



## Original Research

# Evaluation of Healthy Lifestyle Behaviors in Psoriasis Patients

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### Abstract

**Objectives:** The purpose of our study was to compare healthy lifestyle behaviors between psoriasis patients and healthy controls.

**Methods:** This case-control study included 80 psoriasis patients and 80 sex- and age- matched healthy controls aged over 18. Participants completed the socio-demographic data form and the Health-Promoting Lifestyle Profile II (HPLP-II). The HPLP-II consists of 52 items and measures six components of health-promoting behavior outcomes: Nutrition, physical activity, health responsibility, spiritual growth, interpersonal relations, and stress management. Higher scores show that the individual applies the specified health behaviors at a high level.

**Results:** HPLP-II total scores were  $128.3 \pm 21.1$  in patient group and  $132.5 \pm 22.3$  in control group. Based on the scores, psoriasis patients showed a moderate level of health-promoting lifestyle, while controls showed a good level of health-promoting lifestyle. Spiritual growth score of patients (mean $\pm$ SD =  $25.6 \pm 4.9$ ) was statistically lower than the controls (mean $\pm$ SD =  $27.3 \pm 4.5$ ) ( $p=0.040$ ). In addition, spiritual growth score and disease duration were negatively correlated in the patient group ( $r=-0.287$ ,  $p=0.01$ ). Furthermore, nutrition score of those with additional comorbidity was significantly higher than those with psoriasis alone in patient group ( $p=0.002$ ).

**Conclusion:** This is the first study to compare healthy lifestyle behaviors of psoriasis patients and healthy volunteers in Turkish population. The task of dermatologists is not only the medical treatment of psoriasis lesions but also questioning patients' lifestyle behaviors and supporting the development of healthy behaviors in patients.

**Keywords:** Health behaviour, healthy lifestyle, psoriasis

Please cite this article as "Deniz F, Kivanc Altunay I, Ozkur E, Aksu Cerman A, Kaya Erdogan H, Bulur I. Evaluation of Healthy Lifestyle Behaviors in Psoriasis Patients. Med Bull Sisli Etfal Hosp 2021;55(2):197-202".

Healthy lifestyle is the capability of the individual to control his/her behaviors that can influence general health and to prefer the behaviors that are beneficial for the health status while arranging daily activities. Health behavior is defined as overt behavioral patterns, actions, and habits related to health protection and health promotion.<sup>[1]</sup> Psoriasis is a chronic, inflammatory skin disease which can also display multisystem involvement with accompanying comorbidities.<sup>[2]</sup> It is known that altering lifestyle behaviors

is advantageous in preventing psoriasis and/or reducing disease severity.<sup>[3-8]</sup> In our study, we purposed to determine lifestyle behaviors in psoriasis patients comparing with healthy controls.

### Methods

Eighty psoriasis patients without psoriatic arthritis, who admitted to the dermatology outpatient clinics of two centers

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**Submitted Date:** December 19, 2019 **Accepted Date:** August 23, 2020 **Available Online Date:** July 02, 2021

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between November 2015 and May 2016, and 80 sex- and age-matched healthy controls were included in this case-control study. All participants were above the age of 18 and agreed to participate in the research. Ethical approval was obtained on December 8, 2015 with 1146 confirmation number. Participants completed the socio-demographic data form which included age, gender, income, educational status, marital status, and body mass index (BMI) and the Health-Promoting Lifestyle Profile II (HPLP-II). The HPLP-II questionnaire is the revised version of the HPLP questionnaire and was first designed by Walker et al.<sup>[9]</sup> It consists of 52 items and measures self-reported health-promoting behaviors in the scopes of nutrition, physical activity, health responsibility, spiritual growth, interpersonal relations, and stress management. The items are scored on a four-point scale (routinely = 4, often = 3, sometimes = 2, and never = 1). The total scores of HPLP-II range between 52 and 208 and low scores denote a worse level of health-promoting lifestyle.<sup>[10]</sup> Moreover, the HPLP-II total scores are divided into four degrees: 169–208, excellent; 130–168, good; 91–129, moderate; and 52–90, poor.<sup>[11]</sup> The Turkish validity and reliability study of the HPLP-II scale were performed in 2008 by Bahar et al.<sup>[12]</sup>

### Statistical Analysis

SPSS 15.0 for Windows program was used for statistical analysis. Descriptive statistics were given as number and percentage for categorical variables, and mean, standard deviation, minimum, maximum for numerical variables. When the normal distribution condition was satisfied, two independent group comparisons of numerical variables were performed by Student's t-test, and more than two group comparisons were made by One-Way ANOVA test. Kruskal-Wallis test and Mann-Whitney U test were used when normal distribution condition was not achieved. Subgroup analyzes were performed with Mann-Whitney U-test and interpreted with Bonferroni correction. The relationship between numerical variables was examined by Spearman Correlation Analysis since no parametric test condition was provided. The rates were compared with Chi-square analysis. The determinant factors were examined by Linear Regression Analysis Forward Method. Statistical alpha significance level was accepted as  $p < 0.05$ .

### Results

The present study included 41 (51.2%) female and 39 (48.8%) male in psoriasis group, and 46 (57.5%) female and 34 (42.5%) male in control group. The mean age was  $41.99 \pm 13.88$  in psoriasis group, and  $41.04 \pm 10.44$  in control group ( $p = 0.774$ ). The mean disease duration of psoriasis patients was  $166.6 \pm 142.5$  months. No significant statistical

difference was found between two groups in terms of gender, BMI, educational level, and economic status ( $p = 0.429$ ,  $p = 0.053$ ,  $p = 0.025$ ,  $p = 0.193$ ). The mean psoriasis area severity index (PASI) scores of the patients were  $8.2 \pm 6.8$ . Socio-demographic variables are shown in Table 1.

The mean HPLP-II scores were  $128.3 \pm 21.1$  and  $132.5 \pm 22.3$  in psoriasis and control groups, respectively. Based on these scores, psoriasis patients were shown to have a moderate level of health-promoting lifestyle, while controls were shown to have a good level of health-promoting lifestyle.

Spiritual growth score of psoriasis patients was significantly lower than the controls ( $25.6 \pm 4.9$  and  $27.3 \pm 4.5$ , respectively,  $p = 0.04$ ). Physical activity, stress management, nutrition and interpersonal relations, and scores were higher in control group ( $16.6 \pm 5.5$ ;  $19.8 \pm 4.5$ ;  $20.9 \pm 4.5$ ; and  $26.5 \pm 4.3$ ; respectively) than the patient group ( $15.4 \pm 4.5$ ;  $18.9 \pm 3.7$ ;  $20.6 \pm 4.2$ ; and  $25.4 \pm 4.9$ ; respectively) but these differences were not significant statistically ( $p > 0.05$  for all). Only health responsibility subscale score was higher in patient group ( $22.4 \pm 4.9$ ) than the control group ( $21.4 \pm 4.9$ ) but also this difference was statistically non-significant ( $p = 0.298$ ). The difference among the subscale scores between patient and control groups is presented in Table 2.

**Table 1.** Socio-demographic variables of both groups and clinical variables of patient group

	Patient group	Control group	p
Age Mean±SD (Min-Max)	42.0±13.9 (19–65)	41.0±10.4 (25–70)	0.774
Gender, n (%)			
Female	41 (51.3)	46 (57.5)	0.427
Male	39 (48.8)	34 (42.5)	
BMI Mean±SD	25.86±3.3	24.87±3.8	0.053
Marital status, n (%)			
Single	22 (27.5)	24 (30.0)	0.784
Married	52 (65.0)	52 (65.0)	
Widow or divorced	6 (7.5)	4 (5.0)	
Educational level, n (%)			
Primary education	37 (46.3)	22 (27.5)	0.225
Secondary education	25 (31.3)	22 (27.5)	
Tertiary education	18 (22.5)	36 (45.0)	
Economic status, n (%)			
Low	2 (2.5)	10 (12.5)	0.056
Middle	57 (71.3)	51 (63.8)	
High	21 (26.3)	19 (23.8)	
Comorbidity, n (%)	28 (38.9)		
Disease duration Mean±SD (Min-Max)	13.9±11.8 (0–45)		
PASI Mean±SD (Min-Max)	8.2±6.8 (0–31.3)		

\*BMI: Body mass index; \*PASI: Psoriasis area severity index.

Spiritual growth showed positive correlation with educational level ( $r=0.260, p=0.001$ ) and negative correlation with disease duration in psoriasis group ( $r=-0.287, p=0.010$ ).

The whole group (patient + control) was evaluated with Spearman correlation test. Nutrition subscale showed positive correlation with age ( $r=0.185, p=0.019$ ). Spiritual growth showed positive correlation with educational level ( $r=0.260, p=0.001$ ) and economic status ( $r=0.223, p=0.005$ ) but negative correlation with age ( $r=-0.168, p=0.034$ ). Stress management and total score were positively correlated with economic status ( $r=0.183, p=0.020$ ;  $r=0.175, p=0.027$ , respectively) (Table 3).

In psoriasis group, the mean nutrition subscale score of patients with comorbid disease was  $22.7\pm 3.4$  and significantly higher than those without comorbid disease ( $19.6\pm 4.0$ ;  $p=0.002$ ).

When the questions of the HPLP-II were analyzed one by one, in patient group, the mean scores of 3<sup>rd</sup> (Report any unusual signs or symptoms to a physician or other health professionals) and 15<sup>th</sup> (Question health professionals to understand their instructions) questions were significantly higher while the mean scores of 16<sup>th</sup> (Take part in light-to-

moderate physical activity, such as sustained walking for 30–40 min, 5 or more times a week), 23<sup>rd</sup> (Concentrate on pleasant thoughts at bedtime), 24<sup>th</sup> (Feel content and at peace with myself), 31<sup>st</sup> (Touch and am touched by people I care about), 42<sup>nd</sup> (Am aware of what is important to me in life), and 52<sup>nd</sup> (Expose myself to new experiences and challenges) questions were statistically significantly lower than the control group ( $p=0.008, p=0.046, p=0.007, p=0.009, p=0.008, p=0.001, p=0.018, p=0.024$ , respectively).

## Discussion

In this study, psoriasis patients represented a moderate level of health-promoting lifestyle, while controls represented a good level of health-promoting lifestyle according to total HPLP-II scores. In terms of subscale scores, only spiritual growth score of the patients was significantly lower than the controls.

If HPLP-II subscales are evaluated in detail, spiritual growth is about the development of inner resources.<sup>[10]</sup> When the patient and control groups were compared in terms of their answers to the scale questions, a significant difference was found in the 24<sup>th</sup>, 42<sup>nd</sup>, and 52<sup>nd</sup> questions which

**Table 2.** Comparison of HPLP-II subscale and total scores of the patient and control groups

	Patient group			Control group			P
	Mean±SD	Min-Max	Median	Mean±SD	Min-Max	Median	
Health responsibility	22.4±4.9	13–34	22	21.4±4.9	12–32	22	0.298
Physical activity	15.4±4.5	8–29	15.5	16.6±5.5	8–31	16.5	0.204
Nutrition	20.6±4.2	11–32	21	20.9±4.5	10–31	21	0.588
Spiritual growth	25.6±4.9	13–35	26	27.3±4.5	18–36	27	0.040
Interpersonal relations	25.4±4.9	14–35	26	26.5±4.3	14–35	26	0.134
Stress management	18.9±3.7	11–27	19	19.8±4.5	11–31	20	0.306
Total score	128.3±21.1	74–168	130	132.5±22.3	91–189	133	0.222

\*HPLP-II: Health-Promoting Lifestyle Profile II.

**Table 3.** Correlation among socio-demographic variables and HPLP-II subscale and total scores

	Age		Educational level		Economic status		BMI	
	rho	P	rho	P	rho	P	rho	P
Health responsibility	-0.020	0.798	0.041	0.608	0.128	0.107	0.047	0.552
Physical activity	-0.126	0.113	0.135	0.089	0.073	0.360	-0.109	0.171
Nutrition	0.185	0.019	0.008	0.921	0.108	0.173	0.017	0.831
Spiritual growth	-0.168	0.034	0.260	0.001	0.223	0.005	-0.076	0.342
Interpersonal relations	-0.090	0.257	0.150	0.058	0.106	0.180	-0.009	0.911
Stress management	-0.065	0.411	0.101	0.202	0.183	0.020	-0.062	0.439
Total score	-0.066	0.409	0.151	0.057	0.175	0.027	-0.042	0.602

\*HPLP-II: Health-Promoting Lifestyle Profile II, BMI: Body mass index.

are related to spiritual growth in addition to the difference in mean spiritual growth scores. It is possible to anticipate these lower scores of spiritual growth in patient group because stigmatization, social phobia, and insecurity in human relations can frequently be seen in psoriasis patients. As the duration of the illness increases, the decrease in the spiritual growth scores can be explained by the decrease of self-sufficiency and loss of hope. The most determining factor in the spiritual growth subscale was found to be the educational level for the whole group. This finding can be attributed to the positive contribution of educational level to the development of conscious coping mechanisms in the development of one's internal resources.

Nutrition subscale of HPLP-II involves conscious choice and consumption of foods necessary for health and well-being.<sup>[10]</sup> Proper nutrition is one of the prerequisites of protection from metabolic diseases and healthy life. A number of reviews have emphasized diet and nutrition as a component of both triggering or improving psoriasis,<sup>[13-17]</sup> however, no cohort studies have been found. In a pilot study to determine a group of foods that may act as a factor of manifestation and/or exacerbation of psoriasis, poor dietary intake was observed in psoriasis patients. Forty-three patients were evaluated over 2 years, and 88.37% of them had positive results with the change of eating habits. The positive aspects were reduction of scaling and erythema, milder outbreaks, and improved quality of life.<sup>[18]</sup> In another study evaluating, the association between psoriasis severity and adherence to the Mediterranean diet using a 14-item *prevención con dieta mediterránea* (PREDIMED) questionnaire, higher percentage of psoriatic patients had a low adherence to the Mediterranean diet compared with the age-, sex-, and BMI-matched controls.<sup>[19]</sup> Our study showed no statistical significant difference in terms of nutrition subscale scores between patient and control groups. However, nutrition subscale scores were significantly higher in psoriasis patients with comorbid disease and the most common comorbidity was Type II diabetes mellitus. This difference may have arisen due to the awareness of necessity to follow a certain diet in diabetic patients. This finding may indicate that there is insufficient knowledge and awareness of the relationship between nutrition and disease course in psoriasis patients.

Physical activity subscale involves the regular practice of light, moderate, and heavy exercises.<sup>[10]</sup> Physical activity is known to be vital for the prevention and management of cardiovascular diseases and has helpful effects on diabetes, obesity, metabolic syndrome, and other cardiovascular risk factors.<sup>[20,21]</sup> In addition, physical activity has been suggested as an important component of disease management in psoriasis.<sup>[22,23]</sup> In a review investigating the re-

lationship between physical activity and psoriasis, it was proposed that physical activity can positively modify the severity of psoriasis and its cardiometabolic comorbidities.<sup>[24]</sup> In a study using a validated instrument the International Physical Activity Questionnaire-Short Form (IPAQ-S), it has been shown that psoriasis patients have low levels of physical activity in comparison with healthy controls.<sup>[25]</sup> A study conducted by Turkish Ministry of Health, showed that 77% of men and 87% of women in Turkey do inadequate physical activity.<sup>[26]</sup> Our study showed no statistical significant difference between patient and control groups in terms of physical activity subscale scores which may be a reflection of this study. However, when analyzed in details, in psoriasis group mean scores of 16<sup>th</sup> question, which is related to physical activity (Take part in light-to-moderate physical activity, such as sustained walking for 30–40 min, 5 or more times a week) were significantly lower than those of healthy controls ( $p=0.07$ ). This result may be related to psychological barriers. Stigmatization and social avoidance of psoriasis patients may hinder physical activity. In a study conducted with 104 psoriasis patients, most of the patients showed social avoidance, including avoidance of sports (40%), collective showers (64%), wearing sport clothes (64%), and leaving their home (11.5%).<sup>[27]</sup> Considering the positive contribution of physical activity to the disease course in psoriasis, it is very important to direct, support and motivate these patients to physical activity.

Stress management subscale of HPLP-II is the ability of the individual to activate psychological and physiological resources to reduce or control tension.<sup>[10]</sup> Although the difference in stress management scores was statistically insignificant between two groups, the mean scores of the 23<sup>rd</sup> question (Concentrate on pleasant thoughts at bedtime) which is one of the questions related to stress management subscale, were statistically significantly lower in psoriasis group ( $p=0.009$ ). This result is important as 37–71% of patients reported psychological stress as one of the major causes of onset, aggravation, and maintenance of psoriasis.<sup>[28-34]</sup>

Interpersonal relations are relationships with others, requiring the use of communication to establish a meaningful relationship other than causal requirements.<sup>[10]</sup> Psoriasis can cause a significant psychic and psychosocial effect which is commonly caused by feelings of stigma due to the visible skin lesions.<sup>[35]</sup> Society may not have enough awareness about psoriasis and the disease may be considered contagious. Most patients are subject to obvious social rejection, such as being asked to leave the pool, hairdresser, or gym.<sup>[36]</sup> This may cause patients to avoid interpersonal relations. Supporting this finding, the mean scores of patients related to the 31<sup>th</sup> question of HPLP-II (Touch and am

touched by people I care about) were significantly lower than controls ( $p=0.001$ ).

Health responsibility is an individual's active responsibility for his/her well-being. Our study showed no significant difference between psoriasis patients and healthy controls in terms of health responsibility subscale scores. This may reflect the general tendency of our society on health responsibility. On the other hand, when the questions in this subscale were analyzed in detail, the mean scores of 3<sup>rd</sup> (Report any unusual signs or symptoms to a physician or other health professionals) and 15<sup>th</sup> questions (Question health professionals to understand their instructions) were significantly higher in psoriasis group ( $p=0.008$  and  $p=0.046$ , respectively). This can be explained by the recruitment of healthy volunteers without any known disease for the control group. In the literature, there are studies conducted with various diseases in which healthy lifestyle behaviors are investigated but to our knowledge this is the first study which investigates healthy lifestyle behaviors in psoriasis patients. In a study with coronary artery disease patients, the total score of HPLP-II was  $128\pm 22$ ,<sup>[37]</sup> which is the same as our patient group's total HPLP-II score ( $128.3\pm 21.1$ ). Another study conducted with prostate cancer patients, the total score of HPLP-II was  $125\pm 9$ .<sup>[38]</sup> This finding can be interpreted that psoriasis patients are relatively good in terms of healthy lifestyle behaviors.

According to our research, this pilot study is the first study comparing healthy lifestyle behaviors in psoriasis patients and healthy controls in Turkish population. Collection of data only from two tertiary care centers may have led to higher HPLP-II scores in both patient and control groups in whom self-care and health awareness may be better than others. Therefore, additional studies with larger patient and control groups are needed in different populations.

## Conclusion

All psoriasis patients should be supported to adopt a healthy lifestyle which contributes positively to the disease course in psoriasis which is a chronic systemic inflammatory disease associated with cardio-metabolic comorbidities. Therefore, lifestyle habits should be considered in addition to medical treatment in psoriasis patients and patients should be informed about healthy lifestyle behaviors.

## Disclosures

**Ethics Committee Approval:** The study was approved by the Clinical Research Ethics Committee of University of Health Sciences, Şişli Hamidiye Etfal Training and Research Hospital on 08.12.2015 with 1146 confirmation number.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

**Authorship Contributions:** Concept – I.K.A.; Design – I.K.A., A.A.C.; Supervision – I.K.A.; Materials – I.K.A., F.D., A.A.C., H.K.E., I.B.; Data collection &/or processing – F.D., H.K.E., I.B., A.A.C., E.O.; Analysis and/or interpretation – F.D., I.K.A., A.A.C., E.O.; Literature search – F.D., I.K.A., A.A.C., E.O.; Writing – F.D., E.O.; Critical review – I.K.A., A.A.C., E.O.

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