

Cross-Sectional Study

Knowledge of Ovarian Cancer Risk Factors and Symptoms Among Iraqi Women in Baghdad: A Cross-Sectional Study

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Received: 15 December 2024 | Revised: 03 February 2025 | Accepted: 27 February 2025 | Published: 05 April 2025

Abstract

Background: Ovarian cancer is a significant global health concern, often diagnosed at advanced stages due to the absence of specific symptoms and the limited awareness of risk factors and symptoms among the general population. This study aimed to assess the knowledge of ovarian cancer risk factors and symptoms among Iraqi women in Baghdad and identify socio-demographic predictors of knowledge.

Methods: A cross-sectional study was conducted among 492 Iraqi women in Baghdad using a self-administered questionnaire. The questionnaire contained sections on socio-demographic characteristics, knowledge of ovarian cancer risk factors, and symptoms. Data analysis involved the use of descriptive statistics and chi-square tests to ascertain associations between socio-demographic variables and knowledge levels.

Results: The results indicated that the majority of participants exhibited limited knowledge of ovarian cancer risk factors and symptoms. Key risk factors, such as aging (81 slightly familiar) and family history (73 slightly familiar), were poorly recognized. Additionally, misconceptions were observed, with some participants identifying non-risk factors, such as benign ovarian cysts, as risk factors. Symptoms like pelvic pain (89% familiar) and bloating (97% familiar) were moderately recognized, while others, such as fatigue and loss of appetite, were less familiar. Significant predictors of knowledge included higher education ($p = 0.003$ for risk factors; $p = 0.045$ for symptoms) and urban residency ($p = 0.003$ for both risk factors and symptoms).

Conclusion: This study underscores substantial gaps in knowledge of ovarian cancer risk factors and symptoms among Iraqi women in Baghdad, with education and urban residency emerging as key predictors. The findings underscore the imperative for targeted educational initiatives, particularly among rural and less-educated populations, to enhance awareness, facilitate early detection, and optimize outcomes for ovarian cancer.

Keywords: Ovarian Cancer, Knowledge, Risk Factors, Symptoms, Iraq, Education, Public Health.

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Cite This Article: Sedeeq, A. A., Almkhtar, S. A., & Abduljabbar, A. (2025). Knowledge of Ovarian Cancer Risk Factors and Symptoms Among Iraqi Women in Baghdad: A Cross-Sectional Study. *Middle Eastern Cancer and Oncology Journal*, 1(2), 1–7. <https://doi.org/10.61706/MECOJ160126>

Introduction

Ovarian cancer is a significant global health concern, ranking as the eighth most common cancer among women and the leading cause of gynecological cancer-related deaths worldwide (Sung et al., 2021). According to the Global Cancer Observatory, over 313,000 new cases of ovarian cancer were reported in 2020, with an associated mortality rate of nearly 200,000, reflecting the aggressive nature of the disease and the challenges in achieving early diagnosis (International Agency for Research on Cancer, 2020). The unique challenges associated with ovarian cancer, particularly its tendency to manifest with vague and nonspecific symptoms, contribute to delays in diagnosis, often by the time the disease has progressed to advanced stages. This, in turn, results in limited therapeutic options and significantly reduced survival rates (Webb & Jordan, 2017). In comparison to other gynecological cancers, such as cervical or endometrial cancer, the challenges associated with early diagnosis of ovarian cancer are particularly pronounced. This is primarily due to the absence of screening tests and the nonspecific nature of the symptoms, which often lead to misattribution and delayed diagnosis (International Agency for Research on Cancer, 2020). Moreover, public awareness initiatives have historically prioritized more prevalent cancers such as breast and cervical cancer, resulting in underrepresentation and limited public understanding of ovarian cancer (Glanz & Ammerman, 2015). The significance of public knowledge about ovarian cancer cannot be overstated. A comprehensive understanding of risk factors, early symptoms, and the necessity of prompt medical consultation is paramount for early detection, which significantly improves survival outcomes. Studies have shown that individuals with a higher level of knowledge about cancer are more likely to engage in preventive health behaviors and seek medical advice in a timely manner, thereby reducing diagnostic delays (Glanz & Ammerman, 2015). However, despite its significance, public knowledge about ovarian cancer remains inadequate, particularly in low- and middle-income countries where healthcare resources and awareness campaigns are often limited (Jayson et al., 2014).

In Iraq, particularly in Baghdad, ovarian cancer constitutes a growing public health challenge. The lack of structured educational initiatives targeting cancer knowledge has led to limited understanding among women regarding the disease. Factors such as cultural barriers, restricted access to healthcare, and low prioritization of cancer education have further exacerbated this knowledge gap (Mohsin et al., 2024). These challenges are consistent with broader global trends observed in low- and middle-income countries (LMICs), where limited resources, cultural barriers, and inadequate awareness efforts contribute to delayed

diagnosis and poorer outcomes for ovarian cancer (Lheureux et al., 2019). Addressing these shared barriers through global partnerships and knowledge exchange has the potential to enhance education and early detection efforts. A paucity of research has been dedicated to ovarian cancer awareness, with previous studies focusing predominantly on breast cancer or other more prevalent cancers, thereby leaving ovarian cancer underrepresented in health awareness research (Lheureux et al., 2019). The present study aims to evaluate the knowledge of ovarian cancer among Iraqi female adults in Baghdad. By identifying gaps in knowledge and understanding the factors influencing them, the findings of this study will contribute to the development of evidence-based strategies to improve education and early detection efforts. Addressing these knowledge gaps is imperative in empowering women with the requisite information to proactively engage in early detection and timely treatment.

Methods

This research is a cross-sectional study designed to examine the level of knowledge about ovarian cancer risk factors and symptoms among Iraqi adult females residing in the province of Baghdad. A self-administered questionnaire was used for data collection, and ethical approval for the study was obtained from the Medical Ethics Committee of the Al Rafidain University College in September 2023 (REC:45-2023) prior to the commencement of the study.

A convenience sampling method was employed to recruit participants, with the inclusion criteria including Iraqi adult females aged 18 years and above who provided written informed consent to participate in the study. Exclusion criteria included individuals with any medical background or work experience in the healthcare field and those who failed to meet the inclusion criteria.

Survey Instrument

The survey instrument utilized in this study was a self-administered questionnaire that was adapted and extracted from validated literature sources, including studies by Lockwood-Rayermann et al. (2009) and Stearns & Smith (2008). The questionnaire consisted of three sections: Section A, which inquired about the respondents' socio-demographic characteristics and general sources of information about ovarian cancer; Section B, which inquired about respondents' knowledge of risk factors for ovarian cancer; and Section C, which inquired about respondents' knowledge of symptoms associated with ovarian cancer.

The internal consistency of the questionnaire was assessed using Cronbach's alpha, yielding a value of

0.822 based on a sample of 80 respondents, indicating good reliability.

Data Collection and Analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were utilized to summarize the data, including frequency analysis and the presentation of results in frequency tables and bar charts. Chi-square tests were conducted to explore associations between categorical variables. A p-value < 0.05 was considered statistically significant.

Knowledge Scoring System

A point-based scoring system was utilized to evaluate the participants' knowledge. Each correct answer was awarded one point, while incorrect answers received no points. Standardized scores were calculated based on responses to 10 items in Section B and 11 items in Section C. Knowledge levels were classified as follows: scores above 50% indicated adequate knowledge, while scores below 50% were deemed inadequate. This scoring approach was adapted from the methods employed by Stearns & Smith (2008) and Xin et al. (2024).

Results

Socio Demographic Characteristics of Respondents

Table 1 presents a summary of the socio-demographic characteristics of the 492 respondents. The majority of participants were between the ages of 31 and 50 years (41.5%), followed by those aged 18 to 30 years (35.1%). Smaller proportions were in the age groups 51–64 years (13.6%) and 65 years or older (9.8%). In terms of ethnicity, the majority of respondents identified as Arab (47%), followed by Kurdish participants (33.3%), while the remaining 19.7% were categorized as "others". A significant proportion of respondents reported being single (71.2%), with married individuals comprising 28.8% of the sample. Regarding educational attainment, 42.9% of respondents held a bachelor's degree, 35% had completed secondary school, and smaller proportions had attained a master's degree (11.4%), a doctorate (2.2%), or only primary school education (8.5%). The majority of participants resided in urban areas (70.9%), while 29.1% were from rural areas. These findings provide important contextual information for interpreting the knowledge levels of ovarian cancer among the study population, as factors such as education level and urban residence may influence access to health-related resources and information.

Table 1. Socio Demographic Characteristics of Respondents (N=492)

Variables	Frequency, n	Percentage, %
Age Group (Years)		
18 - 30	173	35.1
31 - 50	204	41.5
51-64	67	13.6
≥ 65	48	9.8
Race		
Arab	231	47
Kurd	164	33.3
Others	97	19.7
Marital Status		
Single	218	71.2
Married	88	28.8
Highest Level of Education		
Primary School	42	8.5
Secondary School	172	35
Bachelor's Degree	211	42.9
Master's Degree	56	11.4
Doctorate Degree (PhD)	11	2.2
Description of Hometown		
Urban area	349	70.9
Rural area	143	29.1

Participants' Knowledge of The Risk Factors and Symptoms of Ovarian Cancer

The frequency distribution of respondents' knowledge regarding ovarian cancer risk factors and symptoms is presented in Tables 2 and 3.

Regarding risk factors (**Table 2**), the majority of respondents were not familiar or only slightly familiar with key ovarian cancer risk factors. Aging was identified as a risk factor by 81 respondents who were slightly familiar, while only 6 were very familiar. Postmenopausal status was recognized as a risk factor by 63 respondents as slightly familiar and only 3 as very familiar. Similarly, family history of ovarian cancer was noted by 73 respondents as slightly familiar and only 4 as very familiar. However, the study also revealed some misconceptions, as non-risk factors such as "had a benign ovarian cyst" and "had an abnormal pap smear" had relatively higher familiarity rates, with 23 and 11 respondents reporting being very familiar, respectively. This suggests a gap in distinguishing risk and non-risk factors. For symptoms of ovarian cancer (**Table 3**), the results showed a similar trend of limited familiarity. The most frequently recognized symptom was pelvic or abdominal pain, with 89 respondents indicating familiarity, followed by 74 respondents indicating lack of familiarity. However, symptoms such as loss of appetite, fatigue, and urinary urgency were less frequently recognized, with the majority of respondents indicating slight familiarity or no familiarity at all. Non-symptoms like chest pain and continuous fever were

erroneously identified as familiar by some respondents, with 13 and 21 respondents indicating very familiar, respectively. This observation underscores the potential for misconceptions regarding the symptoms of ovarian cancer. The findings of this study indicate a paucity of knowledge and some confusion among respondents in identifying the correct risk factors and symptoms of ovarian cancer. These findings highlight the necessity for targeted educational interventions to address these knowledge gaps.

Table 2. The Frequency of Respondents' Choices Regarding Ovarian Cancer Risk Factors

Risk Factors of Ovarian Cancer	Very Familiar	Familiar	Slightly Familiar	Not Familiar
1.Aging.	6	41	81	21
2.Postmenopausal.	3	29	63	25
3.Received hormonal replacement therapy.	4	32	86	11
4.Had breast cancer	3	56	98	50
5.Family history of ovarian cancer	4	26	73	19
6.Body Mass Index >25kg/m ²	5	13	68	10
Non-Risk Factors of Ovarian Cancer	Very Familiar	Familiar	Slightly Familiar	Not Familiar
7.Had abnormal pap smear.	11	49	93	27
8.Had benign ovarian cyst.	23	86	97	33
9.Had successive pregnancy	9	32	79	43
10.Breastfeed	13	31	66	39
11.Took contraceptive pills	19	42	63	46

Table 3. The Frequency of Respondents' Choices Regarding Ovarian Cancer Symptoms

Symptoms of Ovarian Cancer	Very Familiar	Familiar	Slightly Familiar	Not Familiar
1.Pelvic and/or abdominal pain.	8	89	57	74
2.Pelvic and/or abdominal distension/ persistent bloating/ feeling of fullness.	2	97	31	59
3.Loss of appetite/ difficulty in eating/ early satiety.	2	62	28	36
4.Ongoing fatigue/tiredness.	4	84	33	51
5.Increased urinary urgency/ frequency and/or burning sensation.	4	73	30	30
6.Bleeding after menopausal.	11	59	25	42
7.Change in bowel habit.	1	44	19	26
8.Unexplained weight gain/loss.	6	69	34	33
Non-Symptoms of Ovarian Cancer	Very Familiar	Familiar	Slightly Familiar	Not Familiar
9.Chest Pain.	13	22	36	29
10.Continuous fever.	21	35	45	36

Association between Socio Demographic Characteristics and Knowledge on Ovarian Cancer Symptoms and Risk Factor

Tables 4 and 5 present the associations between socio-demographic characteristics and participants' knowledge of ovarian cancer risk factors and symptoms.

Regarding knowledge of ovarian cancer risk factors (Table 4), significant associations were observed with the highest level of education ($\chi^2 = 0.009$, $p = 0.003$) and description of hometown ($\chi^2 = 0.006$, $p = 0.003$). These findings suggest that participants with

higher educational attainment and those residing in urban areas were more likely to exhibit superior knowledge of ovarian cancer risk factors. For knowledge of ovarian cancer symptoms (Table 5), significant associations were also identified with the highest level of education ($\chi^2 = 0.022$, $p = 0.045$) and description of hometown ($\chi^2 = 0.036$, $p = 0.003$). Consistent with the findings concerning risk factors, these results indicate that participants with higher educational attainment and those residing in urban areas exhibited greater knowledge of ovarian cancer symptoms. The findings underscore the pivotal role of education and urban residency in enhancing knowledge of ovarian cancer, underscoring the necessity for targeted awareness programs in rural areas and among individuals with lower educational attainment.

Table 4. Association Between Socio Demographic with level of Knowledge of the Participants About Ovarian Cancer Risk Factors

Variable	Knowledge on Risk Factors of Ovarian Cancer	
Age	$\chi^2 = 1.069$	$p = 0.083$
Race	$\chi^2 = 4.077$	$p = 0.061$
Marital Status	$\chi^2 = 2.101$	$p = 0.074$
Highest Level of Education	$\chi^2 = 0.009$	$p = 0.003$
Description of Hometown	$\chi^2 = 0.006$	$p = 0.003^{**}$
Familiarity with Risk Factors of Ovarian Cancer	$\chi^2 = 2.092$	$p = 0.070$

** is significant when $p < 0.05$

Table 5. Association Between Socio Demographic with Level of Knowledge of the Participants about Ovarian Cancer Symptoms

Variable	Knowledge on Symptoms of Ovarian Cancer	
Age	$\chi^2 = 0.442$	$p = 0.092$
Race	$\chi^2 = 0.029$	$p = 0.056$
Marital Status	$\chi^2 = 1.008$	$p = 0.082$
Highest Level of Education	$\chi^2 = 0.022$	$p = 0.045^{**}$
Description of Hometown	$\chi^2 = 0.036$	$p = 0.003^{**}$
Familiarity with Symptoms of	$\chi^2 = 0.079$	$p = 0.051$

** is significant when $p < 0.05$

Discussion

This study evaluated the awareness of ovarian cancer risk factors and symptoms among Iraqi women residing in Baghdad. The findings indicated notable deficiencies in knowledge and a substantial correlation with socio-demographic variables, particularly educational attainment and urban dwelling. These observations are of paramount importance in addressing the obstacles to early detection and prompt diagnosis, which are crucial for enhancing survival outcomes for ovarian cancer patients.

Knowledge of Risk Factors

The findings indicated a deficient comprehension of well-established ovarian cancer risk factors, including aging, family history, and postmenopausal status. The majority of respondents exhibited minimal familiarity with these factors, suggesting a paucity of fundamental knowledge. This observation is consistent with the findings from studies conducted in other low- and middle-income countries, where analogous

deficiencies in understanding have been documented (Brett M. et al., 2017; Giede et al., 2005). This dearth of knowledge can impede women's timely seeking of medical advice, as they may not fully recognize their own vulnerability to the disease (Menon et al., 2014). Notably, misconceptions were observed concerning non-risk factors, with some participants erroneously perceiving benign ovarian cysts and abnormal Pap smears as risk factors. This underscores the potential for confusion surrounding the etiology of ovarian cancer, a situation that may be further compounded by inadequate public health education and access to reliable information. Interventions such as community-based educational programs and healthcare provider consultations can facilitate the accurate self-assessment of risk. Cultural beliefs and media portrayals have been identified as contributing factors in the perpetuation of misconceptions. For instance, a paucity of accurate health information in widely consumed media can lead to overgeneralizations about non-risk factors, such as benign ovarian cysts. To address these issues, the implementation of culturally tailored educational initiatives, such as community theater, interactive radio programs, and health fairs, has been proposed as a strategy to correct these misconceptions. Collaborating with local influencers and trusted community leaders could also facilitate the reshaping of perceptions and the improvement of knowledge retention (Nutbeam, 2000).

Knowledge of Symptoms

The study revealed a paucity of awareness regarding ovarian cancer symptoms, with only a minority of participants able to recognize key symptoms such as pelvic or abdominal pain, bloating, and postmenopausal bleeding. This finding is consistent with global evidence that suggests ovarian cancer symptoms are often misunderstood or mistaken for less serious conditions (Nutbeam, 2000). The nonspecificity and ambiguity of these symptoms further complicate efforts to achieve early detection, as women may hesitate to seek medical attention or be initially misdiagnosed (Shah & Siores, 2010). Of particular concern are instances where non-symptoms, such as chest pain and continuous fever, are mistakenly interpreted as indications of ovarian cancer. Such misinterpretations have the potential to divert attention from the actual signs of the disease, resulting in diagnostic delays. Educational interventions that focus on distinguishing ovarian cancer symptoms from non-symptoms are crucial to improving early detection efforts.

Influence of Socio-Demographic Factors

Education level emerged as a significant predictor of knowledge concerning both risk factors and symptoms. Women with higher levels of education exhibited considerably superior knowledge, a finding

that aligns with prior studies underscoring the pivotal role of education in enhancing health literacy (Brewer et al., 2007). Education not only endows individuals with the capacity to comprehend health-related information but also furnishes them with the tools to make informed decisions regarding their health, including the identification of symptoms and the timely seeking of medical care. These findings underscore the need for targeted interventions leveraging educational institutions and urban centers as hubs for disseminating ovarian cancer awareness. Public health campaigns could focus on integrating cancer education into school curricula and leveraging urban healthcare facilities to host workshops and seminars. Additionally, partnerships with local media and community organizations could help extend the reach of these initiatives to rural and underserved areas. Urban residency was another significant factor associated with higher knowledge levels. This finding highlights the disparities in access to health information and resources between urban and rural populations (Glasgow et al., 2004). Urban residents generally have better access to healthcare facilities, health education programs, and media campaigns, which may contribute to their enhanced awareness. In contrast, women in rural areas often face barriers such as limited healthcare infrastructure, lower literacy rates, and cultural constraints, all of which hinder their access to accurate health information.

Implications for Public Health

The findings of this study carry significant implications for public health strategies aimed at improving ovarian cancer outcomes in Iraq. The implementation of targeted educational campaigns, meticulously tailored to the specific needs of women in rural areas and those with lower educational attainment, is imperative. Community-based interventions, such as the engagement of local leaders and health workers, can serve to bridge the knowledge gap in underserved areas. The incorporation of ovarian cancer education into primary healthcare services and routine gynecological visits has the potential to enhance awareness among women at risk.

Additionally, leveraging mass media, including radio and television, can help disseminate accurate information about ovarian cancer to a broader audience. These approaches have proven effective in similar contexts and could be adapted to the Iraqi setting (Wakefield et al., 2010). Efforts to address misconceptions about risk factors and symptoms should focus on clear, culturally appropriate messaging to ensure that the information resonates with the target population. The development of tailored health campaigns that explicitly address these misconceptions, focusing on distinguishing true risk factors and symptoms from non-risk factors and non-symptoms, is

recommended (Kippen et al., 2017). Community workshops, digital media content, and health education sessions conducted by trained professionals could be designed to correct misunderstandings and reinforce accurate knowledge. The incorporation of patient narratives and culturally sensitive materials has been demonstrated to enhance engagement and retention of information (Hassan et al., 2022; Shannon et al., 2018).

Limitations and Future Directions

This study offers significant insights; however, it is imperative to acknowledge its limitations. The use of convenience sampling may restrict the study's generalizability to the entire Iraqi female population. Additionally, self-reported data are susceptible to recall and social desirability biases, which may have influenced the responses. Future research should employ more representative sampling methods and explore additional regions in Iraq to provide a comprehensive understanding of knowledge levels. Longitudinal studies could also assess the impact of educational interventions on improving knowledge and early detection rates.

Conclusion

This study underscores notable shortcomings in the awareness of ovarian cancer risk factors and symptoms among Iraqi women in Baghdad, highlighting the necessity for targeted educational initiatives. Higher education levels and urban residency were found to be positively correlated with enhanced knowledge, underscoring the importance of tailored educational strategies. By addressing these knowledge gaps, public health initiatives can empower women with the knowledge necessary for early detection and prompt treatment, thereby enhancing outcomes for ovarian cancer in Iraq. To address these deficiencies, health educators must prioritize the development of targeted training programs for healthcare providers. These programs should aim to enhance healthcare providers' capacity to educate women about ovarian cancer risk factors and symptoms during routine visits. Furthermore, policymakers should consider allocating resources to support nationwide awareness campaigns and establish mobile health units to reach remote areas. Additionally, integrating ovarian cancer education into existing maternal and child health programs may enhance its visibility and ensure widespread dissemination.

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