International Journal of Physical Education, Exercise and Sports
www.physicaleducationjournal.com
Online ISSN: 2664-9896
Received: 10-04-2026, Accepted: 11-05-2026, Published: 26-05-2026
Volume 8, Issue 2, 2026, Page No. 89-94

Relationship between physical activity and dietary practices among youth of rajnandgaon sector Chhattisgarh

Khelan Prasad Mahule[1], Aakanksha Verma[2], Bindu Mahule[3], Birendra Kumar[4], Deepti Tikariha Jangde[5*]
[1] Department of Sports, Acharya Panth Shri Grindh Muni Naam Saheb, Govt. P.G. College Kawardha, Kabirdham, Chhattisgarh, India
[2] Department of Home Science, Acharya Panth Shri Grindh Muni Naam Saheb, Govt. P.G. College Kawardha, Kabirdham, Chhattisgarh, India
[3] Govt. School Farasgaon, Chhattisgarh, India
[4] Department of Chemistry, Govt Rajmata Vijiyaraje Sindhiya Kanya Mahavidyalya Kawardha, Kabirdham Chhattisgarh, India
[5] Assistant Professor, Department of Chemistry, Acharya Panth Shri Grindh Muni Naam Saheb, Govt. P.G. College Kawardha, Kabirdham, Chhattisgarh, India
Corrresponding Author: Deepti Tikairiha Jangde

Abstract
Physical activity levels and dietary habits of young adults can affect future health conditions. Poor diet and low physical activeness can promote obesity, diabetes and other metabolic diseases. This study investigates the correlation between physical activity levels and lifestyle practices among adolescents in Rajnandgaon, Chhattisgarh. Utilizing a cross-sectional design, data were collected by a questionnaire inspired by Wani *et al*.,(2025) [11] from 170 students (113 male and 57 female participants) aged 18-23 years across colleges of Rajnandgaon sector. The sample was further divided into two age groups, 17-19 years and 20-23 years. Results indicate that increased physical activity is associated with healthier dietary habits. Most male participants (88%) were engaged in vigorous physical activity than female participants (84%) but preferred more fast foods than female participants. Lack was time and perceived high costs were the most common barriers among the youth (both male and female). The findings underscore the need for targeted interventions to promote physical activity and healthy dietary habits as mean to enhance overall youth health in the region.

Keywords: Healthy diet, dietary behavior, youth health, physical activity, exercise

Introduction

Adolescence (age 13 to 17 years) is a critical period for establishing healthy dietary habits, physical fitness awareness and health-related behaviors. It paves the path for young adults (18-23 years) to live by a balanced and healthy lifestyle. But in past 2 decades in Chhattisgarh, including regions like Kawardha, Rajnandgaon, Manpur-Mohla-Ambagarh Chauki, and Khairagarh-Chhuikhadan-Gandai, that are parts of Rajnandgaon sector, there is a growing concern over sedentary lifestyle and increased consumption of fast foods and sugary energy drinks among youth, leading to various health issues. At university/college level most students are insufficiently physically active and have suboptimal dietary habits (Verma AK *et al*., 2022.) [12].

Different kind of exercises implies different levels of physical activity. Cycling, playing physical sports and athletics are considered vigorous activities whereas walking, light yoga, doing home chores are considered moderate. These practices in daily or weekly routine can help maintain a healthy body as well as contribute to dietary needs. Where heavy and moderate exercises may increase calorie consumption, and muscle building needs more protein, sedentary lifestyle and palate pleasing fast food consumption can cause increased body weight due to high carbohydrates and saturated fats. Olfert MD *et al*., (2022) [13] reported in their study that many college students experienced higher consumption of unhealthy foods as well as reduced physical activity during lock down of COVID-19. It could easily contribute to their long term habit of eating and activeness.

The national survey by Sethi V. *et al,* (2019) [1] has put emphasis on school's/institute's ability to change the nutritional and physical activity environment of the adolescence, this was further echoed in the study by Mohammadi S. *et al* (2025) [5]. Su DLY *et al*, (2022) [10] explains that beyond institutional reach parental modeling and encouragement along with logistical support helps to extend healthy behaviours. Similar conclusions were also presented by Shao *et al*.,(2023) [2]. Guidelines and awareness programmes to motivate proper health behaviour have only been able to resolve the issue to the minimum extent. Lack of information, increased stress, easily available fast foods and small to none active physical exercise made it more difficult to achieve fitness goals. Campus living conditions and pressure of time management cause negative impact on physical activity and increase fast food consumption in students (Piskernik S *et al*., 2023) [17]. In rural areas family and gender norms and socio-cultural beliefs affect dietary and physical activity reforms (Islam MR *et al.,* 2019) [6] and their long term effects shape acceptability and feasibility of these intervantions (Ng AK *et al*, 2020) [7]. This study tries to establish the link/connection between physical activity and lifestyles practices such as dietary habits to understand their inter relationship and effect on health of youth of Rajnandgaon sector.

Methodology

1. Study Design

A cross-sectional study was conducted in Rajnandgaon sector, encompassing both urban and rural colleges. The sample consisted of 170 students aged 17-19 and 20-23 years, selected through stratified random sampling to ensure representation from different demographic groups. This descriptive cross sectional study was conducted to assess physical activity and dietary practices among youth of Rajnandgaon sector Chhattisgarh.

2. Statistical Analysis

Data were analyzed using SPSS version 25. Descriptive statistics were computed, and Pearson's correlation coefficient was used to assess relationships between variables. A p-value of <0.05 was considered statistically significant.

3. Participants

A total of 170 participants (113 male and 57 females) aged 17-23 years were selected form colleges students in urban, semi urban and rural areas of Rajnandgaon sector, Chhattisgarh and divided into two study groups from ages 17-19 years and 20-23 years. Both male and female students were considered for this study to get more diverse data.

4. Instrument

A structured questionnaire inspired by physical activity and dietary habit questions from development of HLS by Wani *et al*., (2025) [11] was corporate in the study.

Survey questions included

Physical Activity

1. I usually engage in at least 30 minutes of moderate physical activity (e.g., brisk walking or household chores).
2. I participate in vigorous physical activities (e.g., jogging and cycling) for at least 20 minutes three days a week.
3. I include flexibility exercises (e.g., stretching or yoga) at least thrice weekly in my routine.
4. I perform muscle-strengthening exercises (e.g., bodyweight or resistance training) at least twice weekly.
5. I take steps to stay active regardless of weather conditions (e.g., snow or extreme heat).

Healthy Diet

1. I eat three balanced Meals daily.
2. I Eat breakfast Daily.
3. I include foods from all major food groups (vegetables, fruits, grains, proteins, and dairy) in my diet. (5 serving Day)
4. I avoid excessive consumption of unhealthy foods.
5. Fast food (3 Days in week), Sugar Sweetened drinks (3 Days in week)
6. Barriers to healthy eating (tick any 01)

a. Lack of Time, b. Taste Preference (Fast Food)
c. Limited nutrition awareness, d. Perceived High Cost

5. Data Collection

Data were collected by the questionnaires in both offline and online form. Item covered, demography, meal frequency, fruit and vegetable intake, fast food and beverage consumption and barriers to healthy eating and another physical activity items covered, moderate physical activity, vigorous physical activity, flexibility exercise, muscle strengthening exercise and weather conditions.

6. Data Analysis

Graphit 5 and SPSS are used for data analysis of all variables. Results are presented in tables with detailed interpretation.

Results

Table 1: Demographic Characteristics of Participants (N = 170)

Variables	Category	n	%
Gender	Male	113	66.47
	Female	57	33.53
Age	17-19	102	60
	20-23	68	40

Table 1 indicates that almost 66% or two-third of the participants was male making female participant's one-third of the sample. The demographic characters suggest overall 60% of the sample were aged 17-19 years and remaining 40% young adults aged 20-23 years old.

Table 2: Difference variance in physical activity behaviours

Variables	Age group 17-19		Age group 17-19		Age group 20-23		Age group 20-23	
	Yes		No		Yes		No	
	M (%)	F (%)	M (%)	F (%)	M (%)	F (%)	M (%)	F(%)
Engage in at least 30 minutes of moderate physical activity (e.g., brisk walking or household chores).	69 (95.57)	29 (90.63)	1 (1.43)	3 (9.38)	43 (100)	25 (100)	00 (00)	00 (00)
Participate in vigorous physical activities (e.g., jogging and cycling) for at least 20 minutes three days a week.	62 (88.57)	19 (58.38)	8 (11.43)	13 (40.63)	38 (88.37)	21 (84)	05 (11.62)	4 (16)
Include flexibility exercises (e.g., stretching or yoga) at least thrice weekly in my routine.	67 (95.71)	22 (68.75)	3 (4.28)	10 (31.25)	42 (97.67)	20 (88)	01 (2.32)	5 (20)
Perform muscle-strengthening exercises (e.g., body weight or resistance training) at least twice weekly.	62 (88.57)	16 (50)	8 (11.43)	16 (50)	42 (97.67)	22 (88)	01 (2.32)	3 (12)
Take steps to stay active regardless of weather conditions (e.g., snow or extreme heat).	52 (74.28)	28 (87.5)	18 (25.71)	4 (12.5)	39 (90.69)	18 (72)	04 (9.30)	7 (28)

M= Male, F = Female

Table 2 shows the physical activity variance in different age groups indicates higher levels of moderate activity in both genders and age group however age group 20-23 shows slightly more activeness than 17-19 years old.

Vigorous physical activity is much higher among male participants in both age group comprising respectively 88.57% and 88.37% for 17-19 years and 20-23 years old male participants, while in case of 17-19 years age group of female participants, only 58.38% responded yes. This data was higher almost 84% in case of 20-23 years old female participants.

Both age groups of male participants showed higher activity (more than 95%) in flexibility exercises, it is suggested by the data that while female participants were slightly behind than male participants, 20-23 years old female students were more (88%) active than 17-19 years old (68.75%).

Muscle strengthening exercise data followed the pattern and again male participants were more active approximately 88% and 97% in age group 17-9 and 20-23 years respectively. 17-19 years old females were behind (50%) than 20-23 years old female participants (88%).

Efforts to remain active despite weather conditions indicate mixed behaviour in both age groups and genders. 17-19 years old females (87.5%) were more active than the same age group of male students (74.28%) whereas opposite pattern was shown by 20-23 years old participants (90.69% in male and 72% in female).

Table 3: Gender Difference in Preventive behaviours

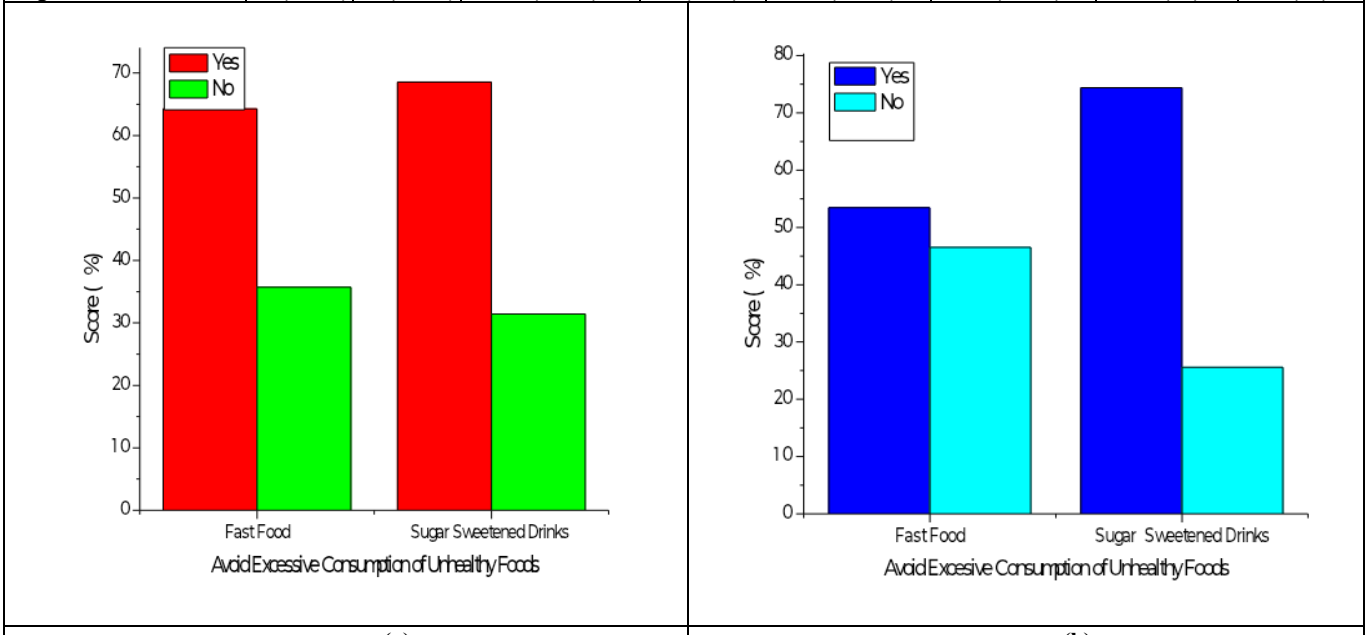
Behaviour	Age group 17-19 Yes		Age group 17-19 No		Age group 20-23 Yes		Age group 20-23 No	
	M (%)	F (%)	M (%)	F (%)	M (%)	F (%)	M (%)	F (%)
Balanced Diet (3)	54 (77.14)	27 (84.38)	16 (22.85)	5 (15.63)	37 (86.04)	20 (80)	06 (13.9)	5 (20)
Eats Breakfast Daily	58 (68.57)	30 (93.75)	22 (31.42)	2 (6.25)	27 (62.8)	22 (88)	16 (37.2)	3 (12)
Include foods from all major food groups (5 Serving Day)	57 (81.43)	20 (62.5)	13 (18.57)	12 (37.5)	33 (76.74)	19 (76)	10 (23.3)	6 (24)

Females in younger age group showed more (84.38%) adherence to balanced diet than male participants (77.14%) shown in Table 3. The opposite was shown in older age group as females (80%) were slightly behind male participants (86.04%).

Habit of eating breakfast daily was more consistent in females of both age groups than males but male participants were more consistent in including all major food groups in their diet than their female counterparts.

Table 4: Avoid excessive consumption of unhealthy foods

Food Type	Age group 17-19 Male		Age group 17-19 Female		Age group 20-23 Male		Age group 20-23 Female	
	Yesn (%)	Non (%)	Yesn (%)	Non (%)	Yesn (%)	Non (%)	Yesn (%)	Non (%)
Fast Food	45 (64.28)	25 (35.71)	23 (70.88)	9 (28.13)	23 (53.48)	20 (46.51)	18 (72)	7 (28)
Sugar sweetened drinks	48 (68.57)	22 (31.43)	29 (90.63)	3 (9.37)	32 (74.41)	11 (25.58)	22 (88)	3 (12)



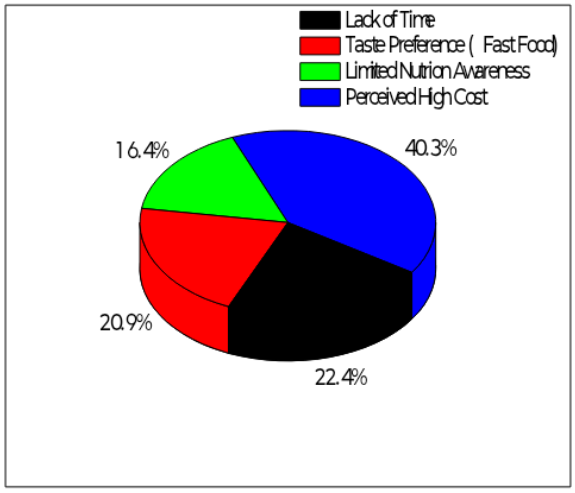
(a) **(b)**

Fig. 1 Avoid excessive consumption of unhealthy foods (a) (age 17-19) (b) (age 20-23)

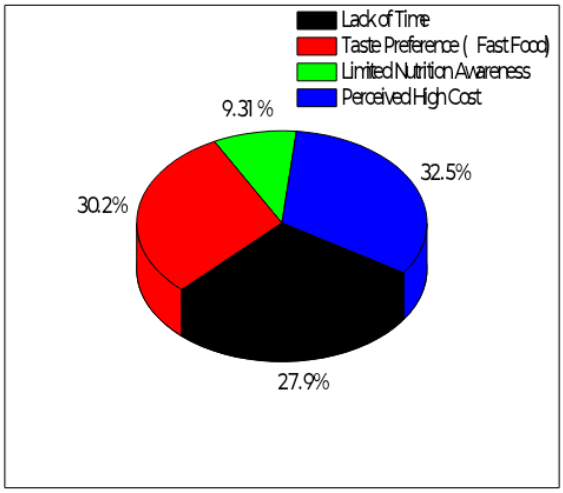
An interesting pattern was displayed regarding excessive consumption of unhealthy foods. Female students of both age groups are more likely to consume healthy foods (more than 70%) and avoid fast foods and sugar sweetened drinks than male students(less than 70%) shown in Table 4 and Fig 1.

Table 5 Reported barriers to preventive health behaviours

Barrier	Age group 17-19		Age group 20-23	
	M	F	M	F
	n%	n%	n%	n%
Lack of Time	15 (21.42)	13 (40.63)	12 (27.91%)	12 (48)
Limited awareness	14 (20)	11 (34.38)	13 (30.23%)	8 (32)
Cost related concerns	11 (15.7)	5 (15.63)	04 (9.31%)	3 (12)
Lack of access to services	27 (38.57)	3 (9.378)	14 (32.55%)	2 (8.0)



(a)



(b)

Fig. 2 Barriers to healthy eating (a) (age 17-19) (b) (age 20-23)

Table 5 and Fig 1 shows that the lack of time was most dominant (40.63% in younger and 48% in older age group) barrier to preventive health behavior for females, but male students (38.57% in younger and 32.5% in older age group) chose lack of access to services as more dominant barrier.

Discussion

This study assesses dietary practices and physical activity in young adults and late adolescent students of Rajnandgaon sector. The results showed similarity to the findings of previous studies on nutritional and physical behaviors of young adults and college/university students (Fayaz T *et al*.,2025) [20] while suggesting regional differences affecting variables including physical activity, barriers in preventive health behaviors and gender differences in dietary habits.

According to the findings of the present study, 95% of men and 90% of women aged 17–19 years were physically active, whereas 100% of men and women in the 20–23-year age group were reported to be physically active. These results indicate that youth aged 20–23 years demonstrate higher levels of physical activity compared to adolescents aged 17–19 years. The study was conducted to assess the physical activity levels of adolescents and youth in the Rajnandgaon region of Chhattisgarh, which is situated on the edge of the Maikal mountain range. The majority of participants reside in rural and forested areas where access to modern amenities is limited. As a result, daily activities are largely performed using traditional methods, naturally promoting higher levels of physical activity. Youth living in forest regions are generally hardworking and place importance on maintaining physical health, which encourages regular physical activity as part of their daily routine. In contrast, global trends show lower activity levels; according to the World Health Organization's Global Recommendations on Physical Activity for Health, (WHO 2010) [21], approximately 31% of youth and 80% of adolescents worldwide are physically inactive. Nevertheless, the WHO recommends that individuals engage in at least 150 minutes of moderate-intensity physical activity per week to maintain optimal health.

Moderate, vigorous, flexibility and muscle strengthening exercises were highly reported by male participants; however female participants were only slightly behind if not equal in moderate activities. Older age group (20-23 years old) was more inclined to do vigorous activity than 17-19 years old. Also it is notable that female students were more consistent to their activities despite weather conditions.

The findings show that, with percentages above 88%, men in both age groups (17–19 and 20–23 years) participate in moderate-pace physical activity almost identically. Women, on the other hand, showed a significant difference, with participation rising from 58.38% in the 17–19-year group to 84% in the 20–23-year group. This implies that age has a major impact on how active women are. Teenage girls' relatively low levels of physical activity could be caused by psychosocial issues, pressure to perform well academically, a lack of opportunities, and a lack of knowledge about the advantages of consistent exercise. These results are in line with WHO guidelines, which stress the value of participating in moderate-intensity physical activity for at least 150 minutes each week in order to support both mental and physical health. (WHO 2010).

Flexibility is crucial for both motor skills and physical fitness. Males were found to participate in flexibility exercises at a high rate, with 95.71% of those aged 17–19 and 97.67% of those aged 20–23 actively doing so. On the other hand, 68.75% of females between the ages of 17 and 19 and 88% of females between the ages of 20 and 23 reported engaging in flexibility exercises. These findings show that males in both age groups are highly engaged in

flexibility training. In contrast to the 20–23 age group, female participation in the 17–19 age group is noticeably lower. Flexibility exercises improve the elasticity and extension of muscles and joints, which is advantageous for people of all ages.

A key element of both motor ability and general physical fitness is muscle strength. A significant percentage of men regularly engage in muscle strength training, with 88.57% of those aged 17–19 and 97.67% of those aged 20–23 doing so at least twice a week. By contrast, 50% of women between the ages of 17 and 19 and 88% of women between the ages of 20 and 23 reported doing muscle strength training twice a week. These results show that while women between the ages of 20 and 23 exhibit participation levels similar to those of men, men in both age groups regularly engage in muscle strength training. Women in the 17–19 age range exhibit moderate engagement, but their participation is still significantly lower than that of other groups. This decreased participation may be explained by a lack of knowledge and comprehension of muscle strength training, in addition to elements like low interest, injury fear, and limited access to training materials. Significantly, it has been demonstrated that women can benefit from resistance training; A. According to (Amanda D. Hägström *et al*.,2019) females who participated in resistance training programs lasting roughly 15 weeks saw an average increase in muscle strength of 1.45 kg. This data emphasises the possible advantages of encouraging young women, especially adolescents, to engage in muscle strength training.

A mixed behavior was shown among both genders regarding dietary habits; female respondents were more likely to include daily breakfast in their meals than male respondents but higher percentage of male respondents used all major food groups in their meals. Usage of unhealthy foods such as sweetened drinks and fast foods were more prevalent in female participants than male. Older male respondents (53.48%) showed lower unhealthy food eating habits than younger male respondents (64.28%), whereas female respondents showed somewhat similar unhealthy food eating habits (above 70% in both cases). Sugar sweetened drinks are loaded with calories and may increase the risk of obesity in young adults. Zhang Y *et al*., (2025) [18] observed in their study that calorie reduction by reducing intake of high calorie foods showed strongest improvements in college student's physical health indicators. Low fruit and vege*et*able intake by undergraduate students with low physical activity in undergraduate students can increase the risk of chronic diseases in future.(Essaw E *et*, al.2019) [16].

Downes L *et al*., 2015 [19] emphasized the role of campus health services in addressing college students physical activity practices. Among male participants lack of access to services was most prevalent barrier of preventive health behavior followed by lack of time and limited awareness. Hailu GN *et al*.,(2021) [15] suggested in their study that health promotion efforts in targeted campus may improve student's physical activity and poor diets. Female participants were more concerned with lack of time followed by limited awareness and lack of access to services. Cost related concern was least of a barrier for both age and gender group.

Correlation across all tables reveals a clear trend

- **Males:** Higher physical activity levels but poorer dietary habits.
- **Females:** Better dietary routines but lower physical activity involvement.
- **17–19 age group:** More behavioural imbalances—lower activity (females) and poorer diet (males).
- **20–23 age group:** More consistent behaviours—both diet and activity improve with age.

Together, these findings emphasize the need for gender-specific and age-appropriate interventions. Physical activity promotion should specifically target young females, while dietary behaviour interventions should be directed more toward young males. Additionally, addressing barriers such as time, awareness, and accessibility is crucial to ensure sustainable healthy lifestyles among youth.

Recommendations and implications

The students of Rajnandgaon sector show almost similar patterns in dietary habits and physical activity, this exhibits same course of action can be implied to improve these conditions. A recent study by Baumann H *et al*., (2025) [8] supports, and Ioannou *et al*,(2024) [9] states that health related digital tools can be most effective with the incorporation of human support such as institutional policies, family support and physical fitness training programmes. Physical development such as muscle strength and lowering adiposity risk can be improved by early and sustainable, di*et*ary intervention and physical activity (Ng AK *et al*, 2020) [7]. This relationship was reinforced in the outcomes reported by Pearson *et al*, 2025 [4].

Dietary habits and physical activity are related behaviours in context of gaining physical fitness and a study by Parker KE *et al*, (2019) [3] states that targ*et*ing clusters of related behaviours yields more health benefits than isolated measures. This study emphasizes on these following suggestions that can positively affect these young students:

- Provide gym facilities for flexibility, muscle strengthening and vigorous exercises for both genders.
- Organize nutrition and dietary habit related awareness programs and workshops on college and sector levels.
- Increase access to health related services.
- Address time and cost management issues and provide time efficient solutions.
- Programs targeted especially female students to increase their participation in vigorous, muscle strengthening and flexibility exercises.

Conclusions

This study address physical activity and dietary habits of 17-19 and 20-23 aged male and female students group by using questionnaire inspired and incorporated with questions related to same in HLS by Wani *et al*. (2025) [11]. Higher level of physical activity was a shown pattern of the students who maintained healthier di*et*s, but transition to university can be linked to reduced and/or poorer dietary and physical practices.(Lonati E *et al*.,2024) [14]. The study provides insight on participation of late adolescents and young adults in moderate, vigorous, flexibility and muscle strengthening physical activity while assessing their dietary habits such as eating breakfast daily, avoiding unhealthy foods and including all the necessary food groups in their meals. This study concludes that physical activity and dietary habits are interrelated and suggest that improvised dietary habits and increased physical activity can pave the path for young adults to live a healthy and fit life. Similar

conclusion was supported by Pearson *et al*., (2025) [4] and Sethi *et al.,* (2019) [1] stated that adolescent health (age 13-18years) can mostly be improved by combination of di*et*ary and physical activity interventions.

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