Breast Self-Examination, Correlates and Predictors of its Attitude among Ghanaian Undergraduate Health Trainees – A Follow up Report.

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Abstract

Breast Cancer (BC) is fast becoming a public health concern in resource deprived settings. Breast self-examination (BSE) is an inexpensive BC preventive method. There is paucity in BSE knowledge, attitude and performance (KAP) and correlates research evidence in health trainee undergraduates in Ghana. The purpose of this study is to examine Breast Self-Examination, Correlates and Predictors of its Attitude among Ghanaian Undergraduate Health Trainees. The study used a mixed method approach among 336 purposively sampled health trainee students. The study revealed that, majority (80.6%) of the female SPs ever practiced BSE, but only 38.3% performed routine monthly checks as recommended and a male minority (36.7%) had ever practised BSE. The study also found a significant positive (r = 0.282, p = 0.000) and very weak insignificant positive correlation (p = 0.041, p = 0.041) between their attitude towards BSE and health LOC on one hand and with their SWL scores respectively. The study recommends a restructuring of curricular of health trainee courses to prioritize BSE as the best BC preventive measure in resource deprived settings. Also many more males must be allowed participation in BSE KAP advocacy, education and research as important stakeholders. Moreover, BSE education must focus on regular routine performance for both males and females. Finally, health professionals as determinants of breast health (LOC) must be factored into BSE education.

Keywords: *Breast Self- Examination, Correlates, Predictors, Attitude, Undergraduate Students.*

Introduction

As a leading cause of global cancer deaths and the most frequently diagnosed malignancy in females (Ferlay et al., 2019), breast cancer (BC) incidence, morbidity and mortality are on the increase and fast becoming a public health concern in low to middle income countries (LMICs; Mena et al., 2014; RamBihariLal Shrivastava et al., 2013). Research evidence also suggest a global rise in male breast cancer incidents (Al-Naggar & Al-Naggar, 2012; Giordano et al., 2004; RamBihariLal Shrivastava et al., 2013; Stang et al., 2008) and on the continent of African Al-Naggar, Al-Naggar, (2012). Of the 3 recommended screening methods prescribed by American Cancer Society (2016), BSE is the inexpensive preventive alternative for resource deprived settings where mortality levels tend to be higher (Khatib & Modjatabai, 2006; RamBihariLal Shrivastava et al., 2013). The efficacy of BSE is evidenced by the fact that 9 out of the 10 breast lumps are identified by the women themselves (Agbo et al., 2012; Simsek &Tug, 2002).

Several BSE KAP research have been conducted globally (e.g. Godazandeh et al., 2008; Kalliguddi, Sharma & Gore 2019; Majeda et al., 2008; Nafissi, Saghafinia & Motamedi (2012) and on the African continent (e.g., Birhane, et al., 2015; Jemebere, 2019; Misauno et al., 2011; Nde et al., 2015) to mention but a few. On sub-Saharan Africa, a recent comprehensive systematic review of literature suggests a dearth of published research on especially the attitude domain of women's BSE KAP, Udoh et al., (2020)] and negligible translation of BSE knowledge into actual

BSE performance in women. Most BSE KAP researchers conclude by recommending intensification of BSE education which requires in-depth knowledge of their attitude and its predictors through relevant change conceptual frameworks such as Health Belief model by Becker and Rosenstock, (1984). Perusal of the BSE knowledge attitude and performance (BSE KAP) research revealed not only is there a dearth, there are also some contextual challenges (Amoah et al., 2021a). These challenges include, but not limited to underrepresentation of health non-nursing professional trainees in terms of research participation. This is because this cohort equally has a duty to educate their clients on the lifesaving BSE when they graduate. Similarly, male gender is also underrepresented in BSE KAP research participation while they are fast becoming important BC BSE stake holders for compelling reasons.

Statement of the Problem

In Ghana, some BC BSE KAP research (e.g., Bonsu et al., 2019; Dadzie et al., 2019; Kudzawu et al., 2016; Korankye, Abada, & Imoro, F. 2016; Mena et al., 2014; Opoku, Benwell & Yarney, 2021; etc.) have been done. However, only a few that have assessed KAP among students (Fondjo et al., 2018; Nsemo et al., 2020; Sarfo et al., 2013) have been carried out. All 3 were carried out among exclusive female students and only Fondjo et al involved non-nursing health trainees. The latter, which was carried out in KNUST, focused exclusively on non- health trainee female students. From the foregoing, BSE KAP research among KNUST health trainees is lacking. More so, no study has assessed BSE performance among mixed and exclusive gender tertiary health trainees in KNUST, and in Ghana as far as the authors are concerned. Moreover, no study has correlated psychological mediators such as locus of control (LOC) and satisfaction with life (SWL) among health trainees in KNUST, Kumasi and Ghana. Finally, predictors of attitude towards BSE among this cohort has never been carried out among this cohort. The general objective of the study is to examine the BSE performance, correlates and predictors of its attitude. In order to achieve the above objective, the current study (which is part of a bigger research) is designed to achieve the following specific objectives: (1) to examine the levels of actual breast self-examination performance among overall mixed and exclusive gender health trainee undergraduate students, (2) to determine the level of correlation between SPs' BSE scores and those of health LOC and satisfaction with life, and (3) to analyze the demographic predictors of attitude towards BSE among the SPs.

Method

This study used primary data obtained from questionnaires from respondents. Thus, it used a mixed method comprising an online cross – sectional survey involving attitude psychometric measure and self-administered questionnaire to ascertain the actual BSE performance as well as correlates of attitudes towards BSE among 336 voluntary participants from purposively sampled health trainee undergraduate students from 3 different faculties in the College of Health Sciences (CoHS), Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana. The questionnaire was developed into a google form and the link forwarded to participants who

volunteered participation after going through the participants' information sheet. This included more information about the study and guarantees of confidentiality as well as consent form. Before then, all three measures used in this study were pretested and their Cronbach's alpha values reported with the description of each of the measures below.

Measures and tools used

This study used 5 sections of google form questionnaires as mentioned above. The first section of 8 questions solicited sociodemographic characteristics. The next 3 sections consisted of psychometric measures namely, attitude towards breast self-examination (BSE) with 24 questions; multidimensional health locus of control (MHLC) with 18 questions and satisfaction with life scale (SWLS) with 5 questions. The last section consisted of 5 questions on actual BSE performance. All 3 psychometric measures described below were obtained from free to use measures for clinical practice by Corcoran and Fishers' (2000).

Breast Self-Examination (BSE)

As mentioned above BSE was obtained from Corcoran and Fishers' (2000) pp. 131 – 133. This BSE psychometric measure was constructed by Race & Silverberg, (1996) and it consists of 24 items constructed to measure attitude towards BSE and discussed in detail in the original BSE article by current authors (Amoah et al., 2021a).

Satisfaction with Life Scale (SWLS)

SWLS was obtained from p 652 of Corcoran and Fisher (2000). It is a psychometric test constructed by Emmons, Larsen and Griffin (1985) and consists of 5 – items. It assesses a person's subjective cognition of quality of life. It has an internal consistency of 0.87 alpha, a 2 month test retest reliability of 0.82 which has been found to correlate well with 9 different measures of wellbeing according to Corcoran and Fishers' (2000). For each question there is a 7 Likert scale ranging from strongly disagree to strongly agree. To score SWLS, items are summed to produce a score range of 5 - 35 with higher scores reflecting higher SWL. It has been used in several studies including Erdogan, Yildirim & Cigdem, (2018), Lucas-Carrasco et al., (2014) etc. Current pretesting yielded a cronbach's alpha of 0.837 (83.7%) and 0.848 (84.8%) in the authors' ground breaking preliminary internet addiction research, Amoah et al, (2020).

Multidimensional Health Locus of Control (MHLC)

MHLC was obtained from pp. 495 – 499 of Corcoran and Fisher (2000). It is an 18- item psychometric instrument with 3 separate dimensions developed by Wallston, Wallston & DeVellis (1978) which measures an individuals' health LOC. It thus measures attributions one assigns to determinants of their health outcomes. Individuals could be categorized into internal, external or powerful others (e.g., supernatural evil forces, health professionals, chance/ fate) control their

health outcomes. LOC has been extensively researched as a mediating factor between several health problems and outcomes. "Health professionals control my health" is a sample question for which participants have to choose between 6 – Likert scale from (1) strongly disagree to (6) strongly agree. Each of its 3 dimensions (internality health LOC, powerful others LOC and chance LOC) has 6 questions which are summed up for that subscale. MHLC boasts of a reliability coefficient of 0.77 for all subscales and a combined Cronbach alpha of from 0.83 to 0.86. Pretesting for the current study yielded 0.711 (71.1%) indicating a high consistency for the construct under MHLC.

Procedure

After going through the objectives of the research and participant's information which included confidentiality and consent, the lead author solicited voluntary participation from students purposely sampled from general nursing 2, midwifery 2, emergency nursing 3, human biology (3 and 1) and physician assistantship 2 – all of which are health trainee courses in the College of Health Sciences (CoHS), Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. A google form link was distributed on their social media platforms for those who volunteered and consented to participate to logon and complete. Ethical clearance (ref number CHRPE/AP/066/21) was obtained from the committee on human research publication and ethics (CHRPE) in KNUST, Kumasi. The total number of voluntary participation obtained was 356 excluding the first 20 early participants whose responses were used to pretest the questions and instructions to determine if they were suitable and comprehensible. The data was analyzed using SPSS version 20 software.

Data Analysis

The analysis of results was categorized into 2 namely; descriptive; involving frequencies and percentages and inferential analyses. The descriptive analysis was performed on the demographic characteristics of the participants and on the BSE attitude measure. A correlational analysis was employed to assess the relationship among the psychological measures used in the study. Last but not the least, binary logistic regression was used to estimate the demographic predictors of study participant's attitude towards BSE.

Results and Discussion

This research received 336 responses from the undergraduate health professional trainee students in the College of Health Sciences (CoHS), KNUST. Nearly 60% of the respondents were females and a little above 40%, males. Thus, females outnumbered their male counterparts by nearly 3:2. Their age ranged between 17 and 38 years ($M = 21$ years, $SD = 2.9$). Their demographic

characteristics are as summarized in table 1 in the original article (Amoah et al., 2021a) and repeated here for easy reference.

Table 1: Demographic Characteristics of Study Participants (SPs)

Variables	Responses	Frequency	Percentage
Age			
	16-18	38	11.50
	19-20	156	47.10
	21-23	114	34.40
	24-26	06	01.80
	>26	17	05.20
Gender	Male	135	40.20
	Female	201	59.80
Prog. of Study	Human Biology	213	63.40
	Physician Assistant	19	05.70
	Nursing & Midwifery	101	30.06
	Missing	03	0.90
Level of Study	1st Year	63	18.70
	2nd Year	108	32.30
	3rd Year	163	48.70
	4th Year	01	0.30
Religion	Christianity	314	93.50
	Islamic	22	6.50
Occupation	Student	327	97.60
	Health Professional	08	2.40

Adopted from (Amoah et al., 2021a), the 1st research report for the study.
Source: Researcher's Construct.

Objective 1: Actual BSE Performance; Exclusive Gender Actual Breast Self-Examination

The study results revealed that 80.6% of the female participants had ever practiced breast self-examination whereas 19.4% had not. Also 36.3% of male participants had ever practiced breast self-examination while 63.7% said no. Table 2 below provides a summary of actual BSE practice of both genders.

Table 2: A Cross-tabulation between Gender and Actual Breast Self-Examination

| | | | Actual Breast Self-Examination | | |
			Yes	No	Total
Gender	Males	Count	49	86	135
		% within Gender	36.3%	63.7%	100.0%
	females	Count	162	39	201
		% within Gender	80.6%	19.4%	100.0%
Total		Count	211	125	336
		% within Gender	62.8%	37.2%	100.0%

Source: Researcher's construct.

A follow – up question was ``If you have ever done so (i.e., ever performed BSE), how recent and the female participants' responses summarized in Table 3 below and those of males in the appendix 1b.

Table 3: A table of Female Study Participant's Recent BSE Performance.		
	Frequency	Percent
this week	15	9.3
last week	15	9.3
last month	42	25.9
over 6 months ago	39	24.1
last year	26	16.0
more than a year ago	24	14.8
i have no answer,	1	0.6
Total	162	100.0

Please see appendix 1b for the responses for the male participants.
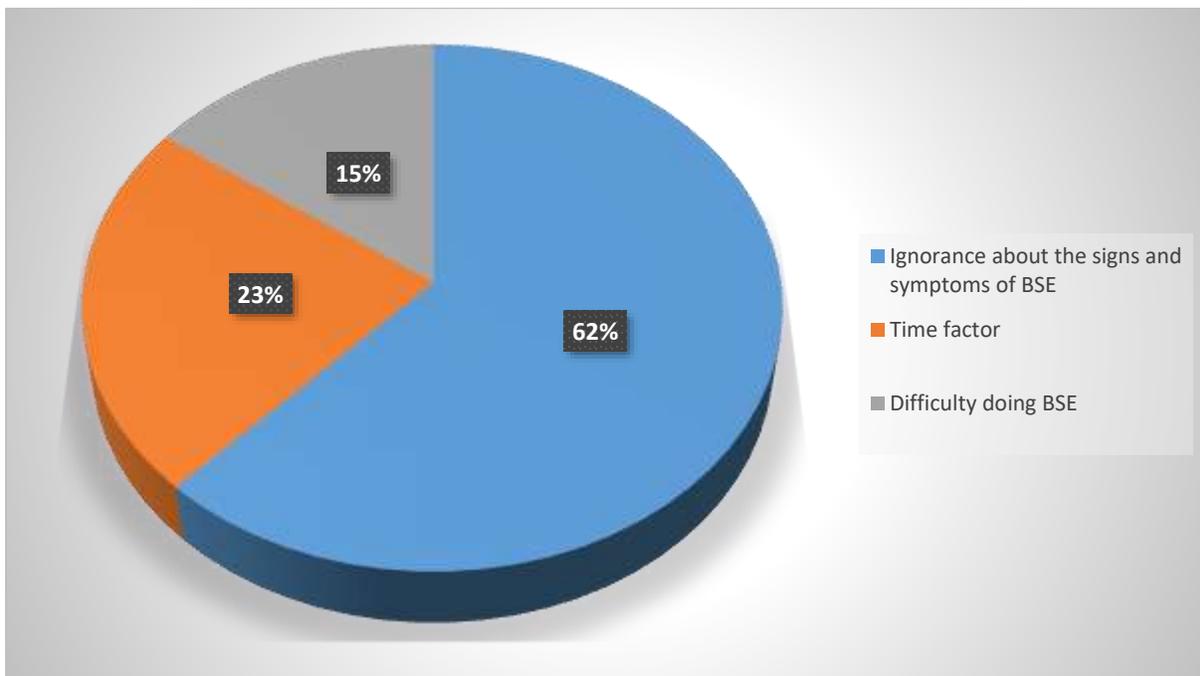Source: Researcher's construct.

A follow up question was "if you answered yes in question 1 above (i.e., if you ever breast self-examined), how often do you do it?" and the female SPs' responses tabulated in the table 4 below and those of the male participant's in appendix 1b for interested readership.

Table 4: A Table of Female Study Participant's Routine Monthly BSE performance.

	Frequency	Percent
Everyday	2	1.2
every week	22	13.6
every month	62	38.3
every year	71	43.8
every hospital check up	4	2.5
i answered no,	1	0.6
Total	162	100.0

Source: Researcher's construct

Also, reasons why some female SPs did not practice BSE were elicited and their responses were varied. However, 3 most important reasons were recurrent and shown in figure 2 below. Thus, the majority (62%) of the female participants attested they do not perform BSE because they were ignorant about the signs and symptoms of BC, and would find it difficult detecting any changes in their breast. Second most common reason for non-BSE performance by the female SPs was time factor. Thus, they did not have time to practice BSE with a corresponding percentage of 23% whereas 15% found it too difficult to carry out successfully.

Source: Researcher's Construct.
Figure 1: A Pie chart showing female SPs Reasons for BSE non-performance.

Objective 2: *Correlation Analysis*

The study also sought to determine if BSE attitude and actual breast self-examination behaviour were mediated by psychological factors such as multidimensional health locus of control (MHLC) and satisfaction with life (SWL). The results are as summarized in table 5 below.

Table 5: A table of Correlation Analysis between SPs' scores of attitudes towards BSE, Multidimensional Health Locus of Control (MHLC) and Satisfaction with Life (SWL).

		AVE_BSE	AVE_MHLC	AVE_SWL
AVE_BSE	Pearson Correlation	1	.282**	.041
	Sig. (2-tailed)		.000	.457
	N	336	336	336
AVE_MHLC	Pearson Correlation	.282**	1	.134*
	Sig. (2-tailed)	.000		.014
	N	336	336	336
AVE_SWL	Pearson Correlation	.041	.134*	1
	Sig. (2-tailed)	.457	.014	
	N	336	336	336

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Researcher's construct

Objective 3: *Demographic predictors of the overall mixed gender BSE scores*

As mentioned above, a binary logistic regression was used to estimate the predictors of breast self-examination using the demographic characteristics. The dependent variable used in the study had a dichotomous response and the independent variables were the demographic characteristics. The Nagelkerke R square for the data was 0.329 (32.9%) which is how much variation in the dependent variable can be explained by the model. The independent variables were able to explain the dependent variable by 32.9% whereas 67.1% was unexplained or unaccounted for by the model. About 76.4% of the data was correctly classified. This reflects the percentage of cases that were correctly classified. The variation in the equation shows the contribution of each independent variable to the model and its statistical significance and it was seen that gender and religion were the demographic characteristics which were significant since their respective p-values of 0.001 and 0.009 were less than 0.05 – our significance level. Thus, all the other demographic characteristics were not significant to the dependent variable (BSE), as their p-values were all greater than the significance level of 0.05. Also, female SPs were 8.04 times more likely to exhibit

breast self-examination compared with their male colleagues. The model for the study was derived as follows;

Logit p = 10.943 + 2.084 **gender** - 0.072 **age** - 2.816 **university** - 0.015 **program of study** - 2.786 **religion** - 5.135 **occupation**……………………… (1). As mentioned above, only 2 two variables (gender and religion) were significant to the dependent variable. Our predictive model therefore is given by;

Logit p = 10.943 + 2.084 **gender** – 2.786 **religion**…………………….(2), and details shown in appendix 2.

Discussion

These main objectives of this follow – up manuscript were (1) to examine the levels of actual breast self-examination performance among overall mixed and exclusive gender health trainee undergraduate students, (2) to determine the level of correlation between SPs' BSE scores and those of health LOC and SWL, and (3) to analyze the demographic predictors of attitude towards BSE among the SPs. In this study males were out-numbered by the female participants by nearly 3:2 ratios and the overall mean age was 21 years (SD ± 2.9) which is well within the recommended age range for BSE practice (Amoah et al., 2021a).

***Objective* 1** – *Actual Breast Self-Examination; Female Study Participants (SPs).*

Even though the main focus of the original research was to assess attitude using psychometric measures, some relevant questions were added to assess the level of the participants' actual BSE performance. They were instructed to answer "NA" for "not applicable" if a question did not apply to them. One significant finding in this study is that 80.6% majority of the female participants had ever practiced breast self-examination whereas 19.4% had never done so (table 2). This finding is similar but higher than 76%, found among nursing students in Presbyterian University College (Sarfo et al., 2013), 76.3% among KNUST undergraduates and senior secondary school (SSS) students (Fondjo et al., 2018), 74.4% Nigerian female medical students (Misauno et al., 2011) and 41% among Cameroonian undergraduate students (Nde et al., 2015). The difference may be explained by the additional participation from other health professional trainees such as medical and physician assistantship students in the current study whose curricula may have introduced them to BSE.

Another significant finding is that, even though as high as 80.6% majority of the current female SPs had ever practiced BSE, only 38.3% practised it monthly as recommended (table 4). This finding confirms similar trends but higher than 17% and 12% among Iranian women (Godazandeh et al., 2008; Nafissi, Saghafinia & Motamedi 2012) and 14% among Kuwaiti women (Majeda , Kamel , Samia & Gamal, 2008) as well as 39.5% among Indian female IT professional (Kalliguddi, S. Sharma, S & Gore, 2019). The differences observed may perhaps be attributable to the sexually repressive middle-eastern and some Asian values, norms and beliefs about self-breast manipulations. In Ghana, and especially in the same study setting (KNUST), a similar trend but even lower percentages had been observed by Fondjo et al., (2018). In their recent comprehensive

comparative study among a combined female undergraduate and SSS students, only 8.1% engaged in regular monthly BSE. The differences may be explained by the differences in the SPs of both of our studies. While they compared the actual BSE practice of representative samples of non-health undergraduate and SSS female students, we assessed actual BSE of not only general nursing, midwifery and emergency students, but also human biology and physician assistantship students, all of whom may have been introduced to the BSE through curricula.

Female SPs Reasons for Non BSE Performance

A follow up question was "if you answered "no" to question 1 above, briefly explain why. The 3 most common reasons advanced by the female SPs who had never engaged in BSE were ignorance of signs and symptoms of BC, inability to detect any changes in their breast when performing BSE and lack of time as well as difficulty performing BSE (Figure 2). These reasons of lack of time and difficulty performing BSE because of inadequate knowledge on procedure have previously been observed and documented as a barrier for BSE performance in respectively 30% of nursing undergraduates by Sarfo et al., (2013) and 36.8% combined KNUST female undergraduates and SSS students, Fondjo et al., (2018) in Ghana. The reason of ignorance of signs and symptoms and inability to detect any changes in breast also agrees with findings of low knowledge of BC symptoms in Ghanaian women population (Kudzawu et al., 2016; Opoku, Benwell & Yarney 2012) and in the sub-Saharan Africa, Githaiga et al., (2017). Moreover, the finding of lack of BSE knowledge has also been cited as the major justification for non-BSE performance in female undergraduate students in the University of Buea in Cameroon (Nde et al., 2015).

Male Study Participants (SPs)

Another significant finding and a surprising one at that, is that a whopping 36.3% of the male SPs who responded affirmatively when asked if they ever practiced BSE (Table 2). As mentioned earlier the expectation was a "no" from all the male SPs in this study however, as mentioned above, males are not only becoming victims of BC and having significant others to possibly remind to engage in the life saving BSE; they are now becoming important stakeholders in BC BSE research and education. Also, there appears to be little or no research, education, advocacy and awareness creation for males globally. More so, there is little or no research on method (s) for male BSE and all these need to be considered in future research. Moreover, the most common reasons on the part of the majority of the males who had never done BSE were the fact that it was neither important nor needed because of their perception of lower threat due to low BC incidence in males as observed in (Amoah et al., 2021a; Al-Naggar & Al-Naggar, 2012). This is also in line with the health belief model modified by Becker and Rosenstock, (1984) in which perception of susceptibility and perceived severity are seen as 2 of the 6 key important determinants of preventive health behaviour such as BSE. Future studies should focus on the how, when and the frequency with which males could perform BSE. In the absence of comparative BSE performance

literature to discuss the overall mixed and male gender responses, their responses have been tabulated and added to the Appendix 1 for interested readerships' perusal.

Objective 2 - Correlation of BSE scores with MHLC and SWL

With the growing evidence of higher knowledge of BC BSE with minimal translation into actual BSE performance, the authors thought it wise to investigate the possible influences of some psychological variables that could be mediating such relationships. This preliminary investigation sought to correlate SPs' attitude towards BSE with 2 such important psychological mediators, namely multidimensional health locus of control (MHLC) and satisfaction with life (SWL) which have not been done in the BSE attitude research area in Ghana.

Hence another finding from table 5 is that the analysis revealed a significant positive correlation with MHLC (r= 0.282, p = 0.000). Thus, as the BSE increases, the SPs' attribution of outcomes of BSE increases towards externality (external LOC) per the scoring instruction for the MHLC on page 495 of Corcoran and Fishers' (2000). What it means is that, instead of increasing positive attitude translating into belief that one's own action of breast self-examination can prevent BC (i.e., Internality), it rather increases their propensity to believe that their breast health depends on external powerful forces or factors such as health professionals (e.g., doctors, nurses etc.), powerful supernatural forces, fate or chance. This is in line with research findings that women who received tailored BSE directives from a health care professional demonstrated superior awareness and showed higher self-confidence and higher tendency to routinely practice BSE as compared to those who became conversant with BSE from other sources, (Misauno et al., 2011; Amoah et al., 2021a). This is an interesting finding that needs urgent further investigations as researchers struggle to explain the minimal translation of higher BSE knowledge and attitude into actual BSE performance.

Again, it was our expectation from table 5 that satisfaction with life would engender higher BSE performance. However, it turned out that the two variables are not so much interrelated as evidenced by a very weak insignificant positive correlation (r = 0.041; p = 0.457). Thus, although BC may adversely impact BC victims' quality of life, the current evidence suggests a healthy individual's subjective mental judgmental aspect of general life satisfaction does not have much influence on attitude towards BSE and actual BSE performance and needs further investigation.

4.3.0 Objective 3 – Demographic Predictors of Attitude Scores of SPs

Another noteworthy finding is that two factors; gender and religion, emerged as the only demographic predictors of attitude toward actual performance of BSE among the current mixed gender SPs. It also emerged that female participants were 8.04 times more likely to practice breast self-examination compared to males (appendix 2). This is at odds with findings by Birhane et al., (2015) who found knowledge of BSE, perceived susceptibility, perceived severity and the perceived benefit to be the most important predictors of BSE among female teachers in Ethiopia. It is also at odds with findings from Jemebere, (2019) who elicited educational status and family history as considerably related with BSE practice in nurses in Southern Ethiopia. The differences in the above findings may be attributable to inadvertent exclusions of some demographic

characteristics that bother on perceived susceptibility (e.g., family history), perceived severity (e.g., relations with victims of BC) and perceived benefit which are recommended in future research in this cohort. The observed differences may also be attributable to the mixed gender participation in the current study. Moreover, it may be attributable to BSE KAP psychometric (measurement) disharmony contextual challenge, whereby different researchers use different measurements which assess different domains altogether. The evidence is that while Birhane et al., (2015) assess correlates from the 6 variables of the health belief model (HBM), Jemebere (2019) like the current study, used demographic characteristics of the SPs' to assess predictors of attitude towards BSE. Future research must invest efforts into constructing psychometric measures that combine all relevant variables to minimize the observed psychometric disharmony.

Limitations

This definitely is a unique study with important contribution to extant literature on BC BSE KAP, however, it must be interpreted with caution. The results adduced were obtained from 336 purposely sampled KNUST CoHS undergraduate health trainees and may not be widely generalizable to all undergraduate health trainees in terms of numbers and representativeness. It has nonetheless provided an important preliminary research basis for a bigger psychometrically based assessment of the scarce research on attitude towards BSE in Sub-Saharan Africa and in Ghana.

Conclusion

The thrust of this study was to ascertain the actual BSE practice of both male and female undergraduate trainees and demographic predictors of their attitude towards BSE. It also sought to find out the relationship between SPs attitude towards BSE and multidimensional health locus of control on one part and attitude towards BSE satisfaction with life on the other. Using a mixed method, the study found that the majority (84.6%) of the female SPs had ever breast self-examined but only 38.3% do it on a routine monthly basis. Again, approximately 37% of the males SPs had ever performed BSE but had previously not been adequately captured in BSE research. However, time constraint and limited resources did not permit further probe into the method, frequency and time to perform male BSE and must be considered in future studies. The study also sought to investigate whether other psychological variables mediate high BSE knowledge, attitude and actual performance. Regarding that relationship, the study found a significant positive and very weak insignificant positive correlation with MHLC and SWL respectively. Finally, only gender and religion emerged as the demographic predictors of SPs attitude towards BSE. The findings of this study will without doubt, provide an important guide for future research, policy formulation towards BC advocacy and education and BSE KAP research.

Recommendations

In light of the above, we recommend;

i.   A radical redesign of the curricula of all health trainee courses to include BSE. This will enable health trainee students to educate their future clients on the need for routine monthly BSE.
ii. The inclusion of more males in the BSE advocacy, education and research participation
iii. Future BSE KAP research must focus on the method and frequency of male BSE
iv. Inclusion of BC BSE knowledge on all health trainee curricular
v.   Health professionals as determinants of breast health (LOC) must be factored into BSE education., and
vi. A replication of this study using randomly sampled participants from tertiary institutions in Ghana.

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APPENDIX 1 Overall and male gender actual BSE responses

Appendix 1a, b and c

a. Have you ever self-examined your breast?

		Frequency	Percent
	yes	211	62.8
Valid	no	125	37.2
	Total	336	100.0

b. If you have ever done so, how recent?

		Frequency	Percent
	this week	21	6.3
	last week	19	5.7
	last month	46	13.7
	over 6 months ago	57	17.0
	last year	32	9.5
	more than a year ago	34	10.1
	i have no answer,	112	33.3
	Total	321	95.5
Missing	System	15	4.5
Total		336	100.0

c. If you answered Yes in question 1 above, how often do you do it?

	Frequency	Percent
everyday	4	1.2
every week	30	8.9
every month	74	22.0
every year	96	28.6
every hospital check up	7	2.1
i answered no,	125	37.2
Total	336	100.0

APPENDIX 2

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	345.583[a]	.242	.329

Classification Table[a]

			Predicted		
					Percentage
Observed			yes	no	Correct
Step 1	ABSE_1	yes	168	38	81.6
		no	40	84	67.7
	Overall Percentage				76.4

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp (B)
Step 1[a]	Gender(1)	2.084	.279	55.760	1	.000	8.035
	Ages	-.072	.064	1.277	1	.258	.931
	university	-2.816	6698.826	.000	1	1.000	.060
	Prog_study	-.015	.104	.019	1	.889	.986
	Religion	-2.786	1.060	6.912	1	.009	.062
	occupation	-5.135	3500.189	.000	1	.999	.006
	Constant	10.943	7558.148	.000	1	.999	56538.195

a. Variable(s) entered on step 1: Gender, ages, university, Program of study, religion, and occupation.