

ORIGINAL ARTICLE

A Cross-sectional Study of Ovarian Cancer Knowledge and Its Determinants among Female Employees in a Public University, Malaysia

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ABSTRACT

Introduction: Ovarian cancer is recognizable as the fourth leading cancer in Malaysia. Knowledge on ovarian cancer is low among Malaysian women, which may affect their interpretation of early symptoms and delay presentation of ovarian cancer cases. The aim of this study was to determine the level of ovarian cancer knowledge and its determinants among female nonacademic staff in Universiti Putra Malaysia, Serdang, Malaysia. **Methods:** A cross-sectional study was designed to collect the data from 366 participants via a validated self-administered questionnaire, from April to July 2015. **Results:** The mean age of participants was 34 ± 7.89 . Most of the sample was Malay (96.4%), married (61.5%). A total of 51.4% of respondents reported low knowledge level. Knowledge of ovarian cancer was significantly associated with marital status ($p < 0.001$), age ($p = 0.03$), interest to know about ovarian cancer ($p < 0.001$) and level of education ($p = 0.02$). Participant's age and having heard or read about ovarian cancer were predictors to low knowledge, with the odds ratios of (OR=1.031, 95% CI= 1.002-1.061, $P=0.03$) and (OR=0.549, 95% CI= 0.356-0.846, $P < 0.00$) respectively. **Conclusion:** Our findings showed that more than half of female nonacademic staff in UPM was not well knowledgeable about ovarian cancer, which needs an educational intervention to improve knowledge among this group.

Keywords: Determinants, Knowledge, Malaysian, Ovarian cancer

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INTRODUCTION

Although ovarian cancer is contributed in five percent of the total malignancies in Malaysian women with a crude incidence rate of 7.4 per 100,000 populations, it is the fourth common malignancy affect Malaysian women (1).

Even though ovarian cancer has a low incidence, it remains the deadliest among all other gynecological cancers (cervix, uterus, and ovary) (2). Between 70% - 75% of cases were diagnosed at stages III-IV when it spreads outside the pelvis, and the 5-year survival rate is only 11-41% of cases (3). On the other hand, early

stages (I, II) have a high cure chances and 90% survival rate if cases diagnosed early (4).

Natural history of the Ovarian cancer is not clear yet, for this reason, understanding risk factors for ovarian cancer is still inconclusive. However, scientific literature shows a number of factors that increase the likelihood of female to get ovarian cancer. First and foremost, mutation of BRCA1 and BRCA2 genes, which is responsible for the majority of hereditary ovarian cancer accounted 10% of all ovarian cancer cases (5). In the second place, woman's age. Women who aged 65 years or older have a higher risk of this cancer compared to younger women (6). Furthermore, usage of Hormonal Replacement Therapy (HRT) more than 10 years elevate the risk of ovarian cancer compared to not use (7). Moreover, reproductive history seems to have effects on the ovarian cancer risk too because of prolonged exposure to ovulation such as low parity increase this risk while factors that reduce the ovulation rate such as breastfeeding, and contraceptive

pills, and multiparity have a tendency to minimize this risk (8).

Ovarian cancer is often referred to as the silent killer (9). This term was used based on the misconception that no symptoms associated with early stages of this disease. But no longer is a silent disease, ovarian cancer now has been recognized as having detectable early warning signs and symptoms (10, 11). Symptoms and signs of ovarian cancer are recently started of symptoms frequently include eating difficulty, bloating, pelvic/abdominal pain, urgency/frequency of urination, and feeling full quickly. If these symptoms occurred > 12 episodes per month, diagnosis of ovarian cancer should be taken into account (12). Women with ovarian cancer may not be aware that their symptoms were indicative of a serious condition like ovarian cancer and may misattribute them to simple and benign conditions such as monthly period, irritable bowel syndrome, aging, or even stress (13).

Developing an effective screening test that can detect a preclinical phase of ovarian cancer were not successful due to failing to understand the natural history of this cancer. Because of that, all current screening methods of ovarian cancer lack of effectiveness and fail to reduce the mortality rate of this disease (14 -16). However, there are few initiatives to determine whether the screening by using intra-vaginal ultrasound, symptom index, in combination with biomarkers can help to diagnose ovarian cancer at earlier stages (17).

Given that early detection significantly improves the prognosis of ovarian cancer cases and no effective screening test is recommended for general population screening purposes, early detection can be predominantly dependent on the women' recognition of early symptoms and reports to physicians (18). Therefore, ovarian cancer early signs and symptoms can play a significant role in the early detection of ovarian cancer cases.

Data obtained from previous studies show that ovarian cancer symptoms were not recognized by the majority of women, especially those with non-gynecological nature symptoms such as a change in bowel habit, feeling full quickly, or urinary symptoms (19, 20).

Limited studies have been carried out among Malaysian women also revealed that women have a significant low knowledge related to ovarian cancer (21 - 23). Consequently, more investigations are needed to help planning of effective strategies that increase levels of ovarian cancer awareness among Malaysian women and enhance early detection. Therefore, the study's aims were to determine the level of ovarian cancer knowledge and assessing the factors that can predict it among female staff in Universiti Putra Malaysia.

METHODS

Study design

A cross-sectional study was conducted among 366 non-academic female staffs in Universiti Putra Malaysia (UPM) between April 1st, 2015 and July 30th, 2015. Women aged 20 to 60 years old who were Malaysian citizens and working as nonacademic staff in Universiti Putra Malaysia (UPM) were invited to take part in the study. Female nonacademic staff who had ovarian cancer and /or had undergone oophorectomy were excluded from the study.

Sampling method

Two-stage simple random sampling technique was used to select 4 out of 7 institutes and centers then select a total of 366 subjects by a simple random method using a list of non-academic staffs in those institutes as a sample frame. List of the staff was obtained from official website of UPM and served as the sampling frame.

Sample size

Daniel formula (24) was used to estimate the number of participants that are needed for this study. To calculate the size of the sample, the prevalence of knowledge of ovarian cancer was 11.2% based on the previous study in Malaysia (23), with taking into consideration the type I error of a 5 % of an absolute error and 20% as an estimation of a non-response rate of participants. 400 subjects were calculated as a final size of the sample. Of those who at first agreed to participate in this study, 34 dropped out for a different of reasons (e.g. sick leaves, moving into different faculties, too busy, and unwillingness to participate). As a result, 366 (91.5% response rate) participants completely filled and returned the questionnaire.

Instrument

Data were collected using a self-administered questionnaire. Based on previous publications that were relevant to this study (25 - 27), the questionnaire was developed then validated by researchers. Content Validity Index (CVI) was over 0.80 (acceptable) and Kappa values as a measurement of reliability (test-retest reliability) of the categorical data (knowledge scale) were as following: symptoms of ovarian cancer (0.55 – 0.90), knowledge of risk factors for ovarian cancer (0.56 – 0.78) and knowledge of ovarian cancer screening and early detection (0.70 – 0.87).

The questionnaire included the following parts:

- 1) Data form for Socio-demographic: Socio-demographic characteristics, include age, family history of breast cancer, marital status, type of religion, race, level of education, religious as well as the history of birth control pills (yes/no), family history of ovarian cancer or breast cancer (yes/no),

having ever read/heard about ovarian cancer (yes/no), interested to know about ovarian cancer (yes/no).

- 2) Data form for Knowledge: the ovarian cancer knowledge was measured using 17 items include 6 items for knowledge about ovarian cancer symptoms, 7 items for knowledge about risk factors for ovarian cancer and 4 items for knowledge about ovarian cancer screening and early detection. A nominal scale of "True", "False" and "Do not know" was used to measured responses to these items, with an overall range score of 0-17. One point was given for a correct answer and zero for an incorrect or do not know the answer. 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 (22).

Source of information: This part of questionnaire examined the source of ovarian cancer information for those who have heard/read about ovarian cancer.

Ethical consideration

The Medical Research Ethics Committee of the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia has approved the study protocol for this study (Reference no: UPM/TNCPI/RMC/1.4.18.1 (JKEUPM) / F2). From each respondent, a written consent has been taken before conducting the study.

Statistical Analysis

The data analysis was accomplished using the Statistical Package for Social Science (SPSS) version 22.0. Descriptive statistics (mean, standard deviation, frequencies, and percentage) were obtained for all continuous and categorical data. Comparisons among groups were made using appropriate inferential tests such as t-test and χ^2 -test. To determine the association of the categorical data in 2×2 tables that contain cells with the expected counts of < 5 , the Fisher's exact test was used. A multiple logistic regression was used to determine the predictor(s) of ovarian cancer knowledge. The significance level was set at $\alpha < 0.05$ for all variables in the analysis.

RESULTS

Participants' characteristics

Table 1 illustrates the socio-demographic descriptions of the sample. The majorities of them were Malay 353 (96.4%), Muslim 358 (97.8%) and married 225 (61.5%). The average of their age was 34 (\pm SD 7.89), and ranging from 20 to 64 years old. Most of the sample doesn't hear/read about ovarian cancer 222 (60.7%). However, 307 (83.9%) of the sample was willing to know about it. Among those 144 who have heard/read about ovarian cancer (39.3%), the main source of information was printed media (brochures, newspapers) reported by 60 respondents (41.6%), followed by information obtained from medical health personnel involving 40 respondents (27.7%), through mass media by 22 respondents (15.2%) and others at 18 respondents (12.5%) (Figure 1).

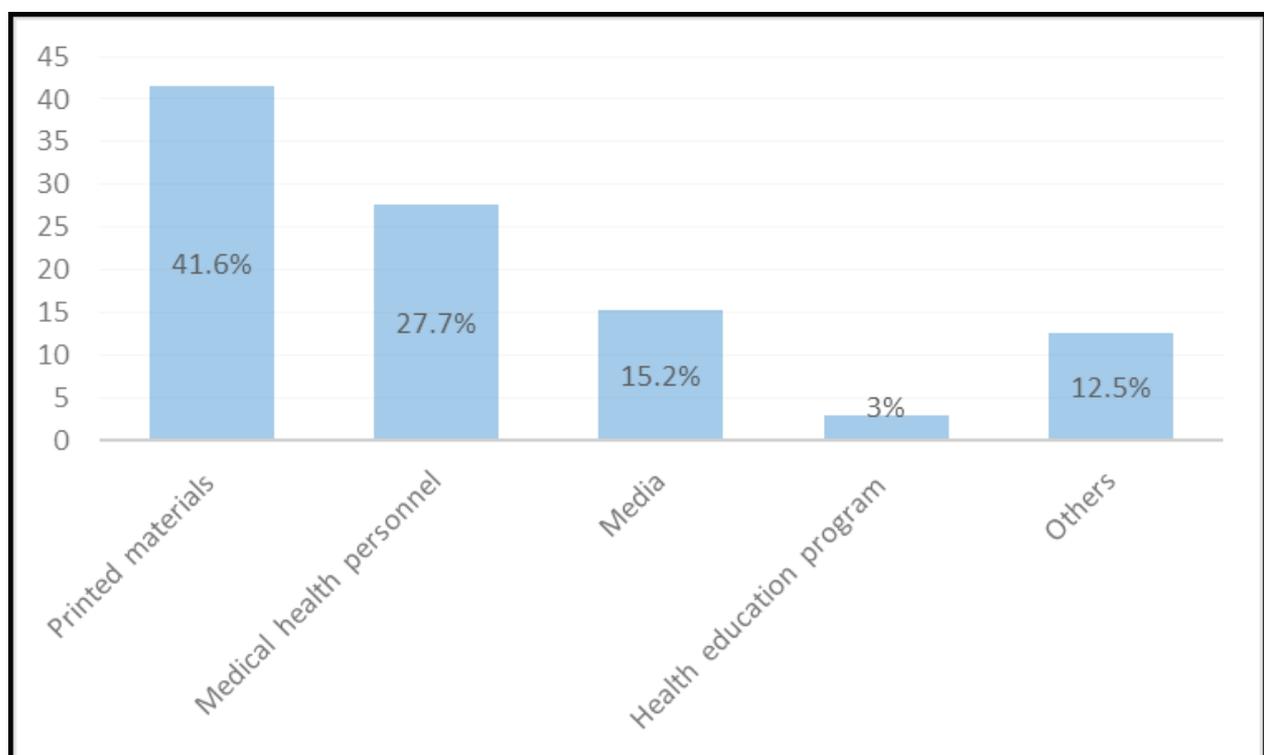


Figure 1. Source of information for ovarian cancer

Knowledge of ovarian cancer

The ongoing unusual fatigue was the most recognizable symptom by participants (60.4%). Followed by pelvic/abdominal pain and weight loss/gain were recognized by nearly half of respondents, 57.1% and 56.6% of respondents responded correctly to these symptoms respectively. Regarding knowledge on risk factors of OC, 58.5% of respondents correctly identified “genetic inheritance” and 186 (50.8%) correctly identified “family history of breast cancer or ovarian cancer or as a risk factor for developing ovarian cancer. With regards to early detection and screening methods, less than half percentage (39.3%) of participants knew “Pap’ smear can’t detect ovarian cancer” and only 13.1% of them answered correctly that “No single screening test currently recommended to detect ovarian cancer” (Table 2).

Based on the median score of overall knowledge (7.0), which used as a cutoff point (22) for high knowledge, the overall knowledge of ovarian cancer was low among 187 (51.4%). Similarly, by using the median score of knowledge about risk factors (3.0), knowledge of symptoms (3.0), and knowledge of screening and early detection of ovarian cancer (1.0). The majority of respondents had a lower level of knowledge about risk factors 247 (67.5%). More than half of participants (64.8%) also had a low level of ovarian cancer symptoms, followed by knowledge on screening and early detection of ovarian cancer 214 (58.6 %) (Table 3).

Factors associated with level of knowledge

Levels of knowledge were explored by socio-demographic characteristics of respondents (Table 4). Significant associations were identified between level of ovarian cancer knowledge and participant’ age (p=0.

Table 1. Socio-demographic characteristics of respondents (n=366)

Variable	Frequency	Percentage (%)
Age (years)		
Mean ± SD*	34.45 ± 7.89	
(Min-Max)	20-64	
Ethnicity		
Malay	353	96.4
Non-Malay	13	3.6
Religious		
Islam	358	97.8
Non-Islam	8	2.2
Marital Status		
Married	225	61.5
Not married	141	38.5
Family income (RM)		
Mean ± SD	5469.41 ± 4815.62	
(Min-Max)	250-5000	
Education level		
Diploma and less	162	44.3
Degree and above	204	55.7
Hear/read about OC		
Yes	144	39.3
No	222	60.7
Interest to know OC		
Yes	307	83.9
No	59	16.1
Used OCP		
Yes	81	22.1
No	285	77.9
Family history of BC/OC		
Yes	59	16.12
No	305	83.33

SD = Standard Deviation; OC = Ovarian Cancer, OCP=Oral Contraceptive Pill

Table 2. Knowledge of ovarian cancer (n=366)

Statements	Correct response
	N (%)
Knowledge on symptoms	
Unexplained change in bowel habit	96 (26.2)
Urgency/frequency of urination	163 (44.5)
Bloating/ fullness	161(44)
Pelvic/abdominal pain	209 (57.1)
Weight loss/gain	207(56.6)
Ongoing un-usual fatigue	221 (60.4)
Knowledge on risk factors	
Family history of BC/OC	186 (50.8)
Personal history of BC	158(43.2)
Genetic inheritance	214 (58.5)
infertility	87(23.8)
Used of HRT	136(37.2)
Late menopause and/or early menarche	95 (26)
Use of OCP decrease the risk of OC	95 (26)
Knowledge on screening and early detection	
Pap' smear can detect ovarian cancer	144 (39.3)
Early stages of ovarian cancer have symptoms	96 (26.2)
Currently, no single screening test recommended for ovarian cancer	48 (13.1)

Table 3. Level of knowledge of ovarian cancer among participants (n=366)

Parameters	Mean \pm SD	Levels of knowledge	
		Low n (%)	High n (%)
Symptoms of OC	2.88 \pm 2.04	169(53.7)	46.2 (46.3)
Risk factors of OC	2.80 \pm 1.47	247 (67.5)	119 (35.5)
Screening/early detection	1.47 \pm 0.79	214(58.6)	151 (41.4)
Overall knowledge on OC	7.15 \pm 3.21	187(51.4)	177(48.6)

OC=Ovarian Cancer; SD=Standard Deviation

03), marital status ($p < 0.001$), educational level ($p = 0.02$), heard /read about OC ($P < 0.001$) and interest to know about OC ($P < 0.001$). Non-significant characteristics related to the level of knowledge of OC are presented in Table 4.

Multiple logistic regression analysis (Table 5) confirmed these associations, except for the level of education, marital status, and interest to know about OC, which became not significant with the level of knowledge of ovarian cancer. Respondents who have not heard about ovarian cancer were more likely to have a lower

level of knowledge about OC than those hear about OC (OR=0.549, 95% CI= 0.356-0.846, $P < 0.001$). Furthermore, older women were more likely to had lower knowledge about ovarian cancer than those who were younger (OR=1.031, 95% CI= 1.002-1.061, $P = 0.03$).

DISCUSSION

Because of the vagueness of ovarian cancer symptoms, it is used to be called “silent killer”. Nonspecific symptoms

Table 4. Factors associated with level of ovarian cancer knowledge among respondents (n=366)

Items	Level of knowledge		Test value	P-value
	Low n(%)	High n(%)		
Age (Mean ± SD)	33.7±7.6	35.5±8.1	$t = -2.14$	$p = 0.03^*$
Ethnicity				
Malay	202(57.5)	149(42.5)	$\chi^2 = 0.70$	$p = 0.40$
Non-Malay	9(69.2)	4(30.8)		
Religion				
Islam	204(57.3)	152(42.7)	N/A [†]	$P = 0.14$
Non-Islam	7(87.5)	1(12.5)		
Marital Status				
Married	93(41.5)	131(58.5)	$\chi^2 = 64.6$	$p < 0.001^*$
Not married	118(84.3)	22(15.7)		
Family income (RM) (Mean ± SD)	5912.01±5583.21	4881.51±3458.41	$t = -2.01$	$p = 0.05$
Education level				
Diploma and less	128(63.1)	75(36.9)	$\chi^2 = 4.87$	$p = 0.02^*$
Degree and above	83(51.6)	78(48.4)		
Hear/read about OC				
Yes	66(45.8)	78(54.2)	$\chi^2 = 14.39$	$p < 0.001^*$
No	145(65.9)	75(34.1)		
Interest to know OC				
Yes	190(62.3)	115(37.2)	$\chi^2 = 14.46$	$p < 0.001^*$
No	21(35.6)	38(64.4)		
Used OCP				
Yes	43(43.1)	38(46.9)	$\chi^2 = 1.01$	$p = 0.31$
No	168(59.4)	115(40.6)		
Family history of BC/OC				
Yes	33(55.9)	26(44.1)	$\chi^2 = 0.12$	$p = 0.72$
No	178(58.4)	127(41.6)		

*Significant at level of p value < 0.05 , [†] Fisher’s exact test, OC ovarian cancer, BC=breast cancer, SD=standard deviation.

Table 5. Multivariate logistic regression analysis models towards ovarian cancer knowledge (n=364)

	Wald	p-value	Adjusted odds ratio	95%CI
Age (year)	4.35	0.03*	1.031	1.002-1.061
Marital Status (married, not married)	0.612	0.43	1.218	0.743-1.999
Education level (diploma, less and degree and above)	0.635	0.42	1.189	0.777-1.821
Hear/read about OC (yes, no)	7.366	<0.001*	0.549	0.356-0.846
Interest to know about OC (yes, no)	2.481	0.11	0.626	0.350-1.121
Constant	0.359	0.54	0.695	

*Significant at level $P < 0.05$; CI=confidence interval; OR=odds ratio.

of ovarian cancer are frequently go unrecognized until malignancies cells have widely spread. Besides, a clear and effective recommended ovarian cancer screening strategy has not existed yet due to inadequate specificity and sensitivity of the available screening methods in general population usage. Therefore, early presentation of cases is largely depending on women' correct interpretation and seeking medical care for ovarian cancer symptoms, which highlighting our need to provide an accurate data about the level of ovarian cancer awareness for planning effective early detection strategies.

Although a high percentage of study' sample (83.9% interested to know about ovarian cancer which may reflect that they were motivated to learn about this cancer, about two third (60.7%) of them have not heard/read about ovarian cancer before. this finding highlighting the limited educational activities related to ovarian cancer in Malaysia compared to breast or cervical cancers. Among those who heard/read about ovarian cancer, the most popular sources of information were printed materials (newspaper and brochures) and followed by medical health professionals. These results are in line with other two comparable studies done in Malaysia (22, 23). However, the popular source of information related to breast cancer among Malaysian female students in UPM was mass media (Television and Radio) (28). It seems that using the printed material to educate women about ovarian cancer still insufficient. Hence, an easily accessible with wide and popular educating methods such as Mass media, social

communicating networks (Mass media, Facebook, WhatsApp, etc.) should be used to spread an updated health information and raise ovarian cancer knowledge about ovarian cancer.

Many previous studies found that abdominal pain, pelvic pain, change in bowel habit, urinary symptoms, and feeling full are present in early stages of ovarian cancer (10 - 12). Consequently, consideration of these symptoms as a potential warning sign and symptoms for ovarian cancer could help in making a diagnosis of ovarian cancer at earlier stages. In this study, our respondents had the lowest awareness of the following 3 symptoms "change in bowel habit", "urinary symptoms" and "bloating" which is consistent with results of studies done in Malaysia (23), Britain (27) and USA (19). However, they were able to recognize the classical symptoms such as pelvic/abdominal pain; weight loss/gain; ongoing unusual fatigue. Hence, education efforts aimed to raise awareness about ovarian cancer symptoms, especially the non-classical symptoms should be considered via health education programs among this target population.

In this study, the misconception that ovarian cancer can be detected by the Pap' Smear test was observed among 60.7% of the sample and only 39.3% of them have the correct information. This finding agrees with some other studies (29, 30). Women who think that Pap' Smear test can detect ovarian cancer, they mistakenly feel safe from developing ovarian cancer which indicates the need of educating Malaysian women during their

visit to screening centers that provide Pap' Smears or even mammograms and highlighting the scopes of each screening test.

Our finding showed that the majority of our respondents had low knowledge about the screening and early detection, signs and symptoms of ovarian cancer. These findings are supported by other studies conducted in Malaysia (21-23) that stated Malaysian working women were not well knowledgeable about symptoms, risk factors, and ovarian cancer screening and the importance of its early detection.

Marital status significantly influenced the level of ovarian cancer knowledge. These might be due to the fact that married women were more exposed to health care facilities and health care professionals during follow-up consultancy at pregnancy and delivery. Also, the observed association between education level and level of knowledge is consistent with results from a previous study in Malaysia (23). However, the significant relation of marital status and educational level with the level of ovarian cancer knowledge did not remain significant after multivariate analysis.

With respect to the predictors of ovarian cancer knowledge level, respondent's age was a significant predictor of the level of knowledge. This study showed that with an increase of 1 year in age, the ratio of low knowledge increased by 1.03 times. This finding was found to be similar to other studies (27, 31). In contrast to our finding, a study in 2009 (29) showed that knowledge on ovarian cancer risk factors was significantly differed by age ($\chi^2 = 44.05$, $p < 0.001$) but not symptoms knowledge ($\chi^2 = 20.2$, $p = 0.321$).

Another predictor affecting the level of ovarian cancer knowledge was heard/read about ovarian cancer. Participants who have heard and/or read about ovarian cancer were less likely 0.549 times to have low knowledge than participants have not heard or read about it, which consider being an evidence to support a need for educational activities that spread up to date knowledge related to ovarian cancer in Malaysia.

There are some limitations found in this study. First, this study has been carried out among the non-academic female staff, hence, the findings cannot be generalized to the whole population of UPM that also include academic staff and students. Also, all collected data were self-reported with no objective measures to evaluate the participants' responses.

CONCLUSION

In short, this study found a potential knowledge gap of ovarian cancer among Malaysian female nonacademic staff in UPM with significant influence of some of the

socio-demographic characteristics of respondents. Efforts to overcome this knowledge gap through providing ovarian cancer awareness programs should be organized among this category of female staff.

ACKNOWLEDGMENTS

Researchers would like to extend their thanks to all the female staff who participated in this study and management officers of Universiti Putra Malaysia who were involved in this study.

CONFLICTING INTEREST: Authors have declared that no conflicting interest exists.

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