Research article

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Prevalence of Malnutrition and Nutritional Knowledge Among Gynecologic Cancer Patients at Hung Vuong Hospital: A Cross-Sectional Study

Phuong Thi Phan[1], Trang Thuy Thi Hoang[2], Chau Giang Huynh[1], Lan Thuy Thi Tran[1], Qui Ngoc Thi Nguyen[1], Oanh Ngoc Khuu[1], Sang Kim Thi Huynh[1]

[1] Department of Gynecologic Oncology Department, Hung Vuong Hospital, Ho Chi Minh City, Vietnam

[2] Hung Vuong Hospital, Ho Chi Minh City, Vietnam

Abstract

Background/Objectives: Malnutrition is a major concern among cancer patients, influencing treatment outcomes and overall survival. Limited research has been conducted on the nutritional status and nutritional knowledge of gynecologic cancer patients in Vietnam. This study aims to determine the prevalence of malnutrition, evaluate patients' nutritional knowledge, and analyze the association between malnutrition and epidemiological, clinical, and nutritional factors among gynecologic cancer patients at Hung Vuong Hospital.

Methods: This was a cross-sectional study conducted at Hung Vuong Hospital in Vietnam. We recruited 319 female patients diagnosed with gynecologic cancer (ovarian, cervical, endometrial, or breast cancer). Data collection involved structured interviews, medical record reviews, and anthropometric assessments. We used the Body Mass Index (BMI) classification to evaluate malnutrition and a validated questionnaire to investigate nutritional knowledge. Statistical analysis included Chi-square tests and logistic regression models to identify factors associated with malnutrition and nutritional knowledge.

Results: The prevalence of malnutrition (BMI <18.5 kg/m²) among participants was 7.8%, with younger patients (<50 years) being at higher risk (OR = 2.49, CI = 1.06–5.85, p = 0.036). Ovarian cancer patients had the highest malnutrition prevalence (10.5%), while endometrial cancer patients had the lowest (4.4%). Surprisingly, radiotherapy was associated with a lower risk of malnutrition (OR = 0.07, CI = 0.01–0.39, p = 0.007); however, this finding may be influenced by confounding factors and requires further investigation. Nearly 58.3% of participants demonstrated adequate nutritional knowledge, but misconceptions remained, particularly regarding excessive nutrition and its effects on tumor growth. Higher education levels and urban residency were significantly associated with better nutritional knowledge (p = 0.033 and p = 0.042, respectively).

Conclusions: Malnutrition remains a problem among gynecologic cancer patients, particularly among younger individuals. While overall nutritional knowledge was moderate, gaps in comprehending dietary results on cancer advances emphasize the requirement for improved patient education programs. These findings underscore the importance of early nutritional screening, targeted education, and integration of dietary interventions into cancer treatment to enhance patient outcomes.

Keywords: Malnutrition, Gynecologic Cancer, Nutritional Knowledge, Body Mass Index, Cancer Treatment, Vietnam

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Author contact:
Chau Giang Huynh
Email: hgchau.ncs18@ump.edu.vn
Phone: 0989617177

1. INTRODUCTION

Malnutrition is a substantial anxiety among cancer patients, adversely impacting treatment outcomes and overall survival. Studies have reported malnutrition prevalence rates ranging from 16.2% to 84.7% in various cancer populations [10];[6]. In Vietnam, a study conducted at K Hospital discovered a malnutrition rate of 17.1% among ovarian cancer patients, with higher rates observed in advanced stages [5].

These results emphasize the critical necessity for comprehensive nutritional assessments in oncology settings. Gynecologic cancers, including ovarian, cervical, and endometrial cancers, pose notable challenges to nutritional status due to tumor location and treatment-related side effects. Malnutrition in these patients can lead to increased treatment toxicity, prolonged hospital stays, and decreased quality of life [11].

Despite the recognized importance of nutrition in cancer care, limited data exist on the nutritional status of gynecologic cancer patients in Vietnam. Nutritional knowledge and awareness among patients are key in managing and preventing malnutrition. A study in Ethiopia displayed that 48.1% of cancer patients undergoing chemotherapy were malnourished, with factors such as food insecurity and poor appetite significantly associated with malnutrition [4].

Understanding patients' nutritional knowledge can inform targeted interventions to improve dietary habits and nutritional outcomes. However, in Vietnam, cultural dietary practices and socioeconomic factors may influence nutritional status and knowledge among cancer patients. Limited research has been conducted to explore these aspects in Vietnamese gynecologic oncology patients. Addressing this gap is essential for developing culturally appropriate nutritional interventions and education programs.

This study aims to assess the prevalence of malnutrition, evaluate nutritional knowledge, and examine the relationships between malnutrition and various demographic and clinical factors among gynecologic cancer patients at Hung Vuong Hospital. The findings will provide valuable insights to inform clinical practice and policy-making, ultimately enhancing patient care and outcomes in this population.

2. MATERIALS AND METHODS

2.1. Procedures and measurements

This descriptive cross-sectional study was conducted at Hung Vuong Hospital from August 2023 to December 2024, focusing on gynecologic cancer patients. The study aimed to assess malnutrition prevalence, nutritional knowledge, and dietary habits among female patients diagnosed with ovarian, cervical, endometrial, or breast cancer and to analyze the association between malnutrition and epidemiological, clinical, and nutritional factors. Data collection involved structured interviews, medical record reviews, and anthropometric assessments. A validated 15-item questionnaire assessed nutritional knowledge [2, 8], covering dietary risks, protective factors, and common misconceptions. Additionally, demographic and clinical data were collected, including age, ethnicity, education level, occupation, cancer type,

time since diagnosis, and treatment modalities (chemotherapy, surgery, radiotherapy).

Nutritional status was evaluated using Body Mass Index (BMI), with patients categorized as underweight (<18.5 kg/m²), normal weight (18.5–24.99 kg/m²), overweight (25.0–29.99 kg/m²), or obese (≥30 kg/m²) [1]. Patients were classified into two groups based on nutritional knowledge scores: adequate (≥60%) and inadequate (<60%) [2]. To ensure study accuracy, specific inclusion and exclusion criteria were applied, recruiting female patients aged 18 or older undergoing cancer treatment while excluding those with severe cognitive impairment, communication difficulties, or comorbidities affecting nutritional status. The sample size of 319 participants was calculated using a prevalence-based formula, with malnutrition prevalence estimated at 29.4% from a previous study [3]. Trained researchers conducted structured face-to-face interviews in Vietnamese, ensuring confidentiality and voluntary participation. Data were collected via anonymous questionnaires. The survey was pilot-tested on 10 patients before full implementation to enhance clarity and reliability.

2.2. Ethical approval

The Ethics Committee of Hung Vuong Hospital approved the study before patient recruitment (No. 1850/HĐĐĐ-BVHV, 15th June 2023), ensuring compliance with ethical standards. Written informed consent was obtained from all participants, emphasizing voluntary participation and the right to withdraw without affecting their medical care. All collected data were securely stored and anonymized to protect privacy, maintaining strict confidentiality throughout the study.

2.3. Statistical analysis

We performed statistical analyses using SPSS version 26.0 to ensure precise and reliable data interpretation. We summarized categorical variables as frequencies and percentages and expressed continuous variables as mean ± standard deviation (SD). To compare malnutrition rates across different demographic and clinical groups, we applied the Chi-square test (χ^2). Additionally, we conducted binary logistic regression to estimate odds ratios (OR) with 95% confidence intervals (CI) for malnutrition-related factors. To identify independent predictors of malnutrition, we performed multivariate logistic regression, adjusting for potential confounders. Characteristics with a P value of <0.2 were further analyzed, and <.05 was used as the significance level.

3. RESULTS

3.1. Participant Characteristics

A total of 319 gynecologic cancer patients participated in the study. Most participants (60.8%) were 50 or older, and most (93.1%) belonged to the Kinh ethnicity. Regarding place of residence, 74.3% lived in urban areas, while 25.7% resided in rural areas. Regarding education, 54.9% had a below-high school education, 27.0% completed high school, and 18.1% attained a college or university degree. For occupation, 32.6% worked as freelancers, followed by office workers (24.8%), those in other occupations (26.9%), and farmers (15.7%). BMI classification showed that 7.8% of patients were underweight, while 30.7% were overweight or obese. Among cancer types,

ovarian cancer was the most common (35.7%), followed by endometrial cancer (28.2%), breast cancer (23.5%), and cervical cancer (12.6%). Regarding disease duration, 40.4% had been diagnosed for 6 months to 1 year, while 39.5% had been diagnosed for over a year. Regarding treatment status, 69.3% were undergoing or waiting for surgery, 26.3% received surgery plus chemotherapy, and 2.5% were on chemotherapy alone (**Table 1**).

Table 1. Baseline Characteristics and Clinical Profile of Study Participants (n = 319)

Characteristic	Frequency (n)	Percentage (%)
Age Group		
<50 years	125	39.2
≥50 years	194	60.8
Ethnicity		
Kinh	297	93.1
Other Ethnic Groups	22	6.9
Place of Residence		
Rural	82	25.7
Urban	237	74.3
Educational Level		
Below High School	175	54.9
High School	86	27.0
College/ University	58	18.1
Occupation		
Worker/ Office Staff	79	24.8
Farmer	50	15.7
Freelancer	104	32.6
Other	86	26.9
BMI Classification (kg/m²)		
Underweight (<18.5)	25	7.8
Normal weight (18.5–24.99)	196	61.4
Overweight (25.0–29.99)	86	26.9
Obese (≥30)	12	3.8
Cancer Type		
Breast Cancer	75	23.5
Ovarian Cancer	114	35.7
Cervical Cancer	40	12.6
Endometrial Cancer	90	28.2
Time Since Diagnosis		
<6 months	64	20.1
6 months - 1 year	129	40.4
>1 year	126	39.5
Current Treatment		
Chemotherapy	8	2.5
Surgery/ Waiting for Surgery	221	69.3
Surgery + Chemotherapy	84	26.3
Surgery + Radiotherapy	6	1.9

3.2. Nutritional Knowledge

Most patients demonstrated a good understanding of basic nutritional principles related to cancer. Most (85.9%) correctly identified that eating more vegetables reduces cancer risk, while 90.3% recognized that processed and fried foods increase cancer risk. Additionally, 93.4% acknowledged smoking as a cancer risk factor, and 88.4% understood that poor nutrition negatively affects cancer treatment response. However, there were notable gaps in knowledge, as only 29.2% believed that excessive nutrition could negatively impact treatment, and just

44.2% recognized that proper nutrition could slow tumor growth (**Table 2**).

Further misconceptions were observed regarding the role of breakfast protein intake (61.1% correct responses) and the impact of processed foods like alcohol and coffee (82.8% correct responses). While 86.2% of participants agreed that malnutrition shortens survival time, and 77.7% acknowledged its role in worsening gastric ulcers, 41.7% of patients still had poor overall nutritional knowledge, with only 58.3% demonstrating good understanding. These findings indicate a moderate level of nutritional knowledges, with key gaps in understanding the effects of excessive nutrition and its influence on tumor growth, highlighting the need for targeted nutritional education (**Table 2**).

Table 2: Nutritional Knowledge

Nutritional Knowledge Statement	**Correct (%)**	**Incorrect (%)**
Eating more vegetables reduces cancer risk	85.9	14.1
Eating processed/fried foods increases cancer risk	90.3	9.7
Long-term smoking increases cancer risk	93.4	6.6
Poor nutrition affects cancer treatment response	88.4	11.6
Excessive nutrition negatively affects treatment	29.2	70.8
Proper nutrition slows tumor growth	44.2	55.8
Malnutrition shortens survival time	86.2	13.8
Malnutrition worsens gastric ulcers	77.7	22.3
High-salt foods increase cancer risk	86.8	13.2
Raw/undercooked foods increase cancer risk	86.2	13.8
Should increase breakfast protein intake	61.1	38.9
Processed foods (alcohol, coffee, canned foods) increase risk	82.8	17.2
Avoid carbonated drinks during treatment	89.3	10.7
Expired/moldy foods increase cancer risk	97.2	2.8
Preservative-rich foods increase cancer risk	93.1	6.9
Overall Nutritional Knowledge Score	**58.3% (Good)**	**41.7% (Poor)**

3.3. Association Between Malnutrition and Epidemiological, Clinical, and Nutritional Factors

Patients under 50 years old had a significantly higher risk of malnutrition (12.0%) compared to those aged ≥50 years (5.1%) (OR = 2.51, p = 0.031). However, malnutrition rates did not significantly differ based on place of residence (urban vs. rural) or education level. Among cancer types, ovarian cancer patients had the highest malnutrition prevalence (10.5%), while endometrial cancer patients had the lowest (4.4%), though this association was not statistically significant. Patients undergoing radiotherapy had a significantly higher risk of malnutrition (50.0%) compared to those who did not receive radiotherapy (7.0%, OR = 0.07, p = 0.002). In contrast, no significant associations existed between malnutrition and chemotherapy, surgery, economic status, or nutritional knowledge. These findings highlight age and radiotherapy as key risk factors for malnutrition among gynecologic cancer patients (**Table 3**).

Table 3. Association Between Malnutrition and Epidemiological, Clinical, and Nutritional Factors

Variable	Malnourished (%)	Not Malnourished (%)	OR (95% CI)	p-value
Age Group				
≥50 years	10 (5.1%)	184 (94.9%)	1.00	**0.031**
<50 years	12 (12.0%)	110 (88.0%)	2.51 (1.08–5.78)	
Place of Residence				
Rural	7 (7.3%)	92 (92.7%)	1.00	0.839
Urban	9 (8.0%)	218 (92.0%)	0.91 (0.35–2.35)	
Education Level				
Below High School	9 (5.1%)	166 (94.9%)	1.00	
High School	10 (9.5%)	97 (90.5%)	0.94 (0.88–1.01)	0.132
College/University	12 (12.1%)	87 (87.9%)	0.93 (0.86–1.01)	0.088
Time Since Diagnosis				
<6 months	4 (6.3%)	60 (93.7%)	1.00	
6 months – 1 year	12 (9.3%)	117 (90.7%)	0.96 (0.89–1.05)	0.459
>1 year	9 (7.1%)	117 (92.9%)	0.99 (0.83–1.07)	0.829
Cancer Type				
Ovarian Cancer	12 (10.5%)	102 (89.5%)	1.00	
Cervical Cancer	4 (10.0%)	36 (90.0%)	1.00 (0.91–1.11)	0.915
Endometrial Cancer	4 (4.4%)	86 (95.6%)	1.06 (0.98–1.14)	0.109
Breast Cancer	5 (6.7%)	70 (93.3%)	1.04 (0.96–1.12)	0.335
Treatment Method				
Chemotherapy	8 (8.5%)	86 (91.5%)	1.00	0.772
No Chemotherapy	17 (7.6%)	208 (92.4%)	0.87 (0.36–2.11)	
Surgery	23 (7.7%)	276 (92.3%)	1.00	0.711
No Surgery	2 (10.0%)	18 (90.0%)	1.33 (0.29–6.11)	
Radiotherapy	3 (50.0%)	3 (50.0%)	1.00	**0.002**
No Radiotherapy	22 (7.0%)	291 (93.0%)	0.07 (0.01–0.39)	
Economic Status				
Poor/Low-income	2 (4.2%)	46 (95.8%)	1.00	0.315
Middle/Upper-income	23 (8.5%)	248 (91.5%)	1.23 (0.48–3.95)	
Nutritional Knowledge				
Adequate Knowledge	16 (8.6%)	170 (91.4%)	1.00	0.398
Inadequate Knowledge	9 (6.1%)	124 (93.9%)	0.68 (0.28–1.65)	
Nutritional Knowledge of Cancer Diet				
Yes	12 (8.4%)	131 (91.6%)	1.00	0.742
No	13 (7.4%)	162 (92.6%)	0.87 (0.36–2.08)	

3.4. Multivariate Analysis of Factors Independently Associated with Malnutrition

The multivariate logistic regression analysis confirmed key risk factors for malnutrition among gynecologic cancer patients. Patients under 50 had a significantly higher risk of malnutrition (OR = 2.49, CI = 1.06–5.85, p = 0.036), reinforcing the association identified in the univariate analysis. Interestingly, radiotherapy was linked to a lower risk of malnutrition (OR = 0.07, CI = 0.01–0.39, p = 0.007). These findings suggest that younger patients are more vulnerable to malnutrition, while radiotherapy may contribute to weight retention or other nutritional effects, warranting further investigation (**Table 4**).

Table 4. Multivariate Analysis of Factors Independently Associated with Malnutrition

Variable	Adjusted OR (95% CI)	p-value
Age group (<50 years vs. ≥50 years)	2.49 (1.06–5.85)	**0.036**
Radiotherapy (Yes vs. No)	0.07 (0.01–0.39)	**0.007**

3.5. Association Between Nutritional Knowledge and Sociodemographic Characteristics

The analysis explored the relationships between nutritional knowledge and sociodemographic factors among gynecologic cancer patients. Urban residents demonstrated significantly better nutritional knowledge than rural residents (OR = 1.68, CI = 1.02–2.81, p = 0.042), suggesting that access to information and healthcare resources may play a role. Higher education levels were strongly associated with better nutritional knowledge (p = 0.033), with patients holding a college or university degree being 2.25 (CI = 1.24–4.07) times more likely to have good dietary understanding than those with below-high school education. Conversely, farmers had significantly lower nutritional knowledge than non-farm workers (OR = 0.47, CI = 0.24–0.92, p = 0.019), indicating potential gaps in knowledges within agricultural communities. However, BMI, knowledges of cancer diets, and age were not significantly linked to nutritional knowledge, suggesting that other factors, such as socioeconomic status and information accessibility, may have a more substantial influence (**Table 5**).

Table 5. Multivariate Analysis of Association Between Nutritional Knowledge and Sociodemographic Characteristics (n = 319)

Variable	Adequate Knowledge (%)	Inadequate Knowledge (%)	OR (95% CI)	p-value
Age group				
<50 years	70 (56.0%)	55 (44.0%)	1.00	0.502
≥50 years	79 (59.4%)	54 (40.6%)	-	-
Place of Residence				
Rural	40 (48.8%)	42 (51.2%)	1.00	**0.042**
Urban	109 (61.8%)	61 (38.2%)	1.68 (1.02-2.81)	-
Ethnicity				
Kinh	136 (59.1%)	94 (40.9%)	1.00	0.253
Other	13 (46.4%)	15 (53.6%)	0.59 (0.25-1.41)	-

Education Level				
Below High School	30 (44.8%)	37 (55.2%)	1.00	**0.033**
High School	49 (59.8%)	33 (40.2%)	1.94 (1.05-3.61)	-
College/University	70 (63.1%)	41 (36.9%)	2.25 (1.24-4.07)	-
Occupation				
Non-farm Worker	103 (62.0%)	63 (38.0%)	1.00	**0.019**
Farmer	19 (43.2%)	25 (56.8%)	0.47 (0.24-0.92)	-
Other	27 (50.9%)	26 (49.1%)	0.64 (0.34-1.20)	-
BMI				
<18.5 kg/m²	5 (35.7%)	9 (64.3%)	1.00	0.549
≥18.5 kg/m²	176 (57.7%)	129 (42.3%)	0.39 (0.13-1.15)	-
Nutritional Knowledge of Cancer Diet				
Yes	72 (59.5%)	49 (40.5%)	1.00	0.745
No	109 (57.1%)	82 (42.9%)	0.93 (0.59-1.45)	-

4. DISCUSSION

Malnutrition is a prevailing anxiety among cancer patients, significantly impacting treatment outcomes and overall survival. In our study, we observed a malnutrition rate of 7.8% among gynecologic cancer patients at Hung Vuong Hospital, notably lower than rates reported in other studies, which range from 16.2% to 84.7% in various cancer populations [6]. Similarly, research at Hanoi Obstetrics and Gynecology Hospital reported a 4.3% prevalence of chronic energy deficiency among gynecologic cancer patients based on BMI classification, with 17.2% being overweight or obese [5]. The relatively lower prevalence observed in our study may be attributed to several factors. Firstly, most of our patients (93.1%) were of Kinh ethnicity and resided in urban areas (74.3%), potentially indicating better access to healthcare services and nutritional resources. Additionally, 45.1% of participants had attained at least a high school education, which may correlate with increased health literacy and proactive health behaviors, including nutritional knowledges.

Our study found that younger patients (<50 years) had a higher risk of malnutrition (OR = 2.49, p = 0.036), a finding that differs from previous studies, potentially due to demographic or lifestyle factors [10]. For instance, a study in Korea reported that approximately 61% of hospitalized cancer patients were malnourished, with higher prevalence observed in older patients and those with advanced cancer stages. Similarly, research has shown that older patients with cancer are at greater risk of being malnourished compared with younger patients, possibly due to age-related physiological decline and comorbidities. The discrepancy observed in our study may be attributed to cultural or socioeconomic factors unique to our study population, such as differences in dietary habits, healthcare access, or social support systems, warranting further investigation [9, 12].

Interestingly, our study identified radiotherapy as associated with a lower risk of malnutrition (OR = 0.07, p = 0.007).

This finding is counterintuitive, as radiotherapy is frequently associated with adverse effects that can impair nutritional intake. One possible explanation is that patients receiving radiotherapy in our setting might have had better baseline nutritional status or received more comprehensive supportive care, including nutritional counseling. Besides, Nutritional knowledge among participants was moderate, with 58.3% demonstrating adequate understanding. However, misconceptions were evident, particularly regarding the impact of excessive nutrition on treatment outcomes and tumor growth. Patients with higher education levels and urban residency exhibited better nutritional knowledge, aligning with previous research indicating that education and access to information are critical determinants of health literacy [4].

The association between malnutrition and cancer type was not statistically significant in our study. However, ovarian cancer patients exhibited a higher prevalence of malnutrition (10.5%) compared to those with endometrial cancer (4.4%). This trend aligns with existing literature suggesting that gastrointestinal and gynecologic cancers are more prone to malnutrition due to tumor location and treatment-related side effects. [7]. Our study underscores the importance of early nutritional assessment and intervention, particularly for younger patients and those undergoing treatments traditionally associated with nutritional decline. Implementing targeted nutritional education programs and integrating dietitians into the oncology care team could enhance patient outcomes. Further, longitudinal studies are recommended to explore the causal relationships between demographic factors, treatment modalities, and nutritional status in gynecologic cancer patients.

This study has several limitations. First, it was conducted at a single hospital, which may limit the generalizability of the findings to other settings. Second, malnutrition was assessed using BMI alone, which may not fully capture other indicators of nutritional status, such as muscle mass or biochemical markers. Third, nutritional knowledge was self-reported, raising the possibility of response bias, as participants may have overestimated their understanding. Despite these limitations, the study provides valuable insights into gynecologic cancer patients' nutritional status and knowledge. Future research should incorporate multi-center studies and comprehensive dietary assessments to strengthen the findings.

5. CONCLUSIONS

This study highlights the rate of malnutrition among gynecologic cancer patients at Hung Vuong Hospital, with younger patients being at higher risk. Nutritional knowledge was moderate, with gaps in understanding the impact of excessive nutrition on cancer progression and treatment. Education level and urban residency were positively associated with better nutritional knowledges, emphasizing the need for targeted nutrition education. Radiotherapy was unexpectedly linked to a lower risk of malnutrition, suggesting potential confounding factors that require further investigation. Early nutritional screening and detailed interventions should be integrated into cancer care to improve patient outcomes and quality of life.

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