WOMEN'S KNOWLEDGE OF OVARIAN CANCER AND ITS DETERMINANTS FACTORS

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Abstract. Ovarian cancer is recognised as the fourth leading cancer in Malaysia. Despite being one of the most common causes of cancer-related death among the female population, very little is known about the disease in our society. The objective of this study was to determine the level of knowledge of ovarian cancer and its determinant factor among women attending the clinic in Hospital Universiti Sains Malaysia (USM).A cross-sectional study was conducted to collect the data from 110 participants. The level of knowledge of ovarian cancer and its determinant factors was assessed using a self-administered questionnaire. Data were analysed using the Pearson chi-square test for the relationship between the level of knowledge of ovarian cancer and the selected factors. The participants of this study aged from 18 to 56 years and above. A majority of them exhibited a low knowledge level of ovarian cancer. Knowledge of ovarian cancer is significantly associated with the education level, the interest in knowing about ovarian cancer, and have heard or read about ovarian cancer.The findings of this study showed that more than half of women attending the clinic at Hospital USM do not have adequate knowledge about ovarian cancer, calling for the involvement of an educational program.
Keywords: *womens' health, cancer prevention, knowledge, risk factors, symptoms*

Introduction

The ovaries are the female reproductive organs that function to produce and protect the eggs (ova) besides producing female hormones, oestrogen and progesterone. Ovarian cancer occurred when abnormal cells in the ovary begin to multiply without control and form a tumour. It is one of the most challenging gynaecological cancers globally and correlates with the high mortality rate (Bankhead et al., 2008; Karim-Kos et al., 2008) According to the Malaysian National Cancer Registry 2012–2016, ovarian cancer makes up 5.5% of female cancer cases in Malaysia, with a 1.6% lifetime risk in the general population (National Cancer Registry, 2019).

Ovarian cancer is typically regarded as a 'silent killer', one of the most dangerous cancers for women. The major reason for its deadly outcome is the absence of any signs or symptoms in its early stages, and even when the symptoms do appear, many women do not realise the danger and can easily mistake them for non-threatening conditions (GOFF, 2012). The common signs and symptoms of ovarian cancer include bloating, pelvic or abdominal pain, trouble eating or feeling full quickly, frequent need to urinate urgently or often, fatigue and menstrual changes. However, these nonspecific complications can be caused by many factors, making it nearly impossible to correlate these symptoms to ovarian cancer. Furthermore, once the symptoms appear, cancer typically advanced rapidly, making treatment more difficult.

The exact causes of ovarian cancer are unidentified, and even the identified risk factors are still not fully understood yet and proven as direct causes. However, several factors may increase a woman's risk for ovarian cancer, including middle-age or older; close family members with ovarian cancer; have a genetic mutation called BRCA1 or

BRCA2, or one related with Lynch syndrome; have had breast, uterine or colon cancer; and have never given birth or have had trouble getting pregnant (Grossman et al., 2018; McCluggage, 2014; Rooth, 2013; Cook, 2002; Risch et al., 2001). In addition, hormone replacement therapy (HRT) has been consistently linked to ovarian cancer. Some studies consistently recovered a small increase of the risk, especially for long-term users of oestrogen replacement therapy (Lacey et al., 2002; Riman, 2002).

Some also argue that ovarian cancer could be more appropriately labelled as a 'whispering disease' due to the absence of a specific diagnostic test. Although several studies have been conducted to develop screening tests for ovarian cancer, there has not been much success to date (Scott-Brown, 2018). The two most often used tests to detect ovarian cancer are transvaginal ultrasound (TVUS) and the CA-125 blood test (Grossman et al., 2018; Rooth, 2013). The TVUS functions by detecting a mass (tumour) in the ovary. However, it could not confirm whether the mass is cancerous or benign because most of the masses detected upon screening are not cancerous. Meanwhile, the CA-125 test is used to measure the amount of protein called CA-125 in the blood, commonly found elevated in many women with ovarian cancer. However, checking the CA-125 level has been proven not a useful screening test because the high level of CA-125 is more often caused by common conditions, such as endometriosis and pelvic inflammatory disease (PID). Moreover, not all ovarian cancer patients have a high CA-125 level. For that reason, both screening tests could not be used as a reliable, foolproof marker when it comes to screening the general population.

Despite being one of the deadliest gynaecologic cancer among women, most women have little or no knowledge about the risks, the possible symptoms, and the dangers ovarian cancer poses to them. Women lacking knowledge of ovarian cancer may underestimate the importance of following up or seeking medical care (Karim-Kos et al., 2008). Early detection and diagnosis of ovarian cancer would result in a high 5-year survival rate; unfortunately, most cases are usually detected at an advanced stage (Buys et al., 2011). Moreover, women may attribute them to other gastrointestinal or urinary system disorders, as the symptoms of this cancer are not specific (Brain et al., 2014). As there are no specific and effective screening strategies, it is believed that a good knowledge about the disease, its alarming symptoms, risk factors, and clinical implications of late presentation is important among women to reduce morbidity and mortality associated with delayed presentation of ovarian cancer (Sopik et al., 2015). If women knew about the risk factors and symptoms of ovarian cancer, it might encourage the early presentation of suspicious symptoms, leading to early detection and treatment of the disease and the availability of suitable effective screening methods.

This study aims to determine the knowledge of ovarian cancer symptoms and risk factors among women attending the clinic in Hospital Universiti Sains Malaysia (HUSM). The outcome of this study could help recommend how to improve women's knowledge about ovarian cancer.

Materials and Methods

This was a cross-sectional study conducted in January 2020 to March 2020 among women attending out-patient clinics in Hospital USM. The outpatient clinics in Hospital USM; the orthopaedic clinics involve are surgical out-patient department (SOPD) clinic, Family Health clinic, Otorhinolaryngology clinic, and Obstetrics and Gynaecology clinic. A total of 110 women, aged 18 to 60, were selected as the participants. The

participants who had been diagnosed with or treated for ovarian cancer were excluded from the study. The sample size estimation was calculated using a two proportion formula and the population proportion taken based on a previous study conducted by Okunowo and Adaramoye (2018). A non-probability convenience sampling method was used in this study. The participants were selected from each clinic that fulfilled the inclusion and exclusion criteria and were asked to answer the questionnaire willingly and give their consent to participate in this research. The study protocol was approved by the Research Ethics Committee (Human) of Universiti Sains Malaysia, Kubang Kerian (USMKK/JEPeM/19110777). Written informed consent was obtained from the participants before data collection. All participants and their backgrounds were kept anonymous and confidential.

Data for this study were collected using a self-administered questionnaire adapted from Elmahdi et al, which consisted of two main sections (Elmahdi et al., 2017). The first part consists of social-demographic characteristic, including age, ethnicity, religion, marital status, employment status, family income, educations level, hear/read about ovarian cancer with a yes or no answer, interest to know ovarian cancer, had a family history of ovarian cancer, and had a discussion of ovarian cancer with the doctor. In the second part, the ovarian cancer knowledge was measured using 20 items, i.e., nine items for knowledge about ovarian cancer symptoms, eight items for knowledge about risk factors for ovarian cancer, and three items for knowledge about ovarian cancer screening and early detection. A nominal scale of 'True', 'False', and 'Do not know' was used to measure responses of these items. The respondents scored 1 marks for correct answers and 0 for the wrong answer and do not know. The cumulative score for knowledge would range from zero to 20. Based on the median score of the overall knowledge scale, the knowledge was categorized as "low knowledge" for scores below median and "high knowledge" for scores above the median (Keng et al., 2015).

The pilot study being conducted on fifteen women in *Klinik Pakar Perubatan* Hospital USM. The Cronbach Alpha result from the pilot study showed was 0.91, Data were analyzed using Statistical Package for Social Sciences Software (SPSS) version 24.0. Descriptive analysis was used to analyze the socio-demographic and the level of knowledge on ovarian cancer. A Chi-square ($\chi2$) tests was used to examine significant association of categorical variables and level of knowledge on ovarian cancer. Significant variable were considered predictors factors and entered into regression model. Multiple logistic regression was perform to analyse factors affecting knowledge level of ovarian cancer with significance at $p<0.05$.

Results and Discussion

Socio-demographic characteristic of participants

A total of 110 women were invited to this study and included in the final analysis making the response rate 100%. Mean age of the participants in this study are 33.4 (9.37) with range age between 18 years old and 67 years old. The majority of the participants are in the age group of 36 to 55 years old (49.0%), followed by 18 to 35 years old (45.5%), and only 5% is in the age group of 56 years old and above. For the ethnicity distribution, most of the participants are Malay with 92.7%, followed by Chinese (3.6%), India (2.7%) and other ethnicities (0.9%). For marital status, a majority (70.9%) of the participants are married. In terms of employment status, 52.7% of the participants are working women, while another 47.3% are not working. Meanwhile, for

the education level, 59.1% of the participants had a high educational level, and another 40.9% had a low educational level. In addition to demographic data, 5.5% of the participants in this study had a family history of ovarian cancer (*Table 1*).

Table 1. *Socio-demographic of participants (n=110).*

Variable	Frequency (Percentage)
Age (years)	
18-35 (young adults)	70 (63.6)
36-55 (middle aged-adults)	36 (32.7)
>56 (older adults)	4(3.6)
Ethnicity	
Malay	102 (92.7)
Chinese	4 (3.6)
Indian	3 (2.7)
Others	1 (0.9)
Religous	
Islam	102 (92.7)
Buddha	4 (3.6)
Hindu	3 (2.7)
Others	1 (0.9)
Marital status	
Single/divorced/widowed	32 (29.1)
Married	78 (70.9)
Employment status	
Working	58 (52.7)
Not working	52 (47.3)
Education level	
High educational	65 (59.1)
Low educational	45 (40.9)
Had family history of ovarian cancer	
Yes	6 (5.5)
No	104 (94.5)
Mean (Standard Deviation)	33.4 (9.37)

Knowledge and awareness levels of ovarian cancer

Participants were asked about their awareness on ovarian cancer (*Table 2*). Most participants (91.8%) ever heard/read about ovarian cancer, and 90.0% were interested in knowing more about it. Only 19.1% women in this study ever discuss about ovarian cancer with their doctor. In this study, the ability of women to recognise symptoms and risk factors of ovarian cancer was assessed. In terms of recognising the alarming symptoms of ovarian cancer, the unusual ongoing fatigue is the most recognisable symptom noted by the participants (53.6%), followed by abdominal pain (45.5%), frequency in urination (45.5%) and weight gain (40.9%). In regards to recognising risk factors of ovarian cancer, the most commonly known risk factor among participants is a family history (70.0%), followed by genetic inheritance (65.5%) and having a history of breast cancer/ovarian cancer (38.2%). In terms of screening methods and early detection of ovarian cancer, 63.6% of participants answered 'yes', that 'Pap smear' can detect ovarian cancer, which incorrectly answered the question, and only 17.3% of them

answered correctly that 'no' specific screening test is presently suggested to detect ovarian cancer.

Table 2. Knowledge items of ovarian cancer among women attending clinics in Hospital USM (n=110).

Statement	Yes (%)	No (%)	Do not know (%)
Knowledge on symtoms			
Q1. Unexplained change in bowel habit	24(21.8)	38(34.5)	48(43.6)
Q2. Urgency in urination	37(33.6)	30(27.3)	43(39.1)
Q3. Frequency in urination	50(45.5)	20(18.2)	40(36.4)
Q4. Bloating	36(32.7)	32(29.1)	43(38.2)
Q5. Pelvic pain	41(37.3)	26(23.6)	43(39.1)
Q6. Abdominal pain	50(45.5)	25(22.7)	35(31.8)
Q7. Weight loss	23(20.9)	37(33.6)	50(45.5)
Q8. Weight gain	45(40.9)	21(19.1)	44(40.0)
Q9. Ongoing usual fatigue	59(53.6)	15(13.6)	36(32.7)
Knowledge on risk factors			
Q10. Family history of ovarian cancer	77(70.0)	15(13.6)	18(16.4)
Q11. Personal history of ovarian cancer/breast cancer	42(38.2)	34(30.9)	34(30.9)
Q12. Genetic inheritance	72(65.5)	16(14.5)	22(20.0)
Q13. Infertility	32(29.1)	36(32.7)	42(38.2)
Q14. Used of hormone replacement therapy	37(33.6)	20(18.2)	53(48.2)
Q15. Late menopouse	21(19.1)	38(34.5)	51(46.4)
Q16. Early menarche	27(24.5)	25(22.7)	58(52.7)
Q17. Used of oral contraceptive pills (OCP)[a]	41(37.3)	21(19.1)	48(43.6)
Knowledge on screening and early detection			
Q18. Pap smear can detect ovarian cancer[a]	70(63.6)	14(12.7)	26(23.6)
Q19. Early stages of ovarian cancer have symptoms	65(57.3)	17(15.5)	30(27.3)
Q20. Currently, no single screening test recommended for ovarian cancer[a]	19(17.3)	43(39.1)	48(43.6)

Notes: a=Knowledge items that had the answer 'No' correctly.

In overall, the total score of knowledge regarding ovarian cancer is 7.40 (4.13) as shown in *Table 3*. Half (52.7%) of the participants had high knowledge of ovarian cancer. Similarly, about 51.8% of the participants aware about the symptoms of ovarian cancer, 58.2% know about the risk factors, and only 28.2% know about the screening and early detection of ovarian cancer.

Table 3. Level of knowledge domains of ovarian cancer among women attending clinic in Hospital USM (n=110).

Knowledge domains	High knowledge (%)	Low knowledge (%)	Mean (SD)
Knowledge on symptoms	57(51.8)	53(48.2)	3.32(2.53)
Knowledge on risk factors	64(58.2)	46(41.8)	2.99(1.92)
Knowledge on screening and early detection	31(28.2)	79(71.8)	1.09(0.71)
Total Score	58(52.7)	52(47.3)	7.40(4.13)

Association between selected factors and level of knowledge of ovarian cancer

Factors that were examined in this study are age, ethnicity, marital status, occupational status, level of education, curiosity about ovarian cancer and exposure of ovarian cancer including family history or ever discuss with doctors. Based on Independent-T tests results showed no significant association between the age and the

level of knowledge on ovarian cancer (p = 0.192). Mean age for high knowledge group was much younger (32.3 ± 8.46) as compared to low knowledge group (34.7 ±10.92). Ethnicity also showed no significant association with knowledge level (p = 0.064). Marital status and education level are significant predictors of the level of knowledge on ovarian cancer (p<0.05). In terms of marital status, unmarried women (68.8%) are more knowledgeable than married women (46.2%). Meanwhile, in terms of education level, highly educated women (70.8%) possess high knowledge of ovarian cancer than women with low education (26.7%).

Participants who had curiosity or interest to know about ovarian cancer (56.6%) had high knowledge as compared to participants who do not have curiosity (18.2%). Chi-square test showed there is significant association between curiosity and knowledge level of ovarian cancer. There were no significant association found in this study between heard or read about ovarian cancer, have family history of ovarian/breast cancer, ever discuss about ovarian cancer with doctor and level of knowledge (*Table 4*). These 3 factors were then analysed using multiple logistic regression analysis and it showed that only factors of educational level were significantly associated with ovarian cancer knowledge with odd ratios = 9.92 and p value <0.001. The participants that had high educational level were 9.92 times more likely to have high knowledge of ovarian cancer.

Table 4. *Association of selected factors and knowledge on ovarian cancer among women attending clinic in Hospital USM (n=110).*

Variables	Knowledge level		X^2 (df)	p-value
	Low	High		
Age (years)	34.69	32.26	1.31	0.192[a]
Ethnicity			4.19(1)	0.064[b]
Malay	51(50.0)	51(50.0)		
Non-malay	1(12.5)	7(87.5)		
Marital status			4.65(1)	*0.031[c]
Married	42(53.8)	36(46.2)		
Unmarried	10(31.3)	22(68.8)		
Education level			20.75(1)	*<0.001[c]
High educational	19(29.2)	46(70.8)		
Low educational	33(73.3)	20(26.7)		
Heard/read about ovarian cancer			0.27(1)	0.733[b]
Yes	47(46.5)	54(53.5)		
No	5(55.6)	4(44.4)		
Interest to know about ovarian cancer			5.85(1)	*0.016[c]
Yes	43(43.4)	56(56.6)		
No	9(81.8)	2(18.2)		
Had family history of ovarian cancer			0.01(1)	1.000[b]
Yes	3(50.0)	3(50.0)		
No	49(47.1)	55(52.9)		
Ever discuss about ovarian cancer with doctor			0.88(1)	0.467[c]
Yes	8(38.1)	13(61.9)		
No	44(49.4)	45(50.6)		

Notes: p-value < 0.05 was considered as statistically significant; a=independent sample test; b=Fisher Exact test; c=chi-square test.

This study explored ovarian cancer knowledge and awareness among women attending the clinics in Hospital Universiti Sains Malaysia (HUSM). This study demonstrated that more than half of the women had high knowledge of ovarian cancer in general, in specific domain on symptoms and risk factors. However, there were many women who had lack of knowledge regarding screening of ovarian cancer. Majority women (91.8%) had heard/read about ovarian cancer and 90.0% of them were interested in knowing or had curiosity regarding this disease. The finding of this study agrees with three other studies (Elmahdi et al., 2017; Keng et al., 2015; Al-Naggar and Kadir, 2013) in Malaysia, which identified the limited awareness programs related to ovarian cancer compared to breast cancer or cervical cancer. Thus, it can be suggested that an easily accessible approach, with wide coverage, such as social communicating networks (Facebook, WhatsApp, Instagram, etc.) should be utilised to spread awareness and update health information and raise ovarian cancer knowledge.

Although the response from the participants was encouraging in recognising ovarian cancer's risk factors than its symptoms, their knowledge of the disease is still insufficient especially regarding screening. Only half of the participants could recognise the potential risk factors listed in the questionnaire. Knowledge of ovarian cancer risk factors is very important as it may encourage women to participate in screening programs and early detection. A study conducted in the United Kingdom explored the possibility of predicting ovarian cancer using an algorithm combining risk factors and symptoms showed that 10% of women with the highest predicted risk were diagnosed with ovarian cancer after the following two years (Hippisley-Cox and Coupland, 2011). This emphasises the importance of increasing women's awareness of the symptoms and risk factors, particularly in countries like Malaysia, where low awareness and knowledge are dominant. This could be achieved using announcement in the general media and social media channels.

In this study, the misunderstanding that the Pap smear test can detect ovarian cancer was observed among 63.9% of the sample. Only 39.1% answered correctly that no specific screening test could be used to detect ovarian cancer and more than half do not know/incorrectly answered about the screening test for this disease. The same result was also highlighted by Elmahdi et al. (2017) in their study among female employees in a public university in Malaysia. Accordingly, women who think that the Pap Smear test can detect ovarian cancer mistakenly felt that they would not contract ovarian cancer. This emphasises the need to educate Malaysian women during their visit to screening centres that provide Pap smear or even mammograms and highlight the scope of each screening test.

Correspondingly, most (70.9%) of the participants in this study were married women but only 46.2% of them had high knowledge level as compared to 68.8% unmarried women. Marital status was found significantly associated with the knowledge level of ovarian cancer (p = 0.031). This finding is consistent with another study (Elmahdi et al., 2017) where 61.2% of participants were married women and marital status significantly influenced the level of ovarian cancer knowledge. They conclude it might be because married women were more exposed to healthcare professionals and facilities during follow up consultancy at pregnancy and delivery. However, the possible explanation for many unmarried women in this study had high knowledge level could be their concern of health status which lead them to search more about ovarian cancer in social media or internet. This is supported by Jamal et al. (2015) as they found that age and marital status does gave effect to online health information seeking behaviour among their

respondent. Those young age group showed frequent use of internet in seeking health information as consistent with unmarried women in this study were in younger age.

Another predictor affecting the level of knowledge is the curiosity or interest to know about ovarian cancer. Women who had interest to know about ovarian cancer were motivated about ovarian cancer and lead them to have higher knowledge on ovarian cancer. Interestingly, educational level is significant predictors of the level of knowledge of ovarian cancer. It is observed that women with a high level of education would have a relatively better awareness of ovarian cancer symptoms and risk factors than women who do not have these characteristics. This result is consistent with the result of previous studies (Keng et al., 2015; Lockwood-Rayermann et al., 2009; Schulman-Green et al., 2008). This might be because women with high education would have more resources to access healthcare services, health information and screening progress. Based on the findings, it is important to conduct awareness programs and support educational activities to disseminate the latest knowledge and findings related to ovarian cancer in Malaysia.

Limitation of the study

Among the limitations of this study is the way of acquiring the participants. Even though many women attended the clinic in HUSM daily, most of them refused to answer the questionnaire because they worry that they would miss their turn to see the doctor. Second is level of knowledge was assessed using a structured questionnaire and it may lead to response positively to all knowledge item introduced.

Conclusion

This study shown that women attending the clinic at Hospital USM have high knowledge (52.7%) of ovarian cancer specifically about symptoms and risk factors but low knowledge regarding screening. The study found three factors influence level of knowledge of ovarian cancer which includes marital status, educational level and curiosity about the disease. After controlling all the factors, only educational level showed significant association with knowledge level. Since no specific and effective screening program is available to detect the disease, national awareness programs are urgently required. Such programs would focus on alerting women to the symptoms, risk factors and how to screen for the disease. This initiative would hopefully increase women's awareness of symptom recognition and get help early.

This finding has important implications for nursing practice. More than half of the respondent never discuss with doctor about ovarian cancer even though most of the respondents had low knowledge toward the ovarian cancer. Hence, in this context, nurses must encourage to seek medical examination from a gynecologist and create awareness among women on the early symptom of ovarian cancer so that they will have greater chances to be cure or reduce the delays in diagnosis. For health care professional, it is suggested that the need of conveying an adequate health education to the population and strongly highlighted those input to be practiced in their daily life. Nurses are being the providers of the first-hand health care to patients and community by educating the population and increase awareness regarding the symptoms, risk factor and screening and early detection of ovarian cancer. As education play important role in maintenance of health and disease prevention. This will lead to learning and social changes that bring positive health outcomes in individual and community.

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Conflict of interest

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