Asian Pacific Journal of Cancer Care
Vol 6 No 3 (2021), 257-262
Original Research

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

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Objectives: 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) membered 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 of prostate cancer.

Introduction

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 demeanour [3]. Other roles women have been shown to play towards health promotion includes 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, husbands confirmed soliciting for 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 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, (1) to translate the questionnaire into the Akan language, and (3) to conduct a validity and reliability analysis on the Akan questionnaire.

Materials and Methods

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 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. [3]. The developed questionnaire was submitted to the Committee on Human Research, Publications and Ethics (CHRPE) and the Biomedical Research Ethics Committee (BREC) of the authors' institutes. 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. [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 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-experts 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. 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 week, week, moderately week, 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 the 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 itself 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 +/-5% and a degree of variability (p) of 50%; an estimated sample size of 400 is recommended according to published tables by Israel [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) items questionnaire was adopted and adapted (Appendix 1). The questionnaire was modified to forty-five (45) (Appendix 2) in response to BREC. 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 3) was approved by all the six (6) independent translators. The translator-approved Akan version was certification.

Validity Analysis Outcome

The face validity scores have been computed in Table 1.

Sections	Language Appropriateness		Clarity		Cultural Acceptance	
	Average score(range)	Mean ±SD	Average score(range)	Mean ±SD	Average score(range)	Mean ±SD
1	4.17 - 4.83	4.44 ± 0.93	4.33 - 5.33	4.69 ± 0.78	4.67 - 5.33	5.17 ± 0.93
2	4.33 - 5.00	4.60 ± 0.93	4.50 - 5.17	4.81 ± 0.78	4.67 - 5.67	4.98 ± 0.90
3	4.33 - 5.17	4.72 ± 0.87	4.50 - 5.33	5.06 ± 0.68	4.33 - 5.67	5.15 ± 0.78

4	4.33 - 4.67	4.53 ± 0.85	4.67 - 5.00	4.80 ± 0.75	4.33 - 5.33	4.77 ± 0.84
5	4.50 - 5.33	4.67 ± 0.77	4.67 - 5.50	5.17 ± 0.78	4.17 - 5.33	4.88 ± 0.91
6 A	4.50 - 6.00	5.00 ± 0.93	5.16 - 6.00	5.47 ± 0.56	5.33 - 5.83	5.67 ± 0.54
6 B	4.67 - 5.50	5.17 ± 0.86	5.17 - 5.67	5.40 ± 0.55	5.33 - 5.50	5.33 ± 0.75
Score (all sections)	4.17 - 6.00	4.73 ± 0.90	4.33 - 6.00	5.04 ± 0.76	4.17- 5.83	5.11 ± 0.86

Table 1. Face Validity Results.

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.

The Content Validity Index (CVI) has been presented (Table 2).

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

Table 2. Content Validity Results.

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 ± 0.44). A CVI range of 0.90 - 0.99 (0.96 ± 0.32) was obtained for the complete questionnaire.

Reliability Analysis Outcome

The socio-demographics of the participants are presented in Table 3.

Variable	Test	Retest
Age (Mean ± 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

Table 3. Demographical Features of Study Subjects (n= 100).

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.

Cronbach’s alpha values obtained in determining the internal reliability of the Akan questionnaire are reported in Table 4.

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	0.707	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

Table 4. Cronbach’s Reliability Test.

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.

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. 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, 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 [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., 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.

In conclusion, the Akan version of the questionnaire was successfully developed and certified. The outcomes of the validity and reliability analysis of the questionnaire were acceptable. It is recommended that the questionnaire be used to study the knowledge, awareness, and perception of Ghanaian women about prostate cancer. Also, a more robust psychometric analysis, not limited to the Exploratory and Confirmatory Factor Analysis, must be performed. Given these recommendations, the Akan tool could adequately study prostate cancer awareness in Ghanaian women. Furthermore, the psychometric analysis would increase the acceptability of the developed tool.

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 validation process was limited to the face and content validation methods and did not include a robust psychometric analysis such as the Exploratory and Confirmatory Factor Analysis.

3. The reliability analysis was restricted to the evaluation of only internal reliability.

Availability of data and materials

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

Authors' Contributions

EW is credited with the study conception, methodological development, data collection, analysis and interpretation of data, study coordination, statistical analysis, drafting of the manuscript, and material support. KBM is credited with the study conception, methodological development, statistical analysis, critical review of the manuscript for important intellectual content, and supervision. ABBM is credited with the statistical analysis, and critical review of the manuscript for important intellectual content. VB is credited with the critical revision of the manuscript for important intellectual content, and supervision. FO is credited with the critical revision of the manuscript for important intellectual content, and supervision. All authors read and approved the manuscript for publication.

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.

Acknowledgments

The research team gives recognition to Prof. Charles Marfo for translation certification. Also, the team appreciates the market women of the Kejetia Market for consenting to the study.

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