

Lifestyle and habits as a risk factor of breast-cancer; a questionnaire-based study from Al-Resafa breast tumours hospitals and centres

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ABSTRACT

INTRODUCTION: the lifestyle of women with breast cancer affects their prognosis and staging.

OBJECTIVE: To assess the personal profile and lifestyle of breast cancer patients who attended breast-tumour-hospitals or breast-tumour-centres and residents at the Al-Resafa-side of the Baghdad government and to find the association between breast cancer diagnostic stage of the participant and their profile and lifestyle variable.

METHODS: A cross-sectional study with a convenient sampling technique was conducted at Al-Amal Hospital for Radiotherapy and nuclear-medicine and the National Centre for Breast Tumours and ten breast tumour centres at ten hospitals. All patients with breast cancer who attended breast-tumour-hospitals or breast-tumour-centres and residents at Al-Resafa side of Baghdad government and accepted to participate in this study were enrolled in this study. Diagnosis of breast cancer was made by pathological approval (fine-needle-aspiration-cytology-biopsy and/or histopathological examination of excisional-biopsy). The sample size was 232 Cases.

RESULTS: Thirty percent of participants were of age between 40-49 years (Mean is 50.10 ± 11.541), housewives were 81%, 78.4% were married, 34.4% have completed the primary school. Of them, 125(53.9%) patients were diagnosed recently, 47(25%) had normal weight, 70(31%) of them had no history of using underarm antiperspirants/ deodorants, 152(65.5%) patients had never smoked, 189(81.5%) patients eat home-made food, 181(78%) patients eat mixed food, and 153(65.9%) patients were using plastics water-containers. Breast-self-examination never practiced in 201(81.9%) and 204(87.9%) patients have never done routine breast clinical examination. Doing regular exercise, source of food, regular visit to primary health care centres, date of diagnosis, Patient's BMI, using underarm antiperspirants/deodorants and its type have shown a statistically significant association with the stage of tumour at diagnosis.

CONCLUSION: Doing regular exercise, source of food, regular visit to primary health care centres, date of diagnosis, Patient's BMI, using underarm antiperspirants/deodorants and its type have shown a statistically significant association with the stage of tumour at diagnosis.

Key words: Risk factor, breast cancer, BMI, Iraq.

INTRODUCTION

All over the world, breast cancer is the most common cancer in females and it is the second leading cause of death among them.¹ Globally, it accounts for 23% of all cancer cases.² All women regardless of their race, ethnicity, or heritage are at risk of having breast cancer.³ WHO has stated that breast cancer impacted 2.1 million women a year and in 2018, 627 000 women died from breast cancer. These num-

bers are increasing globally, particularly in more developed regions.⁴

Breast cancers are classified in different forms based on their origin, grading, staging, and receptor status. Their major risk factors include reproductive, genetic, and environmental variables. Understanding the epidemiology of breast cancer will help clinicians identify high-risk patients for appropriate screening and informed disease management decisions.⁵ Ex-

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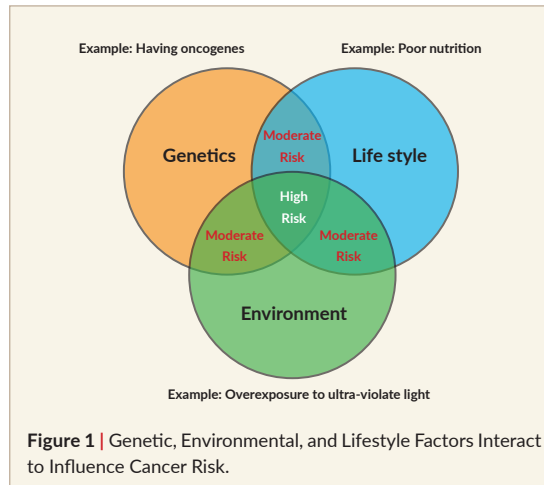
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posure to ionizing radiation, alcohol consumption, being obese, physical inactivity, high socioeconomic status, tall adult height are some of these risk factors. ⁽⁶⁻⁹⁾

Environmental carcinogens are present anywhere and can get into the human body by food, water, air, or absorption through the skin. Reducing the exposure of people especially those in a critical period of development like gestation, childhood, and adolescence to these carcinogens is a very important preventive measure against having cancer later in their life. ^{10, 11} In addition to contamination of food by carcinogens, consumption of unhealthy diet especially high-fat dairy and wrong lifestyle may increase the risk of having breast cancer in women. ^{12,13,14} In contrary food rich in fruits and vegetable preclude weight gain which might be a risk for many cancers including breast. ¹⁵

Risk factors for breast cancer is an interaction between genetics, lifestyle and environmental factors, see **figure 1**; the National Cancer Institute and the American Cancer Society estimate that 30 to 35% of all cancers are diet-related giving hope that many cancers can be prevented by dietary change. ¹⁶

History of smoking and age of women are not surprising risk factors for breast cancer; ¹⁷⁻¹⁸ however, what is interesting is the link between breast cancer and using underarm antiperspirants or deodorants that is proposed by many scientists due to the activity of aluminum in breast tissue. ¹⁹⁻²⁰

In Iraq, the program of early detection of breast cancer started in 2008, and in 2009 the Iraqi national centre for cancer researches was established. ²¹ breast cancer ranks the first among the top ten malignant neoplasms affecting the community; comprising 19.5% of the total (4996 cases) and 34.3% of female cancers (4922 cases). In 2016, 897 women died from that disease which is registered as the first cause of cancer-related mortality among Iraqi females (23.6%) and the second overall among males and females (12.1%) after Bronchogenic cancer. ²² it is an important step to measure the lifestyle and habits of Iraqi women having breast cancer to initiate programs of prevention so this study was conducted to assess the personal profile and lifestyle of patients with breast cancer attended breast-tumour-hospitals or breast-tumour-centres, and who resided at Al-Resafa district of Baghdad, and to find any association between breast cancer diagnostic stage of the participant and their profile and lifestyle variable.

METHODS

Study Design and Setting: A cross-sectional study was conducted at breast tumour centres in 12 hospitals in Al-Resafa District of Baghdad. Al-Amal Hospital for Radiotherapy and Nuclear Medicine and the National Center for Breast Tumors from Medical City Directorate, in addition to 10 other hospitals from Al-Resafa Health Directorate in Baghdad; Al-Elwayia Teaching Hospital, Ibn Al-Baladi Teaching Hospital, Al-Imam Ali Teaching Hospital, Al-Kindy Teaching Hospital, Al-Noaman Teaching Hospital, Al-Shaheed Dhari Teaching Hospital, Al-Za'faranja Hospital, Fatima Al-Zahra 'a teaching hospital. The study was conducted from 1st April- 1st October 2019..

Ethical Approval: The study has been approved by the scientific and ethical committees for research at The Al-Resafa health directorate also approval from the Medical City directorate and each hospital in data collection. The aim of the study was explained to all participants and verbal consent was taken from each participant

before being enrolled in the study, the woman who met the inclusion criteria and excepted to participate in the study was interviewed, items of the form were explained to the participants, and filled in by the researchers.

Case definition: Patients who were diagnosed with breast cancer and who resided at the Al-Resafa district of Baghdad and attended the targeted hospitals during the studied period were included in this study. Diagnosis of breast cancer was based on the results of fine-needle aspiration cytology or histopathological examination of an excisional biopsy. Each patient was verified to make sure that it was counted once in this study regardless of the number of the visits to avoid duplication of enrolment as patients may potentially visit more than one hospital; 18 patients were discovered by this verification, so the final analysis was done on 232 patients.

Sampling technique: Because of limited time and personnel, a convenient sampling technique was used to enrol patient in this study. The total sample was 250 patient; 75 patients from each of Al-Amal Radiotherapy & Nuclear Medicine and National Breast Tumour Centre, in addition to 10 patients from each breast tumour centre of 10 hospitals at Al-Resafa Health Directorate.

The questionnaire: The questionnaire of this study was designed by the study team and reviewed by experts and we tested its reliability on a pilot of 20 patients with breast cancer and make sure that it is understandable to the participants. The results of this pilot were not included in the final analysis of the study. Data were taken from the participants by a trained team through direct interview. The questionnaire included 5 parts: the **first** consisted of 6 questions about some demographic features of the participants like name, age, level of education, marital status, and job. The **second** part consisted of 3 questions about the date of diagnosis of breast cancer and its stage at the diagnosis, the **third** part consisted of 6 questions about some risk factors like smoking, physical activity, types of the containers used in drinking fluids (bottles), and source and types of food with the containers used to provide it.

The **fourth** part consisted of 4 questions about breast health of the participants like doing self-examination of breast or examination by doctors, regular visiting of the primary health care centres, referral to breast cancer hospitals. The **fifth** part consisted of 2 questions about using underarm antiperspirants/ deodorants. At the end of the interview, the length and the weight were measured and the BMI for each participant was calculated.

Statistical Analysis: Data entry and analysis by using SPSS ver. 23, the frequency, percentage, and Chi-Square-test were used. $P < 0.05$ considered significance.

RESULTS

Two hundred and thirty two female with diagnosed breast cancer were enrolled in this study, thirty percent of participant age between 40-49 years old and with Mean = 50.10, SD=11.541, and most of them were housewives 81%, mar-

Table 1 | Distribution of the women according to their demographic characteristic.

	No.	%
Age (years)	Mean: 50.10±11.54	
19-29	9	3.9
30-39	35	15.1
40-49	70	30.2
50-59	66	28.4
60-69	39	16.8
≥ 70	13	5.6
Career	Housewife	188 81.0
	Employee	37 15.9
	Retired	2 0.9
	Not mentioned	5 2.2
Educational level	Illiterate	40 17.2
	Read and write	33 14.2
	Completed primary school	80 34.4
	Completed secondary school	37 15.9
	Completed an institution	17 7.3
	Completed a college	25 10.8
Marital status	Single	24 10.3
	Married	182 78.4
	Divorcee/ separated	8 2.5
	Widow	18 7.8
	Total	232 100

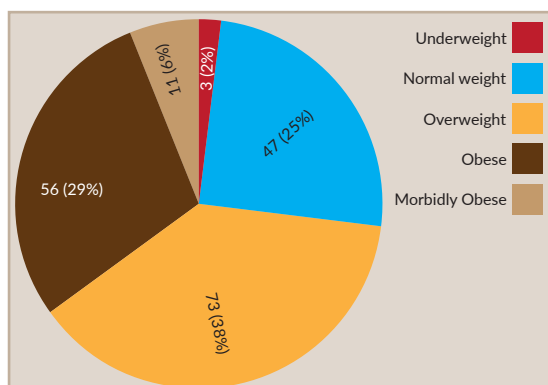
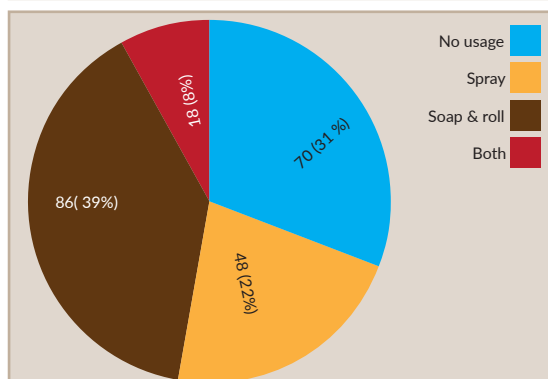
Table 2 | Distribution of the women according to their breast cancer details.

	No. (%)
Year of diagnosis	
Within 2018	125 (53.9)
2017	64 (27.6)
2016	12 (5.2)
2015	11 (4.7)
2014 and before	18 (7.8)
not mentioned	2 (0.9)
Stage of the tumour	
First stage or in situ	30 (12.9)
Second stage	126 (54.3)
Third stage	48 (20.7)
Fourth stage or metastasis	6 (2.6)
Not mentioned	22 (9.5)

ried 78.4%, completed primary school 34.4%. (Table 1)

Near half of the participants were diagnosed recently (within 6 months of data collection), 125(53.9%) and in the second stage. (Table 2)

The study revealed that only 190 out of 232

**Figure 2** | Distribution of women according to their recent BMI (the total number was 190 out of 232)**Figure 3** | Distribution of women according to their Usage and types of underarm antiperspirants/ deodorants**Table 3** | Distribution of the women according to their lifestyle

Life style	No. (%)
Smoking	
Not smoker	152 (65.5)
X-smoker	8 (3.4)
Smoker	6 (2.6)
Passive smoker	66 (28.4)
Exercise	
Rarely/ never	11(4.8)
Sometime	39 (16.8)
Most time	29 (12.5)
Always	153 (65.9)
Food source	
Home-made	189 (81.5)
Restaurants	5 (2.2)
Mixed	34 (14.7)
Not mentioned	4 (1.7)
Food type	
Mostly fatty food	26 (11.2)
mostly vegetables & fruits	18 (7.8)
mostly carbohydrate	1 (0.4)
mostly red meet	3 (1.3)
mixed all	181 (78.0)
not mentioned	3 (1.3)
Food containers	
Vavon/ aluminum	121 (52.2)
Nylon and Flynn	40 (17.2)
iron, steel, and Tefal	19 (8.2)
Glass and pottery vase	52 (22.4)
Water containers	
Vavon, aluminum	22 (9.5)
Nylon and Flynn	153 (65.9)
Iron, steel, and Tefal	45 (19.4)
Glass and pottery vase	12 (5.2)
By self	
Always	8 (3.4)
Most time	8 (3.4)
Sometimes	17 (7.3)
Rarely / never	190 (81.9)
No response	9 (3.9)
By Physician	
Always	7 (3.0)
Most time	9 (3.9)
Sometimes	7 (3.0)
Rarely / never	204 (87.9)
No response	5 (2.2)
Diagnosis PHC	
Yes	41 (17.7)
No	201 (86.6)
Referred breast center	
Yes	41 (17.7)
No	201 (86.6)
Total	232 (100)

have weight and height measured and 47 (25 %) of them had normal weight while the remaining 73 (38%) overweight, (29% obese and 6% had morbid obesity. (Figure 1)

On another hand 70(31%) of participant

Table 4 | The relation between the stage of tumour at diagnosis and some factors

Parametre		df	Mean 2	F	Sig.
Age	Between Groups	4	2.446	1.642	0.165
	Within Groups	203	1.489		
Job	Between Groups	4	0.442	1.337	0.258
	Within Groups	203	0.331		
Educational level	Between Groups	4	3.357	0.993	0.413
	Within Groups	203	3.382		
Marital status	Between Groups	4	1.391	1.934	0.106
	Within Groups	203	0.719		
Smoking	Between Groups	4	1.297	0.694	0.597
	Within Groups	203	1.870		
Exercise	Between Groups	4	2.256	2.712	0.031
	Within Groups	203	0.832		
Food source	Between Groups	4	6.610	5.423	0.000
	Within Groups	203	1.219		
Food type	Between Groups	4	3.845	1.837	0.123
	Within Groups	203	2.093		
Food containers	Between Groups	4	1.205	0.430	0.787
	Within Groups	203	2.800		
Water containers	Between Groups	4	0.907	1.154	0.332
	Within Groups	203	0.786		
Year of diagnosis	Between Groups	4	4.778	3.079	0.017
	Within Groups	227	1.552		
Visit regularly the PHC	Between Groups	4	0.603	4.827	0.001
	Within Groups	227	0.125		
Underarm antiperspirants/ deodorants usage	Between Groups	4	0.738	3.645	0.007
	Within Groups	227	0.202		
Underarm antiperspirants/ deodorants Types	Between Groups	4	15.913	4.291	0.002
	Within Groups	227	3.708		
BMI	Between Groups	4	14.379	8.562	0.000
	Within Groups	227	1.679		

women had no history of using underarm antiperspirants/ deodorants, the remaining divided to 48(22%) using a spray, 86(39%) using soap or roll, and 18(8%) using both. (**Figure 2**)

In concern to lifestyle, most of the patients never smoker 152(65.5%), practising exercises 153(65.9%), eat home-made food 189(81.5%), with mixed food 181(78%), and with Vavon/ aluminium food containers 121(52.2%) Nylon and Flynn water containers 153(65.9%). Most women 81.9% never practice breast self-examination, not visiting primary health care to do routine breast clinical examination 87.9% and so not referred to women-centres in the hospitals. (**Table 3**)

The study revealed there is a statistically significant relationship between the diagnosis stage and exercise, food source, visit regularly the primary health care, diagnosis date, patients BMI, usage of underarm antiperspirants/ deodorants, and its types; but there is no significant relation with other studied factors. (**Table 4**)

DISCUSSION

Breast cancer is the most commonly diagnosed cancer and the leading cause of cancer deaths in women worldwide, accounting for

23% of total cancer cases and 14% of all cancer mortalities.²³

The most important risk factor for cancer is growing older.¹² In the current study, the mean age was 50 years, which agreed with the previous study done in Iraq in 2017-2018,²² and agreed with the American Cancer Society finding.²⁴

Eighty-one percent of breast cancer patients in our series were housewives, and two-third of them reach only primary school level of education, and most of them were married. This is similar to many national and international reports.²⁵⁻²⁸ Half of the participants had diagnosed six months before data collection and half of them had stage II at the time of the survey, this may be due to the higher mortality among patients with stage III and IV; The results that are similar to that of another study from Iraq.²¹ The USA Breast Cancer Statistics Centre found that the five-year relative survival rate was 99 % in localized cancer, 86 % in stage II and III and 27% in stage IV and progressively improving due to improvement of early detection.²⁹

Regarding the habits that may be a risk factor for breast cancer, we found that most of the patients were non-smoker, and that's fit to Iraq Multiple Indicator Cluster Survey 2018.²⁸ Also similar to that of a study done in Arabic Gulf countries where smoker females in Iraq were 2.3% and it is less than any other Arab countries,³⁰ another Iraqi study and literature review have reported that rate of smoker women is ranging from 2-4 % of Iraqi female population.^{31,32} For practising exercise, about two-thirds of the participants were doing exercise, most of them on a regular basis because they may follow the education about the protective effect of recreational physical activity on patients with breast cancer as being suggested by a Thai study.³³ Many studies have also shown the effect on different aspects of patients with breast cancer; a study in Alabama³⁴ found that it decreases physical pain from cancer or treatment and the world cancer researches fund listed that Vigorous physical activity lowers the risk of premenopausal breast cancer and every type of physical activity (moderate and vigor-

ous) helps to protect against postmenopausal breast cancer. We recommend at least 150 minutes of moderate-intensity activity or 75 minutes of vigorous activity a week, and to sit less and the more active you are the better.³⁵ Another study found that complying with minimum Guidelines for physical activity both before diagnosis and after treatment appears to be associated with a statistically significant reduction of hazards of recurrence and mortality among breast cancer patients.³⁶

Food type in this study was mostly home-made and of mixed types, and this is expected in Iraq because we still depend on Mediterranean food. Healthy/Mediterranean-like diet characterized by a high intake of fruit, vegetables, fibre, fish, and unsaturated oils, particularly N-3 fatty acids, has a modest protective effect on breast cancer, whereas a typical western diet characterized by a high intake of total/saturated fat, refined carbohydrates, processed and red meat and low fibre intake is associated with modestly poorer outcome.³⁷ A similar finding was reported by a literature review in 2013.³⁸

A meta-analysis of cohort studies suggested that there was a statistically significant lower risk of breast cancer associated with healthy dietary patterns (RR = 0.93, 95% CI: 0.88, 0.98).³⁹ And the Memorial Sloan Kettering Cancer Center in the USA, enhance women to take food that home-made and fruit-vegetable food more to its protective effect against breast cancer before and during the treatment course.⁴⁰ However, not all women who use health diet are fully protected against breast cancer and this might be due to the delusional effect of other concomitantly present factors.

Half of our patients intake food in aluminium containers followed by glasses and pottery vase, while they drink water mostly in plastic containers. Research suggests that all plastics may leach chemicals if they are scratched or heated. Research also strongly suggests that at certain exposure levels, some of the chemicals in these products, such as bisphenol A (BPA) may cause cancer in people.⁴¹⁻⁴⁴ The FDA admitted that plastic leaches around fifty-five to sixty different chemicals when heated, also if

plastic plates not washed properly, the soap residue left behind can be extremely dangerous. Stainless steel, copper or brass utensils are easier to wash.⁴⁵ A review of the role of emerging environmental contaminants in the development of breast cancer in women in 2016, found that although exposures have been assessed in some human populations, breast and other cancer risks associated with these exposures are largely unknown.⁴⁶

In the current study, 190 patients (81.9%) rarely or never do breast self-examination, and 204 patients (87.9 %) rarely or never visit a health care centre for breast examination by doctors. This behaviour may lead to delay of diagnosis and referral to hospital to start treatment. This is why only 30 patients (12.9%) were in stage I on the diagnosis. A study⁴⁷ in Iraq on 387 educated Iraqis affiliated to two universities has found that only 48.3% practised breast self-examination with a lack of knowledge about how to perform the technique correctly as the commonest excuse. It is worth mentioning that In Iraq there is an active programme of early detection of breast cancer and there is an instruction for all physician working at PHCCs to do breast examination for at least 30 % of female visitors each month as a part of annular screening. In addition to community campaign for health education about self and clinical breast examination including a campaign for students of colleges and institutions in the catchment area for each PHCC. USA Breast-cancer organization still believes that breast self-examination is a useful and important screening tool, especially when used in combination with regular physical exams by a doctor, mammography, and in some cases ultrasound and/or MRI.⁴⁸

Obesity increases the risk of breast cancer,⁷ more than two-thirds of the participants was overweight, obese, and morbidly obese, similar to that reported by a study⁴⁹ conducted at Baghdad Teaching Hospital in 2017. Many studies in Iraq reported that obesity is high among women in Iraq; In 2012, the Iraq Population Situation Analysis Report⁵⁰ has estimated that 38.2 % of females in Iraq are obese, and in 2016 the prevalence of obesity in Iraqi adults

was 30.4 %⁵¹ Similarly, obesity was 35.2% among females in Al-Sader City in Baghdad as reported in a study in 2017.⁵²

Nearly, seventy percent of participants used underarm antiperspirants/deodorants spray or roll/soap types, the active antiperspirant agents are aluminium salts, and aluminium has a known genotoxic profile. The use of these salts in cosmetics relies on the inability of the antiperspirant complexes to be absorbed. Dermal absorption of aluminium from topically applied antiperspirant aluminium chlorhydrate, however, has been demonstrated through intact human skin of the underarm, founded by a study done in 2009.⁵³ Another study done in 2013 found that using a sensitive quantification technique they detected similar aluminium concentrations in the central and peripheral regions of breast tumours and in normal tissues. In addition, they did not detect significant differences in aluminium concentrations as related to the location of breast tumour within the breast, or to other relevant tumour features such as stage, size and steroid receptor status.⁵⁴ The American Cancer Society states that the main risk related to using antiperspirants is that they can cause skin irritation if a razor nick or cut becomes infected.⁵⁵

The study revealed that there is a statistically significant relationship between the diagnosis stage and exercise, Food source, Visit regularly the Primary Health Care, diagnosis date, patients' BMI, usage and types of Underarm antiperspirants/deodorants; but there is no significant relation with other studied factors. All these results must take into consideration in screening-program and health education for women.

CONCLUSION

Most breast cancer cases were housewives and married and more than half of them were diagnosed recently (study done in 2018) and in the second stage. Most of the cases never use any of the screening methods and diagnosed outside the PHC, also more than half of them followed a healthy lifestyle such as avoid smok-

ing, doing exercise, homemade food and mixed type. The study revealed a statistically significant association between the diagnosis stage and exercise, Food source, visit regularly the Primary Health Care, diagnosis date, patients BMI, usage of Underarm antiperspirants/ deodorants, and their-types; but there is no significant relation with other studied factors.

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Abbreviations list: American College of Rheumatology (ACR), Analysis of variance (ANOVA), End stage renal disease (ESRD), Fibromyalgia syndrome (FMS), Haemodialysis (HD), Irritable bowel syndrome (IBS), Peritoneal dialysis (PD), Quality of life (QOL), Statistical Package for the social science (SPSS), The chronic kidney disease-mineral and bone disorder (CKD-MBD), widespread chronic pain (CWP).

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