

Original Article

Women's Knowledge on Ovarian Cancer Symptoms and Risk Factors in Nigeria: An Institutional-based Study

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Ovarian cancer is the 2nd most common and the deadliest gynecological malignancy in Nigeria; yet very little is known about women's knowledge about the disease in our environment. We evaluated the levels of awareness of ovarian cancer risk factors and symptoms among the Nigerian women, and also determined the factors that predict it. A cross-sectional descriptive study was conducted among 400 women attending out-patient clinics at Lagos University Teaching Hospital, Lagos, Nigeria. Using a structured questionnaire, we assessed their knowledge of ovarian cancer risk factors and symptoms and the factors that influence it. Data were analyzed using SPSS version 20.0. Sixty-three percent of the participants were found to be aware of the disease, whereas only 19.5% and 14.0% demonstrated good knowledge of its symptoms and risk factors, respectively. High level of education and previous conversation with a doctor on ovarian cancer were the only factors that significantly predicted good knowledge of symptoms and risk factors ($p < 0.05$). The knowledge of ovarian cancer is extremely poor among women in Lagos, Nigeria. Education of the girl child and health education of women about the disease by healthcare providers is important. This will significantly enhance women's knowledge and encourage early presentation and detection of the disease.

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1. INTRODUCTION

Ovarian cancer is one of the most challenging gynecological cancers in the world, with profound negative effect on the quality and length of life and with more than 70% of the women diagnosed with advanced disease [1,2]. The absence of specific symptoms and effective screening tests make it difficult to establish early diagnosis of ovarian cancer. In addition, most women have a little or no knowledge about the risks, possible symptoms, and the dangers ovarian cancer poses to them [2]. All these factors combined together are likely responsible for most of the late presentations seen in women with ovarian cancer and its related mortality.

Worldwide, ovarian cancer is the 7th commonest cancer in women; accounting for only 3.6% of various cancers diagnosed in women. It is the 3rd commonest genital tract malignancy after cancers of the cervix and uterus with estimated 238,719 new cases seen in 2012 [3]. It is equally the leading cause of genital cancer mortality in developed countries with estimated age standardized mortality rate of 5.0 per 100,000 women [3] and a lifetime risk of 1.37% in the United States [4]. In Nigeria, ovarian cancer is the 6th commonest cancer in women and the 2nd commonest genital tract cancer. It accounted for 1723 incident cases in 2012 with estimated age standardized incidence rate of 3.1 per 100,000 women. It is also the 2nd leading cause of female genital cancer related deaths in the

country with approximately 1300 deaths in 2012, a crude mortality rate of 3.2% and estimated age standardized mortality rate of 2.5 per 100,000 women [3].

In the past, ovarian cancer was believed to be a silent killer due to lack of symptoms in the early stage leading to late presentation of the disease with its related high mortality rates [5,6]. However, this assertion is no longer believed to be true. Recent studies have shown that a significant proportion of women with ovarian cancer present with symptoms in both early and late stages of the disease [7–13]. Unfortunately, because these symptoms are non-specific, they may be attributed to other causes either by the women themselves [14,15] or by the inexperienced physician [16]. These symptoms include abdominal bloating or swelling, pelvic or abdominal discomfort or pain; gastrointestinal symptoms such as loss of appetite, early satiety, nausea, constipation, urinary symptoms; and weight loss [2,7,8,10,14–17].

According to the ovarian cancer symptoms consensus statement, jointly issued by the Gynaecologic Cancer Foundation, Society of Gynaecologic Oncologists, American cancer Society and other 34 endorsing organizations in 2007, the key criteria in the diagnosis of ovarian cancer are the frequency and/or the numbers of these presenting symptoms. When these symptoms are present on almost a day-to-day basis for more than a few weeks, the suspicion of ovarian cancer is high, and such women are advised to see their doctor, preferably a gynecologist [10]. When these symptoms are detected promptly and investigated appropriately, they may aid

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early diagnosis and management, resulting in better prognosis and outcome for the patients [10,17]. This is because the survival rate of ovarian cancer depends significantly on the stage of the disease with the early stage disease having more than 90% 5 year survival rate compared with less than 30% in advance stage disease [18,19]. The risk of developing ovarian cancer is increased with advanced age; family history of ovarian, breast, uterine, and colon cancer; use of fertility drugs and nulliparity [1,20]. However, the awareness of these risk factors and symptoms of ovarian cancer is generally poor among women [2,6,14,17,20,25].

In the absence of effective screening strategy, knowledge about the disease, its probable symptoms, risk factors, and clinical implications of late presentation is essential among women to help reduce morbidity and mortality associated with delayed presentation of ovarian cancer. If women are knowledgeable about the risk factors and symptoms of ovarian cancer, it may encourage early presentation of suspicious symptoms, leading to early detection and management of the disease pending the availability of suitable effective screening methods [15]. Regrettably, there is paucity of data on the awareness of ovarian cancer symptoms and risk factors among women in Nigeria.

The study aims to assess the knowledge of ovarian cancer symptoms and risk factors among women attending outpatient clinics at Lagos University Teaching Hospital (LUTH), Lagos, Nigeria, and to determine the factors that predict good knowledge of the disease. The outcome of this study will assist in making recommendations on how to improve women's knowledge about the lethal disease to aid early intervention.

2. MATERIALS AND METHODS

2.1. Study Design and Setting

This was a descriptive, cross-sectional study conducted at LUTH, Lagos, Nigeria, between 1st September and 30th November, 2014 after obtaining institutional approval. LUTH is one of largest federal tertiary hospitals in Nigeria and it is located in the south-western part of Nigeria. It is the main referral hospital for all government and private hospitals in the state and its environs.

2.2. Study Population and Sample Size Determination

The study was conducted among women attending out-patient clinics at LUTH. Four out of the eight major outpatient clinics were randomly selected by ballot method for the study. The selected outpatient clinics were gynecological outpatient clinic, medical outpatient clinic, surgical outpatient clinic, and obstetric clinic. Adult females from 18 years and above who gave informed consent were recruited into the study. Women with personal history of ovarian cancer, women who were unable to fill the study questionnaire, and women who did not give consent were excluded from the study.

The minimum sample size was calculated using the formula $n = Z^2 p (1 - p) / d^2$ [21] with an absolute error margin of 5% ($d = 0.05$), type 1 error of 5% ($Z = 1.96$), and proportion of women with the knowledge of ovarian cancer symptoms (p) of 15% [20].

The calculated sample size was 196 and after adjusting for a non-response rate of 20%, the final calculated minimum sample size was 235.

2.3. Instrument of Survey and Data Collection

The instrument of survey was a structured questionnaire (see appendix), the content of which was adapted from the validated cancer awareness measure (CAM) [22], ovarian cancer awareness measure (ovarian CAM) [23], and questionnaire developed by the National Ovarian Cancer Coalition [20]. The survey form was designed to elicit information about respondent sociodemographic characteristics, awareness about ovarian cancer, and knowledge of symptoms and risk factors of ovarian cancer. History of previous discussion with a doctor about ovarian cancer and knowing someone with ovarian cancer was also elicited to determine its effect on respondent's knowledge. Sociodemographic characteristics elicited were age, occupation, highest educational status attained, ethnicity, marital status, and religion. Awareness of ovarian cancer was assessed by asking respondents whether they had ever heard of ovarian cancer. The symptoms of ovarian cancer assessed in the study are persistent pain in the abdomen i.e., around the tummy; persistent pain in the pelvis i.e., below the navel; increased abdominal size; persistent bloating or abdominal distension; feeling full persistently; and difficulty eating the usual amount of food. Others were passing more urine than usual; changes in bowel habits e.g., constipation; back pain; extreme fatigue or tiredness; vaginal bleeding after menopause; and unexplained weight loss. The risk factors included having a close relative with ovarian cancer, having personal or family history of breast cancer, increasing age above 50 years, use of oestrogen-containing drugs (hormone replacement therapy), and being overweight or obese. Others include, having infertility problem, not having children, using fertility drugs or having IVF treatment, using talcum powder in the genital area, and being a smoker.

By using a similar scoring system used in assessing cervical cancer knowledge [24], each correctly identified symptom and risk factor were allotted a score of one each and the total scores obtained for both symptoms and risk factors were calculated for each respondent. The total attainable score for ovarian cancer symptoms was 12, whereas the total obtainable score for risk factor was 10. Women with an average score of ≥ 6 were categorized as having good knowledge of ovarian cancer symptoms, whereas women with the score < 6 were categorized as having poor knowledge. Similarly, women with an average score of ≥ 5 were categorized as having good knowledge of ovarian cancer risk factors, whereas women with a score < 5 were said to have poor knowledge.

Four hundred and twenty structured questionnaires were self-administered to the study participants after an initial pilot study. Pilot study was carried out at the Ophthalmology clinic in LUTH. The study questionnaire was distributed by consecutive method to a convenient sample of 30 women who attended the clinic and who had given consent to participate in the pilot study. The questionnaire was tested for the appropriateness of its questions to the target population, clarity of its instructions, and its effectiveness in fulfilling its objective. The observations noted in the pilot study were used to revise the study questionnaire as appropriate. Questionnaires were administered to

105 consecutive respondents in each of the selected clinics, after obtaining written consent. All respondents were encouraged to fill the questionnaires completely and the research assistants looked through the questionnaires at the time of collection to ensure they were completely filled. All questionnaires were retrieved immediately.

2.4. Data Analyses

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20.0, IBM Corp., Armonk, NY, USA. Categorical variables were compared using Pearson Chi-square test or Fisher exact test as appropriate, whereas continuous variables were compared using Student's *t*-test. Multivariate analysis was performed using multiple regression. A *p*-value of <0.05 was considered to be significant.

3. RESULTS

3.1. Sociodemographic Characteristics

A total of 420 questionnaires were distributed, while only 400 completely filled and retrieved questionnaires were analyzed giving a response rate of 95%. Twenty questionnaires were either not retrieved at all or incompletely filled at the time of retrieval, hence not analyzed.

The sociodemographic characteristics of the participants are shown in Table 1. The median age of participants was 35 years (range 18–64 years); median parity was 1 (range 0–6); and, a majority of 224 (56%) had tertiary level of education.

3.2. Knowledge of Ovarian Cancer Symptoms and Risk Factors

Two hundred and fifty-two (63%) respondents indicated they had heard of ovarian cancer, but only 132 (33%) said that they knew what it is, whereas the majority (67%) said they had no knowledge of it. The commonest symptoms identified by the respondents were unexplained weight loss (43.8%), persistent abdominal pain (31.8%), increasing abdominal size (29.3%), persistent bloating or abdominal distension (26.5%), and vaginal bleeding after menopause (26%) (Table 2).

Only 78 (19.5%) respondents possessed good knowledge of the symptoms of ovarian cancer whereas the majority (80.5%) had poor or no knowledge of the disease. The knowledge of ovarian cancer risk factors was also inadequate among the respondents, with only 56 (14.0%) respondents possessing good knowledge. The commonly identified risk factors were family history of ovarian cancer (39.8%), increasing age above 50 years (30.5%), smoking (30.5%), and personal or family history of breast cancer (23.8%) (Table 2).

The sources of knowledge among respondents who were aware of ovarian cancer were television/radio (33.3%), Internet/social media (28.2%), doctors/nurses (16.7%), newspapers/magazines (16.3%) and friends, relatives and colleagues (16.3%).

Table 1 | Sociodemographics (N = 400)

Variables	Frequency	Percentage (%)
Age (as at last birthday) (years)		
<20	21	5.3
20–29	96	24.0
30–39	127	31.8
40–49	79	19.8
50–59	57	14.3
≥60	20	5.0
Total	400	100.0
Occupation		
Skilled	128	32.0
Semi-skilled	32	8.0
Unskilled	114	28.5
Unemployed	126	31.5
Total	400	100.0
Educational status		
Primary education	46	11.5
Secondary education	130	32.5
Tertiary education	224	56.0
Total	400	100.0
Ethnicity/Tribe		
Yoruba	208	52.0
Igbo	128	32.0
Hausa	14	3.5
Others ^a	50	12.5
Total	400	100.0
Marital status		
Single	110	27.5
Married	236	59.0
Separated	8	2.0
Divorced	8	2.0
Widowed	36	9.5
Total	400	100.0
Religion		
Christianity	293	73.3
Muslim	107	26.7
Total	400	100.0

^aInclude Ijaw, Urhobo, Tiv, Ogoni, Efik, Nupe, Ibibio, and Esan.

3.3. Factors Associated with the Knowledge of Symptoms and Risk Factors of Ovarian Cancer

Only 42 (10.5%) of the study participants had ever had a discussion with a doctor on issues regarding ovarian cancer, and this discussion was initiated by the doctor in barely 50% of cases. The proportion of respondents who knew persons suffering from ovarian cancer was 9.8% (39). Table 3 shows the association between the respondent's level of knowledge of ovarian cancer and factors such as previous discussion with a doctor on ovarian cancer and associating people who suffer from ovarian cancer. Women who had previously discussed about ovarian cancer with a doctor had significantly higher level of knowledge of ovarian cancer symptoms and risk factors compared with women who had never had a discussion with a doctor (*p* < 0.001). Similarly, a significantly higher level of knowledge of the symptoms and risk factors of ovarian cancer was observed among women who knew people with ovarian cancer compared with those who did not (*p* = 0.001).

Table 2 | Distribution of the symptoms of ovarian cancer identified by respondents ($N = 400$)

*Symptoms of ovarian cancer	Frequency	Percentage (%)
Persistent abdominal pain	127	31.8
Persistent pelvic pain	69	17.3
Increased abdominal size	117	29.3
Persistent bloating/abdominal distension	106	26.5
Filling full persistently	81	20.3
Difficulty eating usual amount of food	62	15.5
Passing more urine than usual	62	15.5
Changes in bowel habit	68	17.0
Back pain	73	18.3
Extreme fatigue/tiredness	99	24.8
Vaginal bleeding after menopause	104	26.0
Unexplained weight loss	175	43.8
*Risk factors of ovarian cancer	Frequency	Percentage (%)
Having a close relative with ovarian cancer	159	39.8
Personal or family history of breast cancer	95	23.8
Increasing age above 50 years	122	30.5
Use of hormone replacement therapy	80	20.0
Being overweight or obese	89	22.3
History of infertility	63	15.8
Not having children	61	15.3
Use of fertility drugs or IVF treatment	56	14.0
Use of talcum powder in the genital area	61	15.3
Being a smoker	122	30.5

*Multiple responses observed.

The sociodemographic characteristics of the respondents were also observed to significantly influence the knowledge of the symptoms and risk factors of ovarian cancer. Respondent's age, occupation, and educational status significantly influenced the level of knowledge of the symptoms of ovarian cancer ($p = 0.030, 0.001,$ and $<0.001,$ respectively). Increasing age, skilled occupation, and high educational status were associated with good knowledge of ovarian cancer symptoms (Table 4). Similarly, women with skilled occupation and high educational status were more knowledgeable about ovarian cancer risk factors compared with women with unskilled occupation and low educational status ($p = 0.006$ and $0.002,$ respectively) (Table 5). Parity, marital status, and religion did not significantly influence respondent's knowledge of ovarian cancer symptoms and risk factors ($p > 0.05$).

After adjusting for all significant variables, i.e., previous conversation with a doctor about ovarian cancer, knowing someone who suffers from ovarian cancer, age, occupation, and educational status; previous conversation with a doctor about ovarian cancer and educational status of the respondents were the only factors that predicted good knowledge of the symptoms (OR = 2.76, CI = 1.79–7.07, $p = 0.001$ and OR = 3.44, CI = 1.32–6.19, $p = 0.001,$ respectively) and risk factors of ovarian cancer (OR = 2.31, CI = 2.01–8.16, and $p = 0.001;$ and OR = 2.98, CI = 1.88–7.02, $p = 0.002,$ respectively) (Table 6).

4. DISCUSSION

Majority of the women in our study had very poor knowledge of the symptoms and risk factors of ovarian cancer, even though their level of awareness of the disease was high. This is similar to the findings in several studies [2,6,14,20,25], which have consistently shown poor knowledge of the disease among women. In America,

Table 3 | Association between the knowledge of ovarian cancer and prior discussion with a doctor about ovarian cancer and knowing someone with ovarian cancer

Variables	Knowledge of symptoms of ovarian cancer		Total $n = 252$ (%)	p -Value
	Good (%)	Poor (%)		
Had prior discussion on ovarian cancer with doctor				<0.001
Yes	30 (71.4)	12 (28.6)	42 (100.0)	
No	48 (22.9)	162 (77.1)	210 (100.0)	
Total	78	174	252 (100.0)	
Knows someone that has ovarian cancer				0.001
Yes	26 (66.7)	13 (33.3)	39 (100.0)	
No	52 (24.4)	161 (75.6)	213 (100.0)	
Total	78	174	252 (100.0)	
Variables	Knowledge about risk factors for ovarian cancer		Total $n = 252$ (%)	p -Value
	Good (%)	Poor (%)		
Had prior discussion on ovarian cancer with doctor				<0.001
Yes	23 (54.8)	9 (45.2)	42 (100.0)	
No	33 (15.7)	177 (84.3)	210 (100.0)	
Total	56	186	252 (100.0)	
Knows someone that has ovarian cancer				0.001
Yes	18 (46.2)	21 (53.8)	39 (100.0)	
No	38 (17.8)	175 (82.2)	213 (100.0)	
Total	56	196	252 (100.0)	

Table 4 | Association between the knowledge of symptoms of ovarian cancer and sociodemographic characteristics

Variables	Knowledge of symptoms of ovarian cancer		Total n = 252 (%)	p-Value
	Good (%)	Poor (%)		
Age (years)				0.030
<20	1 (8.3)	11 (91.7)	12 (100.0)	
20–29	10 (16.4)	51 (83.6)	61 (100.0)	
30–39	25 (30.9)	56 (69.1)	81 (100.0)	
40–49	20 (40.0)	30 (60.0)	50 (100.0)	
50–59	16 (45.7)	19 (54.3)	35 (100.0)	
≥60	6 (46.2)	7 (53.8)	13 (100.0)	
Total	78 (31.0)	174 (69.0)	252 (100.0)	
Occupation				0.001
Skilled	50 (52.1)	46 (47.9)	96 (100.0)	
Semi-skilled	3 (37.5)	5 (62.5)	8 (100.0)	
Unskilled	10 (16.7)	50 (83.3)	60 (100.0)	
Unemployed	15 (17.0)	73 (83.0)	88 (100.0)	
Total	78 (31.0)	174 (69.0)	252 (100.0)	
Educational status				<0.001
Primary education	0 (0.0)	5 (100.0)	5 (100.0)	
Secondary education	9 (11.4)	70 (88.6)	79 (100.0)	
Tertiary education	69 (41.1)	99 (58.9)	168 (100.0)	
Total	78 (31.0)	174 (69.0)	252 (100.0)	
Parity				0.790
0	20 (22.0)	71 (78)	91 (100.0)	
1	11 (33.3)	22 (66.7)	33 (100.0)	
2	8 (28.6)	20 (71.4)	28 (100.0)	
3	13 (43.3)	17 (56.7)	30 (100.0)	
4	10 (34.5)	19 (65.5)	29 (100.0)	
≥5	16 (39.0)	25 (61.0)	41 (100.0)	
Total	78 (31.0)	174 (69.0)	252 (100.0)	
Religion				0.263
Christianity	55 (29.9)	129 (70.1)	184 (100.0)	
Muslim	23 (33.8)	45 (66.2)	68 (100.0)	
Total	78 (31.0)	174 (69.0)	252 (100.0)	
Marital status				0.065
Single	20 (28.2)	51 (71.8)	71 (100.0)	
Married	48 (32.2)	101 (67.8)	149 (100.0)	
Separated	1 (20.0)	4 (80.0)	5 (100.0)	
Divorced	1 (20.0)	4 (80.0)	5 (100.0)	
Widow	8 (36.4)	14 (63.6)	22 (100.0)	
Total	78 (31.0)	174 (69.0)	252 (100.0)	

only 15% of the women reported they were either familiar or very familiar with the symptoms of ovarian cancer [20]. Similarly, low level of knowledge has also been observed among health workers [17,26] who are supposed to be better informed. This brings to bear the need to study the factors associated with this deficit in knowledge, bearing in mind the significance of early symptom detection in disease diagnosis and prognosis.

Our study revealed that among the several factors that were significantly associated with good knowledge of the ovarian cancer, only educational status of the women and history of previous discussion about ovarian cancer with a doctor were the only factors that significantly predicted good knowledge of both symptoms and risk factors of ovarian cancer. It is not surprising that women with tertiary level of education had significantly better knowledge as compared with their counterparts. This is similar to the findings in the United States and United Kingdom, where women with higher levels of education

Table 5 | Association between the knowledge of risk factors for ovarian cancer and sociodemographic characteristics

Variables	Knowledge of risk factors for ovarian cancer		Total n = 252 (%)	p-Value
	Good (%)	Poor (%)		
Age (years)				0.091
<20	1 (8.3)	11 (91.7)	12 (100.0)	
20–29	6 (9.8)	55 (90.2)	61 (100.0)	
30–39	23 (28.4)	58 (71.6)	81 (100.0)	
40–49	14 (28.0)	36 (72.0)	50 (100.0)	
50–59	10 (28.6)	25 (71.4)	35 (100.0)	
≥60	2 (15.4)	11 (84.6)	13 (100.0)	
Total	56 (22.2)	196 (77.8)	252 (100.0)	
Occupation				0.006
Skilled	36 (37.5)	60 (62.5)	96 (100.0)	
Semi-skilled	2 (25.0)	6 (75.0)	8 (100.0)	
Unskilled	7 (11.7)	53 (88.3)	60 (100.0)	
Unemployed	11 (12.5)	77 (87.5)	88 (100.0)	
Total	56 (22.2)	196 (77.8)	252 (100.0)	
Educational status				0.002
Primary education	0 (0.0)	5 (100.0)	5 (100.0)	
Secondary education	21 (26.6)	58 (73.4)	79 (100.0)	
Tertiary education	35 (20.8)	133 (79.2)	168 (100.0)	
Total	56 (22.2)	196 (77.8)	252 (100.0)	
Parity				0.402
0	14 (15.4)	77 (84.6)	91 (100.0)	
1	8 (24.2)	25 (75.8)	33 (100.0)	
2	6 (21.4)	22 (78.6)	28 (100.0)	
3	9 (30.0)	21 (70.0)	30 (100.0)	
4	7 (24.1)	22 (75.9)	29 (100.0)	
≥5	12 (29.3)	29 (70.7)	41 (100.0)	
Total	56 (22.2)	196 (77.8)	252 (100.0)	
Religion				0.617
Christianity	38 (20.7)	146 (79.3)	184 (100.0)	
Muslim	18 (26.5)	50 (73.5)	68 (100.0)	
Total	56 (22.2)	196 (77.8)	252 (100.0)	
Marital status				0.061
Single	14 (19.7)	57 (80.3)	71 (100.0)	
Married	35 (23.5)	114 (76.5)	149 (100.0)	
Separated	1 (20.0)	4 (80.0)	5 (100.0)	
Divorced	0 (0.0)	5 (100.0)	5 (100.0)	
Widow	6 (27.3)	16 (72.7)	22 (100.0)	
Total	56 (22.2)	196 (77.8)	252 (100.0)	

Table 6 | Multiple logistic regression showing the relationship between adjusted variables and knowledge of ovarian cancer

Adjusted variables	Odd ratio	95% CI	p-Value
Knowledge of symptoms of ovarian cancer			
Conversation with a doctor	2.76	1.79–7.07	0
Knowing someone with ovarian cancer	1.32	0.85–9.36	0.05
Educational status	3.44	1.32–6.19	0
Occupation	2.15	0.54–8.56	0.1
Age of respondents	1.66	0.46–9.75	0.25
Knowledge of risk factors of ovarian cancer			
Conversation with a doctor	2.31	2.01–8.16	0
Knowing someone with ovarian cancer	1.89	0.18–9.21	0.06
Educational status	2.98	1.88–7.02	0
Occupation	1.98	0.33–10.15	0.22

CI, Confidential intervals.

were more knowledgeable of the symptoms and risk factors of ovarian cancer [14,20]. Education is a known determinant of quality of life and health [27]; and educated women are probably more empowered to have a better understanding of health-related issues.

The influence of previous conversation about ovarian cancer with a doctor as a predictor of good knowledge of ovarian cancer underscores the role the physician plays in health education and promotion. Unfortunately, only one-tenth of the women in our study had had previous discussions about ovarian cancer with their doctors, and this process was initiated by the women themselves in half of the cases. This probably shows that most physicians do not regularly talk to their female clients about the risk of ovarian cancer, its possible symptoms, and the need to seek help early. This may be due to either lack of adequate knowledge about the disease burden among healthcare givers themselves or limited time for consultation due to the busy nature of the clinics with large patient load. In addition, most women do not go for a regular medical check-up [6]; hence, they have limited contact with their physician. So, the few opportunities they have to meet with their physician (especially with the general practitioners, obstetricians and gynaecologists) should be well utilized to adequately counsel them on important health issues such as ovarian cancer.

The pattern and frequency of symptoms of ovarian cancer recognized by women vary from study to study. In this study, unexplained weight loss, persistent abdominal pain and increasing abdominal size were the three most common symptoms recognized by women. Only one (abdominal pain) of these three recognized symptoms is consistent with the symptoms frequently associated with ovarian cancer, which is bloating, pelvic or abdominal pain, difficulty eating or feeling full quickly, and urinary symptoms of urgency and frequency [10]. Symptoms associated with changes in bowel habit and urinary frequency and urgency were the least recognized symptoms of ovarian cancer in our study and in other studies [2,14,17,20,26] contrary to what should be expected. These findings support the poor knowledge of ovarian cancer symptoms observed in the study.

The study also revealed that women were more knowledgeable about the symptoms of ovarian cancer than its risk factors, and this is consistent with the findings of another study [26]. This is probably due to the fact that awareness of risk factors requires more in-depth knowledge of the disease condition than symptoms, which is usually the first information to be known about most disease conditions. The most identified risk factors of ovarian cancer in our study were similar to those observed in other studies [2,6,20,25].

The knowledge of ovarian cancer symptoms and risk factors were significantly higher among women who knew people with ovarian cancer compared with those who were not aware. These findings were compatible with findings in other studies [17,20]. Lockwood-Rayermann et al. [20] observed that these women generally endorsed all symptoms and risk factors of ovarian cancer at a higher frequency irrespective of whether they were true or false. This probably could have accounted for the reason why it did not predict good knowledge of ovarian cancer on multivariate analysis. Likewise, the study observed that women with skilled occupation had good knowledge of ovarian cancer symptoms and risk factors compared with those without. However, this did not predict good knowledge of the disease

probably due to the influence of education as a determinant of skilled occupation.

The strength of this study lies in the fact that it is the first study in Nigeria to evaluate the knowledge of women on the symptoms and risk factors of ovarian cancer with the hope of determining the factors that enhance symptom-based detection of ovarian cancer. However, a recognized limitation of the study is that the study did not assess the contribution of other healthcare providers such as nurses to the knowledge of ovarian cancer symptoms and risk factors among women even though the nurses are usually the first point of contact for most women when they visit the health facility. Studies have recommended nurses have an important role to play in this regard [20,26,28,29]. However, the need for health education of women by all healthcare providers cannot be overemphasized.

Education plays a pivotal role in the maintenance of health and disease prevention, as many risk factors for noncommunicable diseases have been shown to be modifiable by educational intervention. This leads to learning and social changes that bring about positive health outcomes in individuals and community. All healthcare professionals are potential educators by the virtue of their professional relationship and interaction with their clients [27,30]. Studies have recommended the need to raise the awareness of ovarian cancer and educate women about its symptoms and risk factors to encourage early presentation and detection of the disease [6,14,25,26,31]. Several interventional studies have shown that knowledge of ovarian cancer significantly improved following the delivery of educational interventions [28,32,33].

The findings from this study have not only shown that most physicians rarely talk to their patients about ovarian cancer; but has also been proved that education of women on ovarian cancer significantly improve their knowledge of the disease. Based on these findings, healthcare providers and all healthcare professionals, especially general practitioners, gynaecologists and gynaecological nurses should be encouraged to regularly educate their female clients on ovarian cancer. In addition, public awareness and health campaign about symptoms and risk factors of ovarian cancer should be encouraged as currently being done by the Centre for Diseases Control and Prevention with the “Inside Knowledge Campaign.”

Evaluation of healthcare provider’s knowledge, especially that of the general practitioners and the nurses on ovarian cancer should also be considered. This is important to ensure that the right information is passed across to the women during health education. It will also help identify the areas of gap in knowledge among healthcare professionals that needs to be addressed.

5. CONCLUSION

The knowledge of the symptoms and risk factors of ovarian cancer is very poor among Nigerian women. Health education remains an effective strategy in the promotion of good knowledge of ovarian cancer and its early detection. Doctors and other health workers have a crucial role to play in educating women they come in contact with about ovarian cancer. This helps in enhancing the knowledge about the disease, which may encourage early presentation of

women with suspicious symptoms to the health facility. This will eventually enhance early detection and management of a disease that cannot be easily detected through regular screening tests or clinical examination. Furthermore, education of the girl child cannot be overemphasized as a pivotal tool for health awareness, education, and promotion.

CONFLICTS OF INTEREST

We have no conflicts of interest to declare.

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APPENDIX

Study Questionnaire

Sociodemographics

Instruction: Please read the following statements and choose/write the correct answers.

1. What is your age? (As on last birthday).
2. What is work do you do? (Please be specific).
3. What is your highest level of education?
 - a. I did not go to school
 - b. Primary education
 - c. Secondary education
 - d. Tertiary education
4. What tribe are you from?
 - a. Yoruba
 - b. Igbo
 - c. Hausa
 - d. Others (please specify).
5. Which religion do you practice?
 - a. Christianity
 - b. Islam
 - c. Others (please specify).
6. What is your marital status?
 - a. Single
 - b. Married
 - c. Separated
 - d. Divorced
 - e. Widowed
 - f. Others (please specify).
7. How many pregnancies have you had? (Please specify).
8. How many children do you have? (Please specify).

Awareness of Ovarian Cancer

Instruction: Please read the following statements and choose the correct answers.

9. Have you heard of ovarian cancer before?
 - a. Yes
 - b. No
10. Do you know what ovarian cancer is?
 - a. Yes
 - b. No
11. Have you ever had any discussion on ovarian cancer with a doctor?
 - a. Yes
 - b. No

12. If yes, who initiated the discussion?
 - a. The doctor
 - b. Myself
13. Do you know anyone who has ovarian cancer?
 - a. Yes
 - b. No

14. How did you know about ovarian cancer?

Instruction: You can choose more than one answer.

- a. Through television/radio
- b. Through newspapers/magazines
- c. Through internet/social media
- d. Through doctors/nurses
- e. Through friends, relatives and colleagues
- f. Others (please specify).

Knowledge of Symptoms and Risk Factors of Ovarian Cancer

Instruction: Please read the following statements and tick the correct answers. You can choose more than one answer.

15. The symptoms of ovarian cancer include:
 - a. Persistent pain in the abdomen, i.e., around the tummy
 - b. Persistent pain in the pelvis, i.e., below the navel
 - c. Increasing abdominal size
 - d. Persistent bloating or abdominal distension
 - e. Feeling full persistently
 - f. Difficulty eating the usual amount of food.
 - g. Passing more urine than usual
 - h. Changes in bowel habits, e.g., constipation
 - i. Back pain
 - j. Extreme fatigue or tiredness
 - k. Vaginal bleeding after menopause
 - l. Unexplained weight loss.
16. The risk factors for ovarian cancer are:
 - a. Having a close relative with ovarian cancer
 - b. Having personal or family history of breast cancer
 - c. Increasing age above 50 years
 - d. Use of oestrogen containing drugs (hormone replacement therapy)
 - e. Being overweight or obese
 - f. Having infertility problem
 - g. Not having children
 - h. Using fertility drugs or having IVF treatment
 - i. Using talcum powder in the genital area
 - j. Being a smoker