risk factors, and screening of prostate cancer. Studies that were conducted among women regardless of the geographical location were included. Studies that were mainly conducted in men were excluded in addition to studies not published in the English language.

Information sources and search strategy

An initial explorative search in PubMed founded search terms in preparation for a comprehensive electronic search. The selected search terms were combined with Boolean operators for a

comprehensive electronic search in MEDLINE (EBSCOhost), CINAHL (EBSCOhost), PsycINFO (EBSCOhost), Web of Science, and EMBASE (Ovid) as “(prostate cancer) AND (awareness OR knowledge) AND (signs OR symptoms) AND (risk factors OR causes) AND (screening) AND (women)”. The search strategy (Appendix 1), so developed, was utilized by the first (EW) and second (KBM) reviewers to independently conduct a literature search as outlined in the review protocol.²⁴

Selection of studies

The first and second reviewers, being guided by the developed review protocol, independently screened and compared the titles and abstracts of the literature search outcomes to a developed standard (Appendix 2). Studies that successfully passed the initial stage of screening were subjected to the independent full-text reading by EW and KBM before consideration for data extraction. Lastly, hand-searching and snowballing on references of selected articles were done to find eligible studies in the grey area. There were no disagreements between EW and KBM. Hence, the third reviewer (ABBM) assessed the studies before data extraction was conducted by the lead author according to the JBI data extraction tools outlined in the review protocol.²⁴ The characteristics of studies that successfully went through the data extraction, the key findings that were extracted, and a summary of the study selection process are detailed respectively (Table 1, Table 2, and Figure 1).

Quality assessment

As described in the review protocol,^{9,18} the methodological quality assessment tool (Appendix 3) was adopted and modified for this review.²⁵ The tool appraised the studies' quality based on the studies sample representativeness, response rate, reliability, and validity of the data collection tool.

The tool was modified to suit the results from the included studies. A score was calculated, and the quality of the studies was classified as weak (0% to 33.9%), moderate (34% to 66.9%), or strong (67% to 100%). Eligible records were subjected to independent quality assessment by EW and KBM. Methodological quality outcomes were not grounds for exclusion.

Synthesis and integration of findings

The review findings were subjected to the convergent segregated approach to synthesis and integration according to the developed review protocol.²⁴ A narrative synthesis was separately performed for qualitative and quantitative findings. The results were finally integrated.

Results

Conducting the review, according to the developed protocol, yielded 2200 studies results. A detailed citation screening led to an additional study, which increased the total studies to 2201. Regarding the summary of the study selection process (Figure 1), 1672 studies were obtained after 529 duplicates were removed from the pool of data. Post- titles and abstracts review excluded 1650 studies leaving 22 studies. The 22 studies were further reduced to 7 after a full-text reading resulted in the exclusion of 15 studies.

Characteristics of included studies

The data extracted from the seven (7) studies are detailed (Table 1). The publication years ranged from 2003 to 2018 with 5 studies having been conducted in the United States. One of the studies was a multicenter study that involved multinationals.²⁶ The study with the highest female participants (4040 women) was conducted in Spain.²⁷ Webb et al. (2006) recruited the lowest

sample size, 14 women.²⁸ A total of 5634 women were involved in the 7 studies. Two studies were solely conducted in women, three included other diseases, and two did not disclose study duration.

Quality of included studies

According to the scoring scheme of the quality assessment tool (Appendix 3), two studies^{27,28} were evaluated as moderate-quality whilst five studies were evaluated as strong quality. None of the studies were excluded based on methodological quality assessment outcomes. There was no disagreement between EW and KBM.

Review findings

Study findings, presented in table 2, were heterogeneous. Quantitative studies indicate that women knew about the existence of PCa. In exploring qualitative evidence, women exhibited knowledge of PCa. Therefore, both arms of the review are supportive of each other.

Women had moderate knowledge about the signs and symptoms of PCa drawing from quantitative findings. The asymptomatic nature of early staged PCa; and women moderately knew urinary symptoms such as urinary frequency, difficulty in urinating, and dysuria. Qualitative studies indicate that women were aware of signs and symptoms such as urinary frequency, difficulty in urinating, glandular enlargement of the prostate, and erectile dysfunction. Hence, quantitative and qualitative findings revealed that women moderately knew the urinary symptoms of PCa.

Quantitative studies indicate an average score of women on knowledge of risk factors of PCa. Risk factors women knew were increasing age, presence of a first-degree relative, being genetically linked to Africa, and excessive truncal obesity. Qualitative evidence recognized all risk factors documented by the quantitative findings except truncal obesity. Also, identified risk factors

included poor diet, inadequate exercise, stressful lifestyle, poor screening habits, cigarette smoking, and poor access to quality healthcare. Women wrongly reported sexual orientation and frequent sexual activity as risk factors. Therefore, qualitative findings confirm the quantitative claim that women have shared knowledge about the risk factors of PCa.

Quantitative studies indicate that women had poor knowledge about PCa screening. Although it was reported that women knew about PSA and DRE, knowledge scores were significantly low. Also, women poorly recognized urine as a screening sample, PSA as an exclusive diagnostic tool, and failed to identify more than one screening tool. Qualitative studies respectively reported PSA and blood as a screening tool and sample. Colonoscopy was wrongly reported as a PCa screening tool. Conclusively, both arms of the review reported women knew about PSA and had poor knowledge about PCa screening.

Discussion

The heterogeneity of the study findings warranted the synthesis as a narrative.^{23,29} The convergent segregated approach was employed according to the recommendation of the JBI reviewer's manual.²³

Generally, from the quantitative evidence, women knew about prostate cancer.^{19,26,30,31} The knowledge of women was found to have increased with educational and financial status;¹⁹ and disease familiarity.^{19,31} The awareness of women about the existence of PCa increased when the disease was mentioned compared to an initial request for women to list cancers.²⁶ Qualitative evidence showed that women were aware of PCa.^{18,30} They appreciated and specifically requested for PCa education partly because they could not tell the location of the prostate gland.¹⁸ Thus, quantitative and qualitative evidence indicates that women know about PCa. Women's awareness

could be due to their role in family health management and the possible health-seeking behavior of educated and financially strong women. As persons are faced with the experiences of a health condition, they will seek to make sense of this illness by acquiring knowledge,³² experiences, and beliefs; hence this theory might explain the improved awareness of women who were familiar with the disease.

Most of the quantitative studies indicate that women are aware of the asymptomatic nature of early-stage PCa.^{19,30,31} Symptoms that women had a fair knowledge about included urinary frequency, difficulty in urinating, and dysuria.³¹ Findings from one of the qualitative studies indicate that women fairly recognized urinary frequency, difficulty in urinating, glandular enlargement of the prostate, and erectile dysfunction as signs and symptoms of PCa.¹⁸ Being familiar with the disease may explain the awareness of women of the urinary symptoms associated with PCa.

According to Okoro and colleagues' quantitative study (2018), although knowledge of PCa was not adequate, women knew associated risk factors such as being a first-degree relative, being a man of African descent, and excessive truncal obesity.³⁰ Blanchard et al. (2005) also documented women's recognition of increasing age as a PCa risk factor.¹⁹ One of the qualitative studies indicates women knew increasing age could increase a man's chance for PCa development.^{18,28} Other causes and risk factors women identified included poor diet, inadequate exercise, stressful lifestyle, family history of the disease, being of African descent, poor screening habits, cigarette smoking, and poor access to quality healthcare.¹⁸ Erroneously, one study reported that women perceived sexual orientation and frequent sexual activity as risk factors.¹⁸ Both quantitative and qualitative findings documented women knew increasing age, family history, and African descent as PCa risk factors.

Quantitatively, women's responses to queries about PCa screening were poor.^{26,31} Some women were unable to recognize at least a PCa screening tool whilst others mistakenly recognized urine as a suitable sample for PCa screening.²⁶ According to Okoro et al. (2018) the majority of women exclusively tagged PSA elevation as a basis for PCa diagnosis.³⁰ This, therefore, calls for extensive education because benign prostatic hyperplasia, prostatitis, and PCa usually present with elevated PSA.¹³ Evidence from qualitative findings indicated women knew physical examination must augment blood analysis.²⁸ Also, women mentioned PSA and colonoscopy as screening tools.¹⁸ The results from included qualitative studies confirmed that women had poor knowledge about PCa screening. The mention of colonoscopy as a screening tool further supports a lack of adequate knowledge about PCa screening.

This critical appraisal and synthesis revealed over the 20 years of study search, only four studies out of the seven included studies investigated all the outcomes of interest. Two studies did not investigate women's awareness of the signs and symptoms^{27,28} and the causes and risk factors^{27,31} of PCa. Therefore, although quantitative and qualitative findings were supportive of each other, studies investigating the causes and risk factors, as well as the signs and symptoms of PCa, were lacking.

Recommendations for Practice

From the review findings, it is recommended that PCa control programs should also focus on educating women. Clinicians and public health practitioners should include women in prostate cancer health promotion. Women should be encouraged to attend PCa clinics with their male significant others suffering from the disease and the effect of this strategy in reducing PCa mortality rate investigated.

Recommendations for Research

Further studies are recommended to investigate the knowledge of women living in low and middle-income countries (LMIC) about PCa. Such studies should focus extensively on the knowledge of women on PCa screening. Also, it is recommended for research to develop and pilot a PCa educational intervention model, applicable to women to reduce the burden of the disease. This tool should be culturally-specific for easy acceptance and recognition. Also, current evidence on the willingness of women to offer social support to men with PCa should be investigated.

Study Limitations

The various restrictions that were imposed on the literature search included a search range from January 1999 to December 2019, a search into only 5 databases, and the outright exclusion of non-English publications.

Other limitations were the exclusion of studies conducted in women who received education on prostate cancer, healthcare professionals, healthcare students, and college/university students, and further exclusion of studies that involved (LGBTQ) participants.

Acknowledgment

The review team gives recognition to Dr. Richard Ofori-Asenso.

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Availability of Data and Materials

Data generated in the conduct of the review is available at;
<https://doi.org/10.17605/OSF.IO/BR456>

Authors' Contributions

EW is credited with the conception of the review, the coordination of the systematic review, the development of the search strategy, the search and selection of studies to be included in the review, the extraction and management of quantitative and qualitative data, the assessment of methodological quality, the filtering of all reference materials, the integration and interpretation of the data, the drafting of the manuscript and is the principal reviewer. KBM is credited with the conception of the review, the review of the search strategy, the search and selection of studies to be included in the review, the extraction and management of quantitative and qualitative data, the assessment of methodological quality, the integration and interpretation of the data, the review of the manuscript, and as the co-supervisor of the review. ABBM is credited with the review of the search strategy, the assessment of the studies before data extraction, and the review of the manuscript. VB is credited with the review of the manuscript, the coordination of the systematic review, and the co-supervisor of the review. FO is credited with the conception of the review, the review of the manuscript, and the overall supervision of the review. Reviewers have reviewed and accepted the final manuscript of the review for publication.

Ethical Consideration

None.

Competing Interests

None.

REFERENCES

1. Bray F, Ferlay J, Soerjomataram I, et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*. 2018;68(6):394-424.
2. James LJ, Wong G, Craig JC, et al. Men's perspectives of prostate cancer screening: A systematic review of qualitative studies. *PloS One*. 2017.
3. GLOBOCAN. GLOBOCAN 2008: Ghana Fact Sheets. 2018. [Available from: <file:///C:/Users/user-pc/Downloads/288-ghana-fact-sheets.pdf>].
4. Yeboah-Asiamah B, Yirenya-Tawiah D, Baafi D, Ackumey M. Perceptions and knowledge about prostate cancer and attitudes towards prostate cancer screening among male teachers in the Sunyani Municipality, Ghana. *African Journal of Urology*. 2017;23(4).
5. Rebbeck TR, Devesa SS, Chang B-L, et al. Global patterns of prostate cancer incidence, aggressiveness, and mortality in men of African descent. *Prostate Cancer*. 2013.
6. Mofolo N, Betshu O, Kenna O, et al. Knowledge of prostate cancer among males attending a urology clinic, a South African study. *SpringerPlus*. 2015;4(1):67.
7. Jemal A, Bray F, Forman D, et al. Cancer burden in Africa and opportunities for prevention. *Cancer*. 2012;118(18):4372-84.
8. Dimah KP, Dimah A. Prostate cancer among African American men: A review of empirical literature. *Journal of African American Studies*. 2003;7(1):27-46.
9. Rashid P, Denham J, Madjar I. Do women have a role in early detection of prostate cancer? Lessons from a qualitative study. *Australian Family Physician*. 2007;36(5):375.
10. Schröder FH, Hugosson J, Roobol MJ, et al. Screening and prostate-cancer mortality in a randomized European study. *New England Journal of Medicine*. 2009;360(13):1320-8.
11. Andriole GL, Crawford ED, Grubb III RL, et al. Mortality results from a randomized prostate-cancer screening trial. *New England Journal of Medicine*. 2009;360(13):1310-9.
12. Nakandi H, Kirabo M, Semugabo C, et al. Knowledge, attitudes and practices of Ugandan men regarding prostate cancer. *African Journal of Urology*. 2013;19(4):165-70.
13. Catalona WJ. Prostate cancer screening. *Medical Clinics*. 2018;102(2):199-214.
14. Catalona WJ, Smith DS, Ratliff TL, et al. Measurement of prostate-specific antigen in serum as a screening test for prostate cancer. *New England Journal of Medicine*. 1991;324(17):1156-61.
15. Wilbur J. Prostate cancer screening: the continuing controversy. *American Family Physician*. 2008;78(12):1377-84.
16. Federman DG, Pitkin P, Carbone V, Concato J, Kravetz JD. Screening for prostate cancer: are digital rectal examinations being performed? *Hospital Practice*. 2014;42(2):103-7.
17. Karim R, Lindberg L, Wamala S, Emmelin M. Men's perceptions of Women's participation in development initiatives in rural Bangladesh. *American Journal of Men's Health*. 2018;12(2):398-410.
18. Owens OL, Friedman DB, Hebert J. Commentary: Building an Evidence Base for Promoting Informed Prostate Cancer Screening Decisions: An Overview of a Cancer Prevention and Control Program. *Ethnicity & Disease*. 2017;27(1):55.
19. Blanchard K, Proverbs-Singh T, Katner A, et al. Knowledge, attitudes and beliefs of women about the importance of prostate cancer screening. *Journal of the National Medical Association*. 2005;97(10):1378-85.

20. Taylor KL, Turner RO, Davis III JL, et al. Improving knowledge of the prostate cancer screening dilemma among African American men: an academic-community partnership in Washington, DC. *Public Health Reports*. 2016.
21. Miller SM, Roussi P, Scarpato J, et al. Randomized trial of print messaging: the role of the partner and monitoring style in promoting provider discussions about prostate cancer screening among African American men. *Psycho-Oncology*. 2014;23(4):404-11.
22. Caruth GD. Demystifying Mixed Methods Research Design: A Review of the Literature. *Mevlana International Journal of Education*. 2013;3(2):112-22.
23. Lizarondo L, Stern C, Carrier J, et al. Chapter 8: Mixed methods systematic reviews: The Joanna Briggs Institute. 2017. [Available from: <https://wiki.joannabriggs.org/display/MANUAL/Chapter+8%3A+Mixed+methods+systematic+reviews>].
24. Wiafe E, Mensah KB, Mensah ABB, Bangalee V, Oosthuizen F. The Awareness of Women on Prostate Cancer: A Mixed-Methods Systematic Review Protocol. 2020. [Preprint is available at [10.21203/rs.3.rs-40585/v1](https://doi.org/10.21203/rs.3.rs-40585/v1)].
25. Mensah KB, Oosthuizen F, Bonsu AB. Cancer awareness among community pharmacist: a systematic review. *BMC Cancer*. 2018;18(1):299.
26. Schulman CC, Kirby R, Fitzpatrick JM. Awareness of prostate cancer among the general public: Findings of an independent international survey. *European Urology*. 2003;44(3):294-302.
27. Carrasco-Garrido P, Hernandez-Barrera V, Lopez de Andres A, et al. Awareness and uptake of colorectal, breast, cervical and prostate cancer screening tests in Spain. *European Journal of Public Health*. 2014;24(2):264-70.
28. Webb CR, Kronheim L, Williams JE, Hartman TJ. An evaluation of the knowledge, attitudes, and beliefs of African-American men and their female significant others regarding prostate cancer screening. *Ethnicity & Disease*. 2006;16(1):234-8.
29. Lockwood C, Porritt K, Munn Z, et al. Chapter 2: Systematic reviews of qualitative evidence: The Joanna Briggs Institute. 2017. [Available from: <https://wiki.joannabriggs.org/display/MANUAL/Chapter+2%3A+Systematic+reviews+of+qualitative+evidence>].
30. Okoro ON, Rutherford CA, Witherspoon SF. Leveraging the Family Influence of Women in Prostate Cancer Efforts Targeting African American Men. *Journal of Racial and Ethnic Health Disparities*. 2018;5(4):820-30.
31. Brown N, Naman P, Homel P, et al. Assessment of preventive health knowledge and behaviors of African-American and Afro-Caribbean women in urban settings. *Journal of the National Medical Association*. 2006;98(10):1644-51.
32. Petrie K, Weinman J. Why illness perceptions matter. *Clinical Medicine*. 2006;6(6):536.

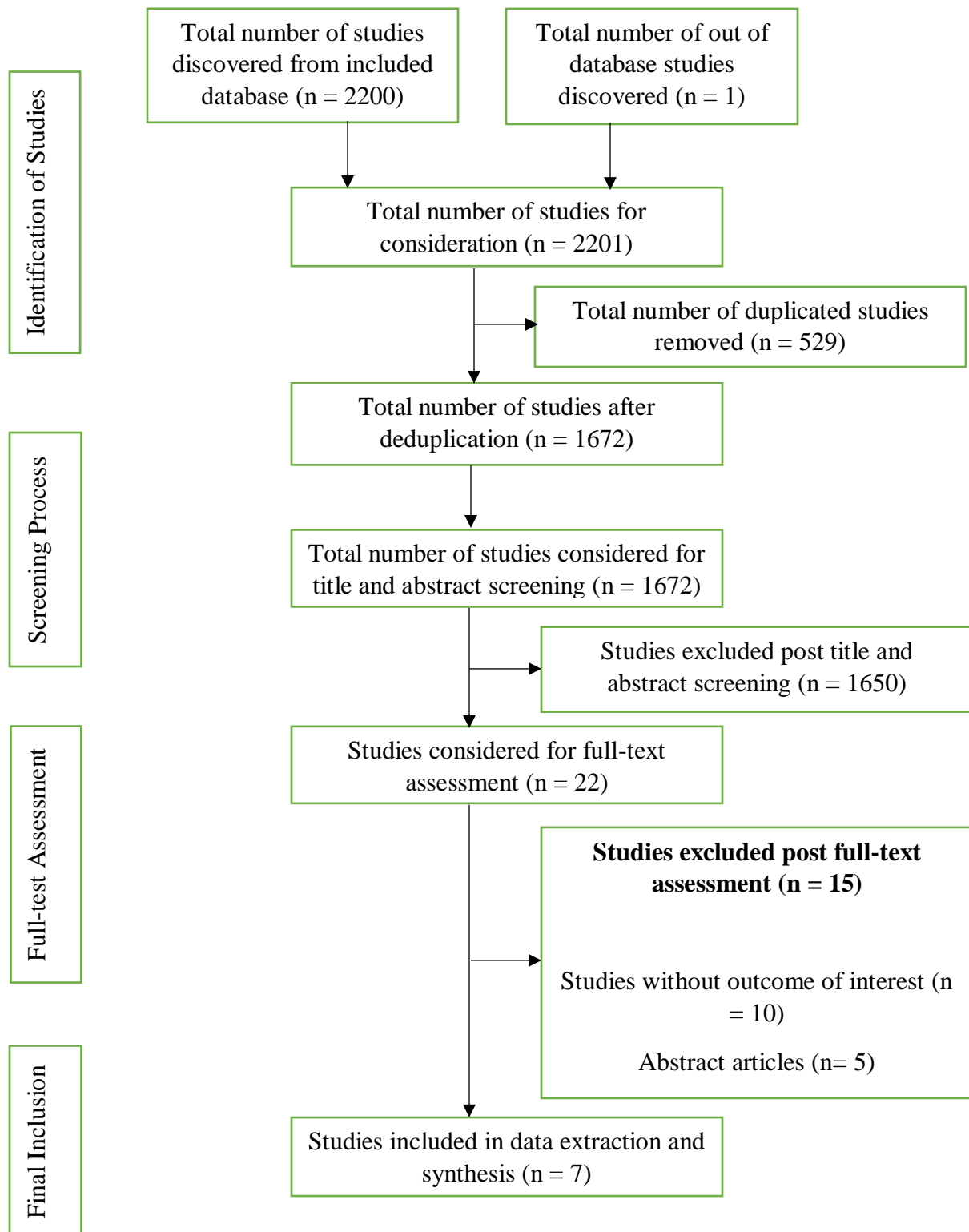


Figure 1: Summary of the study selection process.

Table 1: Characteristics of selected studies

AUTHOR AND YEAR	COUNTRY(S)	ETHNIC/CULTURAL BACKGROUND(S)	STUDY POPULATION	OTHER CONDITIONS/ DOMAINS STUDIED
Blanchard et al., 2005	United States	Caucasians/Whites, African-Americans/Blacks, Hispanics/Whites, and Hispanics/Blacks	Women	None.
Brown et al., 2006	United States	African-Americans and Afro-Caribbeans	Women	Heart health, breast health, prostate health, second-hand smoke, asthma, and sexual health.
Carrasco-Garrido et al., 2014	Spain	Spanish	Men and women	Colorectal cancer, breast cancer, and cervical cancer.
Okoro et al., 2018	United States	Black/African-Americans	Men and women	None.
Owens et al., 2015	United States	African-Americans	Men and women	None.
Schulman et al., 2003	France, Germany, Italy, Spain, Sweden, United Kingdom, and the United States	Western Europeans and Americans	Men and women	Breast cancer, lung cancer, bowel cancer, heart disease, stroke, diabetes
Webb et al., 2006	United States	Blacks (non-Hispanics) and Hispanics/Latinos	Men and women	None.

Table 1 (continued)

AUTHOR AND YEAR	RESEARCH DESIGN	LENGTH OF STUDY	SAMPLE SIZE OF INTEREST POPULATION
Blanchard et al., 2005	Quantitative study	Missing	324
Brown et al., 2006	Cross-sectional quantitative study	Five (5) days	221
Carrasco-Garrido et al., 2014	Population-based cross-sectional mixed-methods study	Two (2) months	4040 (50.9% of 7938)
Okoro et al., 2018	Cross-sectional mixed methods study	Three (3) months	297
Owens et al., 2015	Mixed methods study	About 2 months	38
Schulman et al., 2003	Quantitative study (Telephone interview)	Nineteen (19) days	700
Webb et al., 2006	Qualitative study (Focus group discussion)	Missing	14

Table 2: Summarized study findings

STUDY TITLE	FINDINGS	CONCLUSION	LIMITATIONS
Knowledge, Attitudes and Beliefs of Women about the Importance of Prostate Cancer Screening (Blanchard et al., 2005).	<ol style="list-style-type: none">1. The mean score for women's knowledge about prostate cancer and screening guidelines was determined to be 6.99 ± 3.54 out of 15 points.2. Educational level and income were discovered to have increased the mean score for women's knowledge.3. Women who disclosed their familiarity with cancer of the prostate and available screening recommendations recorded higher scores in knowledge assessment.4. Only 54.3% of women knew about the asymptomatic presentation of prostate cancer in early stages.5. About 37% of women failed to recognize age as a risk factor for prostate cancer.6. 83.9% of women were of the known that men, symptomatic or not, should screen for prostate cancer.7. 54% of married and 42% of single women recognized the early detection of prostate cancer as the key	Women are not knowledgeable about prostate cancer. An educational intervention model, targeting women, could equip women to contribute to the early detection of prostate cancer by encouraging men to screen routinely for the disease.	<ol style="list-style-type: none">1. Women might not have documented true responses to questionnaire items since a self-reporting technique was employed in the study.2. The study was limited to only women fluent in the English language and hence, findings could not be extended to cover all women in New Orleans.3. The use of the convenience sampling method in the study exposed the study to participants' selection bias and hence, a negative impact on the generalization of study findings.

	<p>importance of screening.</p> <p>8. Married (41%) and single (32%) women agreed that men feared prostate cancer screening results as well as the application of the digital rectal examination for screening.</p>		
<p>Assessment of preventive health knowledge and behaviors of African-American and Afro-Caribbean women in urban settings (Brown et al., 2006).</p>	<p>1. Generally, the knowledge score of women on the symptoms of prostate cancer was appreciable.</p> <p>2. Women who knew about the existence of prostate cancer in their families had higher knowledge scores.</p> <p>3. 24% of women responded prostate cancer is asymptomatic; whilst 65%, 67%, and 63% respectively noted the difficulty in passing urine, dysuria, and the need to frequently pass urine as symptoms.</p> <p>4. Women found it difficult in identifying tools applicable to prostate cancer screening.</p> <p>5. 46%, 61%, and 38% of women respectively selected prostate-specific antigen (PSA), digital rectal examination (DRE), and x-ray as</p>	<p>Women are more knowledgeable about the symptoms of prostate cancer but know very little about prostate cancer screening tools. An intervention is needed to upgrade the knowledge of women on the symptoms and screening tools applicable to prostate cancer.</p>	<p>1. The study suffered various forms of selection bias as the participants were conveniently selected from salons that were interested in the health promotion initiatives of the Arthur Ashe Institute for Urban Health (AAIUH).</p> <p>2. The study was restricted to women who used the services of the selected salons and hence, the study findings could not be a true reflection of all New York women.</p> <p>3. There was an observation of a high number of correctly answered questions.</p>

	prostate cancer screening tools.		
Awareness and uptake of colorectal, breast, cervical, and prostate cancer screening tests in Spain (Carrasco-Garrido et al., 2014).	<ol style="list-style-type: none"> 1. 51.56% of Spanish women knew PSA as a prostate cancer screening tool. 2. Education and social status significantly increased women's awareness of PSA as a prostate cancer screening tool. 	The use of prostate-specific antigen (PSA) for prostate cancer screening is poorly known to women. Women should be comprehensively educated on screening tools.	<ol style="list-style-type: none"> 1. The validity and reliability of the survey instrument were not done in the study population. 2. Respondents might have given socially acceptable responses when their awareness about PSA was tested. 3. Women who knew about PSA as a prostate cancer screening tool might have been high in the study.
Leveraging the Family Influence of Women in Prostate Cancer Efforts Targeting African American Men (Okoro, Rutherford, & Witherspoon, 2018).	<ol style="list-style-type: none"> 1. On a 25 knowledge-score scale, women's mean score was 11.4 ± 5.1. 2. No idea accounted for 29.1% of women's responses to prostate cancer knowledge. 3. The focused group discussion involving women revealed an overall poor prostate cancer knowledge. 4. The PSA as a prostate cancer confirmatory tool and the recommended age for universal prostate cancer screening received the worst correct response rates. 5. Only 17.5% of women 	The knowledge and awareness of women about prostate cancer are not appreciable. An educational intervention model can increase prostate cancer awareness and knowledge among women.	<ol style="list-style-type: none"> 1. The study included only African-American women and hence, findings cannot be extended to cover all women in America. 2. The study suffered selection bias as participants were conveniently sampled. 3. The survey instrument did not undergo validation and reliability assessment in the study population. 4. The study engaged relatively young participants and hence findings could not be

	<p>knew elevated PSA levels did not exclusively indicate the existence of prostate cancer.</p> <p>6. As low as 13.5% of women knew universal prostate cancer screening is not exclusively a recommendation for only men above 50 years.</p> <p>7. The educational status of women greatly increased knowledge scores.</p> <p>8. 62.3%, 57.2%, and 38.7% of women respectively identified the presence of a first-degree relative, being a man of African descent, and excessive truncal obesity as risk factors of prostate cancer.</p> <p>9. Women (54.5%) knew the asymptomatic nature of prostate cancer.</p> <p>10. 47.5% of women recognized DRE as a tool for the early detection of prostate cancer.</p> <p>11. Women (40.7%) indicated the need for risk assessment before the initiation of prostate cancer screening; whilst 54.2% agreed with the recommendation that men who are 40 - 45 years and are at risk for the development of the</p>		<p>an exact representation of all age groups.</p> <p>5. The study participants, being young, might have accounted for the observed low knowledge scores.</p>
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	disease should seek adequate health information from registered healthcare providers.		
Prostate cancer knowledge and decision making among African-American men and women in the southeastern United States (Owens, Jackson, Thomas, Friedman, & Hébert, 2015).	<ol style="list-style-type: none"> 1. Women had limited knowledge about prostate cancer. 2. The only signs and symptoms of prostate cancer women were conversant with included urinary frequency, difficulty in urinating, an enlarged prostate gland, and erectile dysfunction. 3. Women acknowledged knowing very little about prostate cancer and called for education. 4. Most women did not know the location of the prostate gland in addition to the available screening tools. Nevertheless, the PSA was mentioned. 5. Some women perceived colonoscopy as a prostate cancer screening tool. 6. Risk factors that attracted much attention from women included; poor diet (high red meat and fatty food consumption) and inadequate physical activity. 7. Other risk factors that did not attract much 	The knowledge of women on prostate cancer was minimal. With education on prostate cancer, women's knowledge was improved. There is a need for a community-based public health intervention geared towards educating women on prostate cancer.	<ol style="list-style-type: none"> 1. The relatively small sample size of the interest population hindered results generalizability. 2. The study was limited to African-Americans and hence, findings could not be generalized to cover other races/ethnic diversities in the study site. 3. The participants were conveniently sampled and hence, the poor generalizability of results.

	<p>attention included; increased age (where age greater or equal to 45 years was tagged the highest risk), stressful lifestyle, family history of the disease, being of African decency, poor screening habit, cigarette smoking, and poor access to quality healthcare.</p> <p>8. Women erroneously perceived a man's sexuality and regularity of sexual intercourse as risk factors.</p>		
<p>Awareness of prostate cancer among the general public: Findings of an independent international survey (Schulman, Kirby, & Fitzpatrick, 2003).</p>	<p>1. 100 women each from 7 countries were involved in the study.</p> <p>2. 28% of female respondents spontaneously included prostate cancer in their list of available cancers whilst 69%, who didn't initially list prostate cancer, agreed to the existence of the disease when asked a closed-ended question.</p> <p>3. Women in the United Kingdom (40%), United States (20%), France (23%), Germany (24%), Italy (21%), Spain (26%), and Sweden (39%) were spontaneously aware of prostate cancer. When prompted, additional respective 58%, 76%,</p>	<p>The recognition of the basic prostate cancer screening tools by women was very low. The general awareness of prostate cancer was lacking in women. To promote the early detection of prostate cancer in an attempt to reduce mortality, and educational intervention targeting women is needed.</p>	<p>1. The study failed to indicate the percentage of women who were able to identify the signs and symptoms, and risk factors of prostate cancer.</p> <p>2. The number of participants from the various countries was relatively small to promote the generalizability of results.</p> <p>3. Respondents might have given socially approved responses since data collection was through a telephone interview.</p> <p>4. The validity and reliability of the questionnaire were</p>

	<p>70%, 75%, 76%, 69% and 61% of women recognized the existence of prostate cancer.</p> <p>4. Women in Spain (36%), the United States (35%), Italy (23%), Sweden (22%), the United Kingdom (17%), France (17%), and Germany (9%) recognized PSA as a prostate cancer screening tool.</p> <p>5. 20% of women in the United States, 14% in France, 8% in Spain, 6% in the United Kingdom, 6% in Germany, 5% in Italy, and 2% in Sweden recognized DRE as a prostate cancer screening tool.</p> <p>6. Mistakenly, 37% of women in Spain, 22% in Italy, 17% in France, 13% in the United Kingdom, 10% in Germany, 11% in Sweden, and 5% in the United States recognized the use of urine as a prostate cancer screening sample.</p> <p>7. The inability of women to recognize at least a prostate cancer screening tool followed the trend: Germany (71%), Sweden (60%), the United</p>		not determined in the study population.
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	Kingdom (56%), the United States (53%), France (52%), Italy (44%) and Spain (41%).		
An evaluation of the knowledge, attitudes, and beliefs of African-American men and their female significant others regarding prostate cancer screening (Webb, Kronheim, Williams, & Hartman, 2006).	<p>1. Women disclosed that prostate cancer may occur in men who are or greater than 65 years old. However, women were not sure if a diet has caused a reduction in the age at which men develop prostate cancer.</p> <p>2. During the FDG, some women agreed that prostate cancer screening starts when men celebrate their 40th birthday.</p> <p>3. The use of blood as a screening sample for prostate cancer detection was mentioned by women. However, women reported the need for a physical body examination in addition to blood analysis.</p>	The knowledge women possess about prostate cancer screening have appreciable gaps. Educating women on prostate cancer screening is of equal importance as male prostate cancer education.	<p>1. Results have low generalizability due to the utilization of the convenience sampling strategy.</p> <p>2. Validity and reliability studies of the FDG questions were not done in the study population.</p> <p>3. The target number of study subjects needed for the FDG was not met. Hence, the study sample was inadequate.</p>

BRIDGING DOCUMENT

The results of chapter 2 B revealed that women had moderate knowledge about the signs and symptoms and the risk factors of prostate cancer. The review further indicated that women had poor knowledge about the screening modalities of prostate cancer. The results directed the researcher to develop an Akan questionnaire for studying prostate cancer awareness in Ghanaian women. A validation and reliability assessment of the Akan questionnaire was also performed. It was then prepared as a manuscript and presented in chapter 3. The manuscript was prepared following the Journal authors' guidelines.

CHAPTER 3

SUBMITTED MANUSCRIPT

An Akan Translation, Validation and Reliability of a Questionnaire for assessing Awareness of Ghanaian women about Prostate Cancer.

ABSTRACT

Aims: The study aimed to: (1) adopt, modify and develop a questionnaire suitable for data collection on prostate cancer in the female population, (2) translate the questionnaire into the Akan language, and (3) conduct a validity and reliability analysis on the Akan questionnaire.

Methods: An English version questionnaire was developed and adequately translated into an Akan version according to the forward and backward translation protocols. The Akan questionnaire went through translator-approval and certification. Validity and reliability analysis were performed on the questionnaire. Statistical analysis for face validity involved the determination of average scores while content validity involved the determination of the content validity index. Regarding reliability analysis, Cronbach's alpha was calculated for the test and retest periods of study.

Results: A forty-five (45) numbered Akan questionnaire was successfully developed and certified. The average scores for all parameters employed in the face validation were greater than 4. The content validity index was within the range of 0.90 - 0.99 while the Cronbach's alpha for both test periods was within the range of 0.7808 - 0.9209.

Conclusion: The Akan questionnaire had acceptable validity and reliability outcome. Therefore, the questionnaire was considered appropriate for assessing knowledge, awareness, and perception of Ghanaian women about prostate cancer.

Keywords: Akan questionnaire, Translation, Validity analysis, Reliability analysis, Knowledge, Awareness, Perception, Prostate cancer, Women.

Abbreviations: BREC: Biomedical Research Ethics Committee; CHRPE: Committee on Human Research, Publications and Ethics; CVI: Content Validity Index; KATH: Komfo Anokye Teaching Hospital; PCa: Prostate cancer; KNUST: Kwame Nkrumah University of Science and Technology; UKZN: University of KwaZulu-Natal.

BACKGROUND

The promotion of family health is attributed to women, including the wellbeing of their acquaintances [1,2]. A study conducted in North America stressed the influence women have on their relatives regarding their health-seeking demeanor [3]. Other roles women have been shown to play towards health promotion include the provision of health-related advice, their acting as advocates for various medical conditions including cancers, and their unique role in providing support for the sick [4]. According to Taylor and colleagues (2016), husbands confirmed soliciting health information from their significant others [5]. Therefore, there is evidence to support the crucial role women could play towards the early detection of prostate cancer (PCa).

Globally, several studies have identified the knowledge, awareness, and perception of women about PCa as moderate [3,6,7]. In Ghana, a literature search on the awareness of women of PCa did not yield any studies. This result indicates the need to conduct such research. However, there are about 50 indigenous Ghanaian languages [8], with Akan been the most spoken language [9]. Providing a valid and reliable Akan version of a modified tool for assessing the awareness of women of prostate cancer is vital. Such a tool should be subjective, useful in a female setting, reliable, and valid. Therefore, this study was conducted with the following objectives; (1) to adopt and adapt a questionnaire suitable for data collection on awareness of PCa in Ghanaian women, (2) to translate the questionnaire into the Akan language, and (3) to conduct a validity and reliability analysis on the Akan questionnaire.

METHODOLOGY

The methodology behind the study is summarized as a flowchart in figure 1.

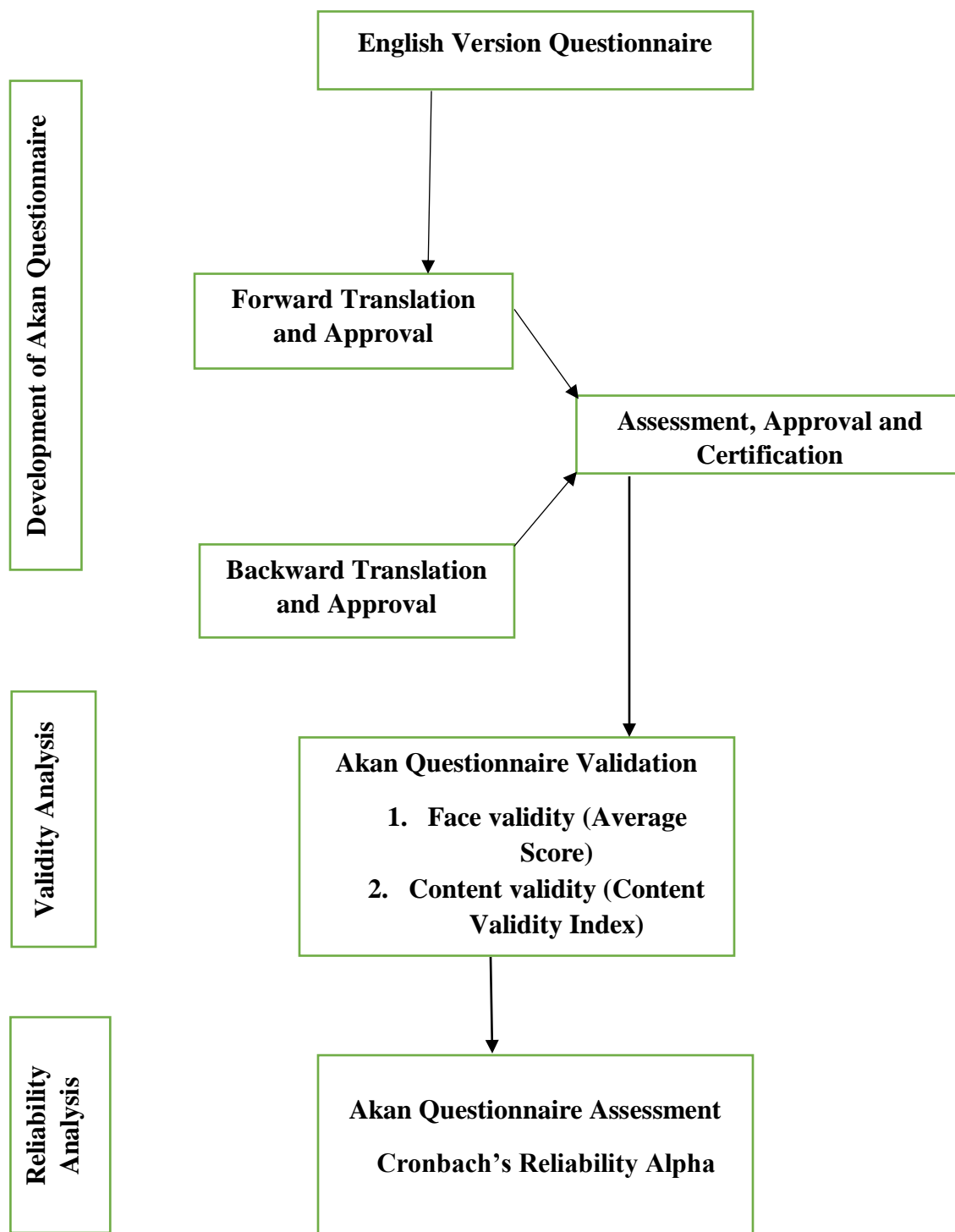


Figure 1: A flowchart illustrating the Translation, Validity and Reliability Analysis Methodology

Development of the English Version Questionnaire

The English version questionnaire was adopted from a study by Otoo (2010) when she undertook a study on prostate cancer awareness in Ghanaian military men [10]. The questionnaire was modified with inputs from a study conducted by Blanchard et al. (2005) [3]. The developed questionnaire was submitted to the Committee on Human Research, Publications and Ethics (CHRPE) of the Kwame Nkrumah University of Science and Technology (KNUST), and the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal (UKZN). The CHRPE accepted and approved the questionnaire whilst a recommendation from BREC to reduce questionnaire length informed the final English version of the questionnaire. The English version questionnaire was resubmitted to BREC for approval.

Forward Translation and Approval

The approved English version was subjected to a forward translation into Akan. The forward translation entails converting a document from an original language into a second language of interest [11,12]. Three translators with academic degrees in the Akan language and fluent in the English language translated the English version into the Akan version. The translators considered the Akan version for approval. English words, such as the prostate that did not have literal meanings in the Akan language were adequately given descriptions as previously done in a study by Nejjari et al. (2014) [13].

Backward Translation and Approval

The Akan version of the questionnaire was back-translated into the English language by three translators with academic degrees in the English language and fluent in the Akan language. This method was by similar studies involving the translation of questionnaires into different native languages [11,12]. The translators considered the back-translated English version for approval.

Assessment, Approval, and Certification

The backward translation version, which is the second English version, was assessed by the six (6) independent translators. The assessment involved a thorough comparison of the second English version to the ethically-approved English version for conceptual agreement [11]. The forward

translation version, which is the Akan version, was further assessed by the six (6) independent translators and considered for translator-approval before submission to the Department of Language and Communication Sciences of KNUST for certification.

Questionnaire Validation

The variables of the construct of the Akan questionnaire was assessed for face and content validity [12,14]. Content validity is the extent to which a set of variables comprehensively covers the different components of the questionnaire [15]. On the contrary, face validity is whether the questionnaire's variables are appropriate, sensible, and suitable to the population intended for use [16].

Face validation

Face validation must preferably be performed by non-expert participants on the construct being studied [14]. It is the simplest validation method and the weakest type of validity [14]. In a study by Sowtali et al. (2016) ten (10) non-experts (stroke patients) were employed in the face validation [14]. To ensure the same number of individuals were employed in the translation, face validation, and content validation processes, six (6) market women fluent in the Akan language were randomly selected to evaluate the Akan questionnaire for face validity. The market women scored, on a scale of 6 (very weak, weak, moderately weak, good, very good, excellent) [17], the 45 variables of the Akan questionnaire according to language appropriateness, clarity, and cultural acceptance [11,14]. The average points scored by the market women were computed into excel [17].

Content validation

The content validation focused on the relevance of the questionnaire to the study and the questionnaire's ability to measure the study construct [12,14]. Six (6) experts adequately assessed the content validity of the questionnaire items [12]. Typically, 5 to 7 experts are used to evaluate whether the variables of interest are well represented in the questionnaire [18]. Therefore, two pharmacists with a Doctor of Pharmacy and Master's degree in clinical pharmacy, two oncology nurses, and two clinical oncologists at the Komfo Anokye Teaching Hospital (KATH), Ghana

scored the questionnaire. Items of the questionnaire were scored on a scale of three (3) (poor, moderate, good) according to the relevance of the items to the study [17]. The Content Validity Index (CVI) was determined and computed [14].

Reliability Assessment

The Akan questionnaire reliability was assessed to verify the tool's ability to measure the domains of the study according to the test-retest method at an interval of seven (7) days [17,19]. Retesting was relevant in reducing the order effect [17]. It also measures the test's internal validity and ensures that the results obtained are reliable and can replicate themselves repeatedly in the same population and situation. The duration of the test-retest was 14 days.

Population

A portion of the female traders on the ground floor of the Kumasi Central Market, also known as the Kejetia Market, located in the Ashanti region of Ghana, was employed in the reliability study. Only women who consented to the study and volunteered to be available for the retest period were recruited. Women below 18 years and female mobile traders were excluded.

Sample size and sampling technique

According to the administrative manager, the market holds about 25,000 female traders. In determining sample size for a conventional study at a confidence level (c) of 95%; a precision level (e, sampling error) of $\pm 5\%$, and a degree of variability (p) of 50%; an estimated sample size of 400 is recommended according to published tables by Israel (1992) [20]. For the reliability study, 100 women (25% of the recommended sample size) were recruited. To obtain an intra-class correlation coefficient (ICC) of not less than 0.75 ± 0.1 at a 95% confidence interval, a sample size of 51 is appropriate [19]. Other studies recruited a lesser sample size [14] and relatively higher sample sizes [17,19].

To reduce bias and ensure an equal chance of participation, the women were simply and randomly sampled [21]. The ground floor of the market was divided into four (4) sections and each section into five (5) sub-sections. Five (5) women were randomly selected per sub-section and considered for inclusion.

Statistical analysis

STATA software was employed for statistical evaluation. The internal reliability of the Akan questionnaire was measured using Cronbach's alpha [17,19]. To measure the constructs of face validity, descriptive statistics were used.

RESULTS

Translation Outcome

A sixty-one (61) item questionnaire was adopted and adapted (Appendix A). The questionnaire was modified to forty-five (45) (Appendix B) in response to BREC (Appendix C). The forward and backward translations were approved by the respective translators. The translator-approved English version questionnaire was found to be conceptually equivalent to the original English version questionnaire. The Akan version (Appendix D) was approved by all six (6) independent translators. The translator-approved Akan version received certification (Appendix E) from the Department of Language and Communication Sciences, KNUST.

Validity Analysis Outcome

The face validity scores have been computed in table 1. The questionnaire, taking all the various sections into account, had an average validity score range of 4.17 - 6.00 (4.73 ± 0.90) on language appropriateness; 4.33 - 6.00 (5.04 ± 0.76) on clarity; and 4.17- 5.83 (5.11 ± 0.86) on cultural acceptance.

Table 1: Face validity results

Sections	Language Appropriateness		Clarity		Cultural Acceptance	
	Average score (range)	Mean \pm SD	Average score (range)	Mean \pm SD	Average score (range)	Mean \pm SD
1	4.17 - 4.83	4.44 \pm 0.93	4.33 - 5.33	4.69 \pm 0.78	4.67 - 5.33	5.17 \pm 0.93
2	4.33 - 5.00	4.60 \pm 0.93	4.50 - 5.17	4.81 \pm 0.78	4.67 - 5.67	4.98 \pm 0.90
3	4.33 - 5.17	4.72 \pm 0.87	4.50 - 5.33	5.06 \pm 0.68	4.33 - 5.67	5.15 \pm 0.78
4	4.33 - 4.67	4.53 \pm 0.85	4.67 - 5.00	4.80 \pm 0.75	4.33 - 5.33	4.77 \pm 0.84
5	4.50 - 5.33	4.67 \pm 0.77	4.67 - 5.50	5.17 \pm 0.78	4.17 - 5.33	4.88 \pm 0.91
6A	4.50 - 6.00	5.00 \pm 0.93	5.16 - 6.00	5.47 \pm 0.56	5.33 - 5.83	5.67 \pm 0.54
6B	4.67 - 5.50	5.17 \pm 0.86	5.17 - 5.67	5.40 \pm 0.55	5.33 - 5.50	5.33 \pm 0.75
Score (all sections)	4.17 - 6.00	4.73 \pm 0.90	4.33 - 6.00	5.04 \pm 0.76	4.17- 5.83	5.11 \pm 0.86

The Content Validity Index (CVI) has been presented (Table 2). The various sections of the questionnaire had a lower limit CVI greater than 0.75 except for section 6B, beliefs about prostate cancer, which had a CVI range of 0.73 - 1.00 (0.91 \pm 0.44). A CVI range of 0.90 - 0.99 (0.96 \pm 0.32) was obtained for the complete questionnaire.

Table 2: Content validity results

Sections	Relevance of Variables to Study	
	Content Validity Index (CVI) range	Mean \pm SD
1	0.89 - 1.00	0.96 \pm 0.31
2	0.92 - 0.96	0.95 \pm 0.35
3	0.93 - 1.00	0.97 \pm 0.29
4	0.93 - 1.00	0.99 \pm 0.18
5	0.95 - 1.00	0.99 \pm 0.15
6A	0.80 - 1.00	0.93 \pm 0.40
6B	0.73 - 1.00	0.91 \pm 0.44
CVI (all sections)	0.90 - 0.99	0.96 \pm 0.32

Reliability Analysis Outcome

The socio-demographics of the participants are presented in table 3, and graphically in figures 2 - 7. The age of participants ranged from 18 - 72 years (41.96 ± 15.288 for the test, and 42.17 ± 15.154). The leading socio-demographical classes were; married reflecting marital status, primary reflecting highest educational level, Christianity to religion, Akan under the major ethnic group section, and non-membership of market associations.

Table 3: Demographical features of study subjects (n= 100)

Variable	Test	Retest
Age (Mean \pm SD)	41.96 ± 15.288	42.17 ± 15.154
Age (Minimum)	18	18
Age (Maximum)	72	72

Age (Ranges)		
15-19	2	2
20-24	18	17
25-29	9	9
30-34	8	8
35-39	4	4
40-44	11	12
45-49	17	17
50-54	9	9
55-59	5	5
60+	19	19
Marital Status		
Married	47	49
Never married	25	25
Cohabiting	8	7
Widowed	15	14
Divorced/Separated	5	5
Highest Educational level		
Primary	46	50
Secondary	35	32
Tertiary	11	10
No education	8	8
Religious Affiliation		
Christianity	92	92
Islamic	7	7
Other	1	1

Ethnic Background		
Akan	90	90
Mole-Dagbane	2	2
Other	8	8
Market Association		
Hair Sellers	1	1
Kejetia Market Union	1	1
Make-Up Sellers	2	2
Petty Traders	1	1
None	95	95



Figure 2: A frequency graph of the age distribution of study participants for the test and retest phases.

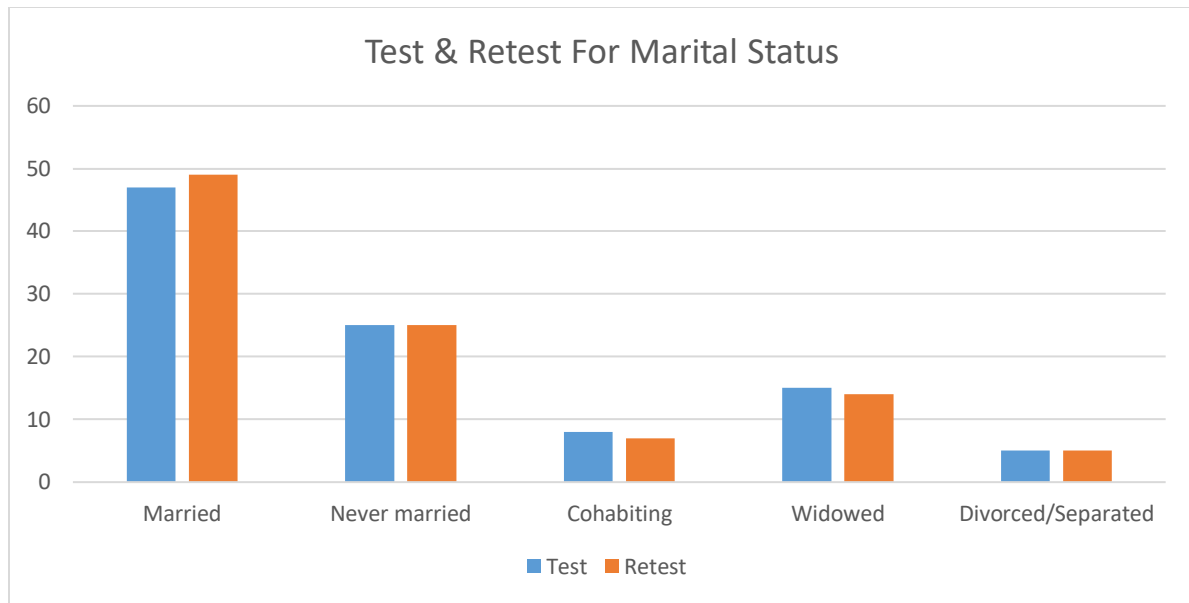


Figure 3: A frequency graph of the marital status of study participants for the test and retest phases.

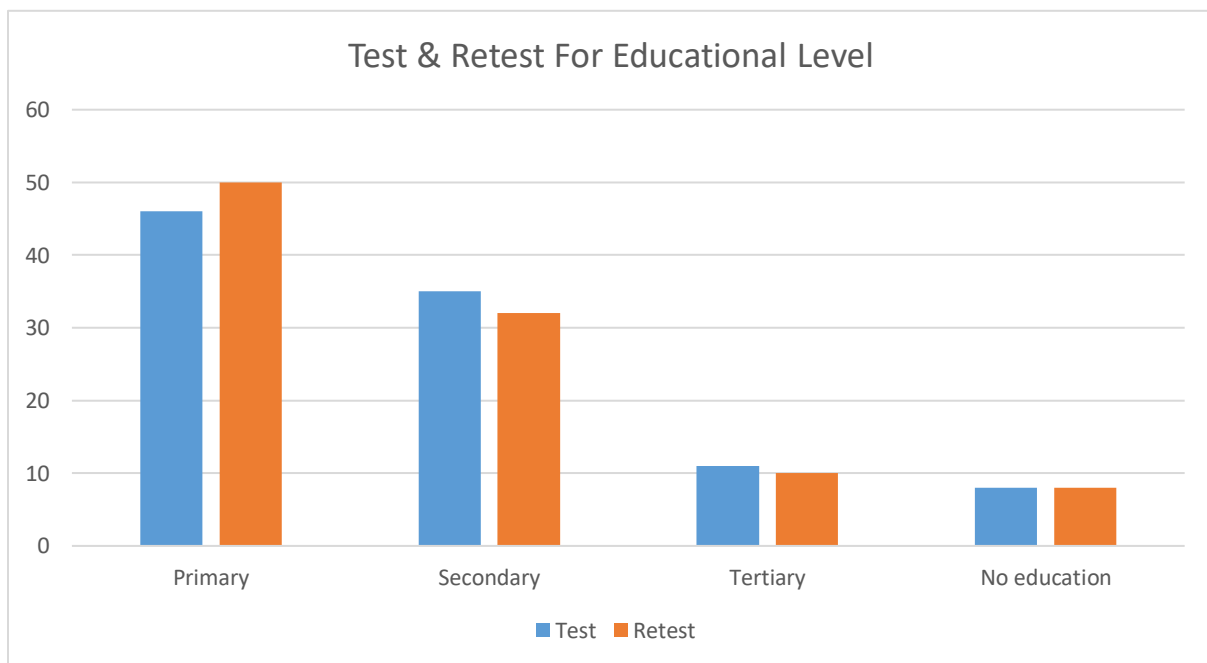


Figure 4: A frequency graph of the educational level of study participants for the test and retest phases.

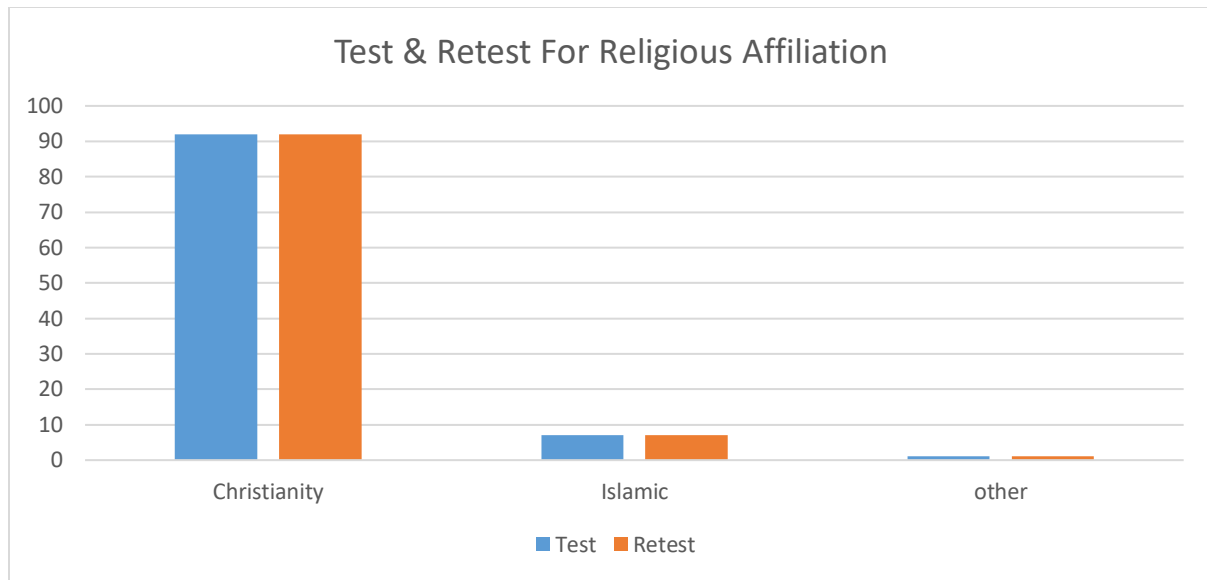


Figure 5: A frequency graph of the religious affiliation of study participants for the test and retest phases.

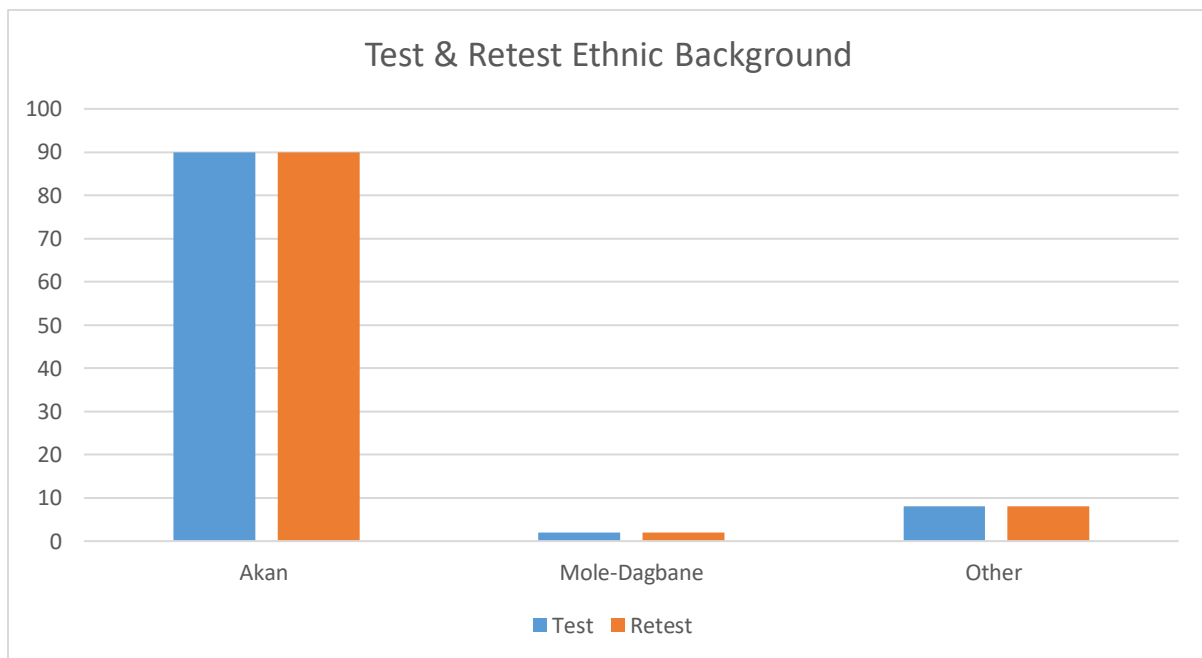


Figure 6: A frequency graph of the ethnic background of study participants for the test and retest phases.

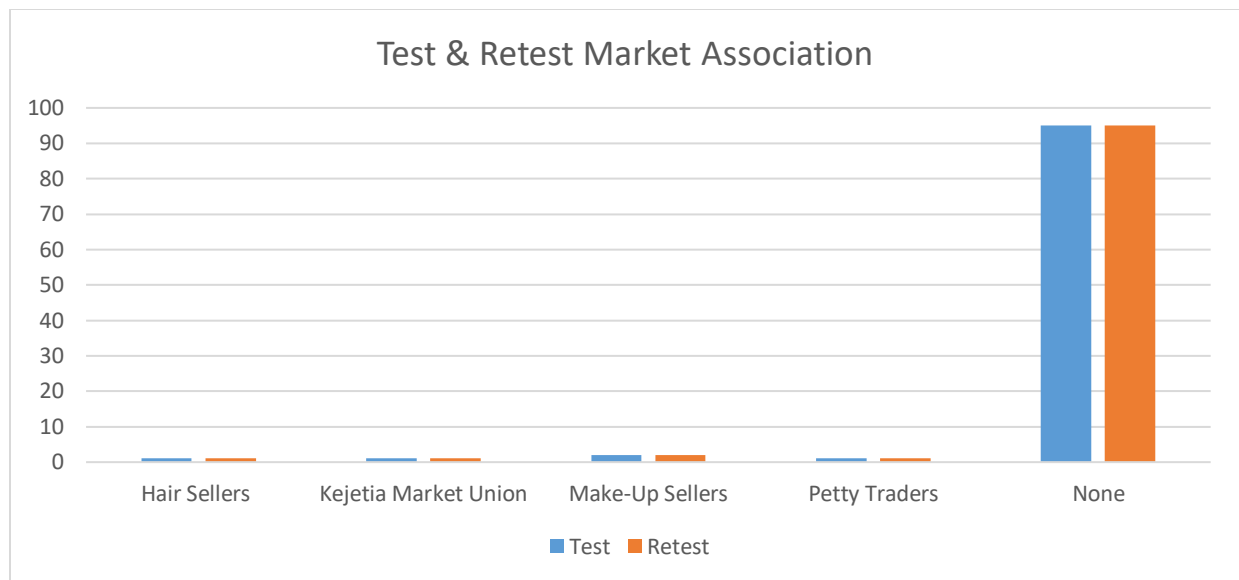


Figure 7: A frequency graph of the market associations of study participants for the test and retest phases.

Cronbach's alpha values obtained in determining the internal reliability of the Akan questionnaire are reported in table 4. Alpha values for the various sections of the questionnaire, taking into account the test and retest periods, were above 0.5 except section 6. For the two sections of the questionnaire that evaluated the perception of women on prostate cancer, the sub-section on women's attitudes towards prostate cancer had a Cronbach's alpha of 0.4637 at baseline and 0.2314 for the retest. Cronbach's alpha of the sub-section that evaluated beliefs about prostate cancer was 0.2211 at baseline and increased to 0.3427 during the retesting period. The overall Cronbach's alpha for all the variables, grouped and ungrouped, for the test and retest was within the range of 0.7808 - 0.9209.

Table 4: Cronbach's reliability test

Sections	Test	Retest
2. Awareness about prostate cancer	0.6161	0.5486
3. Knowledge on signs and symptoms of prostate cancer	0.9364	0.8883
4. Knowledge on the causes of prostate cancer	0.7070	0.7005
5. Knowledge on the risk factors of prostate	0.7749	0.6634
6A. Attitude towards prostate cancer	0.4637	0.2314
6B. Beliefs about prostate cancer	0.2211	0.3427
Cronbach's alpha for all variables (grouped into sections)	0.8101	0.7808
Cronbach's alpha for all variables (ungrouped)	0.9209	0.8892

DISCUSSION

The Akan questionnaire was developed to assess the knowledge, awareness, and perception of women towards prostate cancer. The questionnaire is hoped to aid in studies aimed at equipping Ghanaian women to contribute to the early detection of prostate cancer. The translation procedure was successful and received adequate certification. The face and content validation were performed on the Akan version to assess the feasibility of questionnaires to adequately measure the study construct of interest and determine the relevance of variables to the study [14]. The reliability analysis was performed to determine the Akan questionnaire's ability to adequately measure the domains of the study [12].

According to Nahad et al. (2014), face validity scores greater than 4, on a scale of 6, reflect an excellent questionnaire validity [17]. On a scale of 5, scores of 3 and 4, respectively represent adequate and very suitable absolute face validity [22]. From the results (Table 1), all sections of the questionnaire had an average validity score greater than 4 for language appropriateness, clarity, and cultural acceptance. Therefore, the questionnaire had good face validity. The results further affirm the ability of the Akan questionnaire to measure the study construct of interest adequately.

From the submission of Yaghmaei (2003), a content validity index (CVI) greater than 0.75 describes a good content validity outcome [23]. Some studies have successfully evaluated the content validity of questionnaires according to the recommendation of Yaghmaei (2003) [14,17]. In general, the questionnaire exhibited a good content validity outcome as a CVI range of 0.90 - 0.99 (0.96 ± 0.32) was calculated. Although section 6B of the questionnaire had a lower limit CVI of 0.73, the mean was found to be 0.91 and could be generally considered a good content validity outcome.

According to Sowtali et al. (2016), Cronbach's alpha values between 0.5 to 0.7 are acceptable, while values of 0.7 and higher reflect apparent questionnaire items homogeneity [14]. The Cronbach's alpha values of sections 6A (0.4637 for test and 0.2314 for retest) and 6B (0.2211 for test and 0.3427 for retest) were below the lower acceptable limit. However, the overall Cronbach's alpha for all the variables, grouped and ungrouped, exhibited an acceptable internal reliability and questionnaire items homogeneity as outcomes for both test and retest were within the range of 0.7808 - 0.9209. Therefore, the Akan questionnaire has acceptable internal reliability and homogeneity.

CONCLUSION

The Akan version of the questionnaire was successfully developed and certified. The validity and reliability analysis of the questionnaire was acceptable. It is recommended that the questionnaire be used to study the knowledge, awareness, and perception of Ghanaian women about prostate cancer. Given this recommendation, the Akan questionnaire can be used to study prostate cancer awareness in Ghanaian women adequately.

STUDY LIMITATIONS

1. The questionnaire validity and reliability analysis was restricted to the Kejetia Market and did not include Ghanaian women from other places in the country.
2. The reliability analysis was restricted to the evaluation of only internal reliability.

Acknowledgment

The research team gives recognition to Prof. Charles Marfo for translation certification.

Funding

The study was not funded.

Availability of data and materials

Data and other materials are available at; <https://doi.org/10.17605/OSF.IO/9GZTD>

Authors' contributions

1. Ebenezer Wiafe: Study conception, data collection, analysis and interpretation of data, study coordination, statistical analysis, drafting of the manuscript, and material support.
2. Kofi Boamah Mensah: Study conception, statistical analysis, and critical review of the manuscript for important intellectual content and supervision.
3. Varsha Bangalee: Critical revision of the manuscript for important intellectual content, and supervision.
4. Frasia Oosthuizen: Critical revision of the manuscript for important intellectual content, and supervision.

Ethical consideration

Ethical approval was obtained from the Committee on Human Research, Publications and Ethics (CHRPE) of the Kwame Nkrumah University of Science and Technology (KNUST), and the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal (UKZN). The respective approval references are CHRPE/AP/127/20 and BREC/00001292/2020.

Public involvement

Data was collected from market women who work at the Kejetia Market located in the Ashanti region of Ghana.

Competing interests

The authors affirm that they have no competitive benefits.

REFERENCES

- [1] Stoller EP. Gender and the organization of lay health care: A socialist-feminist perspective. *Journal of Aging Studies* 1993;7(2):151-70.
- [2] Norcross WA, Ramirez C, Palinkas LA. The influence of women on the health care-seeking behavior of men. *Journal of Family Practice* 1996;43(5):475-80.
- [3] Blanchard K, Proverbs-Singh T, Katner A, Lifsey D, Pollard S, Rayford W. Knowledge, attitudes and beliefs of women about the importance of prostate cancer screening. *Journal of the National Medical Association* 2005;97(10):1378-85.
- [4] Miller SM, Roussi P, Scarpato J, Wen KY, Zhu F, Roy G. Randomized trial of print messaging: the role of the partner and monitoring style in promoting provider discussions about prostate cancer screening among African American men. *Psycho-Oncology* 2014;23(4):404-11.
- [5] Taylor KL, Turner RO, Davis III JL, Johnson L, Schwartz MD, Kerner J, et al. Improving knowledge of the prostate cancer screening dilemma among African American men: an academic-community partnership in Washington, DC. *Public Health Reports* 2016.
- [6] Okoro ON, Rutherford CA, Witherspoon SF. Leveraging the Family Influence of Women in Prostate Cancer Efforts Targeting African American Men. *Journal of Racial and Ethnic Health Disparities* 2018;5(4):820-30.
- [7] Owens OL, Jackson DD, Thomas TL, Friedman DB, Hébert JR. Prostate cancer knowledge and decision making among African-American men and women in the southeastern United States. *International Journal of Men's Health* 2015;14(1):55.
- [8] Anyidoho A, Dakubu MK. Ghana: indigenous languages, English, and an emerging national identity. *Language and National Identity in Africa* 2008:141-57.
- [9] Sadat M, Kuwornu M. Views from the Streets of Accra on Language Policy in Ghana. *Journal of Education and Practice* 2017;8(2):185-92.
- [10] Otoo V. Awareness of Prostate Cancer among male soldiers in the Ghana Armed Forces. *University of Ghana* 2010.
- [11] Basim HN, Sesen H, Korkmazyurek H. A Turkish translation, validity and reliability study of the dimensions of the learning organization questionnaire. *World Applied Sciences Journal* 2007;2(4):368-74.
- [12] Arip MASM, Saad FM, Rahman AMA, Salim SSS, Bistaman MN. Translation, validity and reliability of Multidimensional Self-Concept Scale (MSCS) questionnaire among Malaysian teenagers. *Procedia-Social and Behavioral Sciences* 2013;84:1455-63.
- [13] Nejjar C, El Fakir S, Bendahhou K, El Rhazi K, Abda N, Zidouh A, et al. Translation and validation of European organization for research and treatment of cancer quality of life Questionnaire-C30 into Moroccan version for cancer patients in Morocco. *BMC Research Notes* 2014;7(1):228.
- [14] Sowtali SN, Yusoff DM, Harith S, Mohamed M. Translation and validation of the Malay version of the Stroke Knowledge Test. *Journal of Arrhythmia* 2016;32(2):112-8.
- [15] Fitzpatrick P. Evaluating patient-based outcome measures for use in clinical trials. *Health Technol Assessment* 1998;2:14.
- [16] Holden RR. Face validity. *The Corsini Encyclopedia of Psychology* 2010:1-2.
- [17] Nahad HA, Rouzbahani M, Jarollahi F, Jalaie S, Pourbakht A, Mokrian H, et al. Translation, validity, and reliability of a persian version of the iowa tinnitus handicap questionnaire. *Iranian Journal of Otorhinolaryngology* 2014;26(75):79.

- [18] Haynes SN, Richard D, Kubany ES. Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment* 1995;7(3):238.
- [19] Rogers KD, Pilling M, Davies L, Belk R, Nassimi-Green C, Young A. Translation, validity and reliability of the British Sign Language (BSL) version of the EQ-5D-5L. *Quality of Life Research* 2016;25(7):1825-34.
- [20] Israel GD. Determining sample size (Fact sheet PEOD-6). Gainesville, FL: University of Florida 1992.
- [21] Singh AS, Masuku MB. Sampling techniques & determination of sample size in applied statistics research: An overview. *International Journal of Economics, Commerce and Management* 2014;2(11):1-22.
- [22] Nevo B. Face validity revisited. *Journal of Educational Measurement* 1985;22(4):287-93.
- [23] Yaghmaei F. Content validity and its estimation. *Journal of Medical Education* 2003, 3:25-27.

CHAPTER 4

CONCLUSION

4.1 INTRODUCTION

This chapter concludes the study by highlighting the key findings. Also, the significance of the research project, strengths, limitations, recommendations for further studies, and a summary of the study is adequately presented in this chapter.

Women have been tagged the managers of family health with evidence from how they wonderfully navigate the immunization schedule of their newborns in addition to the many prenatal and postnatal schedules the global health community demands of them. With the increase in the late detection of prostate cancer and the need to exploit cost-effective means of increasing the early detection of the disease, this research was to develop a tool to be used specifically in Ghana to study the knowledge, awareness, and perception of women about prostate cancer.

The objectives below were set to achieve the study aim:

1. To conduct a mixed-methods systematic review on the awareness of women about prostate cancer.
2. To translate, validate, and conduct a reliability assessment of a questionnaire for studying the knowledge, awareness, and perception of prostate cancer in Ghanaian market women.

4.2 CONCLUSIONS DRAWN FROM STUDY FINDINGS BASED ON STUDY OBJECTIVES

The study contributed to scientific knowledge as follows;

1. The development of a mixed-methods systematic review protocol suitable to gather evidence on women's awareness about prostate cancer.
2. The systematic review revealed that women had moderate knowledge about the signs and symptoms, and risk factors of prostate cancer.

3. The review further highlighted the poor knowledge women had about prostate cancer screening modalities.
4. A prostate cancer tool, specifically for Ghanaian women, was developed and validated.
5. The 45-item Akan questionnaire was reliable and could be used to study the awareness of Ghanaian women about prostate cancer.

4.3 SIGNIFICANCE OF THE STUDY

The development of a tool to be used specifically in Ghana to study the knowledge, awareness, and perception of women about prostate cancer is relevant in ensuring the timely detection of the disease. The tool, in the Akan language, would be useful in further studies to determine the awareness of Ghanaian women about prostate cancer in addition to developing an educational intervention model. Although all Ghanaian women are not Akans, the Akan dialect is widely spoken and well understood by the majority of Ghanaians. With this tool, the Ghanaian woman stands the chance to be given education on prostate cancer and further equipped to contribute to early detection.

4.4 STRENGTHS

1. The review employed the mixed methods approach to the critical appraisal and synthesis of evidence.
2. None of the search records were excluded from the review based on methodological quality.
3. The search records included all global studies.
4. Study participants were randomly selected.
5. The Akan questionnaire was developed according to the forward and backward translation.
6. The validation of the questionnaire involved the face and content validation techniques.

7. The test-retest approach was employed in the reliability assessment of the Akan questionnaire.

4.5 LIMITATIONS

1. The literature search for the review was limited to 5 databases and to the search range of January 1999 to December 2019.
2. Studies that included women who received education on prostate cancer were excluded from the review.
3. Literature search records that included healthcare professionals, healthcare students, college/university students, and Lesbian, Gay, Bisexual, Transsexual/transgender, and Queer/questioning (LGBTQ) participants were excluded from the review.
4. The questionnaire validation and reliability assessment were restricted to only women in the Kejetia market.
5. The reliability analysis was restricted to the evaluation of only internal reliability.

4.6 RECOMMENDATIONS

1. Prostate cancer programs, aimed at early detection, must involve the active engagement of women as screening promoters.
2. The knowledge of women, living in low and middle-income countries (LMIC), about prostate cancer, must be studied.
3. The current burden of prostate cancer on women, whose significant others are living with prostate cancer, must be investigated.
4. An educational intervention model must be developed to strategically position women to contribute to the early detection of prostate cancer in Ghana.

4.7. SUMMARY OF STUDY

In brief, this study has revealed the insufficient studies conducted globally on the awareness of women on prostate cancer. The study has further developed an Akan questionnaire that aims to study the knowledge, awareness, and perception of Ghanaian women in the bid to strategically position the Ghanaian women to play significant roles in improving the early detection of prostate cancer.

APPENDIX 1: Ethical approval from the Biomedical Research Ethics Committee, University of KwaZulu-Natal



24 May 2020

Dr Ebenezer Wiafe (220108585)
School of Health Sciences
Westville

Dear Dr Wiafe,

Protocol reference number: BREC/00001292/2020

Project title: The knowledge, awareness and perception of market women towards the early detection of prostate cancer

Degree Purposes: Masters

EXPEDITED APPLICATION: APPROVAL LETTER

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application.

The conditions have been met and the study is given full ethics approval and may begin as from 24 May 2020. Please ensure that outstanding site permissions are obtained and forwarded to BREC for approval before commencing research at a site.

This approval is subject to national and UKZN lockdown regulations and the general BREC circular emailed by the Research Office on 23rd March 2020 and repeatedly since.

This approval is valid for one year from 24 May 2020. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be noted by a full Committee at its next meeting taking place on 09 June 2020.

Yours sincerely



Prof D Wassenaar
Chair: Biomedical Research Ethics Committee

Biomedical Research Ethics Committee
Chair: Professor D R Wassenaar
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Email: BREC@ukzn.ac.za
Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>

Founding Campuses:  Edgewood  Howard College  Medical School  Pietermaritzburg  Westville

INSPIRING GREATNESS

APPENDIX 2: Protocol amendment approval from the Biomedical Research Ethics Committee, University of KwaZulu-Natal



10 June 2020

Dr Ebenezer Wiafe (220108585)
School Of Health Sciences Westville

Dear Dr Wiafe,

Protocol reference number: BREC/00001292/2020

Project title: The knowledge, awareness and perception of market women towards the early detection of prostate cancer.

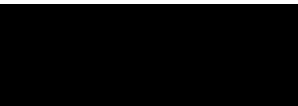
Degree: Master of Pharmacy

NEW TITLE: *The Role of Women in the Early Detection of Prostate Cancer: A study in Ghana."*

We wish to advise you that your application for amendments received on 27 May 2020 to change the title to the new title above for the above study has been **noted and approved** by a subcommittee of the Biomedical Research Ethics Committee.

The committee will be advised of the above at its next meeting to be held on 14 July 2020.

Yours sincerely






Ms A Marimuthu
(for) Prof D Wassenaar
Chair: Biomedical Research Ethics Committee

Biomedical Research Ethics Committee
Chair: Professor D R Wassenaar
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Email: BREC@ukzn.ac.za
Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>



Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS

APPENDIX 3: Ethical approval from the Committee on Human Research, Publications and Ethics, Kwame Nkrumah University of Science and Technology/Komfo Anokye Teaching Hospital

	<p>KWAME NKURUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY COLLEGE OF HEALTH SCIENCES</p> <hr/> <p>SCHOOL OF MEDICAL SCIENCES / KOMFO ANOKYE TEACHING HOSPITAL COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS</p>	
<p>Our Ref: CHRPE/AP/127/20</p>		<p>17th March, 2020.</p>
<p>Dr. Ebenezer Wiafe School of Health Sciences University of KwaZulu-Natal SOUTH AFRICA.</p>		
<p>Dear Sir,</p>		
<p>LETTER OF APPROVAL</p>		
<p><i>Protocol Title:</i> <i>"The Knowledge, Awareness and Perception of Market Women towards the Early Detection of Prostate Cancer."</i></p>		
<p><i>Proposed Site:</i> <i>Kumasi Central (Kejetia) Market.</i></p>		
<p><i>Sponsor:</i> <i>Principal Investigator.</i></p>		
<p>Your submission to the Committee on Human Research, Publications and Ethics on the above-named protocol refers:</p>		
<p>The Committee reviewed the following documents:</p>		
<ul style="list-style-type: none">• A notification letter of 20th February, 2020 from the Administration of Kumasi Central Market (study site) indicating approval for the conduct of the study at the Market.• A Completed CHRPE Application Form.• Participant Information Leaflet and Consent Form.• Research Protocol.• Questionnaire.		
<p>The Committee has considered the ethical merit of your submission and approved the protocol. The approval is for a fixed period of one year, beginning 17th March, 2020 to 16th March, 2021 renewable thereafter. The Committee may however, suspend or withdraw ethical approval at any time if your study is found to contravene the approved protocol.</p>		
<p>Data gathered for the study should be used for the approved purposes only. Permission should be sought from the Committee if any amendment to the protocol or use, other than submitted, is made of your research data.</p>		
<p>The Committee should be notified of the actual start date of the project and would expect a report on your study, annually or at the close of the project, whichever one comes first. It should also be informed of any publication arising from the study.</p>		
<p>Thank you, Sir, for your application.</p>		
<p>Yours faithfully,</p>		
<div style="text-align: center;"> Rev. Prof. John Appiah-Poku Honorary Secretary FOR: CHAIRMAN</div>		
<hr/> <p style="text-align: center;">Room 7 Block J, School of Medical Sciences, KNUST, University Post Office, Kumasi, Ghana Phone: +233 3220 63248 Mobile: +233 20 5453785 Email: chrpe.knust.kath@gmail.com / chrpe@knust.edu.gh</p>		

APPENDIX 4: Protocol amendment approval from the Committee on Human Research, Publications and Ethics, Kwame Nkrumah University of Science and Technology/Komfo Anokye Teaching Hospital

	<p>KWAME NKURUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY COLLEGE OF HEALTH SCIENCES</p> <hr/> <p>SCHOOL OF MEDICAL SCIENCES / KOMFO ANOKYE TEACHING HOSPITAL COMMITTEE ON HUMAN RESEARCH, PUBLICATION AND ETHICS</p>	
<p>Our Ref: CHRPE/AP/158/20</p>		<p>8th May, 2020.</p>
<p>Dr. Ebenezer Wiafe School of Health Sciences University of KwaZulu-Natal SOUTH AFRICA.</p>		
<p>Dear Sir,</p>		
<p><u>LETTER OF APPROVAL - PROTOCOL AMENDMENT</u></p>		
<p>Original Protocol Title: <i>"The Knowledge, Awareness and Perception of Market Women towards the Early Detection of Prostate Cancer."</i></p>		
<p>Amended Protocol Title: <i>"The Role of Women in the Early Detection of Prostate Cancer: A Study in Ghana."</i></p>		
<p>Other Amendments:</p>		
<ol style="list-style-type: none">1. To modify the study objectives.2. To modify the questionnaire.3. To translate the questionnaire into Akan language.		
<p>Your submission to the Committee on amendment to the above protocol refers.</p>		
<p>The Committee has considered the ethical merit of your submission to amend the study title as above and approved it.</p>		
<p>Please note that any further amendment to this approved protocol should receive prior CHRPE approval before implementation.</p>		
<p>Thank you, Sir for your application.</p>		
<p>Yours faithfully,</p>		
<div style="background-color: black; height: 40px; width: 100%;"></div>		
<p>Rev. Prof. John Appiah-Poku. Honorary Secretary FOR: CHAIRMAN</p>		
<hr/> <p style="text-align: center;">Room 7 Block J, School of Medical Sciences, KNUST, University Post Office, Kumasi, Ghana Phone: +233 3220 63248 Mobile: +233 20 5453785 Email: chrpe.knust.kath@gmail.com / chrpe@knust.edu.gh</p>		

APPENDIX 5: Site approval letter from the Administrative Manager of the Kumasi Central Market to conduct research

The Administrative Manager
Kumasi Central Market
Kumasi Metropolitan Assembly
Kumasi, Ghana

20th February, 2020

The Chairman
Committee on Human Research, Publications and Ethics
PMB KNUST
Kumasi, Ghana

Permission to conduct research

The management of the Kumasi Central Market acknowledges receipt of a letter dated 14th February, 2020 and signed by Dr. Frasia Oosthuizen of the University of KwaZulu-Natal concerning the above subject.

The management therefore wishes to grant Ebenezer Wiafe, a Masters' student of Dr. Frasia Oosthuizen, permission to use the Kejetia Market to conduct a research study entitled "*THE KNOWLEDGE, AWARENESS AND PERCEPTION OF MARKET WOMEN TOWARDS THE EARLY DETECTION OF PROSTATE CANCER*".

Should you need any further information, please contact the Administrative Manager on 0242927896.

Thank you.


Miss. Deborah Okrah
Administrative Manager
Kumasi Central Market

APPENDIX 6: Introductory letter from Academic Supervisor to request for permission to conduct research

PRIVATE BAG X54001
DURBAN 4000
SOUTH AFRICA
FAX: (031)260-7383
TEL: (031)260-7111



School of Health Sciences
Westville Campus
Telephone: +2731 260 7242
Telefax: +2731 260 7950
Email: oosthuizenf@ukzn.ac.za

14 February 2020

The Manager
Kumasi Central Market
Kumasi Metropolitan Assembly
Kumasi, Ghana

RE: Request for permission to conduct research

I am a lecturer at the University of KwaZulu-Natal in South Africa. One of my Masters' students, Ebenezer Wiafe, is pursuing a topic entitled "*THE KNOWLEDGE, AWARENESS AND PERCEPTION OF MARKET WOMEN TOWARDS THE EARLY DETECTION OF PROSTATE CANCER*" and wishes to access the Kumasi Central Market as his study site.

The study will only involve a questionnaire to be answered by women at the market to determine their knowledge, attitudes and perceptions regarding this topic. I therefore request your permission to allow us access to the Kumasi Central market to conduct the study. Permission to conduct this study will be obtained from the Ethics Committee at the University of KwaZulu-Natal to ensure necessary safeguarding of study participants.

Should you need any further information, please contact me.

Dr Frasia Oosthuizen
Discipline of Pharmaceutical Sciences
Health Sciences | College of Health Sciences
T: +27 31 2607242; E: oosthuizenf@ukzn.ac.za

APPENDIX 7: Introduction to Research Ethics Training Certificate



CHAPTER-SPECIFIC APPENDICES

CHAPTER 2A

APPENDIX 1: Proposed search strategy using Medline via EBSCOhost

1. Awareness* OR Aware* OR Awarenesses*
2. Knowledge* OR Know* OR Knowledges* OR Knowledgeable* OR Known* OR Knowns* OR Know-how* OR Knowledge-base*
3. Signs and symptoms* OR Early signs and symptoms* OR Signs* OR Symptoms* OR Early manifestations* OR Manifestations* OR Symptomatology* OR Symptomatology*
4. Risk factors* OR Risk factor* OR Causes* OR Cause* OR Predisposing factors* OR Predisposing factor* OR Triggering factors* OR Triggering factor* OR Trigger* OR Triggers* Underlying cause* OR Underlying causes*
5. Screening recommendations* OR Screening Recommendation* OR Screening Guideline* OR Screening Guidelines* OR Screening Guideline Recommendations* OR Screening Suggestions* OR Screening Procedures* OR Screening Methods* OR Diagnostic Guidelines* OR Diagnostic Methods* OR Diagnostic Tests* OR Diagnostic Tools* OR Diagnostic Recommendations* OR Diagnostic Procedures* OR Diagnostic Processes* OR Investigations* OR Laboratory Investigations* OR Clinical Investigations* OR Examinations* OR Laboratory Examinations* OR Clinical Examinations* OR Assessment Methods* OR Testing Tools* OR Testing Methods* OR Testing Guidelines*
6. Prostate cancer* OR Prostate malignancy* OR Prostate tumor* OR Prostate tumour* OR Prostate neoplasm*

7. Women* OR Woman* OR Ladies* OR Lady* OR Female* OR Females* OR Young women* OR Young woman* OR Young Lady* OR Young ladies* OR Wife* OR Wives* OR Mother* OR Mothers* OR Feminine* OR Maiden* OR Maidens OR Bride* OR Brides* OR Dame* OR Dames*
8. #1 OR #2
9. #3 OR #4 OR #5
10. #8 AND #9
11. #10 AND #6
12. #11 AND #7

APPENDIX 2: Joanna Briggs Institute (JBI) Data Extraction Tools

A. JBI MASTARI DATA EXTRACTION TOOL FOR QUANTITATIVE RESEARCH

Reviewer: Date:

Author: Year:

Journal: Record number:

Study Method

RCT ☐ Quasi-RCT ☐ Longitudinal ☐
Retrospective ☐ Observational ☐ Other

Participants

Setting

Population

Sample size

Intervention 1..... Intervention 2 Intervention 3

Interventions

Intervention 1

Intervention 2

Intervention 3

Outcome measures

Outcome Description	Scale/Measure

Results

Dichotomous Data

Outcome	Control group number/total number	Treatment group number/total number

Continuous Data

Outcome	Control group mean & SD (number)	Treatment group mean & SD (number)

Authors Conclusions

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.....

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Comments

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Extraction of findings complete

Yes

☐

No

☐

B. JBI QARI DATA EXTRACTION TOOL FOR QUALITATIVE RESEARCH

Reviewer: Date:

Author: Year:

Journal: Record number:

Study Description

Methodology:

Phenomena of Interest:

Setting:

Geographical location:

Cultural background:

Participants:

Data Analysis:

Authors' Conclusions:

Comments:

Complete Yes ☐ No ☐

Findings	Illustration form Publication (Page number)	Evidence		
		Unequivocal	Credible	Unsupported

Extraction of findings complete

Yes

☐

No

☐

APPENDIX 3: Quality Assessment Tool

QUALITY ASSESSMENT TOOL

SN OF SELECTED STUDY	GENERAL QUALITY ASSESSMENT CRITERIA (GQAC)					SPECIFIC QAC			PERCENTAGE SCORE
	A	B	C	D	E	F	G	H	

KEY

SN= Serial Number

GQAC= General Quality Assessment Criteria

QAC= Quality Assessment Criteria

A= Was the study population adequately represented by the selected study sample size?; B= Did the study document a response rate?; C= Did the data extraction instrument undergo a reliability assessment?; D= Did the data extraction instrument undergo a validity assessment?; E= Does this study contribute to the primary source of data?; F= Was the knowledge of women on the signs and symptoms of prostate cancer assessed?; G= Was the knowledge of women on the causes and risk

factors of prostate cancer determined? H= Was the knowledge of women on the availability of screening guides for prostate cancer detection ascertained?

SCORING SCHEME

Yes (Y)= 1; No (N) or Unclear (U) or Not Reported (NR)= 0

PERCENTAGE SCORE= $100((\text{Selected Study Total Scores}) \div (\text{Sum of Assessment Criteria Scores}))$


INTERPRETATION OF SCORES: Weak= 0 – 33.9%, Moderate= 34% – 66.9%, Strong= 67% – 100%

APPENDIX 4: Manuscript submission confirmation

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SYSR-D-20-00428

The Awareness of Women on Prostate Cancer: A Mixed-Methods Systematic Review Protocol

Ebenezer Wiafe, Pharm D; Kofi Boamah Mensah; Adwoa Bemah Boamah Mensah; Varsha Bangalee; Frasia Oosthuizen

Systematic Reviews

Dear Dr Wiafe,

Thank you for submitting your manuscript 'The Awareness of Women on Prostate Cancer: A Mixed-Methods Systematic Review Protocol' to Systematic Reviews.

The submission id is: SYSR-D-20-00428

Please refer to this number in any future correspondence.

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Best wishes,

Editorial Office

Systematic Reviews

<https://systematicreviewsjournal.biomedcentral.com/>

CHAPTER 2 B

APPENDIX 1: Proposed search strategy using Medline via EBSCOhost

1. Awareness* OR Aware* OR Awarenesses*
2. Knowledge* OR Know* OR Knowledges* OR Knowledgeable* OR Known* OR Knowns* OR Know-how* OR Knowledge-base*
3. Signs and symptoms* OR Early signs and symptoms* OR Signs* OR Symptoms* OR Early manifestations* OR Manifestations* OR Symptomatology* OR Symptomatology*
4. Risk factors* OR Risk factor* OR Causes* OR Cause* OR Predisposing factors* OR Predisposing factor* OR Triggering factors* OR Triggering factor* OR Trigger* OR Triggers* Underlying cause* OR Underlying causes*
5. Screening recommendations* OR Screening Recommendation* OR Screening Guideline* OR Screening Guidelines* OR Screening Guideline Recommendations* OR Screening Suggestions* OR Screening Procedures* OR Screening Methods* OR Diagnostic Guidelines* OR Diagnostic Methods* OR Diagnostic Tests* OR Diagnostic Tools* OR Diagnostic Recommendations* OR Diagnostic Procedures* OR Diagnostic Processes* OR Investigations* OR Laboratory Investigations* OR Clinical Investigations* OR Examinations* OR Laboratory Examinations* OR Clinical Examinations* OR Assessment Methods* OR Testing Tools* OR Testing Methods* OR Testing Guidelines*
6. Prostate cancer* OR Prostate malignancy* OR Prostate tumor* OR Prostate tumour* OR Prostate neoplasm*

7. Women* OR Woman* OR Ladies* OR Lady* OR Female* OR Females* OR Young women* OR Young woman* OR Young Lady* OR Young ladies* OR Wife* OR Wives* OR Mother* OR Mothers* OR Feminine* OR Maiden* OR Maidens OR Bride* OR Brides* OR Dame* OR Dames*
8. #1 OR #2
9. #3 OR #4 OR #5
10. #8 AND #9
11. #10 AND #6
12. #11 AND #7

APPENDIX 2: Eligibility criteria

INCLUSION CRITERIA

- Studies conducted in women aged 18 years and above.
- Studies conducted in women of all racial backgrounds.
- Studies published from January 1999 to December 2019.
- Studies conducted in women of all geographical locations.
- Studies of all research designs.
- All studies on the knowledge of women on the signs and symptoms of prostate cancer.
- All studies on the knowledge of women on the causes and risk factors of prostate cancer.
- All studies on the knowledge of women on the screening recommendations of prostate cancer.
- Studies that were published in the English language.
- Studies with abstract and full text available.

EXCLUSION CRITERIA

- Studies that were published before January 1999 or after December 2019.
- Studies that were not published in the English language.
- Studies that include women below the age of 18 years.
- Studies in which the age of included women cannot be established.
- Studies that did not indicate the number of included women.
- Studies that exclusively included men without any women component (18 years and above).
- Studies conducted amongst women who were previously given education on prostate cancer.
- Studies involving lesbian, gay, bisexual, transsexual/transgender, and queer/questioning (LGBTQ) participants.
- Studies that included healthcare professionals.
- Studies that included healthcare and college/university students.
- Studies that do not include the outcome of interest.
- Book chapters.

- Reviews and overviews.
- Abstracts and conference papers.
- Dissertations and thesis.
- Commentaries and letters to editors.
- Studies published without abstracts.

APPENDIX 3: Assessment of methodological quality of included studies**ASSESSMENT OF METHODOLOGICAL QUALITY OF INCLUDED STUDIES**

SN OF SELECTED STUDY	GENERAL QUALITY ASSESSMENT CRITERIA (GQAC)					SPECIFIC QAC			PERCENTAGE SCORE
	A	B	C	D	E	F	G	H	
1.(Blanchard et al., 2005)	1	1	1	1	1	1	1	1	100
2.(Brown et al., 2006)	1	1	1	1	1	1	0	1	87.5
3.(Carrasco- Garrido et al., 2014)	1	1	0	0	1	0	0	1	50
4.(Okoro, Rutherford, & Witherspoon, 2018)	1	1	0	0	1	1	1	1	75
5.(Owens, Jackson, Thomas, Friedman, & Hébert, 2015)	1	0	1	1	1	1	1	1	87.5

6.(Schulman, Kirby, & Fitzpatrick, 2003)	1	1	0	0	1	1	1	1	75
7.(Webb, Kronheim, Williams, & Hartman, 2006)	1	0	0	0	1	0	1	1	50

KEY

SN = Serial Number

GQAC = General Quality Assessment Criteria

QAC = Quality Assessment Criteria

A = Was the study population adequately represented by the selected study sample size?; B = Did the study document a response rate?; C = Did the data extraction instrument undergo a reliability assessment?; D = Did the data extraction instrument undergo a validity assessment?; E = Does this study contribute to the primary source of data?; F = Was the knowledge of women on the signs and symptoms of prostate cancer assessed?; G = Was the knowledge of women on the causes and risk factors of prostate cancer determined? H = Was the knowledge of women on the availability of screening guides for prostate cancer detection ascertained?

SCORING SCHEME

Yes (Y) = 1; No (N) or Unclear (U) or Not Reported (NR) = 0

PERCENTAGE SCORE = $100((\text{Selected Study Total Scores}) \div (\text{Sum of Assessment Criteria Scores}))$

INTERPRETATION OF SCORES: Weak = 0 – 33.9%, Moderate = 34% – 66.9%, Strong = 67% – 100%

APPENDIX 4: Manuscript submission confirmation

Submission Confirmation

Thank you for your submission

Submitted to Value in Health Regional Issues

Manuscript ID VIHRI-CEEWAA-2020-0169

Title Prostate Cancer Awareness among Women: A Mixed-methods Systematic Review.

Authors Wiafe, Ebenezer
Mensah, Kofi
Mensah, Adwoa
Bangalee, Varsha
Oosthuizen, Frasia

Date Submitted 15-Aug-2020

CHAPTER 3

APPENDIX A: The original English version questionnaire

QUESTIONNAIRE

THE KNOWLEDGE, AWARENESS AND PERCEPTION OF MARKET WOMEN TOWARDS THE EARLY DETECTION OF PROSTATE CANCER.

CODE:

SECTION A: DEMOGRAPHICAL FEATURES OF STUDY SUBJECTS

1. Age:
2. Marital Status:
 - A) Married ☐
 - B) Single ☐
 - C) Cohabiting ☐
3. Highest Educational level:
 - A) Primary ☐
 - B) Secondary ☐
 - C) Tertiary ☐
 - D) None ☐
4. Religious Affiliation:
 - A) Christianity ☐
 - B) Islam ☐
 - C) Traditionalist ☐
 - D) Other.....
5. Ethnic background:
6. Market association:
7. Number of years of working in the Kumasi Central Market:

SECTION B: AWARENESS ABOUT PROSTATE CANCER

8. Do you know of the existence of prostate cancer? A) Yes ☐ B) No ☐
9. If yes, what was your source of information?
- A) Media (Radio, TV, Newspaper, etc) ☐
- B) Health care providers (Medical Doctor, Pharmacist, etc) ☐
- C) Friends ☐
- D) Family members ☐
- E) Others - specify.....
10. Has any of your relatives been diagnosed of prostate cancer?
- A) Yes ☐ B) No ☐ C) Don't know ☐
11. Prostate cancer affects the following;
- A) Only men ☐
- B) Only women ☐
- C) Both ☐
- D) Don't know ☐
12. The prostate gland is found below the waist. A) Yes ☐ B) No ☐ C) Don't know ☐
13. Prostate cancer kills more men than any other cancers found in men.
- A) Yes ☐ B) No ☐ C) Don't know ☐
14. Prostate cancer can spread to other parts of the body. A) Yes ☐ B) No ☐ C) Don't know ☐
15. Men can transfer prostate cancer to women through sex. A) Yes ☐ B) No ☐ C) Don't know ☐

SECTION C: KNOWLEDGE ON SIGNS AND SYMPTOMS OF PROSTATE CANCER

- 16. Poor urine flow. Agree [] Disagree [] Don't know []
- 17. Frequent urination at night which disturbs sleep. Agree [] Disagree [] Don't know []
- 18. Sexual weakness or impotence. Agree [] Disagree [] Don't know []
- 19. Waist pain. Agree [] Disagree [] Don't know []
- 20. Straining during urination. Agree [] Disagree [] Don't know []
- 21. Frequent urination in the course of the day. Agree [] Disagree [] Don't know []
- 22. Blood in urine. Agree [] Disagree [] Don't know []
- 23. Abrupt inability to urinate. Agree [] Disagree [] Don't know []
- 24. Urgent need to pass urine. Agree [] Disagree [] Don't know []
- 25. Abdominal pains. Agree [] Disagree [] Don't know []
- 26. There are no signs and symptoms of prostate cancer. Agree [] Disagree [] Don't know []

SECTION D: KNOWLEDGE ON THE CAUSES OF PROSTATE CANCER

- 27. Prostate cancer is caused by infections. Agree [] Disagree [] Don't know []
- 28. The use of microwave oven in heating food. Agree [] Disagree []
Don't know []
- 29. Putting mobile phones in your pocket. Agree [] Disagree [] Don't know []
- 30. Curses. Agree [] Disagree [] Don't know []
- 31. Some drugs. Agree [] Disagree [] Don't know []
- 32. Changes in DNA (genetic mutations) is a cause. Agree [] Disagree [] Don't know []

33. Exposure to radiation is a cause. Agree ☐ Disagree ☐ Don't know ☐
34. Exposure to chemicals (eg: pesticides) is a cause. Agree ☐ Disagree ☐ Don't know ☐
35. Cause is unknown. Agree ☐ Disagree ☐ Don't know ☐

SECTION E: KNOWLEDGE ON THE RISK FACTORS OF PROSTATE CANCER

36. Increasing age. Agree ☐ Disagree ☐ Don't know ☐
37. Excessive alcohol consumption. Agree ☐ Disagree ☐ Don't know ☐
38. Excessive consumption of fatty food. Agree ☐ Disagree ☐ Don't know ☐
39. Excessive smoking of cigarette. Agree ☐ Disagree ☐ Don't know ☐
40. Being of Black decent. Agree ☐ Disagree ☐ Don't know ☐
41. Family history of the disease. Agree ☐ Disagree ☐ Don't know ☐
42. Sexually transmitted infections increase a man's risk. Agree ☐ Disagree ☐ Don't know ☐
43. Stressful life. Agree ☐ Disagree ☐ Don't know ☐
44. Vasectomy. Agree ☐ Disagree ☐ Don't know ☐
45. Multiple sexual partners. Agree ☐ Disagree ☐ Don't know ☐
46. Regular sexual intercourse. Agree ☐ Disagree ☐ Don't know ☐

SECTION G: PERCEPTION ABOUT PROSTATE CANCER

ATTITUDE TOWARDS PROSTATE CANCER

47. Would you hug someone diagnosed with prostate cancer? Yes ☐ No ☐
48. Have you ever taken your husband/relative/friend to be screened for prostate cancer? Yes ☐ No ☐

49. Will you recommend to men to screen for prostate cancer? Yes [] No []
50. Prostate cancer screening must be free for every man. Yes [] No []
51. Screening for prostate cancer is not necessary. Yes [] No []
52. Prostate cancer education is important and must be intensified. Yes [] No []
53. Men diagnosed with prostate cancer must not have sex with their wives. Yes []
No []
54. Treatment of prostate cancer must be free. Yes [] No []

BELIEFS ABOUT PROSTATE CANCER

55. Prostate cancer is a family disease. Yes [] No []
56. Any man can develop prostate cancer. Yes [] No []
57. Men who cheat on their wives can get prostate cancer. Yes [] No []
58. Prostate cancer is a spiritual disease. Yes [] No []
59. Prostate cancer can be cured when diagnosed early. Yes [] No []
60. People with prostate cancer die before their time. Yes [] No []
61. Nothing can be done to save a person with prostate cancer. Yes [] No []

THANK YOU

APPENDIX B: The ethical approved English version questionnaire

QUESTIONNAIRE

THE KNOWLEDGE, AWARENESS AND PERCEPTION OF MARKET WOMEN TOWARDS THE EARLY DETECTION OF PROSTATE CANCER.

CODE: KCMS.....SS.....NO.....

SECTION 1: DEMOGRAPHICAL FEATURES OF STUDY SUBJECTS.

The following questions are to collect information about yourself. Kindly respond to them.

1. Age:

- A) 15-19 ☐
- B) 20-24 ☐
- C) 25-29 ☐
- D) 30-34 ☐
- E) 35-39 ☐
- F) 40-44 ☐
- G) 45-49 ☐
- H) 50-54 ☐
- I) 55-59 ☐
- J) 60+ ☐

2. Marital Status:

- A) Married ☐
- B) Never married ☐
- C) Cohabiting ☐
- D) Widowed ☐
- E) Divorced/Separated ☐

3. Highest Educational level:

A) Primary ☐

B) Secondary ☐

C) Tertiary ☐

D) No education ☐

4. Religious Affiliation:

A) Christianity ☐

B) Islam ☐

C) Traditionalist ☐

D) Other (specify)

5. Ethnic background:

A) Akan ☐

B) Ga/Dangme ☐

C) Ewe ☐

D) Gurma/Guan ☐

E) Mole-Dagbane ☐

F) Other (specify)

6. Market association:

SECTION 2: AWARENESS ABOUT PROSTATE CANCER.

This section covers an individual's awareness of prostate cancer.

7. Do you know of the existence of prostate cancer? A) Yes ☐ B) No ☐

Please skip to ten (9) if No.

8. If yes, what was your source of information?

A) Media (Radio, TV, Newspaper, etc) ☐

B) Health care providers (Medical Doctor, Pharmacist, etc) ☐

C) Friends ☐

D) Family members ☐

E) Other (specify)

9. Has any of your relatives been diagnosed of prostate cancer?

A) Yes ☐ B) No ☐ C) Don't know ☐

10. Which people does prostate cancer affects?

A) Only men ☐

B) Only women ☐

C) Both ☐

D) Don't know ☐

11. Where can prostate cancer be found?

12. Prostate cancer kills more men than any other cancers found in men.

A) Yes ☐ B) No ☐ C) Don't know ☐

13. Prostate cancer can spread to other parts of the body. A) Yes ☐ B) No ☐

C) Don't know ☐

14. Men can transfer prostate cancer to women through sexual intercourse. A) Yes ☐

B) No ☐ C) Don't know ☐

SECTION 3: KNOWLEDGE ON SIGNS AND SYMPTOMS OF PROSTATE CANCER.

I would like to mention some signs and symptoms of prostate cancer to you. Kindly indicate whether you AGREE, DISAGREE or DON'T KNOW.

NO.	STATEMENTS	AGREE	DISAGREE	DON'T KNOW
15.	Poor urine flow.			
16.	Frequent urination at night which disturbs sleep.			
17.	Sexual weakness or impotence.			
18.	Waist pain.			
19.	Blood in urine.			
20.	Abrupt inability to urinate.			
21.	Urgent need to pass urine.			
22.	Abdominal pains.			

23. There are no early signs and symptoms of prostate cancer. Agree [] Disagree []
Don't know []

SECTION 4: KNOWLEDGE ON THE CAUSES OF PROSTATE CANCER

I would like to mention some causes of prostate cancer to you. Kindly indicate whether you AGREE, DISAGREE or DON'T KNOW.

NO.	STATEMENTS	AGREE	DISAGREE	DON'T KNOW
24.	Infectious diseases.			
25.	Putting mobile phones in your pocket.			
26.	Curses.			
27.	Some drugs for the treatment of diseases.			

28. The cause of prostate cancer is unknown. Agree [] Disagree [] Don't know []

SECTION 5: KNOWLEDGE ON THE RISK FACTORS OF PROSTATE CANCER.

I would like to mention some risk factors of prostate cancer to you. Kindly indicate whether you AGREE, DISAGREE or DON'T KNOW.

NO.	STATEMENTS	AGREE	DISAGREE	DON'T KNOW
29.	Increasing age.			
30.	Excessive alcohol consumption.			
31.	Excessive smoking of cigarette.			
32.	Being of Black decent.			
33.	Family history of the disease.			
34.	Vasectomy.			
35.	Regular sexual intercourse.			

SECTION 6: PERCEPTION ABOUT PROSTATE CANCER

This section covers the attitudes and beliefs people have about prostate cancer.

ATTITUDE TOWARDS PROSTATE CANCER

I would like to mention some attitudes people have towards prostate cancer. Kindly indicate whether you AGREE or DISAGREE.

NO.	STATEMENTS	AGREE	DISAGREE
36.	A woman can take her husband/relative/friend to be screened for prostate cancer.		
37.	A woman can recommend to men to screen for prostate cancer.		
38.	Prostate cancer screening must be free for every man.		
39.	Prostate cancer education is important.		
40.	Men diagnosed with prostate cancer must not have sex with their wives.		

BELIEFS ABOUT PROSTATE CANCER

I would like to mention some beliefs people have about prostate cancer. Kindly indicate whether you AGREE or DISAGREE.

NO.	STATEMENTS	AGREE	DISAGREE
41.	Prostate cancer is a family disease.		
42.	Any man can develop prostate cancer.		
43.	Prostate cancer is a spiritual disease.		
44.	Prostate cancer can be cured when diagnosed early.		
45.	Nothing can be done to save a person with prostate cancer.		

THANK YOU

APPENDIX C: Biomedical Research Ethics Committee (BREC) recommendation for English version questionnaire modification.



29 April 2020

Dr Ebenezer Wiafe (220108585)
School Of Health Sciences Westville

Dear Dr Ebenezer Wiafe,

Protocol reference number: BREC/00001292/2020

Project title: The knowledge, awareness and perception of market women towards the early detection of prostate cancer.

Degree: Master of Pharmacy

PROVISIONAL APPROVAL – Expedited Application

A sub-committee of the Biomedical Research Ethics Committee has noted and considered your application received on 19 April 2020.

The study is given PROVISIONAL APPROVAL subject to a satisfactory response to the following queries:

1. The informed consent is written in the third person. Please amend so that participants understand what aspects of the study relate to them directly.
2. The questionnaire is long (75 minutes). It is recommended that the tool be piloted after a single round of translation to avoid major changes after the final translation.
3. The data collection tool allows for only 3 options regarding marital status: married, single or co-habiting. It is recommended that "widowed" be added as this may contribute to study objectives

Only when full ethical approval is given, may the study begin. Full ethics approval has not been given at this stage.

PLEASE NOTE: Provisional approval is valid for 6 months only – should we not hear from you during this time – the study will be closed and reapplication will need to be made. Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>. BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

Yours sincerely

Ms A Marimuthu
(for) Prof D Wassenaar
Chair: Biomedical Research Ethics Committee

Biomedical Research Ethics Committee
Chair: Professor D R Wassenaar
UKZN Research Ethics Office Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Email: BREC@ukzn.ac.za
Website: <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>

Founding Campuses: ■ Edgewood ■ Howard College ■ Medical School ■ Pietermaritzburg ■ Westville

INSPIRING GREATNESS

APPENDIX D: The certified Akan questionnaire.

NSEMMISA

ADWADIFOO MMAA NIMDEE, NHUNUMU NE NSUSUIE BI A WOWO FA
DWONSOTWAA MU KOKORAM A WOHUNU NO NTEM HO.

CODE: KCMS.....SS....NO.....

OFA A EDI KAN: NHWEHWEMU A EFA WON A YERESUA WON HO ADEE.

Nsemmisa yi a edidisoo yi ye nsemmisa a efa wo ho. Nti bo mmaden a na yihi ano ma yen.

1. Mfee:

- A) 15-19 []
- B) 20-24 []
- C) 25-29 []
- D) 30-34 []
- E) 35-39 []
- F) 40-44 []
- G) 45-49 []
- H) 50-54 []
- I) 55-59 []
- J) 60+ []

2. Awaree Bobere

- A) Owarefoo []
- B) Me nwaree da []
- C) Mpenatwe []
- D) Okunani []
- E) Magyae awaree/Yentam ate []

3. Baabi a woakɔ sukuu aduru:

A) Mfitiasɛɛ sukuu []

B) Ntoasoɔ sukuu []

C) Suapɔn sukuu []

D) Menkɔɔ sukuu da []

4. Ɔsom a wowɔ mu:

A) Kristosom []

B) Nkramosom []

C) Abosomsom []

D) Ɔsom foforo (kyerɛ mu)

.....

5. Abusuakuo a wofiri mu:

A) Akan []

B) Ga/Dangme []

C) Ewe []

D) Gurma/Guan []

E) Mole-Dagbane []

F) Afoforo (kyerɛ mu).....

6. Adwadifoɔ nkaɓomkuo:

**OFA A ETƆ SO MMIENSA: NIMDEE A EFA NSENKYERENNE NE DEE EKYERE
SE OBI ANYA DWONSOTWAA MU KOKORAM**

Mepe se mebobɔ dwons�twaa mu kokoram ho nsenkyerenne bi so kyere wo. Nidie kwan so, kyere se WOGYE TO MU, WONNYE NTO MU anaa WONNIM a, da no adi.

NO.	NSEMFUA	MEGYE TO MU	MENNYE NTO MU	MENNIM
15.	Dwonsɔ ntumi mma yie.			
16.	Dwonsɔ ntentem anadwo a esee nna.			
17.	Mmerɛye wɔ mpa mu anaa ɔɔ benada (ne barima awu).			
18.	Sisie mu yaw.			
19.	Mogya wɔ ne dwonsɔ mu.			
20.	Etɔ da bi a ɔntumi nnwonsɔ.			
21.	Dwonsɔ a eka no mpofirim.			
22.	Ɔte yaw wɔ n'ayaase mu.			

23. Se obi nya dwonsɔtwaa mu kokoram a, nsenkyernne biara nna ne ho adi anim anim no ara.

Megye to mu [] Mennye nto mu [] Mennim []

ɔFA A ɛTO SO NAN: NIMDEɛ A ɛFA DEɛ ɛDE DWONSOTWAA MU KOKORAM ɛBA

Mepe se meka deɛ ɛde dwonsotwaa mu kokoram ba bi kyerɛ wo. Nidie kwan so, kyerɛ se WOGYE TO MU, WONNYE NTO MU anaa WONNIM a da no adi.

NO.	NSEMFUA	MEGYE TO MU.	MENNYE NTO MU.	MENNIM.
24.	Nsaa yadeɛ.			
25.	Se wode afide megyina abɔntene na merekasa/foono rehyɛ wo kotokuo mu.			
26.	Nnuabɔ.			
27.	Nnuro bi a wode sa yadeɛ.			

28. Yɛnnim deɛ ɛde dwonsotwaa mu kokoram ba. Megye to mu [] Mennye nto mu [] Mennim. []

ƆFA A ETƆ SO NUM: NIMDEE A EFA ASIANE/ ƆHAW/ NNEE A ETUMI DE DWONSƆTWAA MU KOKORAM EBA.

Mepe se meka asiane/ ɔhaw/ nnee a etumi de dwonsɔtwaa mu kokoram ba bi kyere wo. Nidie kwan so, kyere se WOGYE TO MU, WONNYE NTO MU anaa WONNIM a, da no adi.

NO.	NSEMFUA	MEGYE TO MU.	MENNYE NTO MU.	MENNIM.
29.	Se mfee reko anim.			
30.	Nsanom mmorosoo.			
31.	Tawanom (sigarete) mmorosoo.			
32.	Se onipa no ase firi abibifoɔ mu.			
33.	Se yadee no bi wo abusua no abakosem.			
34.	Se wɔasa ɔbarima no.			
35.	Se ɔdi mpasogoro waanowaano/berɛ ano berɛ ano.			

ƆFA A ETƆ SO NSIA: ADWENE A WƆWƆ FA DWONSƆTWAA MU KOKORAM HO

Ɔfa yi kyere amanfoɔ su ne gyidie a wɔwɔ fa dwons�ɔtwaa mu kokoram ho.

SU A WƆDA NO ADI FA DWONSƆTWAA MU KOKORAM HO

Mepe se meka su soronko a amanfoɔ wɔ fa dwons�ɔtwaa mu kokoram ho kyere wo.

Nidie kwan so, kyere se WOGYE TO MU anaa WONNYE NTO MU a, da no adi.

NO.	NSEMFUA	MEGYE TO MU.	MENNYE NTO MU.
36.	Ɔbaa bi betumi de ne hokani anaa n'abusuani anaa n'adamfoɔ ako ama wakɔye no dwonsɔtwaa mu kokoram nhwehwɛmu.		
37.	Ɔbaa bi betumi akanfo ama mmarima se wonkɔye dwonsɔtwaa mu kokoram nhwehwɛmu.		
38.	Ɛse se mmarima kɔye nhwehwɛmu fa dwonsɔtwaa mu kokoram ho a wontua hwee.		
39.	Nkyerekyerɛ a ɛfa dwonsɔtwaa mu kokoram ho hia.		
40.	Ɛnye se mmarima a wonya dwonsɔtwaa mu kokoram ne won yerenom da.		

GYIDIE A EFA DWONSOTWAA MU KOKORAM HO

Mepe se meka gyidie a amanfoɔ wo fa dwonsotwaa mu kokoram ho kyerɛ wo. Nidie kwan so, kyerɛ se WOGYE TO MU anaa WONNYE NTO MU a, da no adi.

NO.	NSEMFUA	MEGYE TO MU.	MENNYE NTO MU.
41.	Dwonsotwaa mu kokoram ye abusua yadeɛ.		
42.	Ɔbarima biara betumi anya dwonsotwaa mu kokoram.		
43.	Dwonsotwaa mu kokoram ye sunsum mu yadeɛ.		
44.	Yebetumi asa dwonsotwaa mu kokoram yadeɛ se yehunu no ntem a.		
45.	Biribiara nni ho a yebetumi aye de agye obi a wanya dwonsotwaa kokoram nkwa.		

MEDA WO ASE.

APPENDIX E: The translation certificate.



**Kwame Nkrumah
University of Science
and Technology, Kumasi**

College of Humanities and Social Sciences
FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF LANGUAGE AND COMMUNICATION SCIENCES

1st June, 2020

TO WHOM IT MAY CONCERN

CERTIFICATION OF TRANSLATION

This is to certify that the translation of the questionnaire entitled "THE KNOWLEDGE, AWARENESS AND PERCEPTION OF MARKET WOMEN TOWARDS THE EARLY DETECTION OF PROSTATE CANCER" into Akan (Twi) is professionally done under the supervision of experts on the field at the department.

Thank you.



Prof. Charles Marfo
Head of Department

APPENDIX F: Manuscript submission confirmation



The European Jour... 1:23 PM

to me ▾



Ms. Ref. No.: EJC-D-20-02059

Title: An Akan Translation, Validation and Reliability of a Questionnaire for assessing Awareness of Ghanaian women on Prostate Cancer .
European Journal of Cancer

Dear Dr Wiafe

Your submission entitled "An Akan Translation, Validation and Reliability of a Questionnaire for assessing Awareness of Ghanaian women on Prostate Cancer ." has been assigned the following manuscript number: EJC-D-20-02059. It has been assigned to one of our Editors.

You may check on the progress of your paper by logging on to the Editorial Manager as an author. The URL is <https://www.editorialmanager.com/ejc/>.

Your username is: Dr.Wiafe

If you need to retrieve your password details, please access the site here <https://www.editorialmanager.com/ejc/l.asp?i=417030&l=25UQE5FI>

Thank you for submitting your work to this journal.

Regards

Editorial Office
European Journal of Cancer