Original article

A study of lifestyle factors associated with breast cancer patients in Iran

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Abstract

Background: Several environmental and lifestyle factors have a significant role in the incidence of various types of cancer. Lifestyle factors are important elements in the development of cancer, and correction of them can lead to prevention. Given that the underlying cause of cancer is unclear, comparing the lifestyle of two groups of women can explain some of the breast cancer risk factors.

Objective: The present study was conducted to compare the lifestyle dimensions in women with and without breast cancer.

Methods: This cross-sectional study was carried out to compare two groups of 546 women (273 healthy individuals and 273 cancer patients). The lifestyle sub-scales were collected using a lifestyle questionnaire (LSQ). The differences between the scores of the eight sub-scales in the two groups were analyzed using independent t-test and Mann-Whitney test.

Results: The mean age of the participants in both groups of this study was 44.51 ± 11.28. Although the lifestyle scores of the healthy individuals were higher than the patient group, in terms of all eight dimensions of lifestyle, a significant difference was found between the two groups in terms of four dimensions ($P<0.05$). Also, there was a positive and significant correlation between the socioeconomic status and the lifestyle of women with breast cancer ($P=0.49$).

Conclusions: Regarding the difference between the lifestyle score of the two groups, it seems to be necessary for authorities and healthcare providers to plan for educational programs of lifestyle practices, and healthy behaviors. Besides, conducting longitudinal studies are recommended to find the causal relationship between the two variables. *Ethiop .J. Health Dev.* 2019; 33(3):160-166]

Key words: Lifestyle, breast cancer, patient

Introduction

Breast cancer is the most common and the second leading cause of cancer death in women (1). Globally, every year more than two million new cases of breast cancer are detected in the world, and over 500,000 deaths occur due to this disease. Breast cancer is the most common cancer among women aged 35-64 in Asia. The most common age of developing breast cancer in Iran is one decade less than in developed countries (2). Having breast cancer, particularly at a young age, can challenge all aspects of a person's life, including physical, psychological, social and spiritual (3). The incidence of breast cancer is widely different in various parts of the world, and can be affected by differences in lifestyle, including nutrition and unhealthy behaviors (4,5).

It has been shown that most of the risk factors for breast cancer with a high prevalence in women aged 20-60 years are related to lifestyle, which might be addressed by modifying their lifestyle through training and creating suitable context (6). Some studies on the relationship between lifestyle and breast cancer risk factors also indicate the role of lifestyle in the risk of breast cancer. In a case-control study conducted on 140 patients and 280 healthy people to identify the risk factors for breast cancer, for example, it was found that

menopause, high-fat diets, the use of oral contraceptives, cigarette smoke, and stress were risk factors for breast cancer, all of which were related to people's lifestyle (7). A prospective study (with eight years of follow-up) was also carried out on 242,918 post-menopausal women in several nations (10 European countries) with the aim of identifying the relationship between a healthy lifestyle and the risk of breast cancer. In that study, five lifestyle dimensions (diet, physical activity, smoking, alcohol consumption, and human body evaluation and measurement) were examined. The results were recorded in detail at various points in time. The results of the study showed that the risk of breast cancer decreased in post-menopausal women with a high health index and a healthy lifestyle (8).

In today's world, urbanization and advancements in technology have affected lifestyle, and immobility, obesity, unhealthy eating, mental disorders, physical inactivity, environmental hazards, and the use of drugs and medications, are associated with serious illnesses such as cancer (9). A number of factors appear to justify this increase, particularly the growing and ageing global population, as well as the increase in exposure to cancer risk factors linked to social and economic development. For rapidly growing

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economies, the data suggest a shift from poverty- or infection-related cancers to those associated with lifestyles more typical in industrialized countries (4,10).

Several risk factors for breast cancer have been reported, but women's lifestyle is considered as the most important environmental factor in increasing the risk (11,12). The World Health Organization views lifestyle as an attempt to achieve complete psychological and social well-being (13). The prevention of lifestyle-associated diseases and the promotion of individual and collective mental health require the awareness of how life situations threaten the lives of individuals (14). Medical sociologists believe that high-risk and unhealthy behaviors, such as the use of drugs, alcoholic beverages, diet disregard and not doing exercise, are the norms that are revealed on the individuals' lifestyle by the mental structure, so that body management acts as the symbolic bearer of social norms (15). Appropriate measures to prevent cancer are largely possible by improving lifestyle. It is anticipated that 2 million deaths from cancer could be prevented by 2020 if necessary measures are taken to prevent breast cancer (16).

Researchers have pointed out that more than 70% of diseases are somehow related to individuals' lifestyle, or at least lifestyle is involved in the exacerbation or durability of them (17), so that even the women carrying a variety of common genes associated with breast cancer can reduce the risk of their disease by following a healthy lifestyle (18). Other studies also show a significant difference between the lifestyles of cancer patients and healthy individuals (17,19,20). For example, in a case-control study that investigated the relationship between breast cancer and personal and social characteristics, lifestyle and stressors in two groups of women with and without breast cancer, there was a significant relationship between not getting breast cancer and preventive measures such as consuming fruit, vegetables and dairy products, and exercising (21). In all studies that examined lifestyle in relation to the risk of cancer, lifestyle was the main factor in reducing the risk of breast cancer development or modifying the disease-induced stress. In a systematic study published with the aim of evaluating the methods that reduced the risk of breast cancer in post-menopausal women, a direct relationship was found between exercise, weight loss, low-fat diet, and low alcohol consumption and reduced risk of breast cancer (8).

Another study showed that the immune system function in people who had a healthy lifestyle in general – including regular exercise, adequate sleep, balanced nutrition, and non-use of cigarettes – was stronger than that of other people (22). Although the root cause of breast cancer is uncertain and the disease cannot be completely prevented, various studies acknowledged that the timely diagnosis of predisposing behaviors, lifestyle modification, and avoiding the factors contributing to this disease, along with improving general awareness through proper education and care planning, could be effective in controlling the incidence of breast cancer (23).

The prevalence of breast cancer in the USA and Europe is twice that of Asian countries. The lower incidence in Asian countries is attributed to traditional lifestyles. However, rapid socio-economic development along with socio-cultural changes have led to Westernization of lifestyle and an increased risk of breast cancer, including in Iran. The difference in the incidence of breast cancer is evident in different regions of the country (24). Therefore, it is necessary to study different dimensions of lifestyle in different regions in order to study, identify and correct them in accordance with cultural, climatic and socio-economic conditions.

Objective
Even though several studies have been conducted on the relationship between lifestyle and cancer, showing the risk factors for the disease based on the factors considered in individuals' lifestyles, the present study aimed to compare the lifestyles of women with and without breast cancer to find out if there is any significant difference between the lifestyle sub-scales (physical health, exercise and well-being, mental health, drug and medication avoidance, balanced consumption of food, environmental pollutants, weight control and nutrition, reproductive health) of women in both groups. The current study can therefore be considered more distinct and comprehensive than previous studies.

Methods
This cross-sectional study compares lifestyle sub-scales between breast cancer patients and healthy women. Assumptions for estimating the necessary sample size were derived from a study by Khalili *et al.* (7)

The probability of desirable self-care, physical activity, diet and stress management in breast cancer patients were 0.32, 0.26, 0.74 and 0.39, respectively. Considering a α error of 0.05, and absolute precision of 0.06, 0.05, 0.15 and 0.19 for studying the effect of self-care, physical activity, diet and stress management sub-scales, respectively, the sample sizes were estimated to be 204, 273, 34 and seven patients. Thus, finally 273 patients were recruited for the study. To access high comparison power, 273 healthy women were included in the study, too.

Inclusion and exclusion criteria: A total of 273 subjects with breast cancer who had recently received a positive pathological test result, or were at the surgery stage, or had attended their first or second sessions of chemotherapy, were included in the patient study group. Other inclusion criteria were no more than one month since the onset of disease, and no change in lifestyle since diagnosis of disease. Patients who had been treated and their disease had recurred or metastasized were not included in the study. The other group consisted of 273 healthy women who had undergone breast screening according to the instructions in early detection programs, and did not have breast cancer. It should be noted that due to the possibility of some changes in the lifestyle of the individuals, both healthy and patient groups were asked

to respond to the questions based on information over the past year.

The samples were randomly selected from among those who had been referred to the Breast Disease Clinic of the Motamed Cancer Institute of ACECR and Shahid Beheshti University for diagnosis, operation, chemotherapy, or health screening.

Ethical consideration: The study was approved by the ethics committee of the Motamed Cancer Institute (IR. ACECR.IBCRC.REC.1396.14). The participants entered the study voluntarily after signing an informed consent form. They were advised that they were free to withdraw from the study at any stage, should they choose to do so.

Variables and data acquisition tool: A demographic checklist and a lifestyle questionnaire (LSQ) were used to collect the data and measure key variables (different dimensions of lifestyle). The questionnaire measured eight dimensions of cancer-related lifestyle in the Iranian population. The total lifestyle score was measured using the mean scores of all dimensions. It consisted of 60 questions and had already been validated in relation to cancer (9). The range of lifestyle in this questionnaire was evaluated in eight dimensions of physical health (i.e., medical examinations, control of sugar and fat, regular sleep), exercise and well-being (i.e., having a well-organized exercise program, good physical fitness for daily activities), mental health (i.e., stress and anxiety control, adapting to environmental changes, having positive thoughts), avoidance of drugs and medications (i.e., avoiding tobacco, alcohol, pipe and hookah, not exposed to smoke, and not using medication arbitrarily), balanced consumption of food (i.e., avoiding excessive consumption of sugar, salt and substances with high cholesterol, and preserved and processed food), environmental pollutants (i.e., excessive exposure to sunlight, microwave radiation, disinfectants, insecticides, no use of protective equipment against hazardous substances, using hair dryers, cell phones), weight control and nutrition (i.e., keeping weight balanced and eating fruit, vegetables, whole grains and cereals on a daily basis), and reproductive health (i.e., performing a Pap smear test, using pregnancy pills and hormone replacement therapy (HRT) during menopause). Answers to the questions were classified based on the Likert scale as: always, usually, sometimes, and never, with scores of 1 to 4, respectively.

Data analysis: The recorded information was analyzed using SPSS software version 24. $P < 0.05$ was considered statistically significant. Descriptive statistical methods (mean and standard deviation, number and percentage) and analytical tests (independent t-test for normally distributed variables, and Mann-Whitney U-test for the variables that were not normally distributed), as well as a correlation matrix, were used. The distribution of data was analyzed using a one-sample Kolmogorov–Smirnov test.

Results
The mean age of the participants in both groups of the study was 44/51 (11/28) years, with a variation range of 17 to 80 years. A total of 92% of the women with breast cancer and 83.9% of the healthy women were married, and 30% of the married women had more than two children. Most of the 546 women with and without breast cancer in this study (71%) were under 50 years of age. In total, 60% of the women were housewives and 63% had a high school diploma or academic degree. Table 1 shows the demographic characteristics of the patients.

Table 1: Demographic status of two groups of women with and without breast cancer

	Women with breast cancer No. (%)	Women without breast cancer No. (%)
Age		
20-30	14 (5.1)	47 (17.2)
30-40	57 (20.9)	98 (35.9)
40-50	89 (32.6)	78 (28.6)
50-60	79 (28.9)	40 (14.7)
60-70	27 (9.9)	10 (27)
70-80	7 (2.6)	0 (0)
Education		
Illiterate	34 (12.5)	4 (1.5)
Elementary	78 (28.6)	28 (10.3)
Diploma	99 (36.3)	72 (26.4)
Academic	62 (22.7)	169 (61.9)
Marital status		
Single	22 (8.1)	44 (16.1)
Married	216 (79.1)	214 (78.4)
Widow	24 (8.8)	8 (2.9)
Divorced	11 (4)	7 (2.6)
Occupation		
Housewife	221 (82.5)	107 (39.8)
Employed	47 (17.5)	162 (2.60)
Monthly Income		
< US$400	143 (44.5)	81 (33.5)
US$400 to US$800	58 (27)	115 (47.5)
> US$800	14 (6.5)	46 (19)
Number of children		
One or two	90 (47.6)	126 (72.8)
More than two	99 (52.4)	47 (27.2)

With regard to the study objectives, descriptive statistics (mean and standard deviation), as well as an independent t-test, were used to measure and compare participants' mean lifestyle scores using various dimensions, including physical health, exercise and well-being, mental health, drug and medication avoidance, balanced consumption of food, environmental pollutants, weight control and nutrition, and reproductive health in the two groups of women – one with breast cancer and one without breast cancer. Related data in both groups are shown in Table 2. It should be noted that the number of questions varies in different lifestyle sub-categories. So, in order for the sub-categories to be comparable, they were all calculated on a scale of 100.

Table 2: Lifestyle dimensions in women with and without breast cancer[a]

	Women with breast cancer Mean (SD)	Women without breast cancer Mean (SD)	P-value	t-value
Physical health	54.51 (18.1)	55.11 (16.25)	0.681	-.410
Exercise and well-being	45.96 (23.58)	48.46 (23.05)	0.214	
Mental health	63.86 (19.11)	64.76 (17.18)	0.561	-.545
Non-use of drugs and medication	79.95 (27.59)	88.30 (17.07)	< 0.001	
Balanced consumption of food	65.33 (25.05)	69.85 (17.7)	0.0147	
Contact with environmental pollutants	56.75 (13.45)	58.47 (12.32)	0.151	-1.504
Observing weight control	51.41 (20.56)	55 (17.97)	0.03	
Observing reproductive health	70.68 (34.01)	85.30 (37.92)	< 0.001	
Lifestyle	61.18 (12.87)	65.68 (10.46)	0.002	

[a] Data were analyzed using independent t-test for variables with normal distribution or Mann-Whitney for variables that are not distributed normally.

As shown in Table 2, the mean scores of all dimensions of lifestyle were higher in the healthy group than the patient group. This difference was significant in the dimensions of drug avoidance, balanced consumption of food, weight control and nutrition, reproductive health, and in the mean total lifestyle score (P <0.05).

In the final analysis of the findings, as can be seen in Table 3, the relationship between demographic factors and lifestyle in the two groups of affected and non-affected breast cancer patients was investigated using the correlation matrix.

Table 3: Correlation matrix of demographic characteristics and lifestyle in women with breast cancer

	Age	Lifestyle	BMI	Marital status	Occupation	Income
Patients with the disease						
Age	1					
Lifestyle	-.016	1				
BMI	.112	-.114	1			
Marital status	.116	-1.25*	.242*	1		
Occupation	.254*	-.070	.139*	.121*	1	
Income	-.096	.041	.006	-.050	-.319*	1
Healthy patients						
Age	1					
Lifestyle	.078	1				
BMI	.176*	.217*	1			
Marital status	.136*	.245*	.231*	1		
Occupation	.330*	1.000	.217*	.245*	1	
Income	-.086	-.258*	-.105	-.021	-.285*	1

* Correlation is significant at the 0.05 level.

As shown in Table 3, marital status had a significant relationship with lifestyle in the women with breast cancer. Moreover, the job status of this group had a significant relationship with their marital status, body mass index (BMI) and age. In the non-cancer group, lifestyle had a significant relationship with BMI, marital status and income.

Discussion

The present study compared eight dimensions of lifestyle in women with and without breast cancer. According to the results of this study, the mean total scores of lifestyle in the two groups showed a significant difference. Furthermore, the results showed that, in some dimensions of lifestyle, such as drug avoidance and balanced consumption of food, women with no history of breast cancer had a significant better mean score than those with breast cancer.

In this study, there was a significant difference between mean score of drugs (cigarettes, pipes and hookahs), alcohol and medication abuse in women with breast cancer and non-cancer group , and it could be considered that drug, alchohol and medication abuse are risk factors for breast cancer. Some studies have suggested that cigarette smoking, due to several carcinogens, is one of the risk factors for breast cancer, especially in women who started smoking when they were adolescents and continue to smoke for more than 20 years (25,26). In addition, Hejar et al. has shown that even exposure to cigarette smoke (patio smoker) increases the risk of breast cancer by up to two times (26). The results obtained in previous studies support those of the present study.

The present study also indicated that balanced consumption of food, weight control and nutrition were effective factors in preventing breast cancer. There was a significant difference between mean score of balanced consumption of food and weight control and nutrition in people with breast cancer and non-cancer patients. This may suggest that the type and manner of household food consumption could be an important and effective factor in breast cancer prevention. Other studies on balanced energy consumption and dietary regimen correction and their relationship with cancer have shown that the lack of balanced energy consumption and relatively high energy consumption, especially in post-menopausal women, are associated with an increased risk of breast cancer (27). Regarding the type of food eaten, it has been shown that a high risk of breast cancer is associated with the high consumption of nourishment derived from animal products and the low consumption of vegetables and fruits (28). In their instructions for cancer prevention, the World Cancer Research Fund and the American Cancer Society recommend a minimum of 150 minutes of moderately intense exercise per week, limiting alcohol use, and using vegetarian food in order to have a balanced weight (29).

Another result of this study was that the use of contraceptive pills and post-menopausal hormone replacement therapy (HRT) was more common among women with breast cancer compared to the non-cancer patients, and this difference between the two groups represented a risk factor for breast cancer. The results are consistent with those of a study conducted in England, which showed that HRT used by women aged 50-64 years had increased their risk of breast cancer, and this effect was significantly more for the combination of estrogen and progesterone than other types of HRT (30). The results of the present study also show that marital status has a significant relationship with the lifestyle of women in both groups, in such a way that married women with breast cancer did not have a satisfying lifestyle, whereas this relationship in the second group was positive. Opposed to our findings, in a study by Keyhanian *et al.*, most married patients had a relatively favorable lifestyle (31). Perhaps the cause of this difference could be considered in the research environment, because the participants in Keyhanian *et al.*'s research were selected only from among the individuals referred to an educational hospital, while the subjects of the present study were selected from both the public and the private sectors. More studies are recommended to investigate the cause of this difference.

In the present study, there was a significant and inverse relationship between lifestyle and income of the women without breast cancer, so that increased income led to decreased lifestyle. But in the women with breast cancer, there was no significant relationship between these two variables. Considering the non-matching of the studied groups in terms of income, it seems that the difference between the two groups is due to the difference in their income levels. That is to say, most women suffered from breast cancer had low income, but the household incomes of the non-affected women were mostly moderate (between U$400 and US$800 per month). The results of the study by Keyhanian *et al.* also confirmed the absence of such a relationship in the patient group (31).

Other studies have shown that variables such as eating dairy products, fruit and vegetables, as well as exercising, education level, and awareness of how to prevent breast cancer, are considered as protective factors for breast cancer, but variables such as illiteracy, low income, familial history of benign breast disease, stress, upper body fat, and using contraceptive pills have been identified as risk factors for breast cancer (32). All of these results are consistent with the results of the present study.

In general, in the present study, the mean total lifestyle score in the women with breast cancer was significantly different from that of the women with no history of breast cancer, which showed that lifestyle in people with no history of breast cancer was more favorable than those with breast cancer. Thus, it is possible to take some step to prevent and control breast cancer by conducting educational interventions and raising awareness for the promotion and improvement of lifestyle.

Conclusion
Generally, considering the fact that lifestyle is an effective factor in the risk of breast cancer, and given the fact that lifestyle modification can increase breast cancer prevention, it is recommended for authorities and healthcare providers, to promote women lifestyle and health behaviors by holding educational programs. Finally, due to the high prevalence of breast cancer in women, lifestyle differences in different societies, the impact of multiple factors on the incidence of chronic diseases such as cancer, and different predisposing factors for cancer in various societies, it is necessary to repeat such studies in different cultures. In fact, due to lifestyle differences, various diets in different societies, especially climatic differences resulting in various types of available foods, and the stress and psychological problems in different regions, doing the same research in each part of the country seems necessary.

Limitations
There were some limitations in selecting the samples for the breast cancer group, since their disease had to be diagnosed not more than one month before they completed the questionnaire. Therefore, the researchers spent more time trying to complete the sample size.

Disclosure statement
There is no conflict of interest.

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