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Health-promoting Lifestyle and its Predictors among Students of the University of Elbasan, Albania: A Cross-sectional Study

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Abstract:

Background: Health-promoting lifestyles play a crucial role in improving overall well-being and preventing non-communicable diseases. University students, during their transition to adulthood, often face challenges in maintaining healthy habits due to lifestyle changes, academic demands, and social pressure. Despite their importance, little is known about the adoption of health-promoting behaviors among Albanian university students. This study seeks to investigate the predictors that influence the health-related lifestyle among students at the University of Elbasan "Aleksandër Xhuvani" in Albania.

Methods: A cross-sectional study was conducted among 1,068 students at the University of Elbasan Aleksander Xhuvani, Albania, using the Health-Promoting Lifestyle Profile II (HPLP-II) questionnaire. Data were analyzed using SPSS Version 27.0, employing descriptive statistics, t-tests, and multiple regression analyses.

Results: The overall mean HPLP-II score was moderate at 129.18 ±19.617, with spiritual growth scoring the highest at 26.74 ± 4.736 and physical activity at the lowest at 16.86 ± 4.730. Physical activity (β =-0.33, p<0.001 and self-perception of full health (β =-0.15, p<0.001) were significant predictors of health-promoting behaviors. Non-health-related students scored higher in nutrition and spiritual growth than their health-related counterparts.

Conclusion: These findings reveal moderate adoption of health-promoting behaviors among Albanian students, emphasizing a need for university-targeted interventions. Programs focusing on enhancing physical activity and stress management, tailored to the student's socio-cultural context, are recommended to improve health outcomes.

Keywords: Health promotion, Lifestyle behaviors, University students, HPLP-II, Albanian, Spiritual growth.

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1. INTRODUCTION

1.1. Backgrounds

Non-Communicable Diseases (NCDs), such as diabetes, cardiovascular diseases, chronic respiratory conditions, and cancer, are among the leading causes of mortality worldwide, accounting for 74% of global deaths, making them a critical focus of public health efforts [1]. In Albania specifically, NCDs are responsible for approximately 85% of the overall disease burden and contribute to around 94% of proportional mortality [2]. Abnormal metabolism or early diagnosis of chronic diseases has also been observed in younger age groups [3]. Chronic diseases are caused by long-term inappropriate habits and health behaviors [4]. Extensive research has shown that lifestyle choices such as diet, physical activity, and stress management play an important role in preventing and managing many NCDs [5]. Adopting a health-promoting lifestyle that includes regular exercise, balanced nutrition, sufficient sleep, and effective stress management is essential for lowering health risks and improving overall well-being [6]. Increasing the healthy lifespan of individuals requires actively encouraging healthy habits. Through health education, people can be guided toward making better choices [7]. However, adopting and maintaining these promoting behaviors can be particularly challenging for university students [8].

University students are particularly vulnerable to lifestyle changes that could adversely affect their health. As students transition into greater independence, they often face new social environments and academic pressures that can lead to poor health behaviors [9-11]. Factors such as time constraints, stress, and financial limitations make it difficult for students to maintain healthy habits [12, 13]. Moreover, university students, having only recently entered adulthood, often feel that their youth and current good health will last indefinitely. This perception can lead them to neglect health practices that are essential for long-term well-being [7]. Since it is difficult to change a fixed lifestyle after adulthood, the university is considered the last opportunity for developing behavior and learning, where a healthy lifestyle developed at this time can lay the foundation for health status later in life [14]. Health promotion is a key strategy for encouraging individuals, particularly university students, to adopt healthy lifestyles and prevent NCDs [15]. Numerous studies conducted in different countries have explored health-promoting behaviors among students [16-19]. Most of these studies utilized the Health-Promoting Lifestyle Profile-II (HPLP-II) questionnaire by Walker [20] to evaluate various behaviors such as nutrition, physical activity, health responsibility, stress management, interpersonal relationships, and spiritual growth. Their findings suggest that many students struggle to keep up with regular physical activity and stress management [21-23]. A study conducted in Turkey highlighted the importance of addressing health-promoting behaviors, such as physical activity and health responsibility, among students [24]. Similarly, findings from a Croatian study revealed moderate levels of health-promoting lifestyle among university students. In Albania, there are some studies and projects that promote a healthy lifestyle, but they are implemented in elementary or high schools like 'School for Health' and other target groups [25, 26]. Research on students' health behaviors is notably limited. According to Pikuli [27], Alba-nian students frequently struggle with anxiety, stress, and physical problems, which not only affect their health but also their academic success. Other studies from neighboring countries like Greece and Italy, which share similar socio-cultural characteristics, offer some insights into university students' health behaviors [28, 29]. These findings may not fully reflect the unique socio-cultural and economic contexts influencing Albanian students. Therefore, understanding the specific factors affecting health-promoting behaviors in Albanian students is essential for developing targeted interventions and policies. To create successful health promotion programs in universities, it is crucial to comprehend the various factors that affect students' health behaviors [30].

The aim of this study was to evaluate the health-promoting behaviors and to identify the key predictors influencing these behaviors of Albanian university students. The results can help to plan educational, developmental, and psychosocial programs to encourage students to promote healthy behaviors.

2. MATERIALS AND METHODS

2.1. Study Design

This mono-centric cross-sectional study is part of a scientific project funded by the National Agency for Scientific Research and Innovation (NASRI). The study aimed to assess health-promoting behaviors among students at the public University of Elbasan "Aleksandër Xhuvani" in Albania using the Health Promoting Lifestyle Profile II (HPLP-II) questionnaire.

2.2. Sample

The study targeted undergraduate students from five faculties of the University of Elbasan "Aleksandër Xhuvani" (UE): Natural Sciences, Humanities, Economics, Edu-cational Sciences, and Medical and Technical Sciences. Participants were recruited using convenience sampling methods relying on students' availability and willingness to respond. All students in their first, second, and third year of undergraduate courses were considered eligible to participate. While this method allowed for efficient data collection, it introduced potential selection bias as it may have favored students who were more motivated or health conscious. A total of 1068 students consented and completed the questionnaire, which represents approximately 35% of the total student population of 3,054. This sample size significantly exceeds the minimum required sample size of 341 students, calculated using a 95% confidence sample size and a 5% margin of error.

2.3. Data Collection

Data collection was conducted over a three-month period (December 2023 to February 2024) using a self-administered questionnaire utilizing Google Forms distributed *via* WhatsApp, email, and social media platforms. Prior to the distribution of the questionnaire, theoretical face-to-face meetings were organized by the project team in collaboration with the head of departments and the Deans to explain the purpose of the study and the HPLP-II instrument. The participants completed the self-admi-

nistered questionnaire independently. This study acknowledges potential biases due to its reliance on self-reported data. To mitigate these, anonymity and confidentiality were assured, and participants were explicitly encouraged to provide honest responses. Their data were treated confidentially according to Albanian Law no. 9887 dated 10.03.2008, "Protection of personal data."

2.4. Instrument

The study questionnaire comprised two sections.

The first section included 12 sociodemographic questions about age, gender, residential status, alcohol consumption, smoking status, faculty where they study, physical activity, suffering from chronic illness, medication use, and self-perception of full health.

The second section of the questionnaire utilized the Health-Promoting Lifestyle Profile II (HPLP-II) developed by Walker [16]. The HPLP-II tool consists of 52 health-promoting behavior items that are categorized into six sub-scales: health responsibility (nine items), spiritual growth (nine items), physical activity (eight items), interpersonal relationships (nine items), nutrition (nine items), and stress management (eight items). A Likert-type scale was used to measure each behavior, with ranges of never (1), sometimes (2), frequently (3), and regularly (4). The total score of the HPLP-II ranges from 52 to 208 and is measured by the mean score of the responses to all 52 HPLP items. The total HPLP-II score is further classified into four levels: poor for the range 52–90, moderate for the range 91–129, good for the range 130–168, and excellent for the range 169–208. Following Beaton's Guidelines [31], a cross-cultural adaptation process was undertaken to ensure the attainment of semantic, idiomatic, experiential, and conceptual equivalence between the original HPLP-II and its Albanian versions. It was subjected to initial content validity testing for the Albanian context *via* an independent expert panel (a physician, a narrative speaker, and an English professor, not a health professional) prior to distribution. The expert panel reviewed the HPLP-II for content validity. The final version of the HPLP-II was subsequently piloted with 53 students to estimate Cronbach's alpha using IBM SPSS Version 27.0.

2.5. Data and Statistical Analysis

SPSS version 27.0 was used to perform data analysis. Descriptive statistics, including means, standard deviations, and percentages, were calculated for sociodemographic characteristics and health-related outcomes. Independent t-tests were applied to compare mean scores of health outcomes across groups such as health-related versus non–health-related faculties. Multiple linear regressions were conducted to identify the impact of sociodemographic and behavioral predictors (such as physical activity, self-perceived health, and chronic illness) on health-related outcomes. Unstandardized coefficients (B), standardized coefficients (β), t-values, and p-values were reported, and statistical significance was set at $p < 0.05$. To ensure robustness, adjusted R^2 values were used to indicate the proportion of variance explained by the predictors, and confounders were controlled during regression. The reliability of the Health-Promoting Lifestyle Profile II (HPLP-Il) was assessed using Cronbach's alpha, with a total alpha of 0.925, indicating excellent internal consistency.

3. RESULTS

A total of 1068 UE students participated in the study. Table **1** provides an overview of the socio-demographic characteristics of the participants. The data shows a notable gender imbalance, with 83.6% of participants being female, particularly in health sciences, while 16.3% being male. Most students (81.6%) were aged between 18 and 25, which is typical for undergraduate students. Geographically, most students (63.8%) were predominantly from urban areas, whereas 36.2% resided in rural areas. In terms of faculty enrollment, a significant proportion of participants (73.8%) were enrolled in the Faculty of Medical and Technical Sciences, followed by the Faculty of Natural Sciences (26.2%), Faculty of Economic Sciences (3.6%), and the Faculty of Education Sciences (6.1%). Regarding living arrangements, 76.6% of students reported living with family,19.7% lived with friends, and 2.9% lived alone. Concerning health behaviors, 72.2% of the students stated that they never consume alcohol, and 18.9% drank once a month. 8% of the respondents reported suffering from chronic illness, and 11.3% reported regular medication use. Most students (75.6%) perceived their health status as good.

The overall scores of HPLP-II and its dimensions are presented in Table **2**. The mean total score of HPLP-II was 129.18±19.617. Among the dimensions, spiritual growth had the highest mean score at 26.74± 4.736, followed by interpersonal relations at 24.79±3.938, nutrition at 21.20±3.918, stress management at 20.05± 3.827, and health responsibility at 19.53±4.102. Physical activity had the lowest mean score at 16.86±4.730. Out of 1068 students, 787 were enrolled in health-related science, while 280 were students in non-medical faculties.

A comparative analysis of the sociodemographic data between these two study groups is presented in Table **3**. The findings indicate statistically significant differences (p<0.05) across most variables, suggesting distinct socio-demographic patterns between groups. However, no statistically significant differences were observed for the variables of physical activity (p = 0.143) and self-perceived health status as good health (p = 0.298).

The comparison of HPLP-II scores between health-related and non-health-related students is shown in Table **4.** The total average for health-related students was 128.35±19.706. The highest mean was observed in interpersonal relationships, with health-related students scoring an average of 24.77 ± 4.004, followed by spiritual growth (26.41 ± 4.743), nutrition (20.97 ± 3.931), stress management (19.98 ± 3.820), responsibility for health (19.48 ± 4.079) and physical activity (16.75 ± 4.079). In contrast, the total average for non-health-related students was (131.51± 19.920), with the highest scores observed in

interpersonal relationships 24.86 ± 3.753, followed by spiritual growth (27.89 ± 4.380), nutrition (21.86 ± 4.000), stress management (20.27 ± 3.844), responsibility for health (19.68 ± 4.169) and physical activity (17.16 ± 5.179). The HPLP-II total score (t=-2.32, p= 0.02) and sub-scale scores for nutrition (t= -3.26, p<0.001) and spiritual growth (t= -3.90), p< 0.01) were statistically higher for non-health-related students.

The comparison of health-promoting lifestyles and their predictors between students who perceive themself as healthy (N = 807) and those who do not (N = 261) is presented in Table **5**. Students who reported "yes" to enjoying full health exhibited higher scores and statistically significant differences in all lifestyle dimensions. The overall HPLP-II score for this group was 131.30 ± 19.269 (t = 6.317 and p = 0.000). Specifically, the mean scores for

this group were as follows: responsibility for health 25.13 ± 4.067, physical activity 17.23 ± 4.692, nutrition 21.45 ± 3.895, spiritual growth 27.33 ± 4.532, interpersonal relationships 25.13 ± 3.955, and stress management 20.47 ± 3.694. In contrast, students who responded "no" regarding their enjoyment of full health had a total mean score of 122.63 ± 19.270, with mean scores of 19.02 ± 4.172 for responsibility for health, 15.72 ± 4.670 for physical activity, 20.44 ± 3.898 for nutrition, 24.94 ± 4.905 for spiritual growth, 23.74 ± 3.700 for relationships interpersonal, and 18.78 ± 3.957 for stress management. Statistically significant differences were observed between the two groups across all dimensions-responsibility for health, physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management with t-values ranging from 2.315 to 7.239 and p-values < 0. 05.

Table 1. Distribution of students' sociodemographic characteristics (N 1068).

Sociodemographic Characteristics		Nr	%
Gender	Male	174	16.3
	Female	893	83.6
Age	18-25	871	81.6
	26-35	103	9.6
	Over 35 years	94	8.8
Residence	Rural area	387	36.2
	Urban area	681	63.8
Faculty	Faculty of technical medical sciences	788	73.8
	Faculty of natural sciences	138	12.9
	Faculty of education sciences	60	5.6
	Faculty of human sciences	44	4.1
	Faculty of economics	38	3.6
Medical or non-medical faculty	Faculty of technical medical sciences	788	73.8
	Other faculty	280	26.2
Living with	Family	818	76.6
	Alone	31	2.9
	Friends	210	19.7
	Other	9	0.8
Smoking	Yes	98	9.2
	No	970	90.8
Alcohol consumption	Never	771	72.2
	Once a month	202	18.9
	2 to 4 times a month	74	6.9
	2 to 3 times a week	14	1.3
	More than 4 times a week	7	0.7
Suffering from a chronic illness	Yes	85	8.0
	No	983	92.0
Medication use	Yes	121	11.3
	No	936	87.6
	Sometimes	2	0.2
	Without answer	9	0.8
Self-perception of full health	Yes	807	75.6
	No	261	24.4

Table 2. HPLP-II: Health-Promoting Lifestyle Profile II; SD: Standard Deviation.

HPLP II and sub-scale	Mean	Std. Deviation	Minimum	Maximum	Highest and Lowest Obtainable Score
Health responsibility	19.53	4.102	9	35	9-36
Physical activity	16.86	4.730	8	32	8-32
Nutrition	21.20	3.918	9	35	9-36
Spiritual growth	26.74	4.736	11	36	9-36
Interpersonal relation	24.79	3.938	12	36	9-36
Stress management	20.05	3.827	10	32	8-32
Total HPLP-II	129.18	19.617	67	204	52-208

Table 3 . Comparison of sociodemographic characteristics and health-related behaviors between health-related and non-health-related students (p< 0.05).

Socio-demographic Characteristics		Health-related (787)		Non-health-related (280)		*P-value*
		N	%	N	%	
Gender	Male	83	10.5%	91	32.5%	<0.001*
	Female	704	89.5%	189	67.5%	
Residence	Rural area	310	39.3%	77	27.5%	<0.001*
	Urban area	478	60.7%	203	72.5%	
Age	18-25	722	91.6%	149	53.2%	<0.001*
	26-35	37	4.7%	66	23.6%	
	Above 35 years	29	3.7%	65	23.2%	
Living with	Family	563	71.4%	255	91.1%	<0.001*
	Alone	19	2.4%	12	4.3%	
	Friends	198	25.1%	12	4.3%	
	Other	8	1.0%	1	0.4%	
Smoking habits	Yes	56	7.1%	42	15.0%	<0.001*
	No	732	92.9%	238	85.0%	
Alcohol consumption	Never	589	74.7%	182	65.0%	0.017*
	Once a month	140	17.8%	62	22.1%	
	2 to 4 times a month	46	5.8%	28	10.0%	
	2 to 3 times a week	8	1.0%	6	2.1%	
	More than 4 times a week	5	0.6%	2	0.7%	
Physical activity	Yes	453	57.5%	175	62.5%	0.143
	No	335	42.5%	105	37.5%	
Suffering from a chronic illness	Yes	44	5.6%	41	14.6%	<0.001*
	No	744	94.4%	239	85.4%	
Medication use	Yes	75	9.6%	46	16.7%	0.005*
	No	706	90.2%	230	83.3%	
	Sometimes	2	0.3%	0	0.0%	
Self-perception of full health	Yes	589	74.7%	218	77.9%	0.298
	No	199	25.3%	62	22.1%	

Table 4. Comparison of the HPLP scores between health-related and non-health-related students.

Health-promoting lifestyle and its predictors among health-related and non-health-related university students	Health-related (787)		Non-health-related (280)		t	p-value
	Mean	SD	Mean	SD		
Health responsibility	19.48	4.079	19.68	4.169	-0.69	0.49
Physical activity	16.75	4.558	17.16	5.178	-1.24	0.21
Nutrition	20.97	3.931	21.86	3.813	-3.26	<0.001**
Spiritual growth	26.41	4.743	27.69	4.596	-3.90	<0.001**
Interpersonal relation	24.77	4.004	24.86	3.753	-0.33	0.74
Stress management	19.98	3.820	20.27	3.844	-1.11	0.27
Total	128.35	19.706	131.51	19.208	-2.32	0.02*

Note p< 0.001**, p<0.05*, SD Standard Deviation.

Furthermore, the correlation matrix indicates a significant positive relationship among the various sub-scales of the HPLP-II, suggesting that improvements in one health-promoting are likely to be associated with positive changes in others with all correlations being significant at the 0.01 level (2-tailed), thereby highlighting a strong interrelationship among the measured lifestyle behaviors (Table 6). The highest correlation between stress management and total score (r =.841, p < 0.01) underscores the importance of effective stress management as a critical component of an overall health-promoting lifestyle. Additionally, health responsibility and physical activity exhibit strong relationships with other sub-scales, particularly stress management and nutrition. This correlation implies that individuals who assume responsibility for their health are more likely to engage in regular physical activity, maintain a healthy diet, and effectively manage stress.

Table 5. Comparison of HPLP-II scores based on self-perception of full health among students.

Health-promoting Lifestyle and its Predictors among University Students	Self-perception of Full Health					
	Yes807)		No (261)		t	p-value
	Mean	SD	Mean	SD		
Health responsibility	19.70	4.067	19.02	4.172	2.315	0.021
Physical activity	17.23	4.692	15.72	4.670	4.541	0.000
Nutrition	21.45	3.895	20.44	3.898	3.624	0.000
Spiritual growth	27.33	4.532	24.94	4.905	7.239	0.000
Interpersonal relation	25.13	3.955	23.74	3.700	4.996	0.000
Stress management	20.47	3.694	18.78	3.957	6.292	0.000
Total	131.30	19.269	122.63	19.270	6.317	0.000

Note *p< 0.001**, p<0.05*, SD Standard Deviation.

Table 6. Correlations between HPLP II sub-scales.

	Total	Health Responsibility	Physical Activity	Nutrition	Spiritual Growth	Interpersonal Relation
Health responsibility	.779**					
Physical activity	.772**	.616**				
Nutrition	.743**	.545**	.498**			
Spiritual growth	.772**	.427**	.416**	.457**		
Interpersonal relation	.756**	.483**	.418**	.444**	.633**	
Stress management	.841**	.577**	.604**	.564**	.629**	.574**

Note **. Correlation is significant at the 0.01 level (2-tailed).

A multiple linear regression was conducted to assess the predictive power of sociodemographic and behavioral variables on health-related and non-health-related outcomes (Table 7). The results of this analysis include the unstandardized coefficient (B), standardized coefficient (β), t-values, and p-values for each predictor. For health-related outcomes, the overall model was statistically significant with an Adjusted R^2= 0.147 and p< 0.001, indicating that 14,7% of the variance in health-related outcomes is explained by the selected predictor. Among these, physical activity merged as a significant predictor, exhibiting a negative coefficient B = -13.173, β = -0.330, p<0.001), which suggests that higher levels of physical activity are associated with better health outcomes. Additionally, self-perception of full health was identified as a significant predictor. B = -6.888, β = -0.152, p < 0.001,

indicated students who perceive themselves as healthy report better health outcomes. Other variables, such as gender, residence, and age, did not show significant effects on health-related outcomes in this group. For non-health related, the overall model was also significant with an adjusted R° = 0.169 and p < 0.001, explaining 16.9% of the variance in these outcomes. In this context, physical activity served as a significant predictor (B = -12.021, ß = -0.302, p < 0.001), consistent with findings from health-related students, with higher physical activities associated with better health. Chronic illness was identified as a significant predictor (B = -11.734, β = -0.217, p = 0.035), indicating that students suffering from chronic illnesses report poorer health outcomes. Furthermore, self-perception of full health remained a strong predictor (B = -12.626, β = -0.270, p < 0.001).

Table 7. Multiple linear regression analysis of health-related and non-health-related outcomes predictors.

Predictors	Health-related (787)				Non-health-related (281)			
	B	β	t	P value	B	β	t	*P* value
(Constant)	143.238		30.069	0.000	144.736		26.056	0.000
Gender	-3.292	-0.051	-1.486	0.138	3.210	0.078	1.339	0.182
Age	-2.912	-0.063	-1.721	0.086	-0.832	-0.036	-0.580	0.563
Residence	1.250	0.031	0.920	0.358	2.912	0.068	1.200	0.231
Living with	-1.079	-0.049	-1.457	0.146	-4.142	-0.100	-1.751	0.081
Smoking	2.933	0.038	1.077	0.282	-0.949	-0.017	-0.301	0.764
Alcohol consumption	-0.270	-0.009	-0.266	0.790	-2.278	-0.094	-1.633	0.104
Physical activity	-13.173	-0.330	-9.764	0.000	-12.021	-0.302	-5.304	0.000
Suffering from chronic illness	-5.005	-0.058	-1.407	0.160	-11.734	-0.217	-2.115	0.035
Medication use	-2.472	-0.037	-0.904	0.366	3.516	0.068	0.663	0.508
Self-perception of full health	-6.888	-0.152	-4.174	0.000	-12.626	-0.270	-3.951	0.000
Adjusted R2	0.147				0.169			
p-value	<0.001				<0.001			

Table 8. Combined Multiple linear regression results for socio-demographic and behavioral predictors of health outcomes in university students.

Predictors	B	Beta	t	Sig.
(Constant)	142.084		40.241	0.000
Gender	-0.726	-0.014	-0.457	0.648
Age	-0.845	-0.026	-0.818	0.414
Residence	1.726	0.042	1.464	0.144
Living with	-1.428	-0.060	-2.058	0.040
Smoking	1.303	0.019	0.629	0.530
Alcohol consumption	-0.937	-0.034	-1.146	0.252
Physical activity	-12.710	-0.318	-10.982	0.000
Suffering from chronic illness	-5.644	-0.078	-1.954	0.051
Medication use	-0.967	-0.016	-0.400	0.689
Self-perception of full health	-8.205	-0.179	-5.616	0.000
Adjusted R2	0.152			
p-value	<0.001			

For the combined group of students from both faculties, the model remained significant, as shown in Table **8**, with an Adjusted R2 = 0.152 and p <0.001, explaining 15.2% of the variance in health-related outcomes. Physical activity continued to serve as a strong predictor of better health outcomes (B = -12.710, β = -0.318, p < 0.001), indicating that students who engage in higher levels of physical activity consistently report improved health. Additionally, the living situation was found to be significant (B = -1.428, β = -0.060, p = 0.040), with students living alone reporting poorer health outcomes. Furthermore, self-perception of full health again emerged as a strong predictor (B = -8.205, β = -0.179, p < 0.001), reinforcing the consistent influence of self-perception on health outcomes.

4. DISCUSSION

To the best of our knowledge, this study represents the first evaluation of health-promoting behaviors among a large sample of students in Albania. We aimed to investigate the predictors that influence the health-related lifestyle among students at the University of Elbasan "Aleksandër Xhuvani" in Albania. The average total score of HPLP-II was 129.18 ± 19.617, reflecting a moderate health-promoting lifestyle among students. These findings align with similar studies conducted in neighboring countries such as Croatia [19] as well as in developing countries like Iran [32] and Turkey [33]. Similarly, studies in Palestine and Saudi Arabia also reported moderate engagement in health-promoting behaviors among university students [16, 21, 34]. These findings highlight the shared challenges university students face across diverse cultural and geographical contexts regarding health-promoting behaviors [34].

In alignment with previous research, the dimension of spiritual growth received the highest score among the health-promoting lifestyle dimensions [15, 21, 18, 35]. Conversely, physical activity scored the lowest among the sub-scales, which is consistent with findings from another study conducted at the same university that examined the prevalence of obesity, food habits, and physical activity, revealing that 57% of students did not engage in any physical activity [36]. Furthermore, these results are reinforced and supported by similar international studies [15, 18, 19].

A comparison between medical science students and those in other fields revealed an uneven distribution, with medical science students comprising 73.8% of the sample. This trend reflects a preference among Albanian students to pursue education in medical science, often motivated by employment opportunities abroad [37]. The sociodemographic and behavioral differences between health-related and non-health-related students provide insights into how academic specialization correlates with lifestyle choices and health behaviors. Health-related students exhibit healthier behaviors like smoking and alcohol consumption, influenced by their awareness and understanding of health risks [38].

Notably, the study found that students in health-related fields scored lower than those in non-health-related fields on the overall HPLP-II score, with statistically significant differences observed in dimensions such as nutrition and spiritual growth. This finding contrasts with the results of similar studies [7, 39], potentially due to the smaller sample size of students in non-health-related fields than those in health-related fields. Academic stress and extended study hours faced by health-related students could have impacted their health-promoting behaviors, particularly concerning nutrition [40]. An American study exploring the motivation and barriers to healthy eating among medical students found that while most participants expressed a desire to eat healthily, time limitations and financial constraints led them to adopt less healthy eating habits once they began medical school [41].

Health self-perception is the personal and subjective way an individual views their own health [42]. Research indicates that students who believe they are healthy are more likely to engage actively in their studies, maintain positive relationships, experience a greater sense of fulfillment and balance in their lives [42-45]. Consistent with these findings, our study demonstrates that students who perceived themselves as healthy demonstrated significant outcomes across all dimensions of health-promoting behavior.

The Pearson correlation matrix revealed a positive and statistically significant correlation among the subscales of the health-promoting behaviors profile [HPLP-II]. The analysis indicated an interrelationship among these behaviors, suggesting that improvements in one health-promoting behavior are likely to be associated with positive changes in others. This aligns with a case study by Bastani, who reported similar synergistic effects among health-promoting behaviors, emphasizing the cumulative impact of a well-rounded approach to health management. Notably, the strong correlation between stress management and other sub-scales suggests effective stress management may serve as a foundational behavior that supports other health-promoting practices, such as physical activity and healthy eating. The high correlation observed between health responsibility and physical activity with other sub-scales, especially with stress management and nutrition, further underscores the interconnected nature of these behaviors. This suggests that students who take proactive responsibility for their health are more likely to engage in regular physical activity, maintain a balanced diet, and manage stress effectively. These results are in correlation with other studies conducted among medical students in Saudi Arabia [21].

In this study, a stepwise multiple regression analysis was conducted to identify the predictors of overall HPLP-II among university students. The results underscore the importance of physical activity and self-perceived health status as key factors influencing health-promoting behaviors among university students. These findings are consistent with recent research conducted by Muller [11], which similarly emphasized the role of physical activity in fostering health-promoting behaviors. Their study revealed that students who engaged in regular physical activity were more likely to adopt and maintain behaviors that contribute to overall well-being.

Furthermore, demographic factors such as gender, age, and residential status appear to exert minimal direct influence on students' health-promoting behaviors. This observation may be attributed to the disproportionate

representation of females, who constituted 83.6% of the sample, as noted in the study by Pikuli [27], which also reported a similar gender imbalance among students at Tirana University.

It is important to note that this study was conducted exclusively at the University of Elbasan and does not include data from other universities in Albania. While these results may provide valuable insights into health-promoting behaviors in this population, they may not be fully generalizable to students in other Albanian universities.

5. LIMITATIONS

The study faced several limitations that may impact the findings. First, the unequal distribution of participants between non-medical and medical students may have introduced bias, potentially affecting the comparability of health behavior across these groups. Second, the reliance on self-reporting data may lead to inaccuracies due to over or under-reporting of health-promoting behaviors, influenced by social desirability or recall bias. Furthermore, the cross-sectional design provides a snapshot of behaviors at a single point in time, which limits the ability to determine causal relationships or observe changes in behaviors over time.

CONCLUSION

The overall HPLP-II level among university students was moderate, with a lower score in physical activity. The findings emphasize the critical need for targeted health promotion programs that specifically address the lifestyle challenges faced by university students, particularly in the domains of physical activity, health responsibility, stress management, and nutrition. We recommend integrating tailored programs into the university curriculum, such as workshops on time management, stress reduction, access to fitness facilities, and affordable healthy meal plans.

Our findings may serve as a foundation for developing tailored and effective programs aimed at promoting healthier behaviors among university students. However, the cross-sectional design of the study limits conclusions regarding causality or changes in behavior over time. Future research employing longitudinal designs and broader representation is recommended to better understand behavioral patterns and develop more effective health promotion strategies.

LIST OF ABBREVIATIONS

HPLP-II = Health-Promoting Lifestyle Profile II

NCDs = Non-Communicable Diseases

UE = University of Elbasan

AUTHORS' CONTRIBUTIONS

E.G and A.K; contributed to the concept, study design, writing the manuscript, and revising critically for important intellectual content:. B.B and M.G; contributed to the data collection, manuscript drafting, statistics, and data interpretation. All authors reviewed the results and approved the final version of the manuscript.

ETHICAL STATEMENT

The study "Health-promoting Lifestyle and its Predictors among students of the University of Elbasan, Albania; A Cross-sectional study" was funded by the National Agency for Scientific Research and Innovation (NASRI) in Albania under the project "Determinants of health-related lifestyles among University of Elbasan students; Promoting a healthy lifestyle" as outlined in Decision No 10, dated 21.07.2023. This study was conducted in accordance with the ethical principles outlined in 1964 Declaration of Helsinki. As the research involved minimal risk and non-sensitive topics, formal ethical approval was not required.

CONSENT FOR PUBLICATION

All participants were over the age of 18 and provided informed consent prior to participation.

STANDARD OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the manuscript is available in Zenodo Repository at https://doi.org/10.5281/zenodo.14835050.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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