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Fasting Plasma Glucose Levels in Relation to the Nutritional Status, Dietary Intake, and Lifestyle Factors among a Group of Sri Lankan Undergraduates: A Cross-Sectional Study

P.H. Kaldera[1] and C.M. Wickramatilake[2]

[1]*Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna*
[2]*Department of Biochemistry, Faculty of Medicine, University of Ruhuna*

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*Corresponding author:
hansani352@gmail.com

ABSTRACT

Introduction: Diabetes mellitus (DM) is a global public health concern intricately linked to dietary habits, physical inactivity, and other lifestyle factors.
Objectives: This cross-sectional study aimed to elucidate the associations between fasting plasma glucose (FPG) levels, nutritional status, dietary patterns, and lifestyle factors among undergraduates at the Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka.
Materials & Methods: It was a descriptive cross-sectional study. Data were collected via a self-administered questionnaire. Anthropometric measurements were obtained following standard protocols. Fasting plasma glucose was quantified using the GOD-PAP method. Statistical analysis was performed using appropriate statistical tools.
Results: Participants (n = 100) were in the age range of 20 - 28 years and 58% were females. Their FPG levels ranged from 70 to 108 mg/dL with 3% of impaired fasting glycaemia (IFG) and no instances of DM. Mean (SD) BMI was 20.9 (3.4) kg/m2 . Among them, 29% were overweight or obese. A statistically significant positive correlation was observed between FPG and both waist circumference (p=0.004) and BMI (p=0.019). Dietary assessment revealed suboptimal adherence to recommended portion sizes across all six food categories. Despite 82% consuming three main meals per day, meal-skipping was reported by 36% of the participants. Adequate water intake was reported among 60%, the majority abstained from alcohol and smoking. However, a considerable percentage reported consumption of junk foods. Physical inactivity and inadequate sleep were reported by 73% and 72% of the participants respectively.
Conclusions: The prevalence of IFG among the studied undergraduate population is low. However, the majority exhibited suboptimal dietary practices and insufficient engagement in physical activities, which warrant further attention for preventive health strategies.

INTRODUCTION

The global prevalence of prediabetes was estimated at 7.3% of the adult population in 2017 and half of them were under 50 years of age (Hostalek, 2019). It is revealed that the global prevalence of pre-diabetes will be >470 million in 2030 according to an analysis published in 2014 (Adam et al., 2014). A cross-sectional study carried out on a nationally representative sample of 5000 adults between 2005 and 2006 in Sri Lanka showed that the age and sex-standardized prevalence of total diabetes (previously diagnosed and undiagnosed) and total pre-diabetes among adults ≥ 20 years in Sri Lanka were 10.3% and 11.5% respectively (Katulanda et al., 2008). Diabetic and pre-diabetic cases compared to normal glucose tolerance people are older, physically inactive, and living in urban areas (Katulanda et al., 2008). The projected diabetes prevalence in Sri Lanka for the year 2030 is 13.9% (Katulanda et al., 2008). Further, Katulanda et al, have shown that diabetes and prediabetes patients had higher BMI, waist circumference, waist-to-hip ratio, systolic/diastolic blood pressure, low-density lipoprotein and triglycerides (Katulanda et al., 2008). In Asian countries like India, young adults adapting to the new lifestyle tend to develop type 2 DM (T2DM) increasing the burden of non-communicable diseases (NCDs). In the recent past, there is an increased trend of developing T2DM and pre-diabetes not only among the adults and elders but also in young adults (Nagarathna et al., 2020).

Lack of physical activity decreased high-density lipoprotein cholesterol (HDL-Ch), family history of T2DM, increased body mass index, and high blood pressure were found to be the common risk factors for T2DM. According to the existing literature, unawareness and over-positivity of own health might considerably affect college students in New York. These findings point to a greater need to increase awareness, promoting early detection and adaptation to a healthy lifestyle by changing their behaviors to prevent T2DM (Antwi et al., 2020).

A survey conducted on students aged 18 and older at a Midwest Public University, Mankato, USA revealed lack of physical activity, increased body mass index, and abdominal obesity as major risk factors for T2DM (Ferrian et al., 2011). Undergraduates are vulnerable developing diabetes due to physical inactivity, decreased blood HDL-Ch and unhealthy dietary practices.

There is a paucity of literature in these areas for undergraduates and hence, it is important to add new knowledge to the local literature. This will be beneficial for designing educational and health promotion programs targeting undergraduates at the early stage of their lives.Therefore, our objectives were to describe the fasting plasma glucose (FPG) level, nutritional status, diet and other lifestyle factors among undergraduates at the Faculty of Allied Health Sciences, University of Ruhuna.

MATERIALS & METHODS

Study participants

It was a descriptive cross-sectional study conducted from August to September 2022. All the undergraduates in one batch (n= 100) who were apparently healthyand were not on specific diet plans at the Faculty of Allied Health Sciences, University of Ruhuna were recruited following convenient sampling.

Study instruments and data collection procedure

Ethical approval for the project was obtained from the Ethical Review Committee, Faculty of Allied Health Sciences (Reference no: 125.07.2022). After obtaining the informed written

consent a pretested, self-administered questionnaire was used to collect data on their socio-demographic data, other necessary basic information including lifestyle, dietary behaviors, and exercise/physical activities. Involvement in Yoga, housework and domestic chores, brisk walking, dancing, gardening, workplace activity, carrying/moving moderate loads (< 20kg), manual labor (e.g.: roofing, thatching, painting), games and sports for at least 150 - 300 minutes per week were considered as regular involvement of exercise/physical activities (Ministry of Health, 2021). Information on the duration of exercise/physical activities and the frequency of consuming different food categories (Cereals and starchy foods, Pulses/ fish/ eggs/ lean meat, fruits, fresh milk and its fermented products, nuts/ oily seeds, salty foods, sugary food items, junk foods, supplements and junk foods) and number of meals consume within a day were obtained.

Anthropometric measurements

Height, weight, waist circumference (WC), and hip circumference (HC) were measured following the standard protocols. The height of the participants in bear feet without headwear was measured using a stadiometer with a precision of 0.1 cm. The weight of the participants in bear feet and light clothing was measured using a digital beam balance with a precision of 0.1 kg (Thu Tran et al., 2018). Body mass index (BMI) was calculated using the weight in kilograms and height in meters (Lim et al., 2017). Waist circumference was measured at the level of the midpoint between the lowest point of the rib cage and the top of the iliac crest horizontally using a standard measuring tape without pressing on to the skin after breath-out while standing to thenearest 0.1 cm. Hip circumference was measured to the nearest 0.1 cm at the widest position of the buttocks while standing (WHO, 2008; Thu Tran et al., 2018).

Fasting plasma glucose estimation

Sample of venous blood was collected after eight hours of fasting. Fastingplasma glucose (FPG) was estimated in duplicates using GOD-PAP method (Human GmbH, Glucose liquicolor, complete test kit; Cat no.10121) by BS120-Mindray fully automated biochemistry analyzer. American Diabetes Association criteria (ADA, 2022) was used to define diabetes (FPG ≥126 mg/dl) and IFG (FPG ≥100 mg/dL to <126 mg/dL). When FPGconcentration was not within the normal range the repeat estimation was performed before confirming the IFG.

Data analysis

Data was analyzed using SPSS version 21. Frequencies/percentages were used to present the categorical variables (gender, ethnicity, total monthly family income, meal, water, and alcohol consumption patterns, number of sleeping hours, smoking, regular exercise, and consumption of food items) and continuous variables (age, anthropometric parameters and blood glucose estimation) were presented as mean and standard deviations. The association between two continuous variables (anthropometric parameters and FPG) was determined using the Pearson correlation coefficient. The level of significance was considered as 0.05.

RESULTS

Basic characteristics of the participants

Socio-demographic and other basic characteristics of 100 study participants are shown in Table 1. Participants were in the age range of 20 and 28 years. Ethnically, 95% (n=95) of the sample identified as Sinhalese, and females constituted 58% (n=58) of the sample. Most of them earned the 50 000 LKR or below per month.

Table 1. Demographic characteristics of the undergraduates

Basic characteristics	**(n=100)**
Age	
Mean ± SD (years)	24.4 ± 1.8
Gender	
Male	42 (42%)
Female	58 (58%)
Anthropometry	
Weight Mean ± SD (kg)	54.6 ± 11.4
Height Mean ± SD (cm)	160.9 ± 9.1
BMI Mean ± SD	20.9 ± 3.4
Waist circumference Mean ± SD (cm)	75.3 ± 8.1
Hip circumference Mean ± SD (cm)	83.0 ± 9.4
WHR Mean ± SD	0.91 ± 0.7
Blood glucose estimation	
Fasting plasma glucose level Mean ± SD (mg/dL)	83.4 ± 6.6
Number of normoglycaemic participants	97(97%)
Number of participants with impaired fasting glycaemia	03 (03%)
Number of participants with diabetes mellitus	00 (00%)
Ethnicity	
Sinhalese	95 (95%)
Other	05 (5%)
Total monthly family income	
≤ LKR 25000	23 (23%)
> LKR 25000-≤ LKR 50000	29 (29%)
> LKR 50000- ≤ LKR 75000	19 (19%)
>LKR 75000-≤ LKR 100000	08 (8%)
No regular income	21 (21%)

BMI = Body mass index, WHR = Waist to Hip ratio

The dominant weight range was 50-55 kg, accounting for21% (n=21) of the sample, while the mostfrequent height bracket was 150-152 cm, observed in 12% (n=12) of participants. Interms of Body Mass Index (BMI), the mean for females was 21.2, which was not statistically different from the mean for males, 20.7 (p=0.447). Utilizing the World Health Organization (WHO) classification criteria for Asian populations, 15% (n=15) were categorizedas overweight and 14% (n=14) as obese. The majority (45%, n=45) fell within the normal BMI range, whereas 26% (n=26) were underweight. When abdominal obesity is defined by using International Diabetes Federation (IDF) suggested cut- off values for waist circumference (WC) for Asians, 12% (n=12) exhibited abdominal obesity (9% in males and 3% in females). A notably higher prevalence (65%) of abdominal obesity (35% in males and 30% in females) was observed when using the waist-to-hip ratio (WHR) specific to Asians (>0.95 in males and >0.8 in females) to define obesity. Fasting plasma glucose (FPG) levels spanned from 70 to 108 mg/dL, and impaired fasting glycaemia (IFG) was reported in 3% of the study population.

Lifestyle and dietary habits

Lifestyle and basic dietary habits are demonstrated in Table 2. The majority consume three main meals per day though some of the participants (36%, n=36) skipped their main meals; lunch (47%, n=17), breakfast (45%, n=16) and dinner (8%, n=3). The majority (72%,n=72) had less than seven hours of continuous sleep at night because theyspent time watching movies, studying, and participating in clinical training program. Smoking was relatively uncommon, and the significant majority, 73% (n=73) reported a lack of regular physical exercise.

Table 3 shows the food consumption frequency among the study participants.

Table 2. Distribution of selected lifestyle characteristics among the undergraduates

Lifestyle characteristics	Frequency (%) (n=100)
Regular consumption of three main meals per day	
Yes	82 (82)
No	18 (18)
Regular skipping of any main meal	
Yes	36 (36)
No	64 (64)
Daily water intake in glasses (1 glass~200 mL)	
>10	21 (21)
8 – ≤10	39 (39)
<8	40 (40)
Daily number of sleep hours at night	
≥7hrs	28 (28)
<7hrs	72 (72)
Alcohol consumption †	
Never	73 (73)
Occasional	23 (23)
Infrequent	02 (2)
Frequent	02 (2)
Daily	00 (0)
Smoking	
Non-smoker	92 (92)
Ex-smoker	03 (3)
Current smoker	05 (5)
Regular exercise/physical activities	
Yes	27 (27)
No	73 (73)

†*Daily = Everyday, Frequent = 3- 4 days/week, Infrequent = Less than 3 days/week, Occasional = 1-2 days/month*

Table 3. Distribution of consumption of food items among the undergraduates

Food item	Daily	Frequently (3-4 days/ week)	Sometimes (1-2 days/ week)	Rarely (2-3 days/ month)	Not at all
	Percentages (%) (n=100)				
Cereals and starchy foods	100	0	0	0	0
Pulses/ fish/ eggs/ lean meat	27	26	28	13	6
Vegetables	100	0	0	0	0
Fruits	2	13	48	37	0
Fresh milk and its fermented products	2	9	28	44	17
Nuts/ oily seeds	5	8	31	46	10
Salty foods (salty snacks, instant noodles, chips etc.)	22	27	38	11	2
Sugary food items (biscuits, cakes, sweets etc.) and beverages	31	36	29	4	0
Junk/fast foods	13	18	50	12	7
Supplements	7	2	6	8	77
Energy drinks	0	1	8	19	72

All the participants consumed cereals, starchy foods, and vegetables daily. A nearly equal number of participants consumed pulses/fish/eggs/ lean meat daily, frequently, and 1-2 days per week. Most of the participants (48%, n=48) had fruits 1-2 days per week. Most of the participants consumed fresh milk and its fermented products and nuts/oily seeds rarely, 2-3 days per month. This reflected that their daily diet is not planned according to the food-based dietary guidelines. Some of the participants consumed high-salt food (22%, n=22), and sugary food items (31%, n=31) daily. Most of them (77%, n=77) did not consume nutritional supplements (multivitamins, minerals, proteins/ amino acids, essential fatty acids etc.) and energy drinks (72%, n=72). Among them 50% of the participants tend to consume junk foods, 1-2 days per week.

Association between anthropometric parameters and FPG

Significant positive correlation was observed between FPG and selected anthropometric parameters/indices except WHR (Table 4), though the correlations were weak.

Table 4. Association between anthropometric parameters and the FPG

Measurement	r	p
Weight	0.312	0.002
Height	0.251	0.012
BMI	0.234	0.019
Waist circumference	0.288	0.004
Hip circumference	0.169	0.092
WHR	0.144	0.153

Pearson correlation coefficient was used in the analysis. BMI = Body mass index, r = Pearson correlation coefficient, p = p value WHR = Waist / hip ratio

DISCUSSION

Basic characteristics and lifestyle factors

According to the present study, 3% of the participants in the age ranged between 20-28 years old had impaired fasting glycaemia, though there was no diabetes mellitus. However, the estimated regional prevalence of IFG among South-East Asians by the IDF is to be 9.2% (between 20-79 years old adults) in 2021 is expected to rise up to 9.4% by 2045 (IDF,2021). The difference in the prevalence of prediabetes may be due to the wider age range considered by IDF.

Katulanda *et al*. showed sex and sector (urban and rural) standardized prevalence of IFG and undiagnosed DM of 2.3% and 1.3% respectively in the age range of 20-29 years (Katulanda et al., 2008). Though the two studies demonstrated closely similar results for the prevalence of prediabetes, the variation in theprevalence of diabetes may be due to the difference in the type of population and the smaller sample in the current study restricted to undergraduates.

According to the findings of the current study, the majority of the participants (60%) drink adequate amounts of water, more than 8 glasses (>2000 mL) per day. A study done to determine the diet and lifestyle among university students in Brunei showed that nearly 58% of them drink ≥ 2 L of water (Yun, Ahmad and Quee, 2018). In line with the findings of the current study, an Indonesian study revealed that most of the college students tend to drink ≥ 8 glasses of water (54%) (Djannah and Matahari, 2020). Sri Lankan FBDGs recommend drinking 8-10 glasses (one glass~200 mL) of water for ahealthy adult to keep the hydration. Water is preferred over any other beverages as it does not contain any added sugar, sweeteners and calories. But herbal drinks, coconut water/king coconut water, fresh fruit juices (without added sugar or salt), tea and coffee (without milk and sugar) can be taken other than the water (Ministry of Health, 2021).

Though the diet is not healthy, most of them (82%, n=82) had three main meals daily in the present study. Among those who skip meals (18%, n=18), skipping breakfast and lunch is commoner than dinner. The main reason for skipping breakfast was to prevent getting late to attend to the clinical training. In addition, the low-income level of the family and the increased expenditure on food might have an adverse impact on their lifestyle, because about half of them are from families with an income level of less than 50000 LKR. It was revealed that they share food/meals with their colleagues rather than consuming a balanced diet.

A previous study done among (n=250) undergraduates of Eastern University of Sri Lanka shows that 36% of students skip their breakfast. The main reason for skipping breakfast was lack of time (68.1%). Other possible reasons they found were low appetite in the morning (18.7%), absence of a variety of foods (25.3%), unavailability of foods (9.9%) and other reasons (18.7%) (Handuwala et al., 2022). A systematic review revealed lack of time and hunger, weight control, lack of money, religious/fasting behavior and poor cooking skills as possible reasons for meal skipping among young adults (Pendergast et al., 2016).

The majority of the participants in the present study (72%, n=72) do not sleep seven or more than seven hours continuously in the night due to various reasons such as involvement in studying, clinical training, and watching movies showing sleep deprivation. According to the national guidelines seven or more hours of sleep per night is recommended for the age range of 20 -60 years (Ministry of Health, 2021). It is necessary to make them aware of the importance of having adequate quality sleep and on time management which allows for finding adequate time for sleep. Sleep is an important requirement for tissue repair, productivity improvement and to maintain overall good health (Elkhenany et al., 2018; Hosker, Elkins and Potter, 2019). In addition, sleep is involved in theregulation of metabolism that affects the physiological processes (Grandner et al., 2016) and lack of sleep increases insulin resistance (CDC, 2022). A Pakistan study done among medical students showed negative impact of poor sleeping quality on academic performance. Most of the students with lower average GPA had bad sleep duration (<5-7 hrs.) (Maheshwari and Shaukat, 2019). A cross-sectional study done among undergraduates at the Faculty of Medicine and Allied Health Sciences, Rajarata University, Sri Lanka showed that 25.9% of students (168/649) had bad sleep quality according to the Pittsburgh Sleep Quality Index (Gunathilaka et al., 2020).

In the present study, the majority of undergraduates were non-alcoholic (73%, n=73). A previous study done among 193 Sri Lankan veterinary undergraduates showed that alcohol consumption (n=6) and smoking (n=2) were rare among them (Rita et al., 2014). A previous study done in Myanmar among university students showed 20.3% prevalence of alcohol consumption (males: 36.0%, females: 10.8%). The majority of the participants were non-smokers (92%, n=92), only 5% of participants were current smokers while only 3% were ex-smokers showing that smoking is not popular among the current study group. In contrast to that, a previous study done among the students of the University of Tuzla, Bosnia and Herzegovina in 2012/2013 (Ibisevic et al., 2015) showed that 22.8% were current smokers and 7.8% were ex-smokers and there was no gender difference. A study in Yemen showed a prevalence of 33.1% of smokers among students in Hodeidah University (Nasser and Zhang, 2019). They found a significant association between smoking and increasing age, year of study and family income. Differences between the results in this study and the others may be due to cultural differences of the populations.

The majority of participants (73%, n=73) do not engage in regular exercise. Engaging in regular exercise/physical activities is considerably low among the participants of the current study, which needs to be improved. At least a 150-300 minutes of moderate-intensity physical activities per week is recommended to improve health and prevent most ofhealth-related issues (Ministry of Health Sri Lanka,2021). A Sri Lankan study done to determine physical inactivity among physiotherapy undergraduates at the University of Colombo in 2013 (Ranasinghe et al., 2016) showed a high

percentage of participants were inactive (48.7%) according to the International Physical Activity Questionnaire categorical score. They found lack of time, not having support and motivational encouragement, limited facilities, and lack of accessibilities to engage in sports or physical activities, and low self-efficacy as causes for them withdrawing from engaging in sports and physical activities. Asians show decreased physical activities and increased rate of obesity, and increased insulin resistance are as the major factors of the increasing prevalence of T2DM among Asians at younger ages (Ramachandran, 2012). A national survey done among students at University of Kansas (Huang et al., 2003) showed that most of the college students failed to meet the physical activity guidelines.

Food consumption in relation to the guidelines

According to the current study except the starchy food consumption, their diet is not according to the recommendations of food-based dietary guidelines for Sri Lankans. However, the present study indicated the frequency of the consumption of different food items, it neither showed the details about the portion sizes according to FBDGs (Ministry of Health, 2021) nor the amount of nutrition intake.

A cross-sectional study conducted among the undergraduates of Eastern University, Sri Lanka showed a significant difference in the consumption of individual food categories between males and females (Karthijekan and Anthony, 2020). They used 11 food items and the frequency of consumption was recorded using a self-administered questionnaire. Most of the food items were consumed equally by both sexes including rice, grains, vegetables, fish and sea foods, sweets, hot beverages and dried fish while red meat, fruits, and fast foods were consumed more by males. They have shown that males tend to eat sugary items more thanfemales. The current study also shows a considerable number of participants consuming sugary foods daily (31%), 3-4 days per week (36%) and 1-2 days per week (29%). According to the FBDGs for Sri Lankans, sugary food items (biscuits, cakes and other sweets) and beverages should be avoided as much as possible. The daily consumption of total sugar should be less than that of 30g/6 teaspoon (tsp.) by a person from all sources (Ministry of Health, 2021). WHO also recommends reducing the intake of sugar in view of reducing the risk of NCDs (WHO, 2018).

Avoidance of salty foods like pickles, cheese, sauce (e.g.:- ketchup/ soy sauce), processed meats (e.g.:- sausage/ ham/ bacon), salty snacks, instant noodles, chips, salted nuts are recommended. The recommended amount of iodized salt per person per day is less than 5 g (one tsp.) (Ministry of Health, 2021). High sodium intake (1tsp contains 2300 mg of sodium) is associated with high blood pressure and cardiovascular diseases (World Health Organization (WHO), 2018). The current study shows a considerable number of participants consuming salty foods daily (22%), 3-4 days per week (27%), and 1-2 days per week (38%) respectively. They also tend to eat foods like salty snacks, instant noodles, chips, salted-roasted nuts, pickles and other ready-to-eat meals. Consumption of these food items containing considerable amounts of hidden salt and fat could have long-term health effects and increase the risk of NCDs (Strazzullo et al., 2009). However, the amount of salt intake was not estimated using laboratory-based methods in this study.

A previous study done among undergraduates of Bangladesh University of Health Sciences, Dhaka (Biswas et al., 2020) shows an increasing trend of consuming salty fast foods and they had the habit of adding salts in the table.

Another study done to determine salt consumption and awareness among medical students in Angola demonstrated high salt intake and unsatisfactory behaviors towards salt consumption among them. The majority (96.7%) of them consumed more than 5g of salt per day and the average salt intake was 14.2 ± 5.1 g/ day. Though the majority were aware of the health-related consequences of high salt intake only 6.5% of participants knew about their high salt intake behavior. This shows the importance of assessing the knowledge and perception of high salt consumption and making young adults aware on health-related consequences (Magalhães et al., 2014).

According to the present study, 50% tend to consume junk foods 1-2 days per week. In contrast to a study done among students at Eastern University in Sri Lanka showed a lower intake of fast food (≤ 3 times/ week) and red meat, but males consumed more fast food than femalessignificantly (Karthijekan and Anthony,2020). Another local study revealed anincreased demand for fast food amongstudents at the Faculty of Applied Science, University of Jayewardenepura in Sri Lanka. According to them, males had the tendency to eat fast foods more than that of the females. They found the price (39%), taste (38%) and cleanliness of the outlet (12%) as the factors that they considered when buying fast food (Jayasinghe and De Silva, 2014). Undergraduates with their busy schedules tend to consume unhealthy diet which may potentially contributes to the development of NCDs in later life. This shows the requirement of improving dietary behavior in order to lead a healthy life minimizing the risk of developing NCDs in the future.

Nutritional status, association between selected anthropometric parameters and the fasting plasma glucose concentration

According to the present study, 15 (15%) were overweight and 14 (14%) were obese. Most of the participants (45%, n=45) were in the normal range of BMI while 26 (26%) of them were underweight according to the WHO classification for Asians. Among university students in Malaysia 27% were underweight while 12% were overweight. The findings are closely related to the findings of the present study (Huda and Ahmad, 2010).

The present study identified 12 (12%) students with abdominal obesity, while another study conducted among veterinary students at University of Peradeniya ofSri Lanka in 2014 identified 39 (20%) students with abdominal obesity, 19 (10%) with overweight and a single participant with global obesity. There was a higher prevalence of IFG (42%, n=82) among them compared to the present study. However, the present study showed higher rates of obesity (14%) than the mentioned study (n=1) (Rita et al., 2014). Another local study demonstrated overweight (35.2%), obesity (10.7%), underweight (8.6%) and normal weight (46%) among undergraduates at the Faculty of Health-Care Sciences, Eastern University (Karthijekan and Anthony, 2020).

Waist circumference(r=0.288) and BMI (r=0.234) had a significant positive correlation with the FPG level while hip circumference and WHR did not show a significant correlation (r=0.169) with the FPG level. In a cross-sectional study done using ADA screening guidelines for diabetes on 44 college students at an Upstate New York public college showed a significant direct correlation between the risk of developing T2DM with BMI (r=0.488). However, according to the present study the association between BMI and the plasma glucose level

(r=0.234) was weaker than the mentioned study. Similarly, they showed a significant positive correlation between FBG and waist circumference (r=0.416, p=0.005), and not with WHR (r=0.257, p=0.093) which is in line with the current study (Antwi et al., 2020). Another survey done in adult Indians demonstrated the presence of a significant positive correlation between WC and the high risk for diabetes based on the Indian Diabetes Risk Score (Nagarathna et al., 2020). In consistent with that Katulanda etal found that WC was significantly higher among those with DM and prediabetes in another cross-sectional study done on Sri Lankans aged ≥ 18 years old (Katulanda etal., 2008).

The present study plays an important role in filling the gaps in the local literature pertaining to the health and wellness of young adults. However, there are limitations identified with the study such as not analyzing the amount of food and nutrition intake, small sample size and being a single-center study.

CONCLUSIONS

This study reveals a low prevalence of impaired fasting glycaemia (IFG) among young undergraduates, with no instances of Type 2 Diabetes Mellitus reported. However, dietary habits largely deviate from the food-based dietary guidelines and meal-skipping is notably common. Although water intake is generally adequate, suboptimal engagement in regular physical activities is widespread. Furthermore, the majority of participants reported insufficient nightly sleep, even though smoking and alcohol consumption are relatively uncommon within this cohort.

These findings underscore the necessity for regular educational and awareness programs focusing on nutrition, dietary habits, and lifestyle choices. Such interventions are integral for promoting holistic well-being among undergraduates. Additionally, the data suggests an urgent need for structural changes within the academic environment to facilitate healthier lifestyle choices among students.

By offering targeted awareness and facilitating conducive environments, institutions can better equip undergraduates to make informed decisions regarding their health, thereby potentially mitigating the future onset of metabolic disorders and related health issues.

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DECLARATION OF CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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