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RESEARCH ARTICLE

THE IMPACT OF ON-CAMPUS HEALTH PROMOTION ACTIVITIES ON HEALTHY LIFESTYLE BEHAVIOURS OF INDIAN UNIVERSITY STUDENTS

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ABSTRACT

BACKGROUND:

A paucity of information exists on the impact of health-promoting activities conducted in low-and-middle-income country settings including Indian Higher Education Institution (HEI). Health promoting universities offer a variety of on-campus health promotion activities to improve the health and lifestyle of the university students. However, the information on the impact of such programmes is scanty.

AIM:

The study aimed to assess the university students' Health-Promoting Lifestyle Profiles (HPLP) before and after exposure to the ongoing on-campus health promotional activities for one year.

METHODS:

All freshmen admitted to an international university in India, with campuses across the major cities, were enrolled in the study. The study was conducted in two phases; phase 1 assessed the baseline existing HPLP scores of these students and phase 2 investigated the impact of on-campus health promotion activities for one year on the HPLP scores, a proxy for healthy lifestyle behaviour.

RESULTS:

The total HPLP scores differed significantly between the two phases (137.9 vs 130.9; p=0.000). Similarly, a significant increase in physical activity scores between the two phases was observed (17.8 vs 19.5; p=0.000). A gender-wise comparison of total and sub-scale HPLP scores of phase I reported significantly higher total HPLP, health responsibility, nutrition, and interpersonal sub-scale scores in females; and significantly higher physical activity scores in males (18.5 vs 17.3; p=0.000). In phase 2, females had significantly higher scores in total HPLP, nutrition, interpersonal, and physical activity sub-scale scores. In both phases females had significantly higher total HPLP scores than males (Phase 1: 137.6 vs 139.8; p=0.000; Phase 2 130.6 vs 131.3; p=0.000).

CONCLUSIONS:

A gender-wise difference on the impact of on-campus health promoting activities with higher impact on females was observed. A more focused, systematic, and targeted approach through curricular, co-curricular and extracurricular courses may further improve the HPLP scores of Indian university students.

KEYWORDS
health promotion, physical activity, nutrition, university students, India, higher education institutes

INTRODUCTION

Higher Educational Institutions (HEIs) have the potential to promote health and inculcate healthy lifestyle practices in young adults.[1] The concept of a Health Promoting University (HPU) is gaining importance and positions the University as a unique platform for attaining the above objective.[2]

Students at HEIs are in a phase of transition from adolescence to adulthood, experiencing changes in mind, body, and social relationships.[3]. In addition, they are exposed to academic pressures and peer influences, leading to unhealthy lifestyle practices.[4]. Evidence indicates that at least half of the young adults have inappropriate food/diet habits and poor nutritional status.[4] Further, students have low physical activity levels and difficulty handling stress and interpersonal relations. [5,6,7,8] Therefore, supporting these young adults with healthy lifestyle practices through appropriate health promotion initiatives, implemented on an ongoing basis, could reduce their risk for NCDs, including mental health challenges. [9,10,11]

At the HEI, health promotion strategies could be provided through various curricular, co-curricular and extracurricular activities. Many HEIs have implemented interventions to improve nutrition, physical activity and offer weight management programmes to improve the health and wellbeing of university students with modest benefits.[4]. However, most such studies that evaluated the potential interventions were conducted in developed country settings and contextualising such health promotion activities to the Indian settings may be challenging due to the lack of cultural appropriateness, less adaptability and feasibility.

A paucity of information exists on the effects of health-promoting interventions or programmes conducted in Indian HEI settings. Information on the beneficial effects of such programmes or interventions could be helpful to many other universities and colleges across India or in other low-and-middle-income country settings. Additionally, in Indian context, an earlier study reported gender as a potential predictor of healthy lifestyle behaviours among Indian university students.[12] It is imperative to mitigate the gender-wise differences in healthy lifestyle profiles of young university students and interventions in such settings play an important role. Therefore, the study aimed to assess university students' Health-Promoting Lifestyle Profiles (HPLP) before and after exposure to the ongoing on-campus health promotional activities and explore whether these promotional activities improved their HPLP scores. Improvement in the HPLP scores was considered as a proxy for adapting healthy lifestyle and behaviour.

MATERIALS AND METHODS

STUDY SETTING

All freshmen admitted to an international university in Maharashtra in the academic year (AY) 2015-16 were enrolled for this study. The study was conducted in two phases; phase 1: to assess the baseline existing health-promoting lifestyle practices of these students using the HPLP scale, [12] and phase 2: to determine the same after their exposure to health promotion activities for two years (first-year students of AY 2015-16 who had by then became 2nd-year students). The HPLP scale was used to assess the health promoting lifestyle scores of HEI students because the scale was validated for Indian context with an internal consistency of 0.7 to 0.83, was an easy-to-administer scale widely used in the young populations from diverse settings. [13] Also, the overall HPLP scale was shown to have a high internal consistency and test-retest reliability.[14]

Phase 1 data were collected between June – August 2015, wherein first-year students of graduate and post-graduate programmes across seven faculties viz: Health and Biological Sciences, Media Communication and Design, Humanities and Social Sciences, Computer Studies, Management, Engineering and Law were enrolled. These students were spread across 28 institutes at five campuses of the University at Pune, Hyderabad, Bengaluru, Noida and Nashik. After seeking permission from the respective authorities, a Google form was shared with students on their group email ids of the individual class to explain the details of the study. Written informed consent was obtained from the participants. The number of enrolled participants for

phases 1 and 2 were 4,253 and 3,575 respectively. All freshmen admitted to the different institutions during their induction period in the first year were included in the study based on their willingness to participate in the study. In the phase 2, the same cohort of students was followed up to their second year.

Briefly, in Phase 1, trained researchers collected data from students using a pretested HPLP questionnaire, including a brief section on the socio-demographic questionnaire. All fresher students who consented to participate, and agreed to provide data were included in the study. The details of phase 1, protocols used, data collection, and data analysis are published elsewhere.[12] The sociodemographic section of the questionnaire collected information on age, gender, faculty and institution wherein students were enrolled, zone (i.e. place of permanent residence of the students aligned to four zones- East, West, North and South), original residential location (i.e. urban vs rural), and location of the institute. The modified HPLP scale was used to assess the health-promoting behaviour and emotional wellbeing of students through self-initiated actions, and perceptions that enhance the level of wellness, self-actualisation, and fulfilment.[15] The health-promoting lifestyle of the university students was collected using an HPLP questionnaire. The HPLP questionnaire was a Likert scale with a score range 1-4, 1 = never, 2 = sometimes, 3 = often, and 4 = routinely. Further information regarding the HPLP scale used in the present study is available elsewhere.[12] A higher score on the HPLP scale indicated healthier lifestyle choices and participation in healthy lifestyle activities.

In phase 2, all the students who participated in phase 1 were followed up (n=4,253), and their healthy lifestyle scores were reassessed using the HPLP scale. Data were collected only from consenting students and students who did not opt out of the follow-up study (n=3,575). Ethical approval was re-obtained from the Independent Ethics Committee (IEC) of the University.

The university, being a Health Promoting University, has Recreation & Wellness Centres (RWCs), a Centre for Yoga and a health centre on each of its campuses. The RWC & Centre for Yoga organised different recreational and wellness activities on an ongoing basis for all the students in the university. Similarly, the Health Centre organised annual health check-ups, health promotion sessions and health promoting activities for all enrolled students in the university. All participants of this study were encouraged to attend these health promotion activities organised on the campuses on a regular basis.

The data on different health promotion activities of the above two centres were collated (between August 2015 to August 2016) to understand the type, nature & number of ongoing health promotion activities on the campuses under the study. Later, the activities were aligned under respective HPLP sub-scales based on health responsibility, physical activity, nutrition, stress management, interpersonal relationship, and spiritual growth. The study assumed that all freshmen who participated in the phase 1 study were exposed to a series of health promotion activities in the subsequent one year (i.e., 2015-16) organised on the university campuses. We believe that participation in these health promotion activities might have benefitted students by improving their HPLP scores.

The data for the same participants for phase 1 and phase 2 was retrieved, cleaned, and validated. Statistical analyses were conducted using SPSS software (version 23). Descriptive statistics such as frequency, percentages, mean, and standard deviation summarised the participant profile and HPLP scores. Chi-square was applied to study the association between the sociodemographic variables between phase 1 and phase 2. Repeated measures of the ANOVA test were applied to investigate the mean differences in the total HPLP scores between the zones and faculty. Further, paired t-tests were used to assess the mean gender-wise differences in total HPLP and sub-scale scores and test the difference in the total HPLP and sub-scale scores between phases 1 and 2. P-value <0.05 was considered significant in all statistical tests.

RESULTS

The study was conducted at 28 institutes across India. A total of 4,253 and 3,575 university students participated in phases 1 and 2, respectively, from 5 campuses. The students were of the same cohort followed up in the second year of the university who were exposed to varied health promotion activities in the university. The attrition rate for the study was 16% (678 participants) over the one-year phase.

A comparison of phase I and 2 socio-demographic characteristics was presented (Table 1). The study participants comprised of 46% (n=1792) females and 54% males (n=2130) in phase 1 and 45.2% (n=1617) females and

54.8% males (n=1,958) in phase 2 (Table I). The proportion of young adults in the age group (i.e., 16-≤25 years) was higher than the older age group (i.e., >25-45 years) in both phases (Table I). In phase 2, the proportion of participants from Science, Technology, Engineering and Medicine (STEM) disciplines was significantly higher than students of Management and Law (P=0.000). Further, the zone-wise distribution of students varied significantly between the two phases (p=0.000). A zone-wise comparison of total HPLP scores reported a significant difference, with the highest score in the West zone (135.2) and the lowest in the East zone (122.0) (data not presented). Similarly, faculty-wise distribution of total HPLP scores indicated significantly higher scores in participants from STEM faculty compared to management and law and social sciences (133.1 vs 130.8 vs 129.4; p=0.000) (data not presented). International students from different low-and-middle-income countries (LMICs) constituted (1.8% and 2.1% of the study participants) who had participated in phase 1 & phase 2, respectively (Table-1).

The data indicated a difference in the number of students between the two phases- an increase in the participants from the Hyderabad campus compared to a decrease in the number of students from the Nasik campus (Table 2). More Pune students participated in the study in both phases than other campuses across India (n=3,522 vs n=2,995).

The total and sub-scale HPLP scores and a similar gender-wise comparison of the HPLP scores were presented (Table 3). The total HPLP scores differed significantly between the two phases (i.e., 137.9 vs 130.9; p=0.000). Similarly, a significant increase in physical activity scores between the two phases was observed (17.8 vs 19.5; p=0.000). Conversely, a significant decrease in the sub-scale scores of health responsibility (24.2 vs 17.7; p=0.000), nutrition (21.3 vs 19.5; p=0.000) and spiritual growth (27.1 vs 26.7; p=0.000) was observed after a one-year follow-up. A comparison of females' total and sub-scale HPLP scores between the two phases reported a significant decrease in total and all subscale scores except physical activity (17.3 vs 19.6; p=0.000). On the other hand, comparing the total and sub-scale HPLP scores of males between the two phases showed a significant decrease in total health responsibility and nutrition scores. However, a significant increase in physical activity (18.5 vs 19.5; p=0.000) and stress management (20.4 vs 20.6; p=0.001) scores were observed between the two phases in males. The sub-scale scores of interpersonal relations and spiritual growth remained unchanged over the two-year phase (Table 3).

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF INDIAN UNIVERSITY STUDENTS

Parameters	Phase 1 n=4253	Phase 2 n=3575	*P* value
	% (n)		
Age (Years)[1]	20.2 (2.9)	21.6 (2.9)	0.0001
16–≤25	96.1 (3990)	86.8 (3103)	0.990
>26–45	3.9 (161)	13.2 (472)	
Gender			
Females	45.7 (1792)	45.2 (1617)	0.440
Males	54.3 (2310)	54.8 (1958)	
Faculty			
STEM[2]	17.9 (755)	24.2 (865)	
Management and Law	51.5 (2152)	43.9 (1568)	0.000
Social Sciences, Humanities and Media-communication	30.6 (1290)	31.9 (1142)	
Location of the students			
Urban	96 (3540)	93.5 (3343)	0.235
Rural	4 (147)	6.4 (232)	
Zones			
East	6.9 (269)	10.2 (360)	
West	48.7 (1887)	48.1(1687)	0.000
North	28.1 (1171)	28.7(1008)	
South	14.1 (546)	12.8(450)	
Residential status			
Domestic students	98.2% (3873)	97.9 (3503)	0.083
International students	1.8% (71)	2.1 (72)	

[1]Mean (SD) = Mean (Standard deviation); [2]STEM= Science, Technology, Engineering and Mathematics

TABLE 2: NUMBER OF STUDENTS PARTICIPATED IN THE STUDY FROM DIFFERENT CAMPUSES ACROSS INDIA

Sl No	Name of the campus	Number of institutes	Phase I	Phase 2
1	Pune	21	3597	2995
2	Hyderabad	2	91	150
3	Bangalore	2	216	187
4	Noida	2	218	224
5	Nashik	1	91	19
	Total	**28**	**4253**	**3575**

TABLE 3: TOTAL, SUB-SCALES AND GENDERWISE HPLP SCORES OF PHASES 1 AND 2

Scales (scores)	Expected (Min, Max)	Total HPLP Scores n (Mean (SD))					Females n (Mean (SD))					Males n (Mean (SD))				
Scores		Phase I		Phase 2		*P* value	Phase 1		Phase 2		*P* value	Phase 1		Phase 2		*P* value
Health responsibility	9, 36	4236	24.2 (3.4)	3575	17.74 (2.8)	0.000	1788	24.6 (2.8)	1617	17.8 (2.8)	0.000	2129	24.0 (3.2)	1958	17.66 (2.7)	0.000
Physical activity	7, 28	4231	17.8 (4.3)	3575	19.54 (4.06)	0.000	1788	17.3 (4.1)	1617	19.6 (4.1)	0.000	2125	18.5 (4.2)	1958	19.55 (4.04)	0.000
Nutrition	9, 36	4225	21.3 (4.3)	3575	19.59 (3.1)	0.000	1787	21.9 (3.8)	1617	19.6 (3.1)	0.000	2116	21.1 (3.9)	1958	19.59 (3.1)	0.000
Stress management	8, 32	4219	20.4 (3.9)	3575	20.6 (3.7)	0.021	1786	21.0 (3.4)	1617	20.7 (3.6)	0.000	2117	20.4 (3.6)	1958	20.61 (3.7)	0.001
Interpersonal relations	9, 36	4227	26.9 (5.3)	3575	26.68 (4.7)	0.007	1782	27.7 (4.2)	1617	26.8 (4.7)	0.000	2106	27.1 (4.5)	1958	26.6 (4.7)	0.274
Spiritual growth	9, 36	4192	27.1 (5.6)	3575	26.72 (5.4)	0.000	1779	27.6 (4.5)	1617	26.8 (5.4)	0.000	2099	27.5 (4.7)	1958	26.6 (5.3)	0.180
Total HPLP scores	**50, 200**	**4237**	**137.9 (19.3)**	**3575**	**130.94 (16.3)**	**0.000**	**1791**	**139.8 (15.9)**	**1617**	**131.3 (16.7)**	**0.000**	**2130**	**137.6 (18.8)**	**1958**	**130.6 (16.06)**	**0.000**

TABLE 4: GENDERWISE COMPARISON OF TOTAL HPLP AND SUB-SCALE SCORES FROM PHASE 1 AND PHASE 2

Scales (scores)	Expected (Min, Max)	Phase 1				*P* value	Phase 2				*P* value
Scores		Males		Females			Males		Females		
		n	Mean (SD)	n	Mean (SD)		n	Mean (SD)	n	Mean (SD)	
Health responsibility	9, 36	2129	24.0 (3.2)	1788	24.6 (2.8)	0.000	1958	17.7 (2.7)	1617	17.8 (2.8)	0.796
Physical activity	7, 28	2125	18.5 (4.2)	1788	17.3 (4.1)	0.000	1958	19.6 (4.0)	1617	19.6 (4.1)	0.007
Nutrition	9, 36	2116	21.1 (3.9)	1787	21.9 (3.8)	0.000	1958	19.6 (3.1)	1617	19.6 (3.1)	0.009
Stress management	8, 32	2117	20.4 (3.6)	1786	21.0 (3.4)	0.000	1958	20.6 (3.7)	1617	20.7 (3.6)	0.872
Interpersonal relations	9, 36	2106	27.1 (4.5)	1782	27.7 (4.2)	0.000	1958	26.6 (4.7)	1617	26.8 (4.7)	0.006
Spiritual growth	9, 36	2099	27.5 (4.7)	1779	27.6 (4.5)	0.300	1958	26.6 (5.3)	1617	26.8 (5.4)	0.313
Total HPLP scores	**50, 200**	**2130**	**137.6 (18.8)**	**1791**	**139.8 (15.9)**	**0.000**	**1958**	**130.6 (16.1)**	**1617**	**131.3 (16.7)**	**0.000**

TABLE 5: HEALTH PROMOTION ACTIVITIES CONDUCTED IN DIFFERENT INSTITUTES FOR STUDENTS ACROSS THE UNIVERSITY AND THE RESPECTIVE HPLP DOMAINS COVERED BY THE THESE ACTIVITIES

Sr. No	On Campus Health Promotion activities conducted	2015-2016		HPLP domains covered					
		No.of activities	No of students benefited	Health Responsibility	Physical Activity	Nutrition	Stress Management	Interpersonal Relations	Spiritual Growth
1	**Health and Wellness** -Balanced diet, healthy diet, information about nutrition labels, exercise and its benefits, importance of sleep	74	7312	✓		✓			
2	**Stress management**- Ways of coping stress, handling peer pressure, sharing thoughts, working on improving mental health,avoiding drinking smoking habits, healthy friendship	74	7312	✓			✓	✓	✓
3	**Computer Ergonomics**- Correct posture, Distance from Computer	74	7312	✓					
4	**Recreational Activities**- Standing Broad Jump, Biggest Looser, Plank, Medicine Ball Crunches, Shuttle Run	55	1409		✓				
5	**Recreational Wellness programmes**-Best of Three, Farmer's Walk, Battle Rope, Burpees, Shuttle Run, Power Balance, Step Jump, Rack the Weight, Reverse push ups on bar, Shuttle run, Battle rope (Alt. wave), Pull Ups Challenge, Body weight bench press, Naukasana (Boat Pose) Hold Step Test (18")	NA	NA		✓				
6	**Sports Activities**-Inter institute badminton,football, tennis, swimming, basketball, cricket, volleyball,squash, table tennis,chess (Athlete 2017)	9	2363		✓				
7	Fitness for freedom run	1	1200		✓				
8	Symbi Fit	1	NA		✓				

NA: Not Available

A comparison of total and sub-scale HPLP scores between males and females of phase I reported significantly higher total HPLP, health responsibility, nutrition, and interpersonal sub-scale scores in females (Table 4). Conversely, males had significantly higher physical activity scores than their female peers (18.5 vs 17.3; p=0.000). In phase 2, females had significantly higher total HPLP, nutrition, interpersonal, and physical activity sub-scale scores. In both phases females had significantly higher total HPLP scores than males (Phase 1: 137.6 vs 139.8; p=0.000; Phase 2 130.6 vs 131.3; p=0.000). Sub-scale scores of stress management and spirituality remained the same between both male and female participants in phase 2 (Table 4).

Analysis of the health promotion activities conducted on different campuses of the University over a year (i.e., August 2015 to August 2016) showed several health-promoting activities organised during the study period (Table 5). The health promotion activities were categorised to suit the sub-scale domains of the HPLP scale. The table reported the total number of events that covered a large group of students; however, most of the activities focused on the physical activity sub-scale domain (5 out of 8 activities). Although other health promotion activities were organised, they were conducted 1-2 times/ annum/ institute. The sub-scale domains such as nutrition, interpersonal relations and spiritual growth were covered in a limited number of activities (Table 5).

To summarise, a significant increase in the physical activity subscale scores between the two phases, among both males and female participants of the University, was observed in the study. The health-promoting activities improved female participants' subs-scale HPLP scores on physical activity, nutrition, and interpersonal domains.

DISCUSSION

The present manuscript aimed to investigate the effects of on-campus health promotion activities on the total HPLP and sub-scale scores of students at an Indian university. The study was the first to assess the impact on HPLP scores of Indian students across the country. The results indicated that the participant zone and the faculty (STEM vs Management and Law vs Social science and Humanities) were significantly associated with the total HPLP scores. Also, the periodic health promotion activities significantly improved the physical activity scores of both male and female participants; however, there was no improvement

in the total scores. Further, it was observed that female participants had significant improvement in total HPLP and nutrition, physical activity, and interpersonal sub-scale scores at the end of one year period than their male counterparts.

To our knowledge, this is the first study from a low and middle-income country context that investigated the effects of periodic on-campus health promotion activities in a tertiary education setting across the country. We report that these periodic, on-campus health promotion activities could not significantly improve the total HPLP scores. This could be attributed to a lack of structured, domain-specific, systematic, consistent, frequent, and focused health promotion activities. The health promotion activities organised by the University predominantly focused on the physical activity domain and less on other domains. Also, health and wellness and stress management sessions were less frequent (i.e., 1-2 times/ institution/ year) to affect the sub-scale domains of nutrition, stress management, health responsibility, and spirituality. Further, our study showed a significant increase in physical activity sub-scale scores in male and female participants, which was not surprising because the physical and sports activities dominated the health-promoting activities.

Among the different subscales, the lowest scores were observed for health responsibility, followed by nutrition and physical activity. The results urge the necessity to educate students on health responsibility, nutrition, and improvements in physical activity levels. The health promotion activities conducted on-campus, although they address these domains broadly periodically, more focused, targeted, holistic, and systematic interventions may be required to improve the HPLP scores and, thereby, healthy lifestyle profiles of Indian university students.

The total HPLP scores were higher among the Indian university students in the present study (137.9 and 130.9 for phases 1 and 2) than similar other studies from Turkey (125) on medical students, and Japanese university students (130). [16,17]. Indian students scored higher in physical activity, stress management, nutrition, and health responsibility subscales than medical students from Turkey and Japan. Japanese and Turkish medical students had higher interpersonal relation scores, and Turkish medical students had higher spiritual growth scores than Indian university students). [16.17]

There is a scarcity of studies that have assessed the effects of periodic health-promoting interventions on HPLP scores. In this scenario, a systematic review of 41 studies that evaluated the effectiveness of interventions to improve physical activity, nutrition and healthy weight among university and college students was used to compare the results from our research.[4] The authors reported that 18/29 studies showed a significant increase in physical activity from pre-to-post intervention. Also, the study reported an increase in physical activity minutes, participation, and exercise duration.[4]

Our study did not find significant improvements in total HPLP scores and most sub-scale scores after two years of exposure to periodic health-promoting activities. Several factors could be attributed to the same as below: firstly, actions were periodic, and participation was voluntary for students; secondly, these activities were not curricular activities and were not graded to assess the impact; thirdly, these activities were generic, less focussed on specific individuals and not targeted towards specific sub-scale domains; and finally, students often engaged in physical activities to relieve the stress of the academic pressure, and to support the placement drives. Also, a significant increase in the physical activity scores among participants could be due to the access to the recreation and wellness centres, hands-on training, and motivation from the trained staff.

The gender of students was found to influence the HPLP scores and showed that female students had significantly higher total HPLP and subscale scores than their male peers compared to study in Saudi Arabia, Nepal, and Iran. [18,19,20] Although young women had better lifestyle practices essential from the point of intergenerational effects of malnutrition, evidence suggests that male lifestyle practices also impact the health of future generations. [21,22] Thus, University could be a platform to establish healthy lifestyle practices among today's youth to produce a healthy future generations.

Although the study was conducted on many university students across India, the study relied on self-reported data; the reproducibility of the results might be limited to only a similar population. However, the study provided insights into the lifestyle profiles of many Indian university students from different campuses. Hence, the results could be considered reflective of similar age groups from other parts of the country.

CONCLUSION

In summary, the total HPLP scores varied across the faculty and participant zones. The periodic health promotion activities improved the physical activity scores without improvements in total scores. In addition, the female students at the university improved in nutrition, and interpersonal domain scores at the end of one year period. The study recommends faculty, gender, and zone-specific interventions for university students on different domains of healthy lifestyle behaviours such as nutrition, interpersonal relations, health responsibility, spirituality and stress management through focused, systematic and targeted approach.

The interventions could be implemented more rigorously in a sustained manner through curricular, and co-curricular programmes and extracurricular activities. Additionally, strengthening the HEI ecosystem through multidisciplinary and multistakeholder health promotion activities that address core nutrition issues, develop healthy eating patterns, management of stress levels, awareness of individual health responsibility, and to develop healthy interpersonal skills would improve the HPLP scores of Indian students. From a futuristic public health perspective, this is important in helping raise a healthy future generation and a healthy world.

AUTHORS CONTRIBUTION

The study was conceptualized by RY, MG collected and analysed the data together with KM, and KM critically reviewed, interpretated and drafted the manuscript.

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ETHICAL STATEMENT

All participants provided written informed consent. Ethics approval was obtained for both the phases from the Institutional Ethics Committee of the university.

DECLARATION OF CONFLICTING INTERESTS

The authors declare no conflicts of interest.

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AVAILABILITY OF DATA AND MATERIALS

Data available upon request

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