



# Health-Promoting Lifestyle and its Predictors in Women Under the Chemotherapy for Reproductive System Cancers

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## Abstract

**Objectives:** Gynecologic cancers are common in women. One of the most important challenging risk factors for many cancers is lifestyle, which can affect health. This study was therefore conducted to determine the status of health-promoting lifestyle and its predictors in women under the chemotherapy for reproductive system cancers.

**Materials and Methods:** This cross-sectional study was conducted in 2016 on 151 patients. They were undergoing chemotherapy for gynecologic cancers in oncology wards of Alzahra and Shahid Ghazi hospitals in Tabriz, Iran. The participants were selected through convenience sampling method. The sociodemographic questionnaire and health-promoting lifestyle profile II (HPLP-II) were completed. The data were analyzed using the independent t test, one-way analysis of variance (ANOVA), and multivariate linear regression.

**Results:** Mean (standard deviation, SD) total score of women's health-promoting lifestyle was 2.30 (0.38) in the score range 1-4. The highest mean (SD) score pertained to nutrition subscale ( $2.50 \pm 0.49$ ), and the lowest mean (SD) score pertained to physical activity subscale ( $2.10 \pm 0.50$ ). The predictors of lifestyle included age, income level, number of pregnancies, marital problems, number of children, and family history of gynecologic cancers.

**Conclusions:** The data analysis showed that the mean score of the health-promoting lifestyle was average. It appears necessary to use health education and promotion programs emphasizing the health-promoting behaviors and their determinants.

**Keywords:** Reproductive system cancers, Health-promoting lifestyle, Chemotherapy

## Introduction

Cancer is one of the major causes of death all over the world (1). Gynecologic cancers which affect the ovaries, uterus, cervix, vulva, and vagina, are common in women and cause 10% to 15% of cancers in them (2). Gynecologic cancers are the cause of 25% of all new cancers diagnosed in women up to 65 years of age in developing countries compared to developed countries where gynecologic cancers comprise 16% of cancers in women (3). Cancer and the resulting suffering are among the bitterest human experiences. With the progress of the disease, patients are exposed to a variety of agonies. Physical changes may occur following cancers, and various physical effects of cancer can also affect the psychological and social aspects of patients' life (4).

One of the most important challenging risk factors for many cancers is lifestyle and includes appropriate diet, regular exercise, and staying away from pathogenic substances, and can affect human health. In other words, lifestyle may influence the health either positively or

negatively. Lifestyle as a psychological variable plays an important role in individuals' physical and mental health(5). However, it is disturbed in cases of gynecologic cancers, and hence influences the patients' sexual issues, patients' body image, and fertility potential, and causes severe emotional disturbances, anxiety, and behavioral disorders (6). The health-promoting lifestyle can be considered multidimensional, as it encompasses several aspects of individuals' daily life, including eating habits, leisure activities, the frequency of smoking, regular exercise, stress management, and health (7). The health-promoting lifestyle is self-initiated, continues with daily constant activities, and is accompanied with the aim of promoting their well-being (8).

Participation in the health-promoting lifestyle is one of the main dimensions of health improvement and is considered an important contributor to disease prevention. Changing the unhealthy lifestyle behaviors into healthy behaviors can prevent many diseases, including various types of cancers (7). It has been shown

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that 60% of people's quality of life and health depends on their lifestyle and behaviors. Therefore, practicing health-promoting behaviors and being psychosocially healthy not only affects the health status but also prolongs the health outcomes (9). A preventive and healthy lifestyle can be considered a major approach in maintaining and improving women's health and cancer control (7).

Few studies have been carried out to evaluate the role of health-promoting lifestyle in the patients with cancer. Pieta et al conducted a study during 2007-2011 on 1484 women aged 18-80 years in 2 groups of healthy women without diagnosed focal lesions in the breasts and ovaries, and women with diagnosed breast or ovarian cancer. The results showed that the health-promoting lifestyle, associated with physical activities and other health-promoting behaviors, such as the nutritional status, reduction or cessation of alcohol use, and cessation of cigarette smoking, considerably reduced the risk of breast malignancy and ovarian cancer. The number and diversity of factors influencing the risk of the relapse of cancers reveal the need for controlling risk factors (10). Taechaboonsersak et al during 2004-2005 studied 488 patients undergoing radiotherapy for cervical cancer in 7 public hospitals in 5 districts of Thailand. The results showed direct, positive, and significant effects of the health-promoting behaviors on the quality of life. Moreover, cognitive-perceptual factors had a significant effect on health-promoting behaviors, and social supports also significantly influenced cognitive-perceptual factors, health-promoting behaviors, and quality of life. The stage of cancer had a direct and significant negative impact on cognitive-perceptual factors and quality of life. The direct effect of these factors on the quality of life revealed that the patients with cervical cancer tended to have a better quality of life when they presented health-promoting behaviors more frequently (11).

Problems caused by cancer affect not only the patients but also their family members and undermine the family. Obviously, the identification of risk factors, such as lifestyle, plays an important role in preventing and controlling the disease and promoting the community health. It can also provide the treatment team with new solutions and help the patients to independently manage their life in critical and non-critical conditions. Given that Iran is passing through the areas of healthcare, education, economics, and mass communication, it is necessary to accurately evaluate lifestyle and health behaviors in order to develop preventing and health-promoting programs. Considering that no study has examined health-promoting lifestyle in the women with gynecologic cancers in Iran, this study aimed to evaluate health-promoting lifestyle behaviours in the following dimensions: health responsibility, physical activity, nutrition, and spiritual growth, interpersonal relations, and stress management, and determine the relationship between sociodemographic characteristics and health-promoting lifestyle behaviours, and what the

strength of the relationship would be.

## Materials and Methods

### Study Design and Participants

This cross-sectional study was carried out on 151 patients. They were undergoing chemotherapy for gynecologic cancers in oncology wards of Alzahra and Shahid Ghazi hospitals in Tabriz, Iran. The inclusion criteria were as follows: willing to participate in the study, stages 1 and 2 gynecologic cancers based on the specialist's diagnosis and patient's medical records, undergoing chemotherapy, being 18 years or older, and being aware of one's disease.

### Sample Size

According to the study of Baheiraei et al on the largest standard deviation in subscales of health-promoting lifestyle,  $\alpha = 0.05$ , 95% CI, and  $d = 0.05$  around the mean ( $m = 2.78$ ), the sample size was calculated as 151 subjects (12).

### Sampling

Upon making the arrangements and necessary correspondences and obtaining the approval from Ethics Committee of Research and Technology Deputy, Tabriz University of Medical Sciences, and a reference letter from Research Deputy of the faculty, the participants were selected through convenience sampling method. The researchers referred to the hospitals, introduced themselves, explained the objective of the study and confidentiality of the information, adopted the patients' informed consent, and examined them in terms of the inclusion criteria. An informed written consent was obtained from the patients who fulfilled the inclusion criteria and were willing to participate in the study. The sociodemographic questionnaire and health-promoting lifestyle profile II (HPLP-II) were completed through an interview with each patient privately via their mother tongue. The sampling was performed in 2016, and 20 patients were selected from Shahid Ghazi hospital, and the rest of the patients were selected from Alzahra hospital. Prior to interviewing and completing the questionnaires, all the participants were ensured of the confidentiality of their information and their right to withdraw from the study whenever they desired.

### Data Collection Instruments

The data were collected using the socio-demographic questionnaire and HPLP-II.

The socio-demographic specification questionnaire involved the participants' individual, social, and midwifery information, including age, educational level, marital status, age at menarche, menopause, type and stage of cancer, and so forth.

HPLP-II was developed in 1987 by Walker and Pender (13) to measure the health-promoting lifestyle based on Pender's model. Mohammadi et al (14) measured its

validity and reliability in Iran. HPLP-II has 52 items in the domains of health responsibility, physical activity, nutrition, and spiritual growth, interpersonal relations, and stress management. All the items are scored on a Likert scale of 1 to 4 (Never = 1, Sometimes = 2, Often = 3, Always = 4). Each dimension of HPLP-II is scored separately, and a total score is calculated for the entire questionnaire. HPLP-II consists of 9 items for nutrition, 8 items for physical activity, 9 items for spiritual growth, 9 items for health responsibility, 8 items for stress management, and 9 items for interpersonal relations.

The reliability of HPLP-II was examined in terms of repeatability and internal consistency (Cronbach  $\alpha$ ) through test-retest on 20 patients within two weeks. Cronbach  $\alpha$  for the health-promoting lifestyle, interpersonal relations, nutrition, health responsibility, physical activity, stress management, and spiritual growth was 0.95, 0.81, 0.68, 0.86, 0.90, 0.67, and 0.86, respectively. Furthermore, the intra-class correlation (ICC) for the health-promoting lifestyle, interpersonal relations, nutrition, health responsibility, physical activity, stress management, and spiritual growth was obtained as 0.92, 0.84, 0.89, 0.94, 0.91, 0.83, and 0.70, respectively.

Content validity was used to determine the validity of the socio-demographic questionnaire, in such a manner that the questionnaire was provided for 8-10 faculty members of Tabriz Nursing and Midwifery Faculty and after collecting their comments, necessary amendments were made.

### Data Analysis

The collected data were analyzed using SPSS software version 21.0. Descriptive statistics, including frequency and percentage, mean, and standard deviation were used to describe the socio-demographic specifications and health-promoting lifestyle. The correlation between socio-demographic specifications and health-promoting lifestyle was determined using one-way analysis of variance (ANOVA) and independent *t* test. To adjust the confounding variables, the effect of each of the independent variables (socio-demographic specifications) was determined on the dependent variable (total score of the health promotion lifestyle), and the variance was explained. The independent variables with  $P < 0.2$  were entered into the backward multivariate linear regression model.

### Results

Almost half of the women (41.7%) were in the age range of 40-50 years. Mean age ( $\pm$  standard deviation, SD) of the women was  $47 \pm 10.05$  years. Half of the participants were illiterate (40.4%), and 5.3% of them had university degrees. Most of them were housewives (90.1%). More than two-thirds of the participants reported an adequate income level (70.9%) and 82.8% of the women were married. About three-fourths of the women were living

in a house (73.5%). Most of the participants were living with their husband and children or were living alone (84.8%). Maximum number of pregnancies was 5 or higher (31.1%). One-third of the women had 3 children alive (29.8%). The age at menarche was 12 years or less in almost half of the women (41.1%). The caregivers of half of the women were their children, alone or assisted with their husband, mother, or sister (43.7%). About three-fourths of the women had no marital problems (72.2%). Only 3.3% of the women were dissatisfied with the health care received. Only 6% of the women had a history of infertility. One-third of them were postmenopausal (naturally or surgically) (31.8%). Only one woman had undergone hormone therapy (0.7%). Only 8.6% of the women suffered a chronic disease. Of these women, 70.2%, 18.5%, and 11.3% had uterus cancer, ovarian cancer, and cervical and vaginal cancer, respectively. Only 4% of the women had a family history of gynecologic cancers. There was only one case with a history of gynecologic cancers (0.7%). The maximum number of diagnosed cancers was found in the age group 40-50 years (44.4%). Women at the stage 1 cancer and stage 2 cancer respectively comprised 77.5% and 22.5%. The most frequent treatments were chemotherapy and surgery (55.6%). Most of the women had undergone chemotherapy less than 60 days (90.7%). The body mass index showed overweight in half of the women (55%) (Table 1).

Mean (SD) total score of women's health-promoting lifestyle was 2.30 (0.38) in the score range 1-4. The highest mean (SD) score pertained to nutrition subscale ( $2.50 \pm 0.49$ ), and the lowest mean (SD) score pertained to physical activity subscale ( $2.10 \pm 0.50$ ) (Table 2).

According to the bivariate tests (one-way ANOVA and independent *t* test), the variables, including age, education, occupation, income level, marital status, number of pregnancies, type of care, marital problems, satisfaction with care, number of children, history of infertility, menopausal status, type of gynecological cancer, family history of gynecologic cancers, duration of chemotherapy, stage of the disease, and type of the disease, which correlated with the health-promoting lifestyle at  $P < 0.2$  entered the backward multivariate regression model. The variables of age, income level, number of pregnancies, marital problems, number of children, and family history of gynecologic cancers remained in the model and could predict 24.2% of the variance found in the total score of lifestyle (Table 3).

### Discussion

This study was conducted to evaluate the health-promoting lifestyle and its predictors in the women with gynecologic cancers. The data analysis showed that the mean score of the health-promoting lifestyle was average. Of 6 subscales of the health-promoting lifestyle, nutrition and physical activity gained respectively the highest and the lowest mean scores. The predictors of the health-

**Table 1.** The Correlation Between Socio-demographic Specifications and Total Score of the Health-Promoting Lifestyle (n = 151)

Variables	N	Mean (SD)	P
Age (y)			0.001 <sup>a</sup>
≤40	38	2.46 (0.40)	
40-50	63	2.32 (0.33)	
≥50	50	2.17 (0.37)	
Education			0.011 <sup>a</sup>
Illiterate	61	2.22 (0.33)	
Elementary	32	2.27 (0.37)	
Junior School	16	2.40 (0.33)	
High school	12	2.18 (0.35)	
Diploma	22	2.53 (0.40)	
University degrees	8	2.46 (0.57)	
Job			0.013 <sup>b</sup>
Housewife	136	2.28 (0.36)	
Employed	15	2.53 (0.44)	
Income level			0.100 <sup>a</sup>
Adequate	107	2.34 (0.37)	
Less than adequate	33	2.18 (0.33)	
Inadequacy	11	2.27 (0.54)	
Marital status			0.167 <sup>a</sup>
Single	15	2.35 (0.49)	
Married	125	2.28 (0.36)	
Divorced	11	2.50 (0.41)	
Residence			0.240 <sup>a</sup>
House	111	2.33 (0.35)	
Leasing	21	2.19 (0.35)	
Residence in parental house	19	2.25 (0.52)	
Family members			0.489 <sup>b</sup>
Spouse and children or alone	128	2.30 (0.36)	
Husband or wife's family	23	2.35 (0.47)	
Pregnancy			0.001 <sup>a</sup>
≤2	27	2.49 (0.32)	
3	28	2.29 (0.30)	
4	27	2.33 (0.32)	
≥5	47		
Live children			0.183 <sup>a</sup>
≤2	31	2.37 (0.40)	
3	45	2.29 (0.33)	
4	21	2.31 (0.29)	
≥5	33	2.17 (0.38)	
Menarche			0.550 <sup>a</sup>
≤12	62	2.33 (0.43)	
12-14	54	2.31 (0.33)	
≥14	35	2.24 (0.36)	
Caregiver			0.070 <sup>a</sup>
Mother and/or sister	51	2.33 (0.35)	
Child alone or with the help of a spouse and mother and sister	66	2.23 (0.37)	
Spouse alone or with the help of mother and sister	34	2.41 (0.42)	
BMI			0.583 <sup>a</sup>
Normal (18.5-24.9)	45	2.25 (0.44)	
Overweight (25-29.9)	83	2.32 (0.33)	
Obese (≥30)	20	2.32 (0.40)	
Duration of recent chemotherapy			0.088 <sup>b</sup>
≤60	137	2.32 (0.37)	
>60	14	2.14 (0.41)	
Treatment			0.012 <sup>a</sup>
Chemotherapy	18	2.56 (0.36)	

**Table 1. Continued**

Chemotherapy and radiotherapy	32	2.25 (0.35)	
Chemotherapy and Surgery	84	2.30 (0.39)	
Chemotherapy and adjuvant radiotherapy	17	2.18 (0.30)	
Gynecologic Cancer History			0.605 <sup>b</sup>
Yes	1	2.50	
No	150	2.30 (0.38)	
Age of cancer detection			0.220 <sup>a</sup>
≤40	46	2.38 (0.43)	
40-50	67	2.29 (0.35)	
≥50	38	2.23 (0.35)	
Cancer stage			0.077 <sup>b</sup>
1	117	2.34 (0.35)	
2	34	2.19 (0.45)	
Marital problems			0.041 <sup>b</sup>
Yes	19	2.13 (0.48)	
No	109	2.31 (0.32)	
Satisfaction with care			0.054 <sup>b</sup>
Yes	146	2.32 (0.37)	
No	5	1.98 (0.43)	
Infertility history			0.076 <sup>b</sup>
Yes	9	2.51 (0.49)	
No	126	2.28 (0.35)	
Menopause			0.102 <sup>b</sup>
Non-postmenopausal	103	2.34 (0.37)	
Postmenopausal (naturally or surgically)	48	2.23 (0.4)	
HRT for Menopause			0.503 <sup>b</sup>
Yes	1	2.56	
No	150	2.30 (0.38)	
Chronic disease			0.947 <sup>b</sup>
Yes	13	2.29 (0.65)	
No	138	2.31 (0.35)	
Gynecologic Cancer			0.137 <sup>a</sup>
Uterus	106	2.30 (0.34)	
Ovary	28	2.40 (0.44)	
Cervix and vagina	17	2.17 (0.45)	
Family history of gynecologic cancer			0.003 <sup>b</sup>
Yes	6	2.75 (0.25)	
No	145	0.37 (2.29)	

Abbreviation: HRT, hormone replacement therapy.

<sup>a</sup> One-way ANOVA.<sup>b</sup> t test.

promoting lifestyle included age, income level, number of pregnancies, marital problems, number of children, and family history of gynecologic cancers.

In conformity to the results of this study, the studies of Mirghafourvand et al (15), Yi et al (16), Baheiraei et al (12), Jorfi et al (17), and Mehri et al (18) reported an average score for the health-promoting lifestyle.

Similar to the results of this study, the study of Oran et al indicated the highest and the lowest mean scores for the nutrition and physical activity, respectively (19). In the study of Yi et al, the highest and the lowest mean scores belonged respectively to the nutrition and stress management, which conformed to the results of this study in terms of the highest mean score (16). Proper and

**Table 2.** The Status of Health-Promoting Lifestyle and its Subscales (n = 151)

Variables	Mean (SD)	Score Range	Scoring
Total score of health-promoting lifestyle	2.30 (0.38)	1-4	1-3
Interpersonal relations	2.40 (0.47)	1-4	1-4
Nutrition	2.50 (0.49)	1-4	1-4
Health responsibility	2.30 (0.47)	1-4	1-4
Physical activity	2.10 (0.50)	1-4	1-3
Stress management	2.25 (0.40)	1-4	1-4
Spiritual growth	2.30 (0.51)	1-4	1-4

**Table 3.** Predictors of Health-Promoting Lifestyle Based on Multivariate Linear Regression (n = 151)

Variables	B (95% CI)	P
Age (reference: ≥50)		
≤40	0.08 (-0.13 to 0.28)	0.467
40-50	0.12 (-0.03 to 0.27)	0.106
Income level (reference: Adequate)		
Less than adequate	-0.15 (-0.28 to 0.01)	0.035
Inadequacy	-0.07 (-0.31 to 0.18)	0.575
Pregnancy (reference: ≥5)		
≤2	0.51 (0.20 to 0.82)	0.001
3	0.14 (-0.10 to 0.37)	0.259
4	0.15 (-0.07 to 0.37)	0.172
Live children (reference: ≥5)		
≤2	-0.19 (-0.50 to 0.11)	0.207
3	0.001 (-0.23 to 0.23)	0.993
4	0.06 (-0.18 to 0.29)	0.633
Marital problems (reference: no)		
Yes	-0.19 (-0.35 to -0.02)	0.030
Family history of gynecologic cancer (reference: no)		
Yes	0.409 (0.04 to 0.78)	0.030

Adjusted R Square: 24.2%.

healthy nutrition can support healthy growth and sharpen the mind. On the contrary, unhealthy nutrition causes certain disorders in next decades of the life. Individuals should be informed of the principles of healthy nutrition and use of different methods for modifying wrong eating habits.

In Moghaddam Tabrizi's study on survivors of breast cancer in Iran, the highest and the lowest mean scores pertained to the spiritual growth and physical activity, respectively (20). In the study of Baheiraei et al on Iranian women of reproductive age, the highest and the lowest mean scores pertained to the interpersonal relations and physical activity, respectively, which was different in terms of the highest mean score and similar in terms of the lowest mean score (12). The physical immobility is a challenge facing all countries and a risk factor for many diseases. It has been proved that the physical activity has a positive effect on health. Therefore, it is necessary to examine reasons of physical immobility in women and plan training programs and appropriate measures for promotion of physical activities.

In this study, lifestyle was more favorable in the women aged less than 50 years. However, in the study of Bifulco

et al on the women at early stages of gynecologic cancers, young people had a healthier lifestyle than middle-aged people (6). Rakhshani et al and Zhang et al respectively reported the same results in Iranian older adults and in retired workers in a city in the northeast of China (21,22).

There was a significant statistical correlation between income level and lifestyle in this study to such a degree that the score of lifestyle increased with an increase in the income level. The same result was obtained in the study of Mirghafourvand et al on infertile couples referring to the infertility clinic of Alzahra hospital in Tabriz and women of reproductive age in Tehran, Iran (15,23). The study of Ay et al on lifestyle promoting behaviors for prevention of cancer also showed higher scores of lifestyle along with increases in the income level (9). Furthermore, the study of Zhang et al on retired workers in a city in the northeast of China showed more favorable lifestyle in accordance with high income levels (21).

There was a significant correlation between health-promoting lifestyle and the number of children in this study in such a manner that the score of lifestyle was low in the women having children fewer than 2. However, Ay et al revealed a higher mean score of lifestyle in the

students living in the families with fewer children (9). This nonconformity appears to be related to the use of a different data collection instrument, the Pender's 48-item HPLP, with subscales of self-learning, health responsibility, nutrition, interpersonal support, and stress management. Moreover, the above study was performed on 1007 subjects.

The participants of this cross-sectional study were selected through convenience sampling. Therefore, the results cannot be generalized to all patients with cancer. The individual, cultural, social, and psychological differences might affect the answers to the items, and influence the results of the study, and these are out of the researchers' control. Furthermore, the relationship between health-promoting lifestyle and demographic specifications does not necessarily show the causality. Regarding low score of physical activity, further qualitative and quantitative studies are required to evaluate the facilitators and inhibitors of health-promoting behaviors in the women with cancer.

### Conclusions

The results of this study revealed that the women with gynecologic cancers adhered to health-promoting behaviors at an average level. Furthermore, the women's score of spiritual growth, stress management, nutrition, interpersonal relations, and health responsibility was higher than that of physical activity. Therefore, it appears necessary to perform health education programs emphasizing physical activities and establish counseling centers for teaching the health-promoting behaviors to the women with cancer.

### Conflict of Interests

None.

### Ethical Issues

This study was approved by Tabriz University of Medical Sciences (Ethics code: TBZMED. REC.1394.1124).

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