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RESEARCH ARTICLE

# IMPACT OF CARING FOR A CHILD WITH CANCER: PREDICTING FACTORS AFFECTING THE PHYSICAL HEALTH AND HEALTHY LIFE BEHAVIORS OF THE MOTHER

**Emine Eda Baş[1], Ayfer Aydın[2], Rejin Kebudi[3], Aslı Akdeniz Kudubeş[4], Hülya Dalkılıç Bingöl[5]**

[1] Istanbul Gaziosmanpaşa Education and Research Hospital, Istanbul-Turkey.
[2] Istanbul University, Faculty of Nursing, Department of Pediatric Nursing, Istanbul-Turkey.
[3] Istanbul University, Oncology Institute, Istanbul
[4] Bilecik Şeyh Edebali University, Faculty of Health Sciences, Department of Pediatric Nursing, Bilecik-Turkey
[5] Istanbul University, Oncology Institute, Pediatric Hematology-Oncology, İstanbul-Turkey.

ORCID: E.E.B. 0000-0003-1043-5289; A.A. 0000-0002-1148-7921; R.K. 0000-0003-4343-8174; A.A.K. 0000-0002-0911-8182; H.D.B. 0000-0001-7339-0490

**Corresponding author:** Aslı Akdeniz Kudubeş, **E-mail:** asliakdeniz@hotmail.com
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## ABSTRACT

**Purpose:** To prevent mothers of children with cancer from developing health problems and suggest effective ways to maintain their health, it is important to accurately determine the problems they face. The aim of this study was to examine the physical health problems and healthy lifestyle behaviors of mothers whose children have cancer.
**Material and Methods:** This methodological, descriptive, and correlational study. The study interviewed 150 mothers whose children were receiving treatment for cancer using three forms: Sociodemographic Information Form, Mothers' Physical Health Form, and Healthy Lifestyle Behaviors Scale II. Independent samples t-test and single way variance analysis (ANOVA) tests were conducted to measure the relations between the variables.
**Results:** Mothers' age, number of children with cancer, age of child, educational status, income level and marital status were significantly correlated with the survey variables. A model created based on the regression analysis of the relationship among the variables showed that sociodemographic characteristics affected 24.2% of the healthy lifestyle behavior of mothers of children with cancer.
**Conclusion:** Our results showed that physical activity and stress management received the lowest health lifestyle behavior scores. The current findings emphasize the importance of informing mothers about stress management and physical activities during the care of their children with cancer.

**Keywords:** Cancer, child, healthy lifestyle, mother

## INTRODUCTION

The diagnosis and treatment of cancer in children come with an array of problems and symptoms, such as nausea, vomiting, mucositis, anorexia, and pain, which are often presented with psychological problems such as anxiety, depression, and stress (1). Cancer-associated problems affect not only the child but the lives of all family members. For this reason, childhood cancers are considered a family disease (2).

Due to the long duration of treatment and the need of frequent hospitalization, families are more involved in childcare and play an important role (3). In trying to cope with their child's symptoms and treatment side effects, the physical and psychological health and lifestyle of the mothers are often negatively affected (4,5) Therefore, more attention needs to be paid to the health of those who care for children with cancer (6).

Mothers who cared for children with cancer were found to have worse physical health indicators than those who cared for healthy children (7,8). These mothers experienced physical problems such as insomnia, headache, back pain, decreased appetite, digestive and nutritional disorders, fatigue, weakness, and palpitations (9).

The burden of caring for a child with cancer can cause health problems and increase health risks. Having a child with cancer has been found to negatively affect mothers' healthy lifestyle behaviors promoting unhealthy eating, smoking, and drinking alcohol, and inability to cope with stress (3). Sleep quality was found to be lower in mothers with a child with cancer, with higher weight gain compared to those with healthy children. Maintaining physical and psychological health of parents in turn affects the outcome of child's health. Having healthy mothers will also increase the quality of life of all family members, especially the child with cancer (4).

Studies conducted in Turkey have mostly focused on the psychosocial problems of mothers having children with cancer (10,11). No study has demonstrated both physical and psychological health problems and healthy lifestyle behaviors of mothers whose children have cancer. To prevent mothers of children with cancer from developing health problems and suggest effective ways to maintain their health, it is important to accurately determine the problems they face. In this study, the effects of some characteristics of mothers with cancer children on health problems and healthy lifestyle behaviors were examined. Our findings are expected to be used to assess the health problems of the mothers, to plan for necessary counseling services in order to reduce the health problems in caregivers of children with cancer.

## MATERIAL AND METHODS

### Study Design

This methodological, descriptive, and correlational study examined the physical health and lifestyle behaviors characteristics of mothers whose children had cancer.

### Population and Sample

In the first stage of study, according to the literature, it is stated that in scale validity and reliability studies, it is necessary to reach 5 or 10 times of the scale items (12,13). For this reason, the sampling involved 150 mothers.

In the second stage of study, the sampling calculation required for the study was performed using the G*POWER 3.1 statistical analysis software based on a 0.05 significance level, 80% power, and 0.50 effect size (medium effect size). Thus, the sample size required for independent samples t-test analysis was determined as 128 mothers. The research data were collected between May and August 2019. The sample of the study consisted of 150 mothers over 18 years of age who, for at least 3 months, have been caring for their children receiving cancer treatment. Study participants were volunteers. The research was carried out in the Division of Paediatric Haematology-Oncology of Istanbul University, Oncology Institute.

### Ethical approval

The study was approved by the ethics committee on 06.03.2019 with decision number 2019.075.IRB3.050. All participants were informed about the study's aim and importance, and all subjects signed an informed consent form.

### Data Collection Tools

The research data was compiled using "Sociodemographic Information Form", "Mothers' Physical Health Form" and "Health-Promoting Lifestyle Profile II (HPLP-II)". Mothers of children with cancer were asked to fill in questionnaires that took about 20–25 minutes.

### Sociodemographic Information Form

The form was created by the researchers to determine the sociodemographic characteristics of mothers and children. The form consisted of questions about mother's age, child's age, child's diagnosis duration, marital status, educational status, number of children, employment status, income level, family type, and area of residence (14–17).

### Mothers' Physical Health Form

This form was prepared by the researchers using

findings from the literature and clinical experience (4,6,8,14–16,18,19). The form assessed how the physical health of mothers was affected due to their caregiver role; physical health problems such as anorexia, weight gain, weight loss, headache, back pain, joint pain, and sleep problems were included. The scale consisted of 18 items. Scores obtained from the experts were analyzed with a validity review of the material. Each item in the scale was scored from 1 = Yes and 0 = No. A minimum of 0 and a maximum of 18 points were obtained from the scale. Higher scores indicated an increase in the physical health problems experienced by the mothers. The internal consistency coefficient of the scale was estimated based on the Kuder-Richardson reliability coefficient (KR-20) analysis. The KR-20 reliability coefficient of the scale is 0.81.

**Health-Promoting Lifestyle Profile II (HPLP-II)**

The HPLP-II, developed in 1987 by Walker, Scehnist and Pender, is a scale that measures health promoting behaviors in relation to individuals' healthy lifestyles (20). The Turkish validity and reliability study of the scale was performed in 2008 by Bahar et al. The form consisted of 52 items, in a 4-point Likert-type scale that includes choices of 'never', 'sometimes', 'often', and 'regularly' (21). The scale consisted of six subscales: 'health responsibility', 'physical activity', 'nutrition', 'spiritual development', 'interpersonal relations' and 'stress management'. Lowest score in the scale was 52 and the highest one was 208. A high score in the scale indicates that the individual has healthier lifestyle behaviors. The Cronbach Alpha value of the scale was 0.92 and the values of the sub-scale ranged from 0.64 to 0.80 (21). The Cronbach's alpha value in this study was 0.814.

**Data analysis**

The study data were analyzed using SPSS 21.0 statistical data analysis package program and evaluated by using frequency, arithmetical average, and percentage values.

In the first stage of study, the internal accuracy of the scale and its subscales was determined using

**Table 1.** Characteristics of mothers and children

| Characteristics | | n | % |
|---|---|---|---|
| **Mother's age** | 19–29 | 54 | 36.0 |
| | 30 - 40 | 60 | 40.0 |
| | 41 and above | 36 | 24.0 |
| **Child's age** | 0-2 years | 2 | 14.7 |
| | 3-5 years | 34 | 22.7 |
| | 6 years and above | 94 | 62.6 |
| **Marital status** | Married | 143 | 95.3 |
| | Single | 7 | 4.7 |
| **Educational status** | Literate | 17 | 11.3 |
| | Primary school | 39 | 26.0 |
| | Secondary school | 38 | 25.4 |
| | High school | 39 | 26.0 |
| | University | 17 | 11.3 |
| **Number of children** | Single | 27 | 18.0 |
| | More than 1 | 123 | 82.0 |
| **Employment status** | Employed | 13 | 8.7 |
| | Unemployed | 137 | 91.3 |
| **Income level** | Well | 26 | 17.3 |
| | Moderate | 88 | 58.7 |
| | Poor | 36 | 24.0 |

**Table 2.** Physical health problems of mothers

| Physical Health Problems | n | % |
|---|---|---|
| Fatigue | 136 | 90.7 |
| Sleep Problems | 114 | 76.0 |
| Headache | 102 | 68.0 |
| Back pain | 99 | 66.0 |
| Lumbar pain | 93 | 62.0 |
| Muscle pain | 92 | 61.3 |
| Stomachache | 88 | 58.7 |
| Joint pain | 84 | 56.0 |
| Loss of appetite | 97 | 64.7 |
| Weight losses | 84 | 56.0 |
| Weight Gain | 50 | 33.3 |
| Increased hair loss | 82 | 54.7 |
| Irregularity in menstruation | 78 | 52.0 |
| Increased menstrual bleeding | 32 | 21.3 |
| Wound | 25 | 16.7 |
| Smoking (starting / increasing the number of cigarettes) | 31 | 20.7 |
| Chronic ailments | 18 | 12.0 |
| Using alcohol (starting / increasing amount of alcohol) | 2 | 1.3 |

reliability analysis. The content validity index (CVI) and factor analysis were used. The relationship between item and factor was determined using EFA (exploratory factor analysis). We conducted a CFA (Confirmatory Factor Analysis) with a full estimate of the maximum likelihood using IBM SPSS Amos version 26.0. The internal consistency coefficient of the scale was estimated based on the Kuder-Richardson reliability coefficient (KR-20) analysis. For the item–total score analysis, Pearson correlation analysis was used. The margin of error was set at $p = 0.05$.

In the second stage of study, Shapiro-Wilk was used to determine compliance of the parameters with the normal distribution. Independent Samples t-test and single way variance analysis (ANOVA) tests were conducted to measure the relations between the variables. The Bonferroni test was used to determine where the difference between the variables originated. Linear regression analysis was employed to examine the extent to which the factors associated with healthy lifestyle behaviors of mothers. VIF and tolerance analysis was used to examine whether there was multicollinearity between the factors associated with healthy lifestyle behaviors of mothers. A VIF value of <10, a tolerance value of <0.2, and a condition index value of <15, which are independent variables, were included in the regression analysis (22). Level of significance was accepted as 0.05.

## RESULTS

In the first part of the results, the validity and reliability findings of the Mothers' Physical Health Form used in the study are presented. This form was prepared by the researchers using findings from the literature and clinical experience (6,8,18). The form assessed how the physical health of mothers was affected due to their caregiver role; physical health problems such as anorexia, weight gain, weight loss, headache, back pain, joint pain, and sleep problems were included. The scale was evaluated by a panel of five experts in pediatric oncology (two medical doctors from the Paediatrics Department, three experts from the Department of Paediatric nursing). The scale had a Kaiser-Meyer-Olkin (KMO) value of 0.791, Bartlett's test of sphericity of 1025.744, and an explained variance of 66.19%. According to the explanatory factor analysis results, the factor loading was 0.66–0.78 for the scale. The confirmatory factor analysis

**Table 3.** Healthy lifestyle behaviors scale scores of mothers

| HPLP II and subscales | Mean | SD | Min. | Max. | Highest and lowest obtainable score |
|---|---|---|---|---|---|
| Health responsibility | 22.16 | 5.86 | 10 | 34 | 9-36 |
| Physical activity | 12.96 | 4.61 | 8 | 28 | 8-32 |
| Nutrition | 23.42 | 5.23 | 14 | 62 | 9-36 |
| Spiritual growth | 29.20 | 4.66 | 18 | 36 | 9-36 |
| Interpersonel relationships | 27.29 | 4.89 | 15 | 36 | 9-36 |
| Stress management | 19.41 | 5.52 | 8 | 31 | 8-32 |
| Total HPLP II | 134.54 | 25.80 | 80 | 188 | 52-208 |

*SD: Standard deviation; Min: Minimum; Max: Maximum*

results showed the following fit indices: X2 =399.942, df = 96, X2 / df = 4.166, RMSEA = 0.051, GFI = 0.96, CFI = 0.96, IFI = 0.96, NFI = 0.96, TLI = 0.96, and RFI = 0.95. The factor loading was 0.65–0.76 for the scale. The KR-20 reliability coefficient of the scale is 0.81. The correlation of the scale items with the scale total score was 0.56–0.68. The adapted scale was found to be a valid and reliable measurement tool for assessing the physical health problems of mothers of children with cancer.

Table 1 summarizes the demographic characteristics of mothers and children. According to the results of Shapiro-Wilks test, participants enrolled in this study were not homogeneous in terms of sociodemographic variables ($p < 0.05$).

The physical health problems experienced by the mothers are presented in Table 2. The mean score of the mothers participating in the study on the Mothers' Physical Health Problems Form was 8.71 + 3.96.

In Table 3, the mean scores of the mothers based on the HPLP-II subscale values were calculated as 29.20 ± 4.66 for “Spiritual development,” 27.29 ± 4.89 for “Interpersonal relations,” 23.42 ± 5.23 for “Nutrition,” 22.16 ± 5.86 for "Health responsibility," 19.41 ± 5.52 for "Stress management", and 12.96 ± 4.61 for "Physical activity". HPLP-II total value was found as 134.54 ± 25.80.

There was not a statistically significant difference found between mother’s age and physical activity, which is a subscale of healthy lifestyle behavior scale. There was not a statistically significant difference found between mother’s age and mothers ‘physical health problems form scores ($p > 0.05$). However, a statistically significant difference was found among healthy lifestyle behavior scale total score ($p<0.001$), nutrition ($p<0.001$), health responsibility ($p=0.007$), interpersonal relations ($p<0.001$), stress management ($p<0.001$) and spiritual development ($p<0.001$).

There was a statistically significant difference found between children age, the educational status and income level of the mothers, and health-promoting lifestyle profile scale total score and sub-scales score ($p < 0.05$), whereas no statistically significant difference was found between children age, the educational status and income level and mothers ‘physical health problems form scores ($p > 0.05$).

There was not a statistically significant difference found between number of children and health responsibility and physical activity, which are subscales of healthy lifestyle behavior scale and mothers’ physical health problems form scores ($p > 0.05$); while a statistically significant difference was found health-promoting lifestyle profile total score, nutrition, interpersonal relations, stress management and spiritual development ($p < 0.05$).

No statistically significant difference was found between marital status and employment status, and healthy lifestyle behavior scale total score and its subscales ($p > 0.05$). There was a statistically significant difference found between marital status and mothers’ physical health problems form scores ($p<0.05$), Bonferroni-corrected Mann Whitney U test determined the origin of the observed differences in mothers’ age, children age, education level, and income level. As there were three pairs of comparisons in the analysis for mothers’ age, children age and income level, the accepted significance level ($p = 0.05$) was divided by three to determine the new significance level. The new significance level was 0.05/3 = 0.016. Thus, we determined that the observed differences stemmed from mothers who were thirty years old and over, children aged six and over, and participants with a high-income level.

**Table 4.** Comparison of sociodemographic characteristics and healthy lifestyle behavior scale and physical health problems form scores of mothers

| Descriptive characteristics | | Health responsibility | Physical activity | Nutrition | Spiritual development | Interpersonel relationships | Stress management | HPLP II Total | PHP |
|---|---|---|---|---|---|---|---|---|---|
| Mother age | 19-29 years | 20.26±5.89 | 11.92±4.29 | 21.36±4.32 | 27.32±4.96 | 25.30±4.94 | 16.78±5.64 | 122.98±25.78 | 8.38±3.41 |
| | 30-39 years | 22.68±5.50 | 13.65±4.78 | 23.88±3.58 | 29.88±3.71 | 28.38±3.89 | 20.48±5.14 | 138.96±21.92 | 8.48±4.24 |
| | 40 years and over | 24.11±5.83 | 13.42±4.65 | 25.85±7.51 | 30.77±5.01 | 28.37±5.55 | 21.60±4.72 | 144.14±26.35 | 9.71±4.23 |
| | **F** | 5.069 | 2.135 | 9.155 | 7.260 | 7.498 | 10.835 | 9.517 | 1.673 |
| | **p** | 0.007* | 0.122 | 0.000* | 0.001* | 0.001* | 0.000* | 0.000* | 0.191 |
| Child age | 0-2 years | 19.00±5.45 | 10.59±3.44 | 20.00±3.57 | 25.90±4.33 | 24.18±4.66 | 14.40±4.05 | 113.68±18.25 | 8.09±3.35 |
| | 3-5 years | 20.2 ±5.59 | 12.00±3.90 | 22.17±4.27 | 27.61±4.76 | 25.52±4.25 | 17.94±5.25 | 125.52±24.13 | 8.70±3.00 |
| | 6 years and above | 23.57±5.58 | 13.87±4.79 | 24.28±3.81 | 30.55±4.14 | 28.62±4.67 | 21.11±5.07 | 141.92±23.50 | 8.86±4.39 |
| | **KW** | 15.290 | 15.784 | 20.553 | 21.800 | 20.770 | 31.499 | 25.886 | 1.250 |
| | **p** | 0.000* | 0.000* | 0.000* | 0.000* | 0.000* | 0.000* | 0.000* | 0.535 |
| Marital status | Married | 22.34±5.77 | 13.06±4.61 | 23.27±4.18 | 29.29±4.58 | 27.38±4.91 | 19.54±5.51 | 134.77±25.09 | 8.54±3.96 |
| | Single | 18.28±6.39 | 10.85±3.53 | 21.28±3.77 | 27.42±6.13 | 25.00±4.32 | 16.71±5.58 | 119.57±26.11 | 12.14±1.67 |
| | **U** | 312.000 | 325.500 | 352.500 | 409.000 | 350.000 | 358.500 | 331.000 | 218.500 |
| | **p** | 0.096 | 0.126 | 0.186 | 0.414 | 0.179 | 0.205 | 0.148 | 0.012* |
| Educational status | Literate | 19.70±5.68 | 10.88±2.47 | 22.70±3.56 | 28.64±4.76 | 27.00±4.96 | 18.23±4.91 | 127.17±20.53 | 10.00±4.04 |
| | Primary school | 19.94±4.54 | 11.48±3.45 | 21.76±4.08 | 27.97±4.32 | 25.15±4.60 | 17.25±5.09 | 123.82±22.40 | 8.51±3.66 |
| | Secondary school | 22.34±5.40 | 12.89±4.06 | 22.9±4.00 | 28.60±4.58 | 27.02±4.85 | 18.97±5.51 | 132.50±23.60 | 8.44±3.80 |
| | High school | 23.89±6.11 | 14.12±5.39 | 23.94±4.41 | 31.10±4.25 | 28.79±4.61 | 21.48±4.96 | 142.89±25.58 | 8.56±4.24 |
| | University | 25.23±6.67 | 15.94±5.57 | 25.70±3.60 | 29.58±5.44 | 29.47±4.62 | 21.76±6.34 | 147.70±27.96 | 8.82±4.43 |
| | **KW** | 17.003 | 13.096 | 11.567 | 11.206 | 14.765 | 14.784 | 14.803 | 1.952 |
| | **p** | 0.002* | 0.011* | 0.021* | 0.024* | 0.005* | 0.005* | 0.005* | 0.744 |
| Number of children | Single | 20.62±5.72 | 13.00±5.52 | 21.07±3.91 | 27.40±4.19 | 25.25±4.43 | 16.88±6.02 | 124.25±25.83 | 8.37±3.71 |
| | More than 1 | 22.48±5.84 | 12.95±4.37 | 23.64±4.09 | 29.60±4.68 | 27.71±4.89 | 19.96±5.27 | 236.2±24.71 | 8.78±4.02 |
| | **U** | 1326.500 | 1482.000 | 1065.500 | 1161.500 | 1170.000 | 1080.000 | 1153.000 | 1516.000 |
| | **p** | 0.114 | 0.449 | 0.004* | 0.014* | 0.016* | 0.004* | 0.019* | 0.478 |
| Employed status | Employed | 24.23±7.38 | 15.15±6.21 | 23.76±4.88 | 29.84±4.77 | 28.00±5.49 | 21.84±6.36 | 142.84±32.57 | 8.61±5.39 |
| | Unemployed | 21.95±5.67 | 12.75±4.36 | 23.12±4.11 | 29.14±4.66 | 27.20±4.85 | 19.18±5.41 | 133.23±24.43 | 8.72±3.82 |
| | **U** | 684.000 | 736.500 | 798.000 | 810.500 | 813.500 | 664.500 | 704.000 | 887.000 |
| | **p** | 0.178 | 0.336 | 0.536 | 0.606 | 0.606 | 0.130 | 0.254 | 0.981 |
| Income level | Well | 25.15±5.55 | 14.50±5.93 | 24.96±3.96 | 31.65±3.76 | 29.50±4.67 | 22.23±5.79 | 148.00±25.75 | 9.07±4.50 |
| | Moderate | 22.98±5.63 | 13.37±4.42 | 23.60±4.08 | 29.61±4.43 | 27.52±4.71 | 20.04±5.017 | 139.93±23.46 | 8.27±4.01 |
| | Poor | 17.94±4.20 | 10.86±2.95 | 20.86±3.61 | 26.44±4.56 | 25.05±4.71 | 15.83±4.83 | 117.00±20.19 | 9.52±3.31 |
| | **KW** | 27.239 | 11.138 | 15.595 | 20.118 | 13.336 | 23.353 | 22.469 | 2.751 |
| | **p** | 0.000* | 0.004* | 0.000* | 0.000* | 0.001* | 0.000* | 0.000* | 0.253 |

HPLP II: Healthy Lifestyle Behavior Scale II; PHP: Mothers'Physical Health Problems; KW: Kruskal Wallis Test; U: Mann Whitney U Test; *p<0.05

**Table 5.** Linear regression analysis of the factors associated with healthy lifestyle behaviors of mothers

| | Healthy Lifestyle Behavior Scale II | | | | | | |
|---|---|---|---|---|---|---|---|
| | Model 1 | | | | | | |
| | Unstandardized Beta | Coefficients Standart Error | Standardized Beta β | t | p | 95 % Confidence Interval | |
| | | | | | | Lower | Upper |
| **Mothers' Age[a]** | 4.352 | 5.379 | 0.081 | 0.809 | 0.420 | -6.282 | 14.986 |
| **Children' Age[b]** | 13.985 | 5.278 | 0.262 | 2.650 | 0.009 | 3.551 | 24.419 |
| **Education Status[c]** | 10.774 | 3.990 | 0.203 | 2.700 | 0.008 | 2.886 | 18.663 |
| **Number of Children[d]** | 5.861 | 5.631 | 0.088 | 1.041 | 0.300 | -5.271 | 16.993 |
| **Income Level[e]** | 10.369 | 5.278 | 0.154 | 1.965 | 0.049 | -0.065 | 20.803 |
| **R** | | **0.492** | | | | | |
| **$R^2$** | | **0.242** | | | | | |
| **F** | | **9.021** | | | | | |
| **p** | | **0.000** | | | | | |
| **Durbin Watson (1.5–2.5)** | | **2.166** | | | | | |

[a]While coding, 30-40 years and 41 years and above was coded as 1 and 19-29 years was coded as 0; [b]While coding, 6 years and above was coded as 1 and 0-2 years and 3-5 years was coded as 0; [c]While coding, the secondary school, high school and university was coded as 1 and the literate and primary school was coded as 0; [d]While coding, more than one was coded as 1 and the single was coded as 0; [e]While coding, the weel income was coded as 1 and the moderate and poor income was coded as 0. R: correlation; R2: correlation coefficient (explained variance ratio); F: model statistics; p: level of significance

Additionally, given that there were ten pairs of comparisons in the analysis performed on the origin of the observed difference in education level, the new calculated significance level was determined as 0.005, which originated from participants who were secondary school, high school, and university graduates.

A regression model was created that included the variables that affected the level of healthy lifestyle behavior in a statistically significantly (mothers' age, children age, educational status, number of children and income level) (Table 5). Model 1 describes the effect of the sociodemographic characteristic of mothers on Health-Promoting Lifestyle Profile II, and shows that sociodemographic characteristics predicted on 24.2% of the health-promoting lifestyle behavior of mothers. Based on the analysis, for every 1 year increase in the ages of mothers of children with cancer, the healthy lifestyle behavior was 4.35 points higher, for every 1 year increase in the children's ages, the mothers' health-promoting lifestyle behavior was 13.98 points higher, and as the number of children increased by 1 per mother, the healthy lifestyle behavior of the mother was 5.86 points higher. Further, as the education level and income increased by 1 level, the healthy lifestyle behavior of the mothers was 10.77 and 10.36 points higher, respectively. Each of the factors, except for mothers' age and number of children, had a statistically significant relationship with the health-promoting lifestyle behaviors of mothers ($p < 0.05$, Table 5).

## DISCUSSION

Providing care for a child with cancer, who needs intensive treatment and care, is a difficult and tiring process for family members. It is known that the health of mothers is most negatively affected during this process (6,8). In this study, we observed that, during treatment, the most common physical health problems in mothers were fatigue, sleep problems, headache, back pain, and anorexia (Table 2). The stress experienced by mothers due to physical care responsibilities, such as meeting the self-care needs of the child, as well as other responsibilities, can lead to the occurrence of such physical symptoms.

This study, the mothers' age, children age, educational status, number of children and income level that affected the level of healthy lifestyle behavior in a statistically significantly (Table 4). Healthy lifestyle behaviors are a condition that can be affected by many factors. In the literature, it is stated that the average score of healthy lifestyle behaviors

of young people is higher than that of the elderly (14,15). In addition, it is emphasized that the increase in the level of education is a positive factor in the development of healthy lifestyle behaviors of individuals (16). Studies show that income level is effective in developing healthy lifestyle behaviors of individuals. As the income level increases, the healthy lifestyle behaviors of individuals are positively affected (14–16) In addition, it is stated in the literature that the age of the children that mothers have can affect many maternal conditions (15). One of these situations is healthy lifestyle behaviors. As the child's age increases, his dependence on the mother decreases. In addition, as the age of the child increases, he/she realizes his/her self-care skills and becomes more free and independent. This may lead mothers to devote more time to themselves and to display healthy behaviors (4,17,23,24). The findings of this study support the literature.

Model 1 showed that the sociodemographic characteristic of mothers predicted on their healthy lifestyle behavior by 24.2%, based on HPLP-II. There are many factors that affect mothers' healthy lifestyle behavior, including sociodemographic characteristics, environment, chronic illness, presence of a person with a chronic or fatal disease in the family, education for a healthy lifestyle, presence of obesity, presence of addiction, stress level, social support systems, and the support of a husband (4,25). For this reason, a 24.2% influence of sociodemographic characteristic on healthy lifestyle behavior of mothers whose children were hospitalized for a long time, who had to cope with so many symptoms, and whose healthy lifestyle behavior was influenced by various variables, is consider to be good, and consistent with previous findings (25,26).

### Limitations

The sample size of the study were limitations of the present study, which may affect the generalizability of the study's findings. Second limitations; one of the most important limitations of the research is using voluntary sampling.

## CONCLUSION

Our results showed that physical activity and stress management received the lowest health lifestyle behavior scores. The current findings emphasize the importance of informing mothers about stress management and physical activities during the care of their children with cancer. There was an increase in the rate of smoking in mothers, indicating the need to provide these mothers with help to quit smoking. Spiritual support may help mother's wellbeing. Obstacles to health promoting behaviors should also be investigated in this population, alongside longitudinal cohort studies.

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