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Metastasis Breast Cancer and Patients' Knowledge about Medication Safety, Adherence and Prevention: An Empirical Study in Iraq

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Abstract

In Iraq, particularly among women, the prevalence of cancer is notably high. Breast cancer is the least prevalent cancer in females worldwide, accounting for approximately 23 percent of all female cancers. Numerous factors point to an increase in breast cancer, but few have been identified as sufficient drug safety, prevention, and adherence for Iraqi patients with metastatic breast cancer. The format of the investigation was quantitative. To elicit a response, 350 cancer survivors in Iraq have been targeted. Three hundred thirteen questionnaires with appropriate and complete responses were obtained. The analysis of data was conducted using SPSS and AMOS. The results reveal a substantial relationship between patient education and drug safety, prevention, and adherence among Iraqi women with metastatic breast cancer. The study has increased practical and theoretical importance. The study contributes important insights to the expanding literature on pharmaceutical safety, preventative measures, and treatment adherence. Practically, the study is of similar significance since, with the increase in the prevalence of cancer, the only factor that can aid in stopping its rapid spread is adequate disease-related knowledge among patients, which is the central concept of this study.

Keywords:

Cancer, Adherence, Prevention, Medication safety, Patients knowledge.

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Introduction

Cancer is the second leading cause of death, accounting for one out of every six disease-related deaths. According to the World Health Organization, 8.8 million individuals perished from cancer in 2015.[1] After cardiovascular diseases, infectious diseases, and injuries, cancer is the fourth leading cause of death in the Eastern Mediterranean region.[2] In 2008, the average cancer incidence in industrialized nations was over 80 per 100,000 individuals. In comparison, it was less than forty per one hundred thousand persons in emerging economies.[3, 4] According to the ICR, 21,101 new cancer diagnoses were reported in 2012 among an estimated population of 32,500,000; 9,268 cases involved men, and 11,833 involved women.[5]

Breast cancer is the least prevalent disease in females worldwide, accounting for approximately 23 percent of all female cancers[1-4] Following lung cancer (which accounted for 26% of all cancer deaths in women), breast cancer is rated the second leading cause of cancer-related death[6, 7] Breast cancer is the most prevalent disease in Iraq, per Alwan[3] According to the Global Burden of Cancer 2013 report Fitzmaurice *et al.*[1], breast cancer has the highest incidence and mortality rate of all female malignancies. The WHO estimates an increase in breast cancer cases in developing countries, which may be attributable to urbanization, an increase in life expectancy, and the adoption of western lifestyles.[8]

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In 2001, the Iraqi Ministry of Health implemented early breast cancer detection in Alwan *et al*.[9]. Subsequently, other departments and the establishment of the NCRP assisted in their efforts. According to the most recent report by the International Union Against Cancer, Iraq has made significant strides in providing cancer health services to its citizens by expanding its national registry to include the entire population.[10] It is by initiating community campaigns to promote initial recognition, promoting physical activity and tobacco control, and enhancing public access to free cancer diagnosis and treatment facilities.[11] Numerous innovative hubs were built in Baghdad and other provinces to provide residents with improved services and easier access to healthcare. Recent research is being conducted in Iraq to evaluate the " breast cancer screening program" as a result of the development of the NCCP. According to research from 2018[12], Baghdad's breast cancer screening program has a coverage rate between 63% and 77% and a detection rate between 1% and 10%.

Numerous studies of the clinicopathologic characteristics of breast cancer in Iraq have revealed that ethnic variation in the population influences incidence, stage, therapy, and survival.[3, 9, 11, 12] Determining how the characteristics of Iraqi breast cancer patients differ from the overall trends for this disease may therefore serve as a control for improved treatment and early detection. This study intends to collect data on patients seen at the National Center for Cancer throughout the preceding year to determine if their presentations differ from those observed in previous research. Numerous early studies had a narrow focus and paid little attention to alternative data sources. For instance, when a study provided clinical evidence but insufficient data regarding the socio-demographic status of the patient, or vice versa.

Using the empirical study approach, this quantitative study will evaluate the effects of information on drug safety adherence and disease prevention by assessing the knowledge of Iraqi cancer patients with metastatic cancer at various stages. The following objectives are derived for determining metastatic cancer patients, the majority of whom are female.

- To determine the impact of patient knowledge on medication safety in metastatic breast cancer patients in Iraq.
- To investigate the impact of patient knowledge on adherence in metastatic breast cancer patients in Iraq.
- To explore the impact of patient knowledge on prevention in metastatic breast cancer patients in Iraq.

Our quantitative investigation focuses on determining the effect of metastatic patients' drug knowledge on their safety throughout treatment. The other objective of our research is to determine how knowledge of patient suffering affects adherence among female metastatic breast cancer patients in Iraq. This study also emphasizes the significance of medical education for females with metastatic cancer in preventing disease, aiding recovery, and selecting the most appropriate treatment.

Literature Review

Patient's knowledge of medication safety in metastasis breast cancer patients

Research indicates that patients' engagement and involvement in their treatment reduces the risk that they may be adversely affected by their medication, therapy, and care during their illness, especially for chronic conditions such as cancer. Patients are obliged to provide information about their disease, drugs, and treatment to enhance their decision-making, involvement, and safety surrounding their treatment. It is suggested that patients inquire about the medication and treatment they receive to ensure the drug's safety and therapy and their health.[13] However, there is a widespread lack of understanding and awareness regarding therapy and medicine among patients, particularly cancer patients. Patients more knowledgeable about their therapy and medications collaborate with their physicians to guarantee their safety, contributing to improved treatment outcomes. According to research, cancer patients who are aware of their treatment have greater confidence in it, cooperate with their physicians, and exercise caution, resulting in better treatment outcomes.[14, 15] The WHO world alliance also stressed the significance of patient safety and declared the significance of the patient's participation in enhancing safety in healthcare systems globally. Lack of patient understanding influences their therapy and medication intake. Patients with cancer who are unaware of their comorbidities, illnesses, drugs, and how they work may be reluctant to take their meds.[14, 16, 17] Occasionally, they take their medications incorrectly, negatively compromising their health.[18] It thus influences their decision-making, resulting in inadequate pharmaceutical safety. Knowledge-based precautions informed judgments, and physician participation can considerably improve safety.[14, 17, 19] However, most studies in this area were conducted qualitatively and did not directly examine the relationship between patient knowledge and pharmaceutical safety. Therefore, additional research analyzing direct relationships is necessary.

H1: *Patients' knowledge significantly impacts medication safety in metastatic cancer patients.*

Patient's knowledge and adherence in metastasis breast cancer patients

The effect of patients' knowledge and information regarding their treatment on their adherence to treatment has been investigated. The findings show that individuals with a greater understanding of their ailment are more likely to adhere to their prescribed medications, physical exercise requirements, and nutritional recommendations. Therefore, when patients are told about their disease and treatment effects, they adhere to the suggested treatment in various actions.[20-22] Patients knowledgeable about their disease and its characteristics, prescription medications, and treatment modalities are more likely to adhere to their meds and treatments. In addition, when patients are informed of the necessity of the medications, they establish positive

expectations and behavior regarding the therapy, which influences their medication intake behavior and overall treatment adherence. Studies indicate that patients with chronic illnesses who begin to take new medications related to their disease sometimes stop taking them and require additional information regarding the importance of medication intake and the adverse effects of stopping medication intake, particularly for long-term therapies designed to treat persistent illnesses.[23] The research found that breast cancer patients knowledgeable about their treatment are more likely to be actively involved in their treatment and medication decisions. They thus have a positive perception of the effects of their treatment and have greater faith in the treatment's ability to cure them. These factors affect patients' adherence to recommended medications and treatments.[24] Patients with cancer are not adequately informed about their treatments' dangers and side effects, resulting in poor outcomes and decreased medication intake. If people are told about this, risks can be successfully handled when adverse effects occur.[25] Thus, informed breast cancer patients exhibit greater pleasure and adherence.[26]

H2: *Patient knowledge significantly impacts adherence in metastatic cancer patients.*

Patient's knowledge and prevention in metastasis breast cancer patients

When patients are educated about their illnesses, they take preventative actions. According to research on cancer patients' knowledge and participation in treatment and prevention, their expertise and information influence their involvement in treatment and prevention. Awareness of breast cancer, routine mammography screening, and breast self-examinations have been associated with earlier decisions to seek professional care and earlier breast cancer stages at early assessment. Greater levels of knowledge have also been associated with increased engagement in the treatment process and improved outcomes. According to research, women who utilize the Internet, read health periodicals, and have more in-depth discussions with their doctors about breast cancer are more informed. Consequently, these women take numerous precautions to avoid and manage breast cancer.[27, 28]

H3: *Patient knowledge significantly impacts prevention in metastatic breast cancer patients.*

Methodology

Methods and data collection process

The design of the investigation was quantitative and deductive. The method was selected because it provides an impartial investigation of patients' knowledge of medication safety, adherence, prevention, and metastatic breast cancer. The information was collected and then disseminated using standardized surveys via the Internet and direct distribution. The questionnaires contained age and education demographic questions. Before the study began, all participants gave written consent and were promised that their information would remain confidential. To comply with the ethical requirement of confidentiality, the researcher required no information that could be used to identify the participants.

Sample

This study was conducted on Iraqi women using a quantitative cross-sectional design. The data was gathered from 350 Iraqi breast cancer survivors. The rate of response was 89.4% (313/350)

Sample Size

While Kline[29] believes that a sample size of 200 or more is adequate for applying SEM, some researchers have recommended sample sizes between 250 and 350 for more accurate results.[30] The model utilized in this study is applicable in both cases. The sample size for this study was 314.

Patient's Knowledge

We utilized a seven-item measure developed by Lee[31] to evaluate the PK behavior of the patients. Patients were asked to rate how they share or disseminate knowledge on a five-point scale (1=strongly disagree; 5=highly agree). Seven items were utilized for the patient's ability.

Medical safety

To evaluate the patient's medical safety, we altered six items from Neal and Griffin[32]. Compliance and safety participation were the two factors of the scale used in our study. There are provided examples. The workforce was asked to rate their MS toward patients on a five-point scale (1=strongly disagree; 5=strongly agree). Due to the close connections between the two features, it was challenging to distinguish between them. Eight things were employed for medical safety.

Adherence

Self-reported treatment was examined using a previously translated and validated version of the MMAS-8. MMAS-8 is user-friendly, practical, and inexpensive in healthcare settings. The MMSA-8 was developed to identify behaviors and obstacles associated with chronic medication management.[33, 34] In this study, five measures of conformity were used.

Prevention

The proportion of individuals who were aware of, actively engaged in, or planned to engage in the 13 recommended breast cancer prevention behaviors[35] 6 items for prevention were used.

Statistical Analysis

AMOS was used to evaluate the direct and indirect relationships between the variables. To examine the demographics of the respondents, the researcher utilized SPSS. The second phase consisted of doing descriptive analysis to examine the normality of the data. Using EFA, the researcher assessed the sample's variability and appropriateness.

Ethical considerations

The research was designed with ethical norms and criteria in mind. To protect research participants' rights, dignity, and well-being, all studies involving human subjects must incorporate ethical considerations. The participants' information was kept private through anonymization, and no personal information was collected.

Results

Demographic characteristics of respondents

This study's demographic features were studied according to the age and level of education of breast cancer survivors in Iraq. From the 350 questionnaires, 313 were returned as complete, sufficient, and data-processing-ready. The results suggested a change in the demographic characteristics of the respondents. The education levels of these women also varied, with 70, 151, 80, and 12 women belonging to intermediate, bachelor's, and master's programs, respectively. 96 women were less than 25 years of age, 130 were between 26 and 30 years of age, 72 were between 31 and 35, and 15 were older than 35.

Descriptive Summary

The age and level of education of breast cancer survivors in Iraq were used to examine the demographic characteristics of this study. From 350 questionnaires distributed, 313 were returned as complete, adequate, and data-processing-ready. The results revealed a shift in the respondents' demographic features. The educational levels of these women varied as well, with 70, 151, 80, and 12 women enrolled in intermediate, bachelor's, and master's programs. 96 women were younger than 25, 130 were between the ages of 26 and 30, 72 were between the ages of 31 and 35, and 15 were older than 35.

Table 1: Descriptive characteristics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
PK	313	1.00	5.00	3.2437	1.04513	-.333	.138
MS	313	1.00	5.00	3.3055	1.20868	-.253	.138
A	313	1.00	5.00	3.2479	1.22731	-.201	.138
P	313	1.00	5.00	3.3701	.97511	-.343	.138
Valid N (listwise)	313						

PK= Patient's knowledge, MS= Medical safety, A= Adherence, P=Prevention

Exploratory factor Analysis

When the entire collection of constructs is evaluated using a single survey, there is a chance that a common biased technique will occur. This study adopts CFA as a reliable method for eradicating the CMB threat. The EFA is considered a valid method for evaluating the CMB and considers both the structural and measurement models. The use of EFA is also deemed appropriate when the researcher wishes to evaluate the measurement capability of the variables; the implications of an additional EFA test can be considered without regard to the variables' pre-existing theoretical context.

Table 2: KMO & Bartlet

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.964
Bartlett's Test of Sphericity	Approx. Chi-Square	14032.726
	Df	325
	Sig.	.000

This study extracted factors using the maximum likelihood technique. In this approach, the variables with low loading values have been deleted. Incorporating this test indicated that all variables contributed significantly to variation and that the four categories represented patient knowledge, medical safety, adherence, and preventive. In addition to analyzing the KMO and Bartlett values for the research model, the researcher determined that the sample data were effective and correct. The test demonstrates the correctness of the sample and corresponds effectively in variance contribution.

Rotated Component Matrix

Table 3: Factor Loadings

	1	2	3	4
PK1		.794		
PK2		.765		
PK3		.722		
PK4		.699		
PK5		.692		
PK6		.821		
PK7		.821		
MS1	.834			
MS2	.839			
MS3	.845			
MS4	.838			
MS5	.844			
MS6	.840			
MS7	.839			
MS8	.844			
A1			.757	
A2			.772	
A3			.779	
A4			.777	
A5			.762	
P1				.806
P2				.802
P3				.804
P4				.829
P5				.792
P6				.408

PK= Patient's knowledge, MS= Medical safety, A= Adherence, P=Prevention

The rotated matrix from the factor loading analysis is

presented in Table 3. The itemized variance has been seen to be considerable. All variables contributed to the variance of the model. Six items were taken from the patient knowledge section, eight from the medical safety section, five from the adherence section, and six from the prevention section. No value in the study is less than 0.04, as observed. Cross-loading and duplication error-related issues are not present. The EFA produced significant results, resulting in no CFA indication in the research, adequate sample data, and evidence that the research factors contributed effectively to the full variance.

Convergent and Discriminant Validity

Table 5: Validity of Constructs

	CR	AVE	MSV	PK	MS	A	P
PK	0.879	0.679	0.470	**0.870**			
MS	0.820	0.681	0.420	0.772	**0.858**		
A	0.840	0.692	0.437	0.614	0.734	**0.808**	
P	0.867	0.631	0.498	0.710	0.695	0.759	**0.783**

PK= Patient's knowledge, MS= Medical safety, A= Adherence, P=Prevention

Through discriminant and convergent validity, construct validity has been demonstrated. The scale's internal consistency is proved via convergent validity and quantified by extracted average variance and composite reliability. Following Table 5, the acceptability thresholds are 0.5 and 0.7, respectively. The results are noteworthy because the CR (Composite reliability) for the four constructs is greater than 0.70, and the AVE (average variance extracted) values for the four variables are greater than 0.50. The values revealed that the model possessed convergent validity. MSV values were less than AVE values. Inter-construct correlation is significantly less than intra-construct correlation. There was a strong correlation between related constructions, and no other construct sufficiently explains the phenomena of the variable.

Confirmatory factor analysis

The confirmatory factor analysis has been used to assess the goodness of fit of the measurement model. The results in Tables 4, 5, and 6 demonstrated that the measurement model was acceptable, exhibiting adequacy, validity, and goodness of fit. Table 6 illustrates that CMIN/df was 2.563, GFI =0.808, IFI= 0.929, and RMSEA=0.053. Neither criteria for the analysis demonstrated a lack of fitness; therefore, the measurement model in figure 2 is adequate.

Table 6: Model Fit Indices

CFA Indicators	CMIN/DF	GFI	IFI	CFI	RMSEA
Threshold Value	≤3	≥0.80	≥0.90	≥ 0.90	≤ 0.08
Observed Value	2.563	0.808	0.929	0.958	0.053

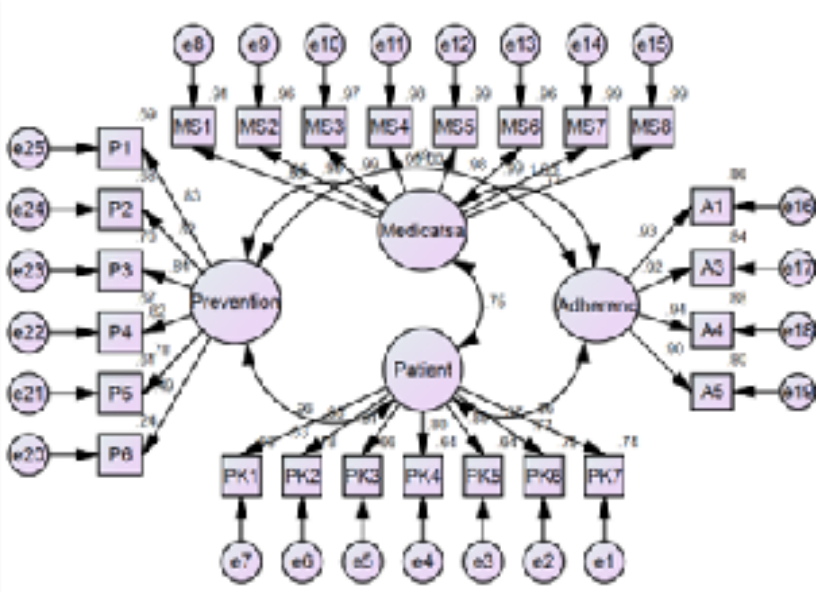

Figure 2: CFA

Structural Equation modeling

Structural equation modeling is believed to be the best method for evaluating the formulated hypothesis. The direct and indirect relationships between variables are investigated using structural equation modeling. The purpose of this study is to evaluate the three-formed hypothesis. The first hypothesis concerns the influence of pharmaceutical safety on patient knowledge. Since the probability value is less than 0.05, the hypothesis is accepted with high confidence. Figure 3 also depicts the outcomes as a one-unit improvement in patient awareness and a considerable rise in medication safety. This likelihood is 0.02, showing that PK substantially affects MS. Regarding the second hypothesis, the patient's adherence safety has been evaluated. This hypothesis is supported by a p-value of 0.01, which corresponds to its acceptance. The final linear impact of the patient's knowledge of prevention must be tested to demonstrate

the validity of the hypothesis. The p-value for the linear impact between PK and prevention is 0.01, indicating a significant relationship between the two variables.

Table 7: Structural Equation Modeling

	Path		Estimate	SE.	P
MS	<---	PK	0.72	.068	0.02
Adherence	<---	PK	0.73	.059	0.01
Prevention	<---	PK	0.52	.064	0.01

PK=Patient's knowledge, MS=Medical safety, A=Adherence, P=Prevention

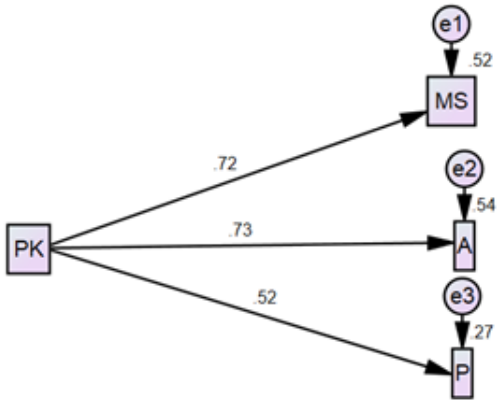

Figure 3: SEM

Discussion

This study aims to investigate the factors that influence the drug safety, adherence, and prevention of female cancer survivors in Iraq. For this goal, the influence of patient education on medication safety, adherence, and prevention in Iraqi breast cancer metastasis survivor women will be evaluated. The results suggested that patient knowledge significantly affects medication safety. El-Alfy and El-Sayed[36] found that the greater a patient's awareness of an illness, the better preventive actions he takes to keep safe. As the proportion of breast cancer patients, particularly women, has increased significantly, there is an urgent need for enhanced patient education so that patients may take the necessary steps to combat the disease and ensure their drug safety. The study by Glazebrook *et al*.[37] further noted that pharmaceutical safety provides that the clinician's safety prescriptions and appropriate knowledge regarding a particular condition confirm the medicine's safety from any disease perspective. Thus, the heightened awareness prompts the escalation of safety measures and contributes to patients' productive knowledge of any condition. The research by Ramberg *et al*.[38] revealed that a patient's awareness of or concern about any disease increases his perceptions of attitudes to adhere to medical clarity to take medications regularly, observe the diet (beneficial to prevent him from any disease), and above all, the cost of missing medicines that he had to pay for through the most severe impact of any disease. Knowledgeable patients are twice as likely to have moderate-to-high adherence compared to those who are not.[27, 39] Non-adherence to therapy or medicine for any disease is viewed as the root cause of patients failing to assess their medication goals, resulting in unsatisfactory health outcomes. Non-adherence is also a significant contributor to mortality and increased healthcare system costs. Ghembaza *et al*.[40] also revealed that a patient's enhanced awareness resulted in a greater propensity to adhere to procedures or directions regarding medicine or preventative health measures. Drug dislike and forgetfulness are the most frequently mentioned impediments to medication adherence. There are various benefits indicated by patient knowledge and its effect on adherence, the most prominent of which is that the patient becomes aware of his health-related questions; being informed about a disease prevents the patient from engaging in non-adherence behaviors. According to a study by Tae *et al*.[21], patient adherence is vital because it results in the regular use of medications to manage chronic disorders, treat diseases, and ensure long-term well-being and health. Medication adherence depends on accurate understanding, disease-related information, and a personal relationship with a healthcare practitioner or therapist. The last hypothesis, which highlights the effect of patient knowledge on prevention in breast cancer survivors, has been accepted; numerous research[41, 42] report the significance of patient knowledge on disease prevention. According to reports, the number of cancer patients has increased significantly; methods that allow people to recognize symptoms early and treat the disease earlier are more effective at protecting them from the disease. By having enough knowledge about cancer and following specified screening guidelines, patients can reduce the number of cases and improve survival rates by deciding to begin treatment sooner.[43] Knowledge of Cancer or any other disease, its treatment, and the potential treatment results is crucial for treatment adherence and prevention-related decision-making. To evaluate the diagnostic and treatment efficacy of cancer, as well as the effectiveness of cancer prevention[44, 45], researchers must collect the beliefs and attitudes of cancer patients. Acquiring accurate information regarding therapy, early symptoms, and diagnostic influence is crucial and equally significant for ensuring pharmaceutical safety, treatment adherence, and cancer prevention.

Conclusion

Around 23% of all malignancies in women are breast cancer, making it the least prevalent cancer among females worldwide. Following lung cancer (which accounts for 26% of all cancer-related fatalities in women), breast cancer is the second greatest cause of mortality worldwide. Breast cancer is the most prevalent malignancy among female Iraqi patients. The researchers assess the knowledge of Iraqi patients with metastatic breast cancer on medication safety, adherence, and prevention. All of the participants in this study were females of a single gender. The population included breast cancer patients and survivors of varying ages with metastatic disease. The questionnaires were

provided to 350 participants, but only 313 were completed and returned to the researchers. By assessing all three research drug safety, adherence, and preventative factors, the researchers observed the good effects of patient awareness on treating metastatic breast cancer. The patient can obtain the correct and appropriate treatment because of their prior understanding of medication.

The quantitative research reveals that knowledge of medication positively affects metastatic breast cancer patients. Their caregivers can take better care of them if they are well-versed in all safety precautions. The researchers investigated whether understanding patient distress adherence in females with metastatic breast cancer in Iraq helps them combat disease with greater vigor. Using the final premaster, the researchers determine that awareness of preventative actions for female patients with metastatic breast cancer inhibits the progression of the disease, and patients recover rapidly.

Implications

The study greatly increased Iraqi breast cancer patients' understanding of medication safety, adherence, and prevention. The study sheds light on the lack of awareness regarding Medication Safety, Adherence, and Prevention among female Iraqi patients with metastatic cancer. As this is an ethical and health concern, Iraqi healthcare administrators and legislators can use the study's findings to alleviate the challenges faced by Iraqi female patients with metastatic cancer. In addition, Iraqi healthcare managers should educate cancer patients and Metastasis Breast Cancer Survivors on Medication Safety, Adherence, and Prevention. To prevent women from developing metastatic breast cancer, they must maintain open lines of communication with cancer survivors to identify their concerns regarding Knowledge about Medication Safety, Adherence, and Prevention in Iraq.

Limitations And Delimitations

Future researchers should be mindful of the study's limitations despite its complete understanding of Medication Safety, Adherence, and Prevention in female Iraqi cancer patients with metastases. With a restricted number of participants, a quantitative method can be utilized to explore the issue in depth. However, the other research methods can provide in-depth knowledge regarding Medication Safety, Adherence, and Prevention in female Iraqi cancer patients with metastatic disease. The perception of a specific type of cancer patient was investigated in a single country, another limitation of our study. Therefore, future research can consider the viewpoints of cancer survivors to appreciate how knowledge about medication safety, adherence, and illness prevention can aid in disease prevention.

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