

A Cross-sectional Study to Assess the Healthy Lifestyle Profile of University Students in Faisalabad, Pakistan

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ABSTRACT

Background: This study described the effect and correlation of independent variables such as discipline (MBBS, BDS, DND, AHS, DPT, and OD), study years (first, second, third, and fourth), and living system (with family or university hostel) with a healthy lifestyle. **Objective:** The study aims to assess the healthy behaviors of students enrolled in various disciplines at The University of Faisalabad. **Study Design:** Cross-sectional. **Settings:** The data was collected from students enrolled in various disciplines such as Bachelor of Medicine & Bachelor of Surgery (MBBS), bachelor of dental surgery (BDS), doctor of nutrition and dietetics (DND), allied health sciences (AHS), doctor of physical therapy (DPT), and doctor of optometry (OD) during different study year such as first, second, third and fourth years at the University of Faisalabad (TUF). **Duration:** Dec 2023 to January 2024 **Methods:** A questionnaire designed for health-promoting lifestyle profile II (HPLP-II) was distributed among 384 students to assess their healthy life profile. One-way ANOVA and chi-square tests were applied to check the effect and regression analysis was done to determine the correlation of independent variables with the overall HPLP-II and its six subscales ($p > 0.05$). **Results:** MBBS participants got the overall HPLP-II mean value of 2.541 ± 0.068 with the highest mean score 2.869 ± 0.036 for spiritual growth and the lowest mean score 2.169 ± 0.075 for health responsibility. This overall HPLP-II score declined among BDS (2.529 ± 0.089), DND (2.521 ± 0.059), AHS (2.513 ± 0.058), DPT (2.498 ± 0.078), and OD (2.493 ± 0.019). The first-year participants showed significantly better health responsibilities, physical activity, spiritual growth, and nutrition than the participants of the second, third, and fourth years. The participants who were living with their families had significantly better nutrition, health responsibility, interpersonal relations, and physical activity scores as compared to those students living in university hostels. **Conclusion:** These findings relate the HPLP-II to a variety of university disciplines, study years, and students' living systems. This will allow university administrators and healthcare practitioners to devise interventions aimed at enhancing and designing healthy lifestyles and suitable educational programs for students.

Keywords: Healthy lifestyle, Education, University students, Study year, Discipline.

INTRODUCTION

COVID-19 outbreaks have recently become a global public health problem. Despite over a century of medical advancements, the world was brought to its knees.¹ The pandemic of COVID-19 has highlighted the inadequacies of many national public health infrastructures in addressing the requirements of their

population, particularly those with inadequate social, educational, and economic resources.² COVID-19 incidence is also thought to be influenced by the prevalence of non-communicable diseases, poor eating habits, and a sedentary lifestyle in people of all ages. Basically, lifestyle is an important aspect of life that can either be good or bad depending on people's behavioral choices.³ A health-promoting lifestyle is a multi-

dimensional pattern that is self-initiated and serves to maintain or improve an individual's degree of wellness, self-actualization, and fulfillment.⁴ Physical activity (PA), nutrition (Nu), spiritual growth (SG), interpersonal relations (IR), and stress management (SM) are all examples of health-promoting practices.⁵ A healthy lifestyle is a significant component of health status and is widely regarded as a key component in maintaining and improving health.⁶

Mainly mental health, safety, and well-being of the individuals and communities may be affected by public health emergencies.⁷ These impacts might manifest themselves in a variety of emotional responses, including anxiety or psychiatric problems, harmful behavior, and non-compliance with public health recommendations.⁵ Emotional discomfort is common in disaster-affected communities. According to studies on disaster mental health, pandemic has great impact over people healthy lifestyle leading in development of anxiety and socio-economic problems.⁸ People who contract the disease, the elderly, those with compromised immune systems, those who live or receive care in communal settings, and those who have pre-existing medical, and/or psychiatric are all at risk for adverse psychosocial effects.⁹

Currently, the COVID-19 pandemic affected the psychosocial behavior of the public especially healthcare workers and shortage of personal protective equipment (PPE). It also created the fear about being infected, infection transmission and care for their loved ones. The exposure to virus and transmission via directly or indirectly created the unemployment or less effective working.¹⁰ These groups should be targeted for prevention activities such as healthy behavior promotion, health problem screening, psychoeducation, and psychosocial assistance, especially for negative psychosocial consequences.¹¹ Furthermore, the controlling of all these behaviors may affect the human health and their adaptation may serve to maintain and enhance the human healthy life and develop awareness about healthy activities.¹² Therefore, nutrition, physical activity, stress management, health responsibility, interpersonal relationships, and spiritual growth are all part of a multidimensional pattern of health-promoting behavior.¹³ While health-promoting behavior is critical for staying healthy and combating the pandemic, it may be harmed by the preventive measures used to combat it, which will cause their own difficulties following it.¹⁴

Therefore, this study aims to assess the healthy life behaviors of the students enrolled in various disciplines during different study years at the University of Faisalabad (TUF). To our knowledge, it is a preliminary study to assess the lifestyle of students post-COVID-19 outbreaks and would be vital for developing effective and beneficial interventions that will undoubtedly improve

the quality of life. This study will also provide a baseline for the comparison of healthy lifestyle profile among students of different specialties with reference to Pakistan. The findings of this study give comprehensive data to the university officials and the community for general educational program awareness and to assist the participants in adopting a healthy and nutritious lifestyle, hence increasing individual and population health in Pakistan.

METHODS

The research was conducted using a cross-sectional approach. The data was collected from 384 participants (students) enrolled in various disciplines such as bachelor of medicine & bachelor of surgery (MBBS), bachelor of dental surgery (BDS), doctor of nutrition and dietetics (DND), allied health sciences (AHS), doctor of physical therapy (DPT), and doctor of optometry (OD) during different study year such as first, second, third and fourth years at the University of Faisalabad (TUF) after ethical approval from the ethical committee(TUF/Dean/21:79). A Questionnaire called health-promoting lifestyle profile II (HPLP-II) was distributed among the participants by a research associate that was not a regular member of teaching faculty. To confirm the concealment, no name was needed to be written on the questionnaire (survey), and it was returned in assigned box after completion. The participants were directed to fill in the HPLP-II questionnaire particularly designed for the study. This questionnaire has 52 health promoting lifestyle attitudes classified into six subscales as physical activity (PA), health responsibility (HR), nutrition (Nu), spiritual growth (SG), stress management (SM), interpersonal relations (IR). These subscales have a four-point response scale indicating 1 meant for "never", 2 meant for "sometimes", 3 meant for "often", and 4 meant for "routinely". The frequency of each behavior was calculated using this response scale. According to a prior study,¹³ a mean value of ≥ 2.50 was a positive response. Age, discipline, study year, and living system (with the family or in the university hostel) were self-reported by the participants. The goal of the study was explained to the participants, and their consent was obtained. Participants were told that they may participate if they wanted to and that any information, they gave would be kept confidential. The survey protocols were designed with the goal of protecting students' privacy and allowing them to participate anonymously.

The collected data was statistically analyzed by using SPSS analytical software (version 17.0). One-way ANOVA (analysis of variance) and chi-square test were applied to record the significant effect of independent variables on dependent variables ($p < 0.05$). The t-test was applied to evaluate the HPLP-II scale values with discipline, study year and the living system (with family

or in university hostel). Multiple regression analysis was performed to analyze the relationship of four independent variables such as age, discipline, study year, and the living system over seven dependent variables (overall HPLP-II and its six health-promoting lifestyle profile values). In health-promoting lifestyle analysis, only those participants who answered “often” or “routinely” are engaged with healthy practices and deemed to be pursuing a healthy and nutritious lifestyle profile. Participants who answered “never” or “sometimes” were deemed not to be following healthy lifestyle profile. The χ^2 test was used for evaluating the percentage (%) of age, discipline, study year and living system of the participants who reported “often” or “routinely” having a health-promoting lifestyle.

Validity and Reliability: The overall HPLP-II and its six subscales values have been verified in various studies and is being utilized extensively in multi-dimensional research by a wide range of people. The HPLP-II Arabic version has also been proved for its validity and reliability in several studies. The translated version of the HPLP-II has also been evaluated by four experts who were chosen for their experience in public health and nursing education in Jordan to ensure content validity. Inter rater agreement ranged from 70% to 100% for all HPLP-II items. Factor analysis was used to verify construct validity, and the six subscales were verified.¹⁴

RESULTS

Demographic characteristics of participants: The participants demographic data is shown in Table 1 and a total of 384 participants (female students only) were involved in this survey. Three hundred and seventy-one (371) participants completed the questionnaire which showed 96.62% response rate. One hundred and nineteen (119) survey questionnaires were returned from MBBS students, showed 97.48% response rate followed by BDS students 96.15% (78), DND students 96.3% (54), AHS students 98.39% (62), DPT students 96.67% (30), and OD students 95% (41). The mean age (year) of the participants was recorded 21.8±0.7 (a range of 18–25 years; the higher range was characterized by one 25-year-old participant).

A significant variation was recorded between the age (year) of the participants (F = 10.787, p<0.05).

Table 1: Participant’s demographics (n = 384)

Variables		Percentage (n)	Age - year (Mean ± SD)
Disciplines	MBBS	30.99% (119)	18.6 ± 1.9
	BDS	20.31% (78)	20.9 ± 0.9
	DND	14.06% (54)	18.7 ± 1.9
	AHS	16.15% (62)	21.8 ± 0.7
	DPT	7.81% (30)	19.4 ± 1.5
	OD	10.68% (41)	21.5 ± 0.7
Study year	First	17.71% (68)	18.5 ± 1.4
	Second	28.38% (109)	19.6 ± 0.7
	Third	32.29% (124)	21.0 ± 0.7
	Fourth	21.62% (83)	21.9 ± 0.8
Living system	With family	53.39% (205)	20.3 ± 0.8
	University hostel	46.61% (179)	20.9 ± 0.8

Discipline Enrolled: The overall HPLP-II scores i.e., 2.541±0.068 for MBBS followed by BDS (2.521±0.059), DND (2.493±0.019), AHS (2.513±0.058), DPT (2.498±0.078), and OD (2.529±0.089) participants were recorded. Among six health-promoting lifestyle subscales, the MBBS, DND, AHS, and DPT participants showed the highest mean scores 2.991±0.054, 2.879±0.098, 2.844±0.071, and 2.911±0.001 respectively for PA. The BDS and OD participants showed the highest mean scores 2.869±0.036, and 2.832±0.075 respectively for SG. All the participants enrolled in various disciplines at TUF showed the lowest score for HR subscale; 2.271±0.078 for MBBS, 2.191±0.085 for BDS, 2.193±0.067 for DND, 2.243±0.058 for AHS, 2.263±0.091 for DPT, and 2.169±0.075 for OD as shown in Table 2. The regression analysis described a significant positive correlation among the overall HPLP-II, and discipline (R² = 0.145, p<0.05). The χ^2 test analysis described that there was significant difference between the study disciplines and some health-promoting lifestyle subscales. Furthermore, MBBS (n=54, 45.38%), BDS (n=29, 37.78%), DND (n=21, 38.89%), AHS (n=19, 30.65%), DPT (n=13, 43.33%), and OD (n=12, 30%) said to follow a planned exercise program(p<0.05).

Table 2: Distribution of overall HPLP-II and its subscales scores according to the disciplines of the participants enrolled at TUF (n = 384)

Discipline	HR	SG	PA	IR	Nu	SM	Overall HPLP-II
MBBS	2.271 ± 0.078	2.914 ± 0.025	2.991 ± 0.054	2.901 ± 0.037	2.588 ± 0.091	2.671 ± 0.033	2.541 ± 0.068
BDS	2.191 ± 0.085	2.869 ± 0.036	2.758 ± 0.013	2.824 ± 0.013	2.245 ± 0.032	2.618 ± 0.083	2.521 ± 0.059
DND	2.193 ± 0.067	2.819 ± 0.081	2.879 ± 0.098	2.789 ± 0.072	2.471 ± 0.027	2.539 ± 0.016	2.493 ± 0.019
AHS	2.243 ± 0.058	2.769 ± 0.075	2.844 ± 0.071	2.641 ± 0.068	2.478 ± 0.025	2.628 ± 0.021	2.513 ± 0.058
DPT	2.263 ± 0.091	2.761 ± 0.023	2.911 ± 0.001	2.735 ± 0.019	2.529 ± 0.011	2.438 ± 0.096	2.498 ± 0.078
OD	2.169 ± 0.075	2.832 ± 0.075	2.719 ± 0.076	2.8048 ± 0.026	2.405 ± 0.039	2.593 ± 0.082	2.529 ± 0.089
F value	0.189	1.792	5.091	3.82	5.351	4.812	3.509

Means ± SD values of HPLP-II scores subscales, one-way ANOVA, and multiple comparison analysis (p<0.05). HR= health responsibility, SG= spiritual growth, PA= physical activity, IR= interpersonal relations, Nu= nutrition, SM= stress management

Study Year: The overall HPLP-II value for all the participants was 2.538±0.029 during different study year. Among six health-promoting lifestyle subscales, all the participants showed the highest mean value for Nu (2.907±0.027) and the lowest mean value for HR (2.260±0.025). Furthermore, the participants of first year obtained 2.581±0.028 as the overall HPLP-II value followed by second (2.538±0.029), third (2.526±0.029), and fourth (2.497±0.031) years participants. The participants of first, second, third, fourth year showed the highest mean scores i.e., 3.019±0.029, 2.913±0.025, 2.801±0.025, and 2.898±0.029 respectively for Nu and the lowest mean

scores i.e., 2.438±0.029, 2.392±0.024, 2.391±0.038, and 2.215±0.029 respectively for HR as shown in table 3. The overall distribution of HPLP-II values indicated that, the participants of first and second year were involved more significantly in PA and IR than third and fourth year participants. The regression analysis illustrated a significant negative correlation between the overall HPLP-II value and study year (R2 = -0.213, p<0.05). The χ^2 test analysis described that there was significant difference between the study year and various health-promoting lifestyle subscales.

Table 3: Distribution of overall HPLP-II and subscales scores according to study year of the participants at TUF (n = 384)

Study year	HR	SG	PA	IR	Nu	SM	Overall HPLP-II
First	2.438 ± 0.091	2.718 ± 0.041	2.513 ± 0.048	2.719 ± 0.047	3.019 ± 0.091	2.768 ± 0.021	2.581 ± 0.087
Second	2.392 ± 0.041	2.591 ± 0.059	2.417 ± 0.098	2.813 ± 0.046	2.913 ± 0.051	2.814 ± 0.049	2.538 ± 0.095
Third	2.391 ± 0.038	2.569 ± 0.081	2.438 ± 0.071	2.517 ± 0.086	2.801 ± 0.057	2.748 ± 0.091	2.526 ± 0.093
Fourth	2.215 ± 0.093	2.681 ± 0.043	2.348 ± 0.053	2.673 ± 0.039	2.898 ± 0.093	2.581 ± 0.018	2.497 ± 0.013
All students	2.260 ± 0.051	2.640 ± 0.068	2.423 ± 0.058	2.681 ± 0.069	2.907 ± 0.071	2.728 ± 0.69	2.538 ± 0.094
<i>F value</i>	1.745	2.479	6.491	3.359	5.637	3.921	3.183

Means ± SD values of HPLP-II scores subscales, one-way ANOVA, and multiple comparison analysis (p<0.05). HR= health responsibility, SG= spiritual growth, PA= physical activity, IR= interpersonal relations, Nu= nutrition, SM= stress management

Living System: The overall HPLP-II and healthy lifestyle subscales scores of the participants either living with their family or in university hostels are described in Table 4. The overall HPLP-II value indicated that a non-significant difference was observed among the participants living with their family and/or in university hostel ($\chi^2= 1.87$, p<0.05). About 53.39% (205) participants were living with their families showed 2.521±0.068 and 46.61% (179) were living in university hostels showed 2.512±0.059 overall HPLP-II scores. Among six health-promoting lifestyle profile subscales, the participants living with families showed the highest mean scores i.e., 2.991±0.054,

2.981±0.047, and 2.958±0.041 for PA, IR, and Nu respectively. Similarly, the participants living in university hostels also showed the highest mean scores i.e., 2.948±0.053, 2.894±0.051, and 2.845±0.043 for PA, IR, and Nu respectively. Furthermore, both participants showed the lowest mean score for HR. Regression analysis reported that non-significant difference was observed between the participants living with their families and discipline ($\chi^2=1.22$, p<0.05), or among participants living with their families and study year ($\chi^2=0.074$, p<0.05).

Table 4: Distribution of overall HPLP-II and subscales scores according to the living system of the participants (n=384)

Living system	HR	SG	PA	IR	Nu	SM	Overall HPLP-II
With family	2.271 ± 0.048	2.581 ± 0.025	2.991 ± 0.054	2.981 ± 0.047	2.958 ± 0.041	2.671 ± 0.031	2.521 ± 0.068
University hostel	2.191 ± 0.045	2.689 ± 0.036	2.948 ± 0.053	2.894 ± 0.051	2.845 ± 0.043	2.618 ± 0.047	2.512 ± 0.059
<i>t value</i>	0.189	1.792	5.091	3.82	1.453	0.0892	0.709

Means ± SD values of HPLP-II scores subscales, one-way ANOVA, and multiple comparison analysis (p<0.05). HR= health responsibility, SG= spiritual growth, PA= physical activity, IR= interpersonal relations, Nu= nutrition, SM= stress management

Regression Analysis: The multiple regression analysis of the four independent variables (age, discipline, study year, and living system) with seven dependent variables (overall HPLP-II and its six health-promoting lifestyle profile subscales) was carried out to explain that which independent variable(s) indicated a good healthy lifestyle profile among the participants. The regression analysis of all these four independent variables described a baseline for healthy life as 7.1% (p<0.005), 4.3% (p<0.001), 10.35% (p<0.005), 10.09% (p<0.001), and 8.65%

(p<0.005) against overall HPLP-II, SM, PA, Nu, and IR respectively for the participants (Table 5). The independent variables such as age, discipline and the living system showed significant positive associations while study year had the significant negative impact on the overall HPLP-II value. Age, discipline and living system had significant effects on Nu, PA, and IR. Study year had significant effects on SG and Nu. The independent variables described the non-significant effect on stress management (SM).

Table 5: Correlation of the independent variables (demographic data of the participants) with dependent variables (health-promoting lifestyle profile II scales)

Variables	HR	SG	PA	IR	Nu	SM	Overall HPLP-II
Age (years)	0.162**	0.100	0.001	-0.086	0.051	0.058	0.087
Discipline	0.134**	0.007	0.136**	-0.130*	0.108	-0.084	0.145**
Study year	-0.023	-0.114**	-0.212**	0.015	-0.126**	0.015	-0.213**
Living system	0.070	0.006	-0.003	-0.139*	0.094	-0.029	0.019
R ²	0.041**	0.029	0.098***	0.074**	0.102***	0.035	0.032

multiple regression; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

DISCUSSION

The present study describes the various levels of the healthy lifestyle profiles among university participants with distinct demographic factors like age, discipline, study year, and living system. However, awareness and adaptation of these healthy lifestyle scales among people are limited in our region. This present study provides a baseline about the health-promoting lifestyle profile among the people of Pakistan with reference to Asian subcontinent. According to the current study, MBBS participants were more likely to pursue health-promoting lifestyles in their daily lives than BDS, DND, AHS, DPT, and OD participants. Regression analysis described a significant correlation between the discipline, study year, living system and health-promoting behaviors subscales. Discipline, living system and HPLP-II were shown to have a significant positive association, while no such correlation was recorded for age. Similar findings have been reported.^{15,16} The present study shows that the participants had consistent self-care and awareness of healthy lifestyles. They continued their healthy lifestyle such as participation in physical activity (sports club), friendships, and spiritual growth from high school. According to previous studies, HPLP-II had a significant positive connection with age in university participants.^{4,13,17} Similarly, the present study also recorded a significant positive correlation between the age, discipline, living system and HPLP-II. The findings for the participants enrolled in various disciplines during different study years were similar to HPLP-II and demographic characteristics of nursing students in their second year of study.^{7,13} Previously, it is reported that demographic factors such as age, study year, education awareness, and living setup of the participants made a reasonable contribution in explaining the health-promoting lifestyles profile.¹⁸

In present study, HPLP-II scores indicated that, the participants of first and second year were involved more significantly in better nutrition (Nu), PA, and IR than third- and fourth-year participants. Among six health-promoting lifestyle subscales, all the participants showed the highest mean value for nutrition (Nu) and the lowest mean value for health responsibility (HR). Furthermore, the participants of first year obtained the highest overall

HPLP-II score as compared to second, third-, and fourth-year participants. The present study also recorded the significant negative association between the study year and the HPLP-II scales similar to the previous findings.¹⁹

In the current study, the university participants showed the highest mean values for Nu, PA, SM, and IR while the lowest mean values were recorded for SG and HR. This study showed that the participants were actively involved more in nutrition, physical activities, interpersonal relationships, and stress management related activities compared to spiritual growth and health responsibility related activities. The present study showed that continuing physical education at university level could help in the development of healthy life awareness and promotion.^{19,20} These findings also demonstrated a significant positive association between the participants with physical activities and followed a scheduled exercise program This could be because these students have a better understanding of health, which is reflected in their exercise habits. The current study described that the overall HPLP-II as well as subscales values indicated the non-significant difference among the participants living with family and in university hostels. Almost 50% of each participant were living in both systems (with family and in university hostels) which didn't influence the social activities, nutrition requirements and stress bearing capabilities. The present results of comparison of the students' living systems were similar to previous studies.^{21,22} Opposite to this study, various studies described that the participants who lived with their families had better nutrition status than those who did not. It is also reported that the participants who live with their families have better balanced diet in their daily meals.^{23,24,25}

CONCLUSION

The current study emphasized over more research activities over healthy life awareness, study styles, disciplines, leisure, physical, and social activities throughout the daily life. Future aspects of this study involve the participants from other life stages i.e., school students, graduate students, adults, old-age, and people at different workplaces. They are needed to demonstrate how a change in life and environment conditions affect

the healthy life related behaviours. These findings underscore the need for more research into the barriers of a healthy lifestyle and development and implementation of such programs that will motivate the public to be more responsible toward their health. Furthermore, it is critical to offer curricula and counselling services that provide students with the knowledge, support, and empowerment they need to make healthy decisions.

LIMITATIONS

The sample size was small and no gender variability was present.

SUGGESTIONS / RECOMMENDATIONS

Healthy life-style profile study should be undertaken at various settings with multidisciplinary set ups for better understanding and to highlight the barriers to achieve the best outcomes.

CONFLICT OF INTEREST / DISCLOSURE

None.

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