"STUDY OF METABOLIC PARAMETERS IN THE MEDICAL STUDENTS OF JAWAHARLAL NEHRU MEDICAL COLLEGE – A ONE YEAR CROSS SECTIONAL STUDY IN KLE DR. PRABHAKAR KORE HOSPITAL ANDMRC, BELAGAVI"

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
CVD	Cardiovascular Diseases
T2DM	Type 2 Diabetes Mellitus
NCDs	Non-Communicable Diseases
BMI	Body Mass Index
WHR	Waist-Hip Ratio
BP	Blood Pressure
CAD	Coronary Artery Disease
DBP	Diastolic Blood Pressure
FBG	Fasting Blood Glucose
FPG	Fasting Plasma Glucose
HDL	High-Density Lipoprotein
hs-CRP	High-Sensitivity C-Reactive Protein
IDF	International Diabetes Federation
LDL	Low-Density Lipoprotein
MetS	Metabolic Syndrome
MO	Medical Officer
MS	Metabolic Syndrome
NCEP/ATP III	National Cholesterol Education Program/Adult Treatment Panel III
SBP	Systolic Blood Pressure
TC	Total Cholesterol
TG	Triglycerides
WHtR	Waist-Height Ratio
WC	Waist Circumference
SD	Standard Deviation
Min	Minimum
Max	Maximum
QQ Plot	Quantile-Quantile Plot
ANOVA	Analysis of Variance
DM	Diabetes Mellitus
HTN	Hypertension
IHD	Ischemic Heart Disease
HDL-C	High-Density Lipoprotein Cholesterol
LDL-C	Low-Density Lipoprotein Cholesterol

ABSTRACT

Background

Metabolic health, influenced by dietary and lifestyle factors, plays a crucial role in preventing chronic diseases such as cardiovascular disorders and type 2 diabetes. Medical students, due to their demanding academic schedules, irregular eating habits, and high stress levels, are particularly vulnerable to metabolic disturbances. However, limited research has focused on their metabolic health in relation to dietary patterns. This study aimed to assess and compare metabolic parameters—including lipid profiles, fasting blood glucose, and anthropometric indices—among medical students following different dietary patterns (vegetarian, lacto-ovo-vegetarian, and non-vegetarian) while evaluating the influence of lifestyle factors.

Methods

A cross-sectional study was conducted among 200 final-year MBBS students at Jawaharlal Nehru Medical College, Belagavi, India. Data were collected using structured questionnaires, anthropometric measurements (BMI, waist-hip ratio, neck circumference), and biochemical analyses (lipid profile, fasting blood glucose). Statistical analysis was performed using R version 4.4.3 and Microsoft Excel, with significance set at $p \leq 0.05$.

Results

The mean age of participants was 21.34 ± 1.42 years, with 59.5% following a non-vegetarian diet and 40.5% being vegetarians. Non-vegetarians had higher alcohol consumption ($p = 0.0075$), smoking rates ($p < 0.001$), and poorer lipid profiles, including higher LDL-C ($p = 0.0475$) and triglycerides ($p = 0.0262$). Vegetarians had a higher BMI ($p = 0.0182$) but better lipid outcomes. The prevalence of non-

vegetarianism increased from 42% in the first year to 70% in the fourth year ($p = 0.0231$), along with a decline in physical activity and worsening lipid profiles, with increased cholesterol, LDL-C, and triglycerides, and decreased HDL-C. BMI and waist-hip ratio showed significant correlations with adverse metabolic markers.

Conclusion

The study highlights worsening lifestyle behaviors and metabolic health among medical students over time, particularly in later academic years. Institutional interventions—such as nutritional counseling, stress management, and physical activity promotion—are needed to mitigate long-term cardiovascular risks and foster healthier habits in future healthcare professionals.

Keywords: Metabolic health, dietary patterns, lipid profile, lifestyle factors, cardiovascular risk, anthropometric indices.

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INTRODUCTION

Background of the Study

Metabolic health encompasses various physiological parameters, including lipid profiles, blood glucose levels, and anthropometric indices, which collectively serve as markers for an individual's risk of developing chronic conditions such as cardiovascular diseases (CVD), type 2 diabetes mellitus (T2DM), and metabolic syndrome. Dysregulation in these parameters, often driven by lifestyle factors, contributes significantly to the global burden of non-communicable diseases (NCDs).[1]

Among the key determinants of metabolic health, diet and lifestyle play crucial roles. Unhealthy dietary patterns, characterized by high intake of refined carbohydrates, trans fats, and processed foods, along with a sedentary lifestyle, have been strongly linked to metabolic dysfunction. Conversely, diets rich in fiber, polyunsaturated fats, and antioxidants—such as vegetarian and Mediterranean diets—have shown protective effects against metabolic diseases.[2–4]

Medical students represent a particularly vulnerable population for studying metabolic health due to their demanding academic schedules, irregular meal patterns, high-stress levels, and potential neglect of physical activity.[5] Despite their awareness of health risks, studies have indicated that medical students may exhibit suboptimal dietary habits, increased reliance on convenience foods, and insufficient engagement in regular exercise.[6] Given their role as future healthcare providers, understanding their metabolic health is crucial, as their personal health behaviours can influence their clinical practice and patient counseling.

Rationale and Justification

The study of metabolic health among medical students is of significant importance due to the unique challenges they face in their academic and clinical training. Medical students undergo intense academic pressure, long study hours, irregular sleep schedules, and frequent clinical rotations, all of which contribute to stress and lifestyle disruptions.[7,8] These factors may predispose them to metabolic disturbances, including dyslipidemia, insulin resistance, and obesity-related conditions.[9] Unlike the general population, medical students are expected to have a deeper understanding of health and disease, yet their demanding schedules often lead to poor dietary choices and sedentary behavior. Investigating their metabolic health provides insights into the early onset of metabolic risks in a group that will eventually play a crucial role in healthcare delivery.

Despite extensive research on metabolic disorders in the general population, limited studies have focused specifically on medical students. Many studies on university students generalize findings across different academic disciplines, failing to account for the unique stressors and lifestyle constraints of medical education. Given that medical students are exposed to long hospital hours, irregular meal timings, and increased mental strain, their metabolic profiles may differ significantly from their non-medical counterparts. Examining this population separately allows for a more precise understanding of how medical training influences metabolic health and whether dietary patterns play a role in mitigating or exacerbating these effects.

The impact of personal health behaviours on professional practice is another critical aspect of this study. As future healthcare providers, medical students serve as role models for their patients. Research suggests that physicians who lead healthier

lifestyles themselves are more likely to provide effective dietary and lifestyle counseling to patients. If medical students develop poor metabolic health early in their careers, they may be less inclined to advocate for preventive health measures in clinical practice. By assessing the metabolic health of medical students, this study aims to highlight the importance of self-care in medical training and reinforce the need for a strong foundation in preventive healthcare practices.

Additionally, early identification of metabolic risks in this population presents an opportunity for timely intervention. Addressing lifestyle-related metabolic disturbances during medical training can significantly reduce the long-term risk of non-communicable diseases. Interventions such as structured dietary counseling, physical activity programs, and stress management strategies could be integrated into medical curricula to promote healthier lifestyles among students. Institutional policies that support healthy eating, exercise, and mental well-being could play a pivotal role in shaping a generation of healthcare professionals who not only practice preventive medicine in their own lives but also encourage their patients to do the same.

Research Questions

1. What is the prevalence of metabolic abnormalities among medical students with different dietary patterns?
2. Is there a significant association between specific dietary habits and adverse metabolic parameters?
3. How do lifestyle factors such as physical activities, stress levels, and sleep patterns interact with diet to influence metabolic health?
4. Are there gender-based differences in metabolic health indicators among medical students?

AIMS AND OBJECTIVES

Objectives

Primary Objective

- To assess and compare metabolic parameters (lipid profiles, fasting blood glucose, and anthropometric indices) among medical students following different dietary patterns, including vegetarian, lacto-ovo-vegetariann, and non-vegetariann diets.

Secondary Objectives

- To evaluate the correlation between dietary habits and anthropometric measurementss such as Body Mass Index (BMI), Waist-Hip Ratio (WHR), and Conicity Index.
- To analysee the influence off lifestyle factors, including physical activity levels and stress, on the relationship between diets and metabolic healths.
- To determine whether specific dietary patterns are associatedd with an increasedd or decreased risk off dyslipidemia andd other metabolicc abnormalities.

Hypothesis

- **Null Hypothesis (H_0)**: When there is no0 significant differences in metabolic parameters between medical studentss following different dietary patterns.
- **Alternative Hypothesis (H_1)**: There are significantt differences inn metabolic parameters between medical students following different dietary patterns.

Significance of the Study

The significance of thiss studys extends beyond the individual health of medical students, influencing medical education, institutional policies, and broader public health strategies. One of the key implications of this research lies in its potential impact on medical education. The findings may help inform medical curricula by emphasizing the importance of self-care and preventive medicine among future physicians. Despite their role as healthcare providers, medical students often overlook their own well-being due to the pressures of academic and clinical training. Integrating knowledge about metabolic health, nutrition, and lifestyle modifications into their education could reinforce the necessity of prioritizing personal health, which in turn may enhance their ability to counsel patients effectively.

Another critical aspect of this study is its role in increasing health awarenesss among medicall students. Understanding the metabolic risks associated with specific dietary patterns and lifestyle choices can encourage healthier behaviours within this population. Studies have shown that individuals who adopt healthy practices during their formative years aree more likelyy to sustain them inn the long run. Given that medical students are future healthcare professionals, their personal commitment to healthy living can have a cascading effect, as they serve as role models for their patientss and the communityy. This awareness could lead to improved long-term health outcomes not only for the students themselves but also for the populations they will serve in the future.

From an institutional perspective, this study could provide valuable data supporting the need for structured wellness programs, dietary guidance, and stress management interventions within medical colleges. Medical institutions have a responsibility to

ensure that students maintain optimal health while navigating the demands of their training. If the study identifies significant metabolic risks among students, it could serve as a foundation for policy changes, such as providing healthier food options in medical school cafeterias, promoting regular physical activity, and incorporating mental health support programs. Institutional policies aimed at fostering a culture of health-conscious decision-making can play a crucial role in mitigating metabolic risks at an early stage.

This study contributes to the broader field of preventive medicine by identifying early metabolic risks in young adults, particularly among a high-risk group such as medical students. By recognizing early warning signs of metabolic disturbances, targeted interventions can be implemented to prevent the progression of NCDs such as obesityy, type 2 diabetess, and cardiovascular diseasess. Given the global rise in NCDs, particularly among younger populations, this research aligns with the broader goal of reducing disease burden through early identification and lifestyle modifications. In the long run, this study has the potential to shape healthcare policies that emphasize preventive strategies, ultimately benefiting not just medical students but the general population as well.

REVIEW OF LITERATURE

1. A study conducted by Pertseva et al. (2022) investigated early metabolic disorders among medical students, highlighting their vulnerability to metabolic abnormalities. The research examined a group of Ukrainian medical students with abdominal obesity and compared them to a healthy control group. Key findings indicated that a significant proportion of medical students exhibited metabolic disturbances, including hyperleptinemia (96.8%), insulin resistance (96.8%), hyperinsulinemia (87.1%), impaired fasting glucose (25.8%), and impaired glucose tolerance (29.1%). Additionally, dyslipidemia, characterized by decreased HDL and elevated triglyceride levels, was prevalent in the study group. A noteworthy observation was the presence of microalbuminuria in 9.7% of students, suggesting early-stage kidney dysfunction and endothelial impairment. Correlation analyses further demonstrated a strong association between insulin resistance and urine albumin excretion ($r=+0.73$, $p<0.001$), emphasizing the predictive role of metabolic disturbances in the development of renal dysfunction.[10]
2. A studyy conductedd by Ahmed et al. (year) examined the prevalencee and risk factors associated with metabolic syndrome (MS) among first-year undergraduate students in three Sudanese universities. This cross-sectional study, which included 384 students attending university medical clinics for obligatory medical screening, assessed anthropometric parameters such as weight, height, BMI, and waist circumference (WC) based on NCEP/ATP III guidelines. Additionally, fasting blood samples were analyzed for fasting blood glucose (FBG), total cholesterol (TC), triglycerides (TG), high-density lipoprotein (HDL), and low-density lipoprotein (LDL). The findings revealed an overall prevalence of MS at 7.8%, with a slightly higher occurrence in females, though this difference was not statistically significant (p

= 0.32). Furthermore, urban students exhibited a higher prevalence (10.4%) compared to their rural counterparts (4.4%), although this association was not statistically significant ($p = 0.25$). A positive correlation was observed between MS prevalence and increasing age, while obesity and elevated BMI emerged as significant predictors of MS ($p < 0.001$).[11]

3. A studyy conductedd by Abolfotouh et al. (2012) examinedd the prevalence offf metabolic abnormalities and their association with obesity among Saudi college students in Riyadh, Saudi Arabia. This cross-sectional study, which included 501 participants, assessed anthropometric parameters, blood pressure (BP), and biochemical markers to determine the presence of metabolic abnormalities. The findings revealed that 21.9% of students were classified as overweight and 20.6% as obese based on BMI, while central obesity was present in 26.9% and 42.2% of students based on waist circumference (WC) and waist-to-height ratio (WHtR), respectively. Other metabolic abnormalities identified included hypertension (23.6%) and abnormal fasting plasma glucose (FPG) levels (22.6%). The study also demonstrated that the prevalence of metabolic syndrome (MS) increased significantly with obesity. Three or more metabolic abnormalities were present in 7.8% of the total sample, rising to 26.4%, 20%, and 17.6% among obese individuals, depending on BMI, WC, and WHtR, respectively. Furthermore, with the exception of abnormal FPG levels, the prevalence of individual metabolic abnormalities, including hypertension and dyslipidemia, showed a strong positive correlation with increasing BMI, WC, and WHtR ($P < 0.001$ each).[12]
4. A studyy conducted by Telii et al. (2019) investigated the prevalencee of metabolic syndromes (MS) among first-year medical students at JN Medical College, North Karnataka, India. This cross-sectional observational study, conducted between January and July 2018, included 120 students, with 67 females (55.83%) and

53 males (44.17%). The study utilized the International Diabetes Federation (IDF) criteria for diagnosing MS and collected data on anthropometric parameters (height, weight, BMI, waist circumference), fasting blood glucose, serum cholesterol, triglycerides (TG), high-density lipoprotein (HDL), and low-density lipoprotein (LDL). Statistical analysis was performed using SPSS version 20.0, with independent t-tests used for physiological comparisons and Chi-square tests for prevalence estimation. The results showed an overall prevalence of MS at 10.83%, with a slightly higher prevalence among females (11.94%) compared to males (9.43%), though this difference was not statistically significant (P = 0.66). The prevalence of individual metabolic risk factors included abdominal obesity (59.17%), raised TG (2.50%), reduced HDL (38.33%), raised systolic blood pressure (SBP) (20.83%), raised diastolic blood pressure (DBP) (28.33%), and raised blood glucose (5.83%). Gender-based analysis revealed significantly lower HDL levels among females (46.27%) compared to males (28.30%) (P = 0.04). Conversely, SBP was significantly higher in males (37.74%) compared to females (7.46%) (P = 0.0001).[13]

5. A studyy conductedd byy Al-Nasser et al. (year) assessed the knowledge off metabolic syndrome (MS) among third- and sixth-year medical students in Saudi Arabia, highlighting gaps in awareness despite their medical training. This cross-sectional survey utilized a self-administered questionnaire that covered key metabolic syndrome components, including diabetes, adiposity, hypertension, and hypercholesterolemia. The study aimed to evaluate students' knowledge levels, categorizing them as adequate (81–100%), moderate (51–80%), or low (≤50%). Statistical analysis using independent t-tests and Chi-square tests examined associations between knowledge levels and academic year, with a significance level set at $p < 0.05$. The survey included 224 respondents, with 102 third-year (46%) and 122 sixth-year (54%) students. The findings revealed strong overall awareness,

with more than 70% of students correctly identifying symptoms, complications, and risk factors of diabetes, adiposity, and hypertension, while 90% recognized different types of diabetes. However, misconceptions were prevalent, as 91% of third-year students (compared to 70% of sixth-year students) falsely believed that fatigue is a frequent symptom of high serum cholesterol ($p < 0.001$). Additionally, 36% of students incorrectly identified liposuction as the best treatment for adiposity. The sixth-year students and those with a family history of hypercholesterolemia demonstrated higher knowledge scores across most categories, suggesting that progression in medical education and personal exposure to metabolic disorders contribute to better understanding.[14]

6. A studyy conductedd by Yeasmin et al. (2015) assessed the prevalencee off overweight, obesity, and metabolic variables among medical students in Dhaka, Bangladesh, highlighting the increasing burden of obesity-related health risks in young adults. This cross-sectional study aimed to evaluate body mass index (BMI), central obesity indicators (waist-hip ratio [WHR], waist-height ratio [WHtR], and waist circumference [WC]), blood pressure (BP), lipid profile, and glycemic status in medical students and analyse gender-based differences in these parameters. The findings revealed that overweight and obesity were more prevalent in female students compared to males. Based on BMI, 15% of females were overweight and 3.2% were obese, whereas the prevalence in males was 8.6% for overweight and 1.9% for obesity. Central obesity was also significantly higher in females when measured using WHR (31.3% in females vs. 3.5% in males) and WHtR (65.2% in females vs. 34.8% in males). However, when assessed using waist circumference, 30.7% of males and 24% of females were found to be centrally obese. These variations highlight the importance of using multiple anthropometric measures to assess obesity accurately.

Blood pressure measurements showed a significant gender difference, with males exhibiting higher systolic blood pressure (SBP) and diastolic blood pressure (DBP) values (118.9 mmHg & 79.22 mmHg, respectively) compared to females (108.67 mmHg & 72.71 mmHg, respectively) ($p < 0.001$). Despite these metabolic differences, no significant associations were found between glycemic status ($p = 0.286$) or lipid profile ($p = 0.347$) with central obesity. This suggests that while obesity is prevalent, its direct metabolic consequences may not yet be evident in this young population.[15]

7. A studyy conductedd by Kumar et al. (2024) examined the prevalencee off metabolic syndrome (MetS) and its correlation with lifestyle-related risk factors among medical students in North India. This institution-based, cross-sectional study included 300 MBBS students from all three professional years, aiming to identify MetS prevalence and its associated lifestyle behaviours. Data collection involved sociodemographic variables, lifestyle-related risk factors, anthropometric measurements, blood pressure assessment, and laboratory investigations. The International Diabetes Federation (IDF) criteria were used for diagnosing MetS.

   The study found that the overall prevalence of MetS was 9.0%, with a higher prevalence in male students (12.4%) compared to female students (4.1%). Among the individual metabolic parameters, low HDL-C was the most common abnormality (57.37%), followed by abdominal obesity (25.6%) and raised triglycerides (18%). Notably, the prevalence of MetS increased with progression through medical training, suggesting a possible impact of prolonged academic stress and lifestyle deterioration.

   The study also identified several lifestyle-related risk factors significantly associated with MetS. Frequent consumption of fast food (>7 times/week) [OR 1.75 (1.196-1.306)], habit of watching screens while eating [OR 1.78 (0.872-0.892)], and alcohol

consumption (>3 drinks per month) [OR 1.73 (1.068-1.170)] were all linked to a higher likelihood of developing MetS. These findings emphasize the role of unhealthy dietary habits, sedentary behaviours, and alcohol intake in the progression of metabolic abnormalities.[16]

8. A study conducted by Begum et al. (2022) examined the diagnostic parameters for metabolic syndrome (MetS) among first-year medical students in Telangana, India. This cross-sectional quantitative study included 150 MBBS students, evaluating anthropometric measurements, blood pressure, fasting blood glucose, lipid profile, demographic details, and risk factors. Statistical analysis was performed using SPSS version 20, with a p-value <0.05considered statistically significant.

   The study found that the overall prevalence of MetS was 28.35%, with a notably higher prevalence in females (37.8%) compared to males (18.8%). The primary contributing factors to MetS among students included overweight and obesity, hypertension, and low HDL levels. These findings suggest that even in early medical education, students exhibit metabolic abnormalities that increase their risk for future cardiovascular and metabolic diseases. The study highlights the role of unhealthy lifestyle habits and lack of awareness as key contributors to the high prevalence of MetS in this population.[17]

9. A studyy conductedd by Nitescu et al. (2010-2011) investigated the prevalence of metabolic syndrome (MetS) and its components among young adults in Romania, focusing on a cohort of 235 medical students. This cross-sectional study utilized the International Diabetes Federation (IDF) criteria for MetS diagnosis, and statistical analyses were performed using SPSS version 17, including T-student tests, Chi-square tests, and Pearson correlation coefficients. The study found that the overall prevalence of MetS was relatively low (1.28%), but individual metabolic risk factors were highly

prevalent. The most common MetS component was abnormal waist circumference (49.4%), followed by low high-density lipoprotein cholesterol (HDL-C) levels (13.58%) and hypertriglyceridemia (3.08%). A significant association was observed between low HDL-C levels and increased waist circumference, indicating a strong metabolic risk even in the absence of full MetS diagnosis. Women exhibited a significantly higher prevalence of abdominal obesity (63.6%) compared to men (15.7%), which was also correlated with increased body mass index (BMI) in the female subgroup. Despite the low prevalence of complete MetS, the high occurrence of central obesity (waist circumference above the threshold) suggests an increased risk for metabolic complications in this young population.[18]

10. A studyu conductedd by Kumar et al. (2021) examined the prevalencee off metabolic syndrome (MetS) among medical students at a tertiary healthcare center in India. This cross-sectional observational study, conducted over one year (2018–2019) at Indira Gandhi Institute of Medical Sciences, Patna, included 150 randomly selected MBBS students from different semesters. The study utilized the International Diabetes Federation (IDF) criteria to assess the prevalence of MetS and its individual metabolic components. The findings revealed that 20% of the study population met the criteria for MetS, with a higher prevalence in males (23.3%) compared to females (17.8%). Among the individual metabolic components, increased waist circumference (42%) was the most prevalent abnormality, followed by low high-density lipoprotein (HDL) levels (35.3%), elevated triglycerides (32.7%), increased fasting blood sugar (0.02%), and hypertension (0.03%). These findings indicate that central obesity and dyslipidemia are the predominant risk factors contributing to MetS among medical students. The study highlights insulin resistance as a key pathophysiological mechanism underlying MetS and notes the growing burden of metabolic syndrome in South Asia, where an estimated 20%–25% of adults are affected. The findings

emphasize the need for early lifestyle modifications, including dietary interventions, physical activity promotion, and stress management, to reduce the long-term risk of cardiovascular diseases and type 2 diabetes in medical students.[19]

BASIC SCIENCE

Introduction to Metabolic Parameters

Metabolic parameters are crucial indicators of an individual's overall metabolic health, encompassing biochemical and anthropometric measures that help assess the risk of metabolic disorders such as cardiovascular disease, type 2 diabetes mellitus (T2DM), and metabolic syndrome (MetS). These parameters include lipid profile, fasting blood glucose, anthropometric indices, and other biochemical markers such as lipoprotein (a) and high-sensitivity C-reactive protein (hs-CRP).[20]

Lipid profile is one of the most widely used metabolic assessments, as it provides information about various lipid parameters in the body such as total cholesterol , low-density lipoprotein (LDL), high-density lipoprotein (HDL), and triglyceride levels. Elevated LDL cholesterol and triglycerides , along with reduced HDL cholesterol, contribute to the development of atherosclerosis and cardiovascular diseases.[21–24] Regular monitoring of lipid parameters aids in early identification and intervention for dyslipidemia. Another essential metabolic marker is fasting blood glucose, which measures blood sugar levels after an overnight fast. An elevated fasting blood glucose level is an early indicator of insulin resistance and prediabetes, which, if left uncontrolled, may progress to T2DM.[25–28]

Anthropometric indices such as body mass index (BMI), waist-hip ratio (WHR), tserve as indirect markers of adiposity and fat distribution.[29] BMI is a simple measure derived from an individual's weight and height , helping categorize individuals into different weight categories such as underweight , normal weight , overweight , or obese.[30] WHR assesses fat distribution, with higher values indicating

central obesity, a strong predictor of cardiovascular risk. The conicity index provides additional insight into central adiposity, as it accounts for the shape and fat accumulation patterns in the abdominal region.[31,32] In addition to these parameters, lipoprotein (a) and hs-CRP have emerged as critical biomarkers for cardiovascular risk.[33] Elevated lipoprotein (a) levels are primarily genetically determined and contribute to atherosclerotic plaque formation, while hs-CRP, an inflammatory marker, is associated with systemic inflammation and cardiovascular disease progression.

Physiological and Pathological Aspects

Metabolic processes in young adults are characterized by efficient energy metabolism, balanced lipid levels, and optimal glucose regulation. However, alterations in these physiological functions due to genetic, environmental, or lifestyle factors can lead to metabolic disorders such as dyslipidemia , diabetes mellitus , and metabolic syndrome .

Dyslipidemia, characterized by abnormal lipid levels, plays a key role in the development of cardiovascular diseases . High LDL cholesterol levels promote the deposition of cholesterol in arterial walls, leading to atherosclerotic plaque formation and increasing the risk of coronary artery disease (CAD). Conversely, low HDL cholesterol impairs the reverse cholesterol transport mechanism, reducing the clearance of excess cholesterol from the bloodstream. Genetic predisposition, physical inactivity, and unhealthy dietary habits, such as excessive intake of trans fats and refined carbohydrates, are common contributors to dyslipidemia.[34,35]

Diabetes mellitus is a metabolic disorder characterized by chronic hyperglycemia resulting from insulin deficiency, insulin resistance, or both . Type

1 diabetes is an autoimmune disorder involving the destruction of pancreatic β-cells , leading to absolute insulin deficiency . Type 2 diabetes , which is more prevalent, results from a combination of insulin resistance and β-cell dysfunction.[36] Chronic hyperglycemia in diabetes leads to microvascular complications such as diabetic nephropathy , retinopathy , and neuropathy , as well as macrovascular complications , including increased risk for stroke and CAD.[37]

Metabolic syndrome , a cluster of conditions that includes central obesity , insulin resistance , hypertension, and dyslipidemia, significantly increases the risk of developing cardiovascular diseases and T2DM. Its pathogenesis involves complex interactions between genetic predisposition and environmental influences such as poor diet , sedentary behavior, and chronic stress. The presence of three or more MetS components is associated with a higher likelihood of adverse cardiovascular outcomes , making early detection and intervention critical.[38,39]

Diet and Metabolic Health

Dietary patterns play a fundamental role in shaping metabolic health, influencing lipid profiles, glucose homeostasis, and body composition. A well-balanced diet can help prevent metabolic disorders, while unhealthy dietary habits contribute to the progression of metabolic abnormalities.[40]

One of the most debated topics in metabolic health is the comparison between vegetarian and non-vegetarian diets . Vegetarian diets are rich in fiber, antioxidants, and unsaturated fats, all of which contribute to reduced LDL cholesterol, improved insulin sensitivity, and a lower risk of metabolic syndrome . However, vegetarian diets may also pose nutritional challenges, particularly concerning vitamin

B12 , iron , and omega-3 fatty acid deficiencies , which require careful dietary planning or supplementation .[41,42] Non-vegetarian diets, while providing essential nutrients such as high-quality protein and heme iron , can also be high in saturated fats and cholesterol, potentially increasing the risk of dyslipidemia and atherosclerosis.[43]

Omega-3 fatty acids , found in fatty fish , flaxseeds , and walnuts , exhibit anti-inflammatory properties and have been shown to improve lipid profiles by reducing triglycerides and increasing HDL cholesterol levels.[44] In contrast, diets high in saturated fats , trans fats, and processed foods contribute to insulin resistance, increased visceral fat deposition, and dyslipidemia, thereby elevating the risk of metabolic syndrome. Given these effects, adopting a balanced diet that includes whole grains , lean proteins , and healthy fats while limiting processed foods and sugar -sweetened beverages is critical in maintaining metabolic health.

Lifestyle Factors and Metabolism

Beyond diet, lifestyle factors such as physical activity , stress, and smoking have a profound impact on metabolic health. Regular physical activity is known to enhance insulin sensitivity, lower triglycerides, and promote weight management. Aerobic exercise and resistance training both play important roles in maintaining glucose homeostasis and preventing metabolic syndrome. Sedentary lifestyles, however, are strongly associated with increased visceral fat accumulation, insulin resistance, and cardiovascular risk.[2,45,46]

Chronic stress is another key contributor to metabolic dysfunction. Prolonged activation of the hypothalamic -pituitary -adrenal (HPA) axis leads to elevated cortisol levels , which promote central obesity, impair glucose regulation, and

contribute to insulin resistance.[47,48] Stress management strategies such as mindfulness, meditation , and structured exercise programs can mitigate these adverse effects.

Smoking has well-documented adverse effects on metabolism, significantly increasing oxidative stress, promoting systemic inflammation, and exacerbating insulin resistance. Tobacco use negatively impacts lipid metabolism , increasing LDL cholesterol and reducing HDL cholesterol levels, thereby accelerating the progression of atherosclerosis.[45]

Medical students, due to their rigorous academic workload, experience unique lifestyle challenges that can adversely affect metabolic health. High levels of academic stress, irregular sleep patterns , and unhealthy eating habits are commonly reported among medical trainees.[6,7] These factors can contribute to weight gain, increased insulin resistance, and dysregulated lipid metabolism. Implementing structured wellness programs within medical institutions can help mitigate these risks by promoting balanced diets, physical activity, and stress management techniques.

Existing Research and Studies

Several studies have explored the relationship between dietary patterns , lifestyle behaviours, and metabolic health. Research has consistently shown that adherence to the Mediterranean diet —characterized by high consumption of fruits , vegetables , and olive oil —is associated with a reduced incidence of metabolic syndrome and cardiovascular diseases. In contrast, Western dietary patterns, which include high intake of red meat , refined carbohydrates , and sugar-sweetened beverages , are linked to increased metabolic risks.

Meta-analyses and systematic reviews have further confirmed the protective effects of dietary fiber, omega-3 fatty acids , and regular exercise in preventing metabolic syndrome components.[49] They have also highlighted the detrimental impact of trans fats, excessive fructose consumption, and sedentary behaviours on metabolic health.

Globally, research on medical students has revealed a concerning trend of unhealthy eating habits and declining physical activity levels. Studies conducted in different regions have reported a high prevalence of obesity , dyslipidemia , and insulin resistance among medical students, emphasizing the need for targeted interventions to improve metabolic health in this population. By promoting early education and lifestyle modifications, medical institutions can help prevent the progression of metabolic disorders and foster long-term well-being among future healthcare professionals.

MATERIALS AND METHODS

Study Design & Study Setting

This study employed a cross-sectional observational design to assess metabolic parameters among medical students at Jawaharlal Nehru Medical College (JNMC), Belagavi , India .

Study Duration

The study was conducted over a period of one year , from January 2023 to December 2023.

Population and Sampling

The study population comprised MBBS students in the final phase of their medical education. The sample size was determined based on variations in lipid profile levels across different dietary groups. Systematic sampling was employed to ensure representation across various dietary patterns while maintaining the statistical power of the study. A total of 200 students were enrolled, equally distributed among vegetarian and non-vegetarian groups. Participants were systematically selected based on roll numbers and inclusion criteria to minimize selection bias.

Inclusion and Exclusion Criteria

Participants were included in the study if they were medical students aged 18 years or older and belonged to one of the following dietary groups: Vegan, Vegetarian, Lacto-Ovo Vegetarian, or Non-Vegetarian. The study excluded students with pre-existing metabolic disorders, such as diabetes mellitus, obesity, hypercholesterolemia, and dyslipidemia, to avoid confounding effects. Additionally, students who had been on anti-hyperlipidemic medications in the last three months were excluded to prevent pharmacological influences on metabolic parameters.

Ethical Considerations

The study received approval from the Institutional Ethics Committee (IEC) of JNMC, Belagavi. All participants were required to provide written informed consent before enrollment. Confidentiality was ensured by anonymizing participant data, and all information was securely stored following ethical guidelines. Participants were informed about their right to withdraw from the study at any time without any consequences.

Data Collection Procedure

Data collection involved a structured questionnaire and clinical assessments. The questionnaire gathered information on demographics, lifestyle habits, and dietary patterns. Anthropometric measurements, including Body Mass Index (BMI), Waist-Hip Ratio (WHR), and Neck Circumference, were recorded. Biochemical investigations were performed using venous blood samples collected after an overnight fast. These included lipid profile assessment (total cholesterol, LDL, HDL, triglycerides), fasting blood glucose, and renal and liver function tests. The collected samples were analyzed using standardized laboratory techniques.

Study Protocol and Workflow

The study followed a structured step-wise workflow to ensure consistency and accuracy in data collection. Initially, participant selection and consent were carried out, where eligible students were identified based on the inclusion criteria, and informed consent was obtained. Following this, a standardized questionnaire was administered to gather information on dietary patterns, physical activity levels, smoking habits, alcohol consumption, and other lifestyle factors. Subsequently, anthropometric measurements including height, weight, waist circumference, hip circumference, and neck circumference were recorded

using calibrated equipment to ensure precision. In the next phase, blood sample collection and laboratory analysis were conducted, where venous blood samples were collected, processed, and analyzed for fasting blood glucose, lipid profile, and renal/liver function markers. All collected data were compiled and entered into statistical software for further analysis, ensuring a systematic and comprehensive approach to data management and evaluation.

Statistical Analysis

Data is analysed using statistical software R version 4.4.3. and Microsoft Excel. Categorical variables given in the form of frequency tables. Continuous variables given in Mean ± SD / Median (Min, Max) form. Chi square test is used to check the association of categorical variables. Normality of variable is checked by Shapiro Wilk test and QQ plot. If data follows normal distribution, parametric tests will be used. Otherwise, non-parametric tests will be used. Two sample t test is used to compare the mean of variables over two groups. Mann Whitney U test is used to compare the distribution of variables over two groups. One-way ANOVA is used to compare the mean of variables over academic year. Kruskal Wallis test is used to compare the distribution of variables over academic year. Pearson's correlation test/Spearman's rank correlation test are used to check the correlation of BMI and waist hip ratio with different variables. P-value less than or equal to 0.05 indicates statistical significance.

RESULTS

The dataset includes measurements from 200 subjects. The following table gives the distribution of subjects according to demographic details.

Table 1: Distribution of subjects according to demographic details.

Variable	Sub Category	Number of subjects (%)
Age (years)	Mean ± SD	21.34 ± 1.42
	Median (Min, Max)	22 (19, 23)
Sex	Female	84 (42%)
	Male	116 (58%)
Year	First year	50 (25%)
	Fourth year	50 (25%)
	Second year	50 (25%)
	Third year	50 (25%)

The mean age of the participants was 21.34 ± 1.42 years, with a median age of 22 years (ranging from 19 to 23 years). Out of 200 subjects, 116 (58%) were male and 84 (42%) were female. Regarding the academic year distribution, the participants were evenly divided, with 50 (25%) subjects each from the first, second, third, and fourth years.

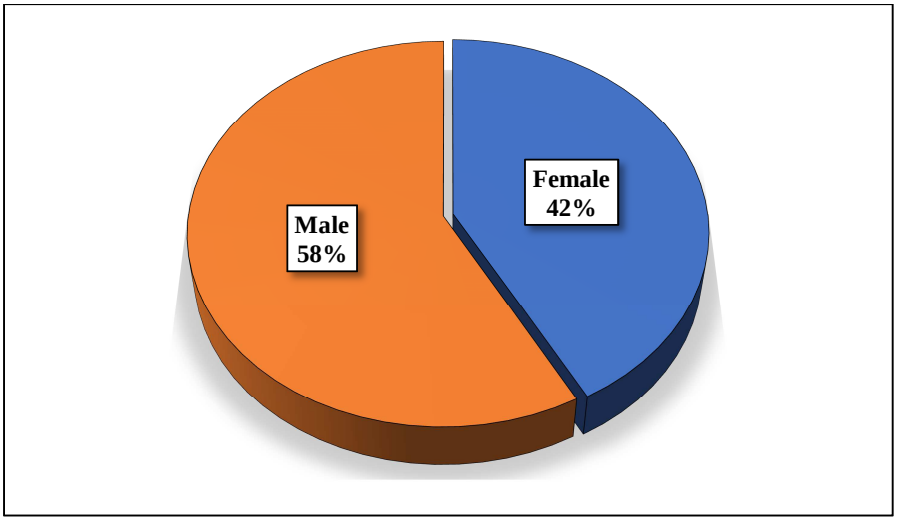

Figure 1: Distribution of subjects according to sex.

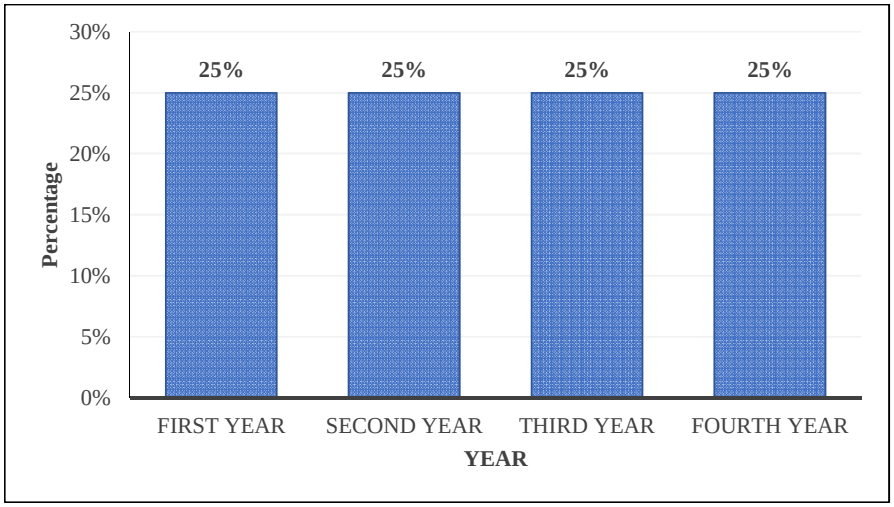

Figure 2: Distribution of subjects according to year.

The following table gives the distribution of subjects according to vitals.

Table 2: Distribution of subjects according to vitals.

Variable	**Mean ± SD**	**Median (Min, Max)**
Pulse Rate (bpm)	79.76 ± 8.83	78 (60, 98)
SBP (mmHg)	118.68 ± 8.47	118 (102, 138)
DBP (mmHg)	75.5 ± 7.02	76 (60, 90)

The mean pulse rate was 79.76 ± 8.83 bpm, with a median of 78 bpm (ranging from 60 to 98 bpm). The mean systolic blood pressure (SBP) was 118.68 ± 8.47 mmHg, with a median of 118 mmHg (ranging from 102 to 138 mmHg). The mean diastolic blood pressure (DBP) was 75.5 ± 7.02 mmHg, with a median of 76 mmHg (ranging from 60 to 90 mmHg). Based on blood pressure classification, 125 (62.5%) subjects had normal blood pressure, while 72 (36%) were categorized as prehypertensive and BP details of 3 subjects were missing.

The following table gives the distribution of subjects according to lifestyle factors.

Table 3: Distribution of subjects according to lifestyle factors.

Variable	Sub Category	Number of subjects (%)
Diet Pattern	Non-Vegetarian	119 (59.5%)
	Vegetarian	81 (40.5%)
Alcohol	None	103 (51.5%)
	Mild	45 (22.5%)
	Moderate	37 (18.5%)
	Heavy	15 (7.5%)
Smoking	No	166 (83%)
	1-2 Cig/Day	7 (3.5%)
	2-3 Cig/Day	14 (7%)
	3-4 Cig/Day	3 (1.5%)
	4-5 Cig/Day	6 (3%)
	5-6 Cig/Day	3 (1.5%)
	10 Cig/Day	1 (0.5%)
Exercise	None	5 (2.5%)
	Very Light Activity	37 (18.5%)
	Light Activity	55 (27.5%)
	Moderate Activity	81 (40.5%)
	Heavy Activity	22 (11%)

Regarding diet patterns, 119 (59.5%) subjects followed a non-vegetarian diet, while 81 (40.5%) were vegetarians. In terms of alcohol consumption, 103 (51.5%) subjects reported no alcohol intake, whereas 45 (22.5%) consumed alcohol mildly, 37 (18.5%) moderately, and 15 (7.5%) heavily.

Smoking habits varied among the participants, with 166 (83%) being non-smokers and 34 (17%) were smokers where 7 (3.5%) consumed 1–2 cigarettes per day, 14 (7%) consumed 2–3 cigarettes per day, 3 (1.5%) consumed 3–4 cigarettes per day, 6 (3%) consumed 4–5 cigarettes per day, 3 (1.5%) consumed 5–6 cigarettes per day, and 1 (0.5%) reported smoking 10 cigarettes per day.

Physical activity levels also differed across the subjects. A small proportion, 5 (2.5%), reported no physical activity, while 37 (18.5%) engaged in very light activity. Light activity was reported by 55 (27.5%) subjects, moderate activity by 81 (40.5%), and heavy activity by 22 (11%).

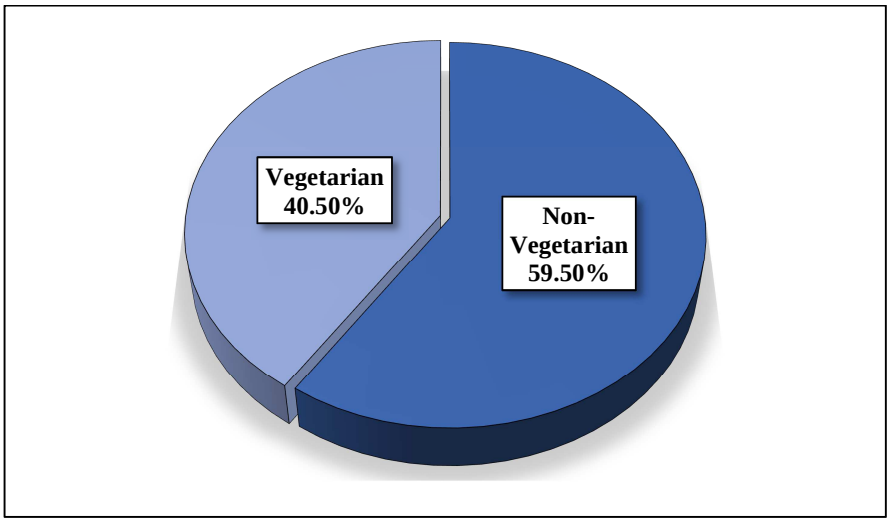

Figure 3: Distribution of subjects according to diet pattern.

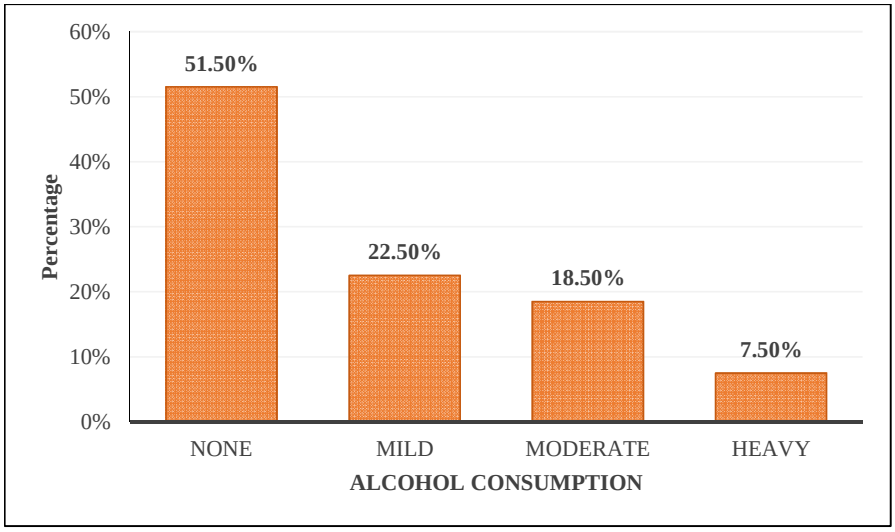

Figure 4: Distribution of subjects according to alcohol consumption.

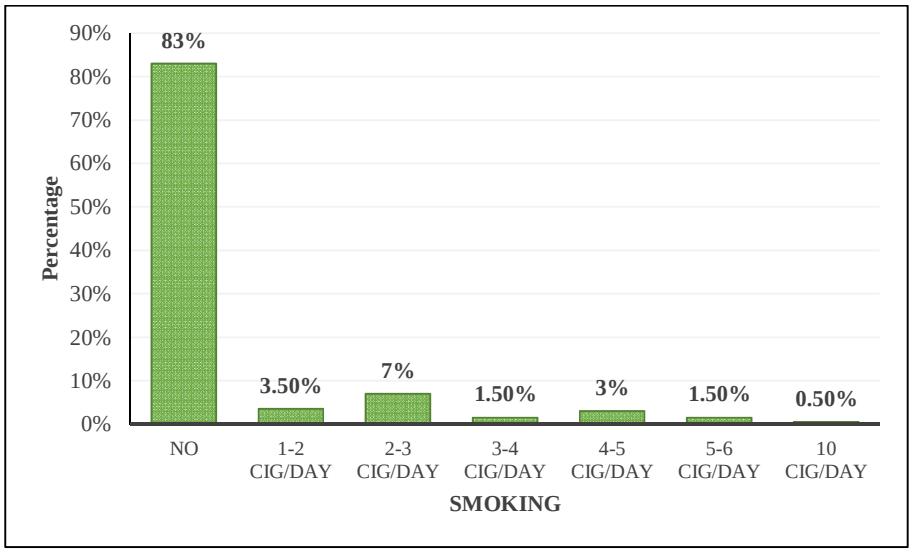

Figure 5: Distribution of subjects according to smoking.

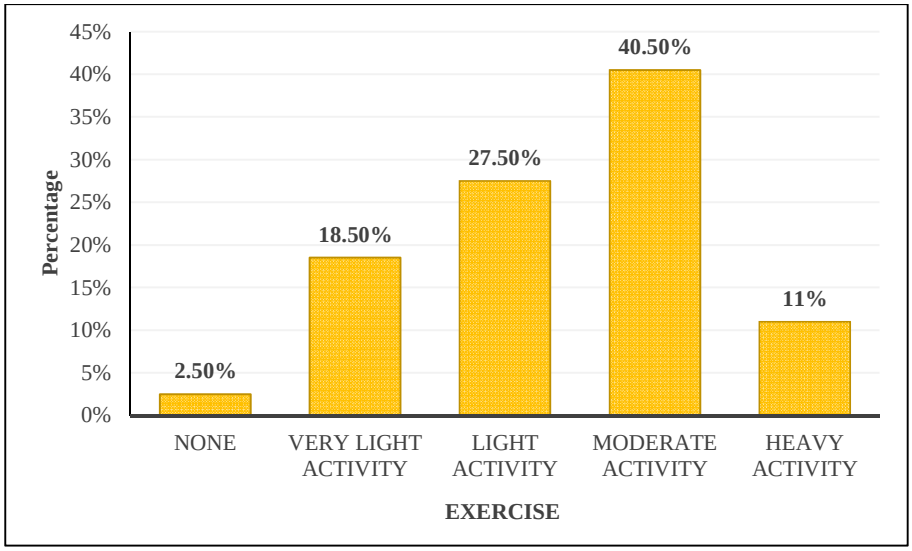

Figure 6: Distribution of subjects according to exercise.

The following table gives the distribution of subjects according to family history.

Table 4: Distribution of subjects according to family history.

Family history	Number of subjects (%)
DM	70 (35%)
HTN	88 (44%)
Hypothyroidism	52 (26%)
Obesity	66 (33%)
IHD	14 (7%)
No History	69 (34.5%)

Among the study population, 70 (35%) subjects had a family history of diabetes mellitus (DM), while 88 (44%) reported a history of hypertension (HTN). A family history of hypothyroidism was noted in 52 (26%) subjects, and 66 (33%) had a history of obesity in their family. Ischemic heart disease (IHD) was reported in 14 (7%) subjects. Notably, 69 (34.5%) subjects had no reported family history of these conditions.

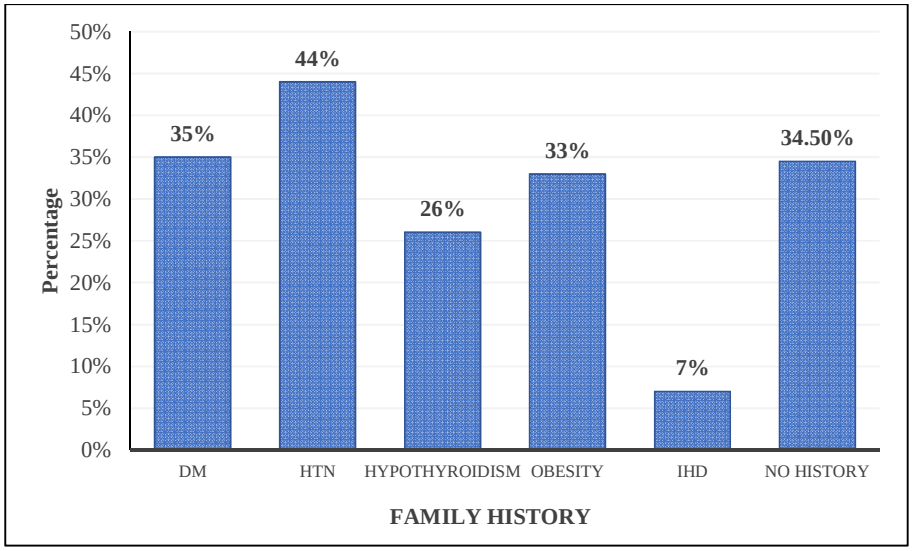

Figure 7: Distribution of subjects according to family history.

The following table gives the distribution of subjects according to anthropometric measurements.

Table 5: Distribution of subjects according to anthropometric measurements.

Variable	Mean ± SD	Median (Min, Max)
Height (cm)	169.9 ± 9.83	169 (148, 190)
Weight (kg)	71.03 ± 15.52	69.85 (40, 125)
BMI (kg/m2)	24.45 ± 4.09	24.19 (15.92, 39.64)
Neck Circumference (cm)	34.62 ± 3.6	34 (27, 43)
Waist Circumference (cm)	85.41 ± 11.66	84 (61, 126)
Hip Circumference (cm)	99.9 ± 11.87	99 (76, 147)
Waist/Hip Ratio	0.86 ± 0.07	0.86 (0.63, 1.17)

The mean height of the participants was 169.9 ± 9.83 cm, with a median of 169 cm (ranging from 148 to 190 cm). The mean weight was 71.03 ± 15.52 kg, with a median of 69.85 kg (ranging from 40 to 125 kg). The mean body mass index (BMI) was 24.45 ± 4.09 kg/m², with a median of 24.19 kg/m² (ranging from 15.92 to 39.64 kg/m²).

The mean neck circumference was 34.62 ± 3.6 cm, with a median of 34 cm (ranging from 27 to 43 cm). The mean waist circumference was 85.41 ± 11.66 cm, with a median of 84 cm (ranging from 61 to 126 cm). The mean hip circumference was 99.9 ± 11.87 cm, with a median of 99 cm (ranging from 76 to 147 cm). The waist-to-hip ratio had a mean of 0.86 ± 0.07, with a median of 0.86 (ranging from 0.63 to 1.17).

The following table gives the distribution of subjects according to biochemical parameters.

Table 6: Distribution of subjects according to biochemical parameters.

Variable	**Sub Category**	**Number of subjects (%)**
Fasting Sugar Level (mg/dl)	Mean ± SD Median (Min, Max)	83.89 ± 10.74 84 (63, 149)
Serum Cholesterol (mg/dl)	Mean ± SD Median (Min, Max)	152.56 ± 29.93 153.5 (84, 253)
HDL-C (mg/dl)	Mean ± SD Median (Min, Max)	47.53 ± 18.48 43 (24, 127)
LDL-C (mg/dl)	Mean ± SD Median (Min, Max)	90.2 ± 25.06 87.5 (34, 157)
Serum Triglycerides (mg/dl)	Mean ± SD Median (Min, Max)	112.69 ± 55.5 97 (24, 414)

The mean fasting blood sugar level was 83.89 ± 10.74 mg/dL, with a median of 84 mg/dL (ranging from 63 to 149 mg/dL). The mean serum cholesterol level was 152.56 ± 29.93 mg/dL, with a median of 153.5 mg/dL (ranging from 84 to 253 mg/dL).

The mean HDL-C level was 47.53 ± 18.48 mg/dL, with a median of 43 mg/dL (ranging from 24 to 127 mg/dL), while the mean LDL-C level was 90.2 ± 25.06 mg/dL, with a median of 87.5 mg/dL (ranging from 34 to 157 mg/dL). The mean serum triglycerides level was 112.69 ± 55.5 mg/dL, with a median of 97 mg/dL (ranging from 24 to 414 mg/dL).

The following table gives the comparison of demographic variables over year.

Table 8: Comparison of demographic variables over year.

Variable	Sub Category	First year	Second year	Third year	Fourth year	p-value
Age (years)	Mean ± SD Median (Min, Max)	20.14 ± 1.46 19 (19, 23)	20.56 ± 1.03 20 (20, 23)	22.3 ± 0.51 22 (21, 23)	22.34 ± 0.82 22.5 (20, 23)	< **0.001^{K}***
Sex	Female	12 (24%)	25 (50%)	26 (52%)	21 (42%)	**0.0184^{C}***
	Male	38 (76%)	25 (50%)	24 (48%)	29 (58%)	

*Abbreviation: K – Kruskal Wallis test, C – Chi square test, * indicates statistical significance.*

The mean age of first-year students was 20.14 ± 1.46 years, with a median of 19 years (ranging from 19 to 23 years). Second-year students had a slightly higher mean age of 20.56 ± 1.03 years, with a median of 20 years (ranging from 20 to 23 years). Third-year students had a mean age of 22.3 ± 0.51 years, with a median of 22 years (ranging from 21 to 23 years), while fourth-year students had a mean age of 22.34 ± 0.82 years,

with a median of 22.5 years (ranging from 20 to 23 years). The age differences across academic years were statistically significant (p-value < 0.001).

Regarding sex distribution, the proportion of female students varied across the years: 12 (24%) in the first year, 25 (50%) in the second year, 26 (52%) in the third year, and 21 (42%) in the fourth year. The proportion of male students was highest in the first year at 38 (76%), while in the second, third, and fourth years, the distribution was 25 (50%), 24 (48%), and 29 (58%), respectively. The difference in sex distribution across academic years was statistically significant (p-value = 0.0184).

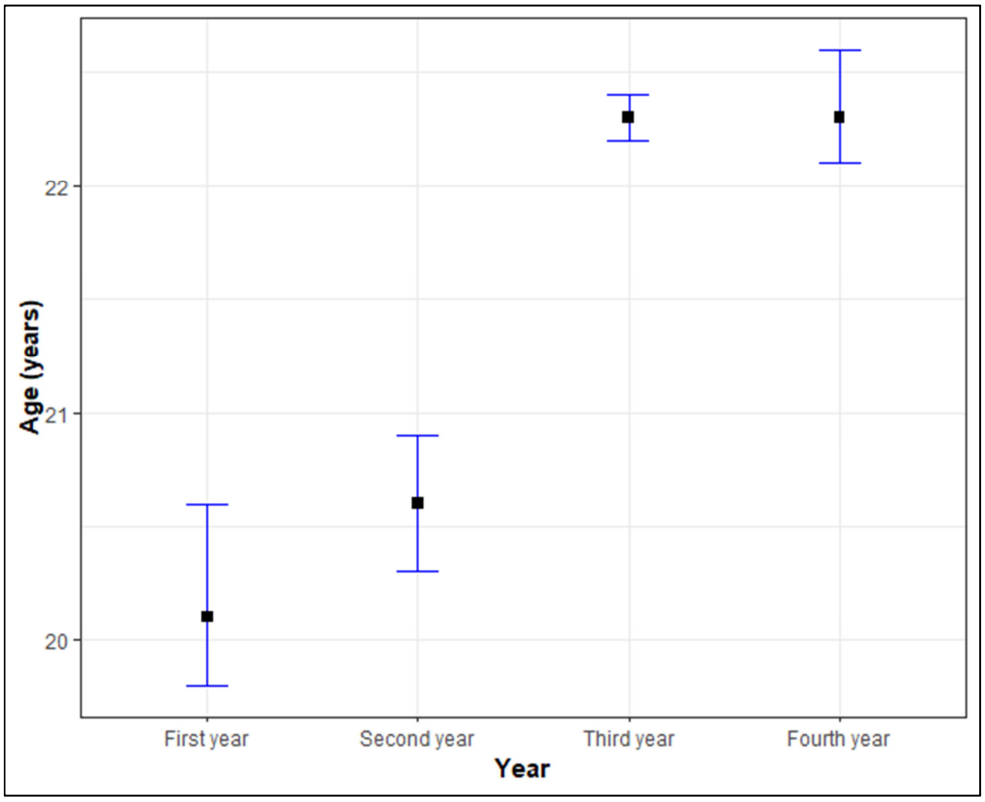

Figure 10: Mean plot of age over year.

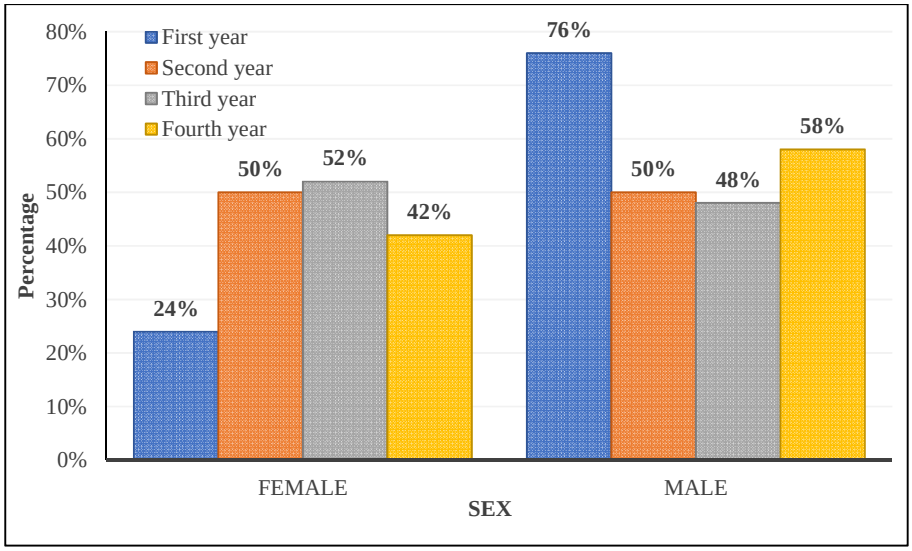

Figure 11: Distribution of sex over year.

The following table gives the comparison of vitals over year.

Table 9: Comparison of vitals over year.

Variable	First year	Second year	Third year	Fourth year	p-value
Pulse Rate (bpm)	81.04 ± 7.3 84 (66, 96)	77.72 ± 9.22 76 (62, 96)	78.78 ± 9.47 78 (60, 98)	81.56 ± 8.78 84 (64, 96)	0.0955[K]
SBP (mmHg)	118.25 ± 7.78 118 (106, 138)	117.64 ± 8.11 116 (102, 134)	118.2 ± 8.38 118 (106, 136)	120.6 ± 9.44 120 (106, 138)	0.4113[K]
DBP (mmHg)	75.5 ± 6.48 75 (60, 90)	74.28 ± 6.5 74 (60, 86)	76.33 ± 7.58 76 (60, 90)	75.92 ± 7.48 76 (64, 90)	0.4807[K]

Abbreviation: K – Kruskal Wallis test.

While minor variations in pulse rate and blood pressure were observed among different academic years, none of these differences were statistically significant (p-values > 0.05).

The following table gives the comparison of lifestyle factors over year.

Table 10: Comparison of lifestyle factors over year.

Variable	Sub Category	First year	Second year	Third year	Fourth year	p-value
Diet Pattern	Non-Vegetarian	21 (42%)	33 (66%)	30 (60%)	35 (70%)	**0.0231^{C}***
	Vegetarian	29 (58%)	17 (34%)	20 (40%)	15 (30%)	
Alcohol	No	30 (60%)	35 (70%)	21 (42%)	17 (34%)	**0.0010^{C}***
	Yes	20 (40%)	15 (30%)	29 (58%)	33 (66%)	
Smoking	No	44 (88%)	46 (92%)	40 (80%)	36 (72%)	**0.0390^{C}***
	Yes	6 (12%)	4 (8%)	10 (20%)	14 (28%)	
Exercise	None	0	1 (2%)	2 (4%)	2 (4%)	**0.0090^{MC}***
	Very Light Activity	7 (14%)	9 (18%)	7 (14%)	14 (28%)	
	Light Activity	11 (22%)	11 (22%)	20 (40%)	13 (26%)	
	Moderate Activity	25 (50%)	17 (34%)	19 (38%)	20 (40%)	
	Heavy Activity	7 (14%)	12 (24%)	2 (4%)	1 (2%)	

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, * indicates statistical significance.*

The proportion of non-vegetarians increased across academic years, from 42% in the first year to 70% in the fourth year, while vegetarianism declined (p-value = 0.0231). Alcohol consumption also showed an increasing trend, with only 40% of first-year students reporting alcohol use compared to 66% in the fourth year (p-value = 0.0010).

Smoking prevalence was lowest among first-year and second-year students (12% and 8%, respectively) but increased to 20% in the third year and 28% in the fourth year (p-value = 0.0390).

Exercise patterns also varied significantly (p-value = 0.0090). Moderate activity was most common among first-year students (50%) but decreased in later years. Conversely, very light activity was more frequent in fourth-year students (28%) compared to first-year students (14%). Heavy activity was highest in the second year (24%) but declined sharply by the fourth year (2%).

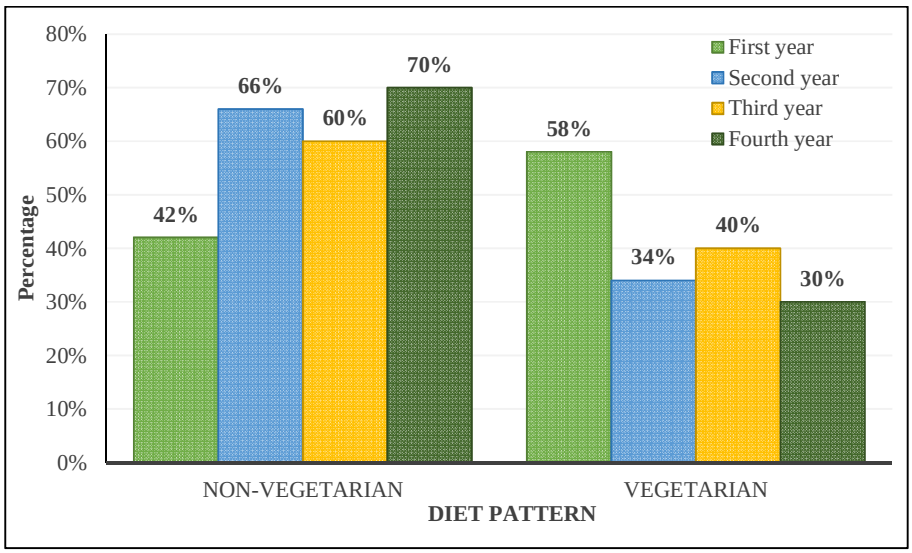

Figure 12: Distribution of diet pattern over year.

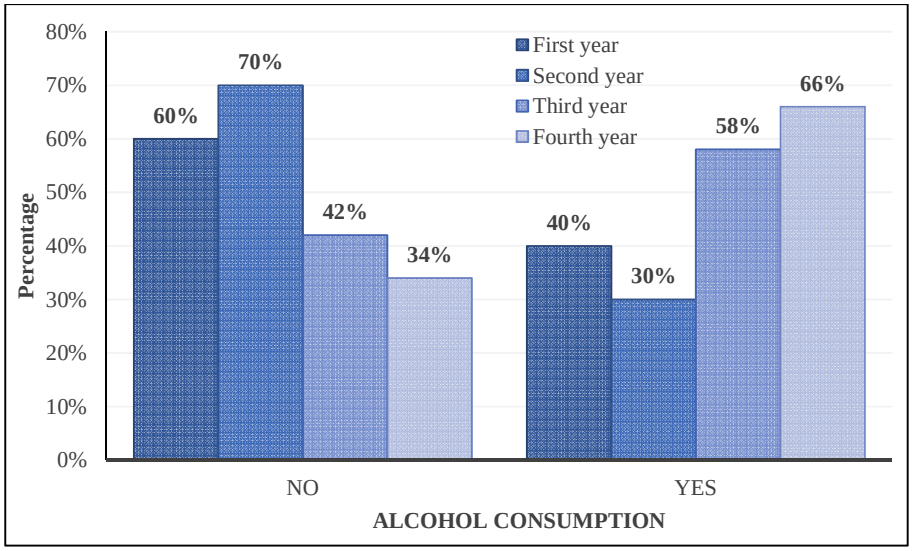

Figure 13: Distribution of alcohol over year.

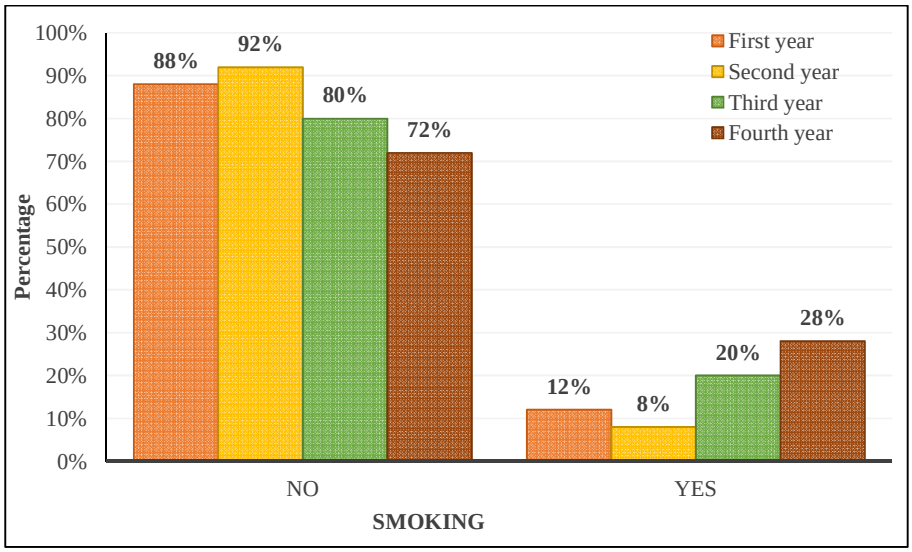

Figure 14: Distribution of smoking over year.

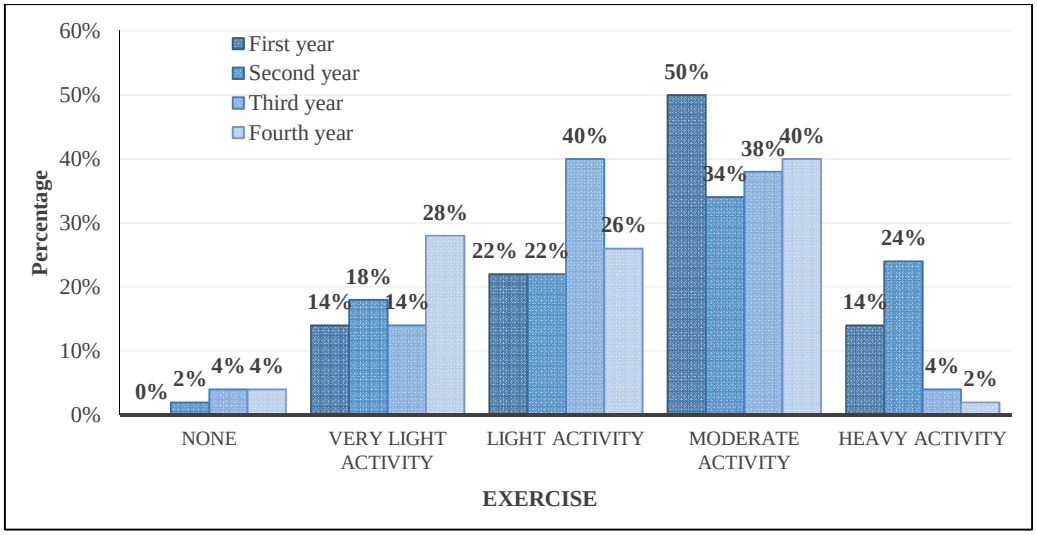

Figure 15: Distribution of exercise over year.

The following table gives the comparison of family history over year.

Table 11: Comparison of family history over year.

Family history	First year	Second year	Third year	Fourth year	p-value
DM	17 (34%)	18 (36%)	16 (32%)	19 (38%)	0.9320[C]
HTN	20 (40%)	26 (52%)	21 (42%)	21 (42%)	0.6180[C]
Hypothyroidism	17 (34%)	13 (26%)	10 (20%)	12 (24%)	0.4398[C]
Obesity	20 (40%)	13 (26%)	15 (30%)	18 (36%)	0.4534[C]
IHD	7 (14%)	1 (2%)	2 (4%)	4 (8%)	0.1199[MC]
No History	21 (42%)	12 (24%)	19 (38%)	17 (34%)	0.2657[C]

Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation.

The differences in family history distribution among academic years were not statistically significant (p-values > 0.05), indicating a relatively stable prevalence of hereditary conditions among the student population.

The following table gives the comparison of anthropometric measurement over year.

Table 12: Comparison of anthropometric measurement over year.

Variables	First year	Second year	Third year	Fourth year	p-value
Height (cm)	171.43 ± 9.2 171 (148, 187)	168.17 ± 10.11 169 (148, 190)	168.24 ± 9.97 167 (148, 188)	171.76 ± 9.73 170 (152, 190)	0.1150[A]
Weight (kg)	72.69 ± 14.42 70.5 (41.5, 115)	68.71 ± 15.78 65.8 (45, 120)	68.12 ± 15.19 66 (40, 96.4)	74.6 ± 16.12 75.28 (40.5, 125)	0.0606[K]
BMI (kg/m2)	24.6 ± 3.78 24.16 (17.95, 37.55)	24.18 ± 4.4 23.81 (15.92, 39.64)	23.85 ± 3.77 23.63 (16.72, 30.67)	25.15 ± 4.37 24.9 (16.53, 39.01)	0.3655[K]
Neck Circumference (cm)	35.19 ± 3.33 35 (30, 43)	33.48 ± 3.2 33 (27, 41)	34.55 ± 3.81 34 (28.9, 43)	35.25 ± 3.82 35 (28, 42)	0.0720[K]
Waist Circumference (cm)	84.69 ± 10.91 83 (61, 108)	83.51 ± 11.79 82 (66, 126)	84.58 ± 11.42 84 (64, 110)	88.82 ± 12.12 89 (62, 110)	0.0711[K]
Hip Circumference (cm)	97.82 ± 11.58 98 (76, 127)	97.36 ± 12.81 96 (80, 147)	99.97 ± 11.65 97.5 (80, 133)	104.37 ± 10.35 104 (81, 128)	**0.0047[K] ***
Waist/Hip Ratio	0.87 ± 0.08 0.85 (0.76, 1.17)	0.86 ± 0.06 0.86 (0.69, 1.03)	0.85 ± 0.07 0.85 (0.63, 1.03)	0.85 ± 0.07 0.86 (0.63, 1.01)	0.8969[K]

*Abbreviation: A – One-way ANOVA, K – Kruskal Wallis test, * indicates statistical significance.*

Height, weight, BMI, neck circumference, waist circumference, and waist/hip ratio did not show statistically significant differences over years (p-values > 0.05). However, the hip circumference showed a statistically significant difference across academic years (p-value = 0.0047), indicating a notable variation among students. The highest hip circumference was observed in the fourth-year group.

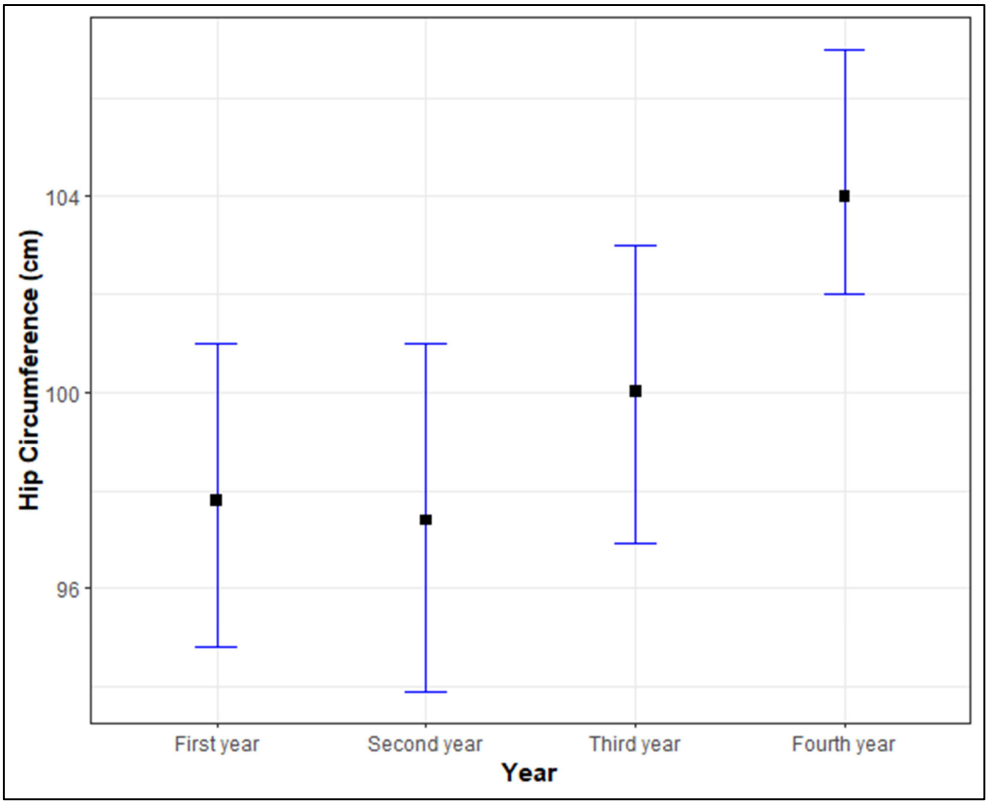

Figure 16: Mean plot of hip circumference over year.

The following table gives the comparison of biochemical parameters over year.

Table 13: Comparison of biochemical parameters over year.

Variable	Sub Category	First year	Second year	Third year	Fourth year	p-value
Fasting Sugar Level (mg/dl)	Mean ± SD Median (Min, Max)	85.04 ± 13.24 84.5 (63, 149)	81.58 ± 8.93 80.5 (67, 112)	84.82 ± 10.77 83.5 (63, 125)	84.14 ± 9.46 85 (63, 110)	0.1977^{K}
Serum Cholesterol (mg/dl)	Mean ± SD Median (Min, Max)	143.36 ± 29.3 142 (84, 190)	147.18 ± 24.62 141.5 (104, 214)	156.26 ± 30.56 159 (85, 225)	163.42 ± 31.45 159 (111, 253)	**0.0144^{K}***
HDL-C (mg/dl)	Mean ± SD Median (Min, Max)	53.4 ± 27.77 41.5 (24, 127)	50.6 ± 15.31 49 (26, 121)	44.86 ± 12.9 43 (28, 98)	41.28 ± 11.1 38 (24, 86)	**0.0025^{K}***
LDL-C (mg/dl)	Mean ± SD Median (Min, Max)	82.38 ± 25.29 85 (34, 138)	87.42 ± 24.36 80.5 (44, 147)	92.8 ± 22.5 90.5 (49, 156)	98.22 ± 25.84 94.5 (64, 157)	**0.0281^{K}***
Serum Triglycerides (mg/dl)	Mean ± SD Median (Min, Max)	98.92 ± 38.01 97 (24, 186)	107.7 ± 48.51 92.5 (42, 234)	114.16 ± 59.8 93 (52, 282)	130 ± 67.88 105.5 (56, 414)	**0.0375^{K}***

*Abbreviation: K – Kruskal Wallis test, MC – Chi square test with Monte Carlo simulation, * indicates statistical significance.*

While fasting blood sugar levels remained stable (p-value = 0.1977), serum cholesterol levels significantly increased (p-value = 0.0144), and HDL-C levels declined (p-value = 0.0025), LDL-C and triglycerides also showed significant increases (p-value = 0.0281 and p-value = 0.0375, respectively) indicating a worsening lipid profile.

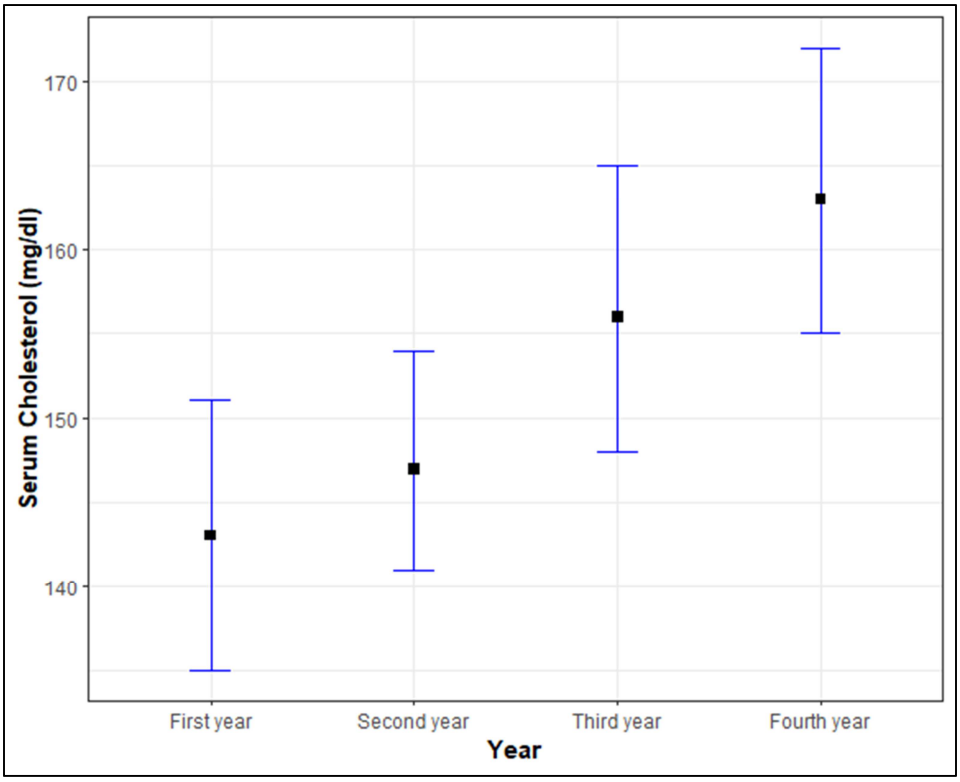

Figure 17: Mean plot of serum cholesterol over year.

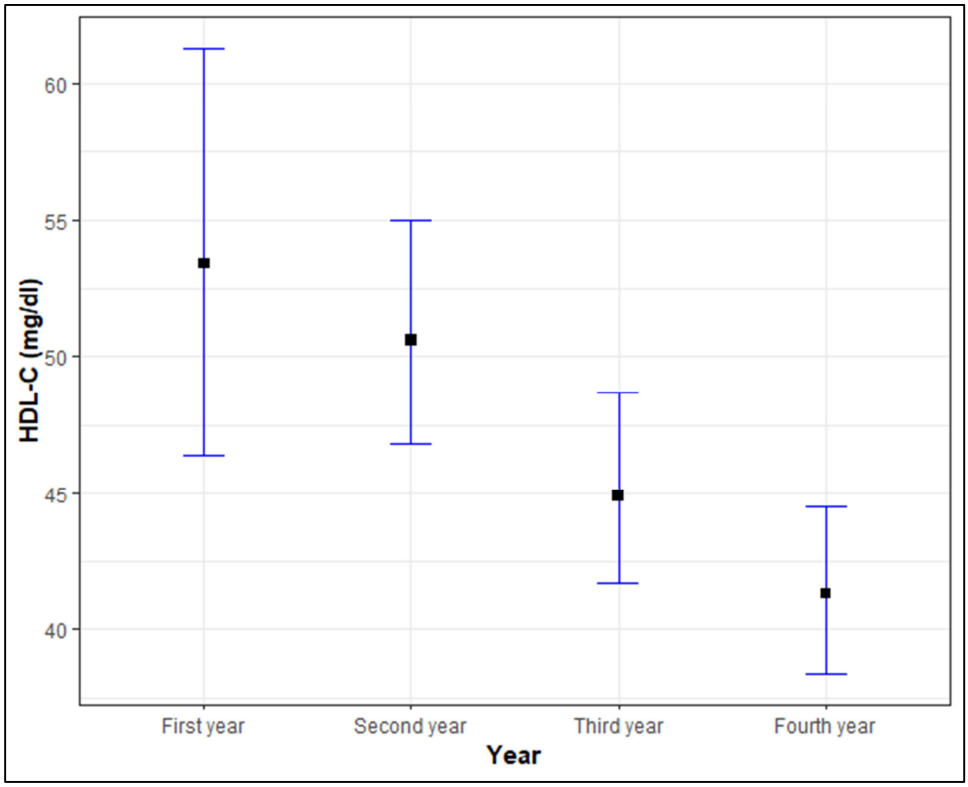

Figure 18: Mean plot of HDL-C over year.

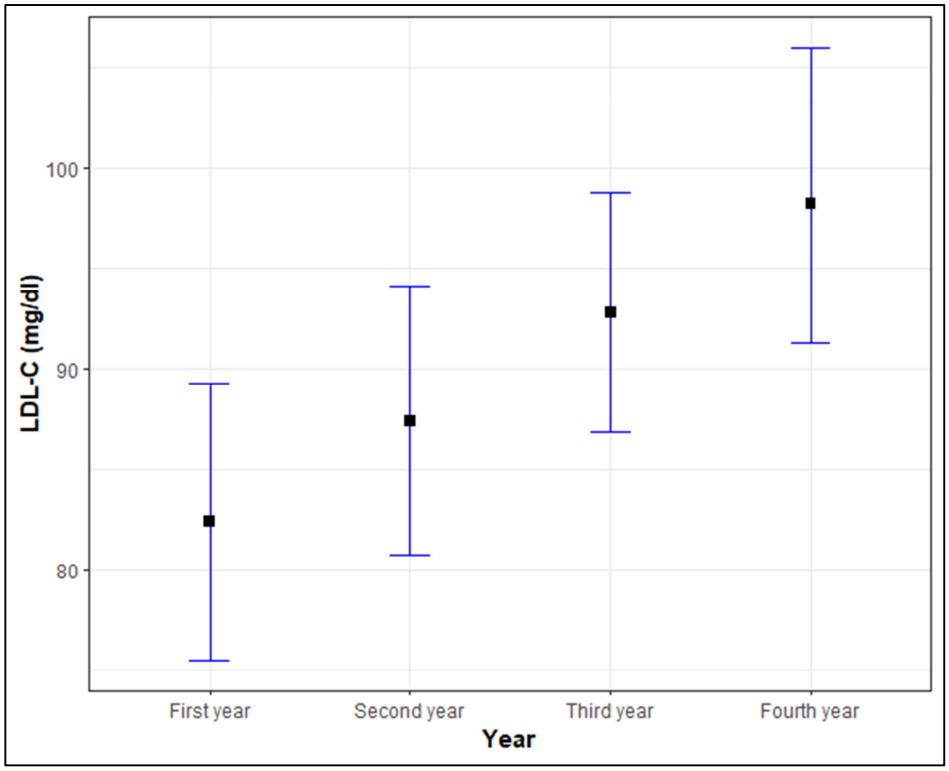

Figure 19: Mean plot of LDL-C over year.

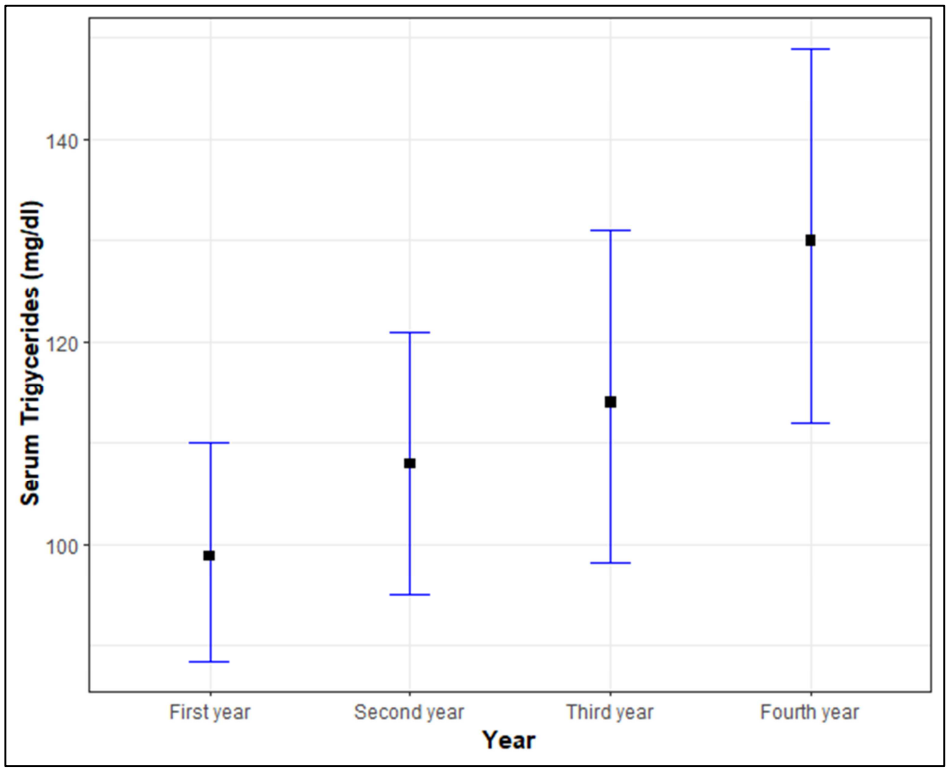

Figure 20: Mean plot of serum triglycerides over year.

The following table gives the comparison of demographic variables over diet pattern.

Table 15: Comparison of demographic variables over diet pattern.

Variables	**Sub Category**	**Non-Vegetarian**	**Vegetarian**	**p-value**
Age (years)	Mean ± SD Median (Min, Max)	21.3 ± 1.48 22 (19, 23)	21.38 ± 1.33 22 (19, 23)	0.9206^{MW}
Sex	Female	43 (36.13%)	41 (50.62%)	**0.0416^{C}***
	Male	76 (63.87%)	40 (49.38%)	

*Abbreviation: MW – Mann Whitney U test, C – Chi square test, * indicates statistical significance.*

There is no significant difference in age between non-vegetarians and vegetarians (p-value = 0.9206). However, there was a statistically significant difference in sex distribution (p-value = 0.0416), with a higher proportion of females following a vegetarian diet (50.62%) compared to non-vegetarians (36.13%). Conversely, a greater percentage of males were non-vegetarian (63.87%) compared to vegetarians (49.38%).

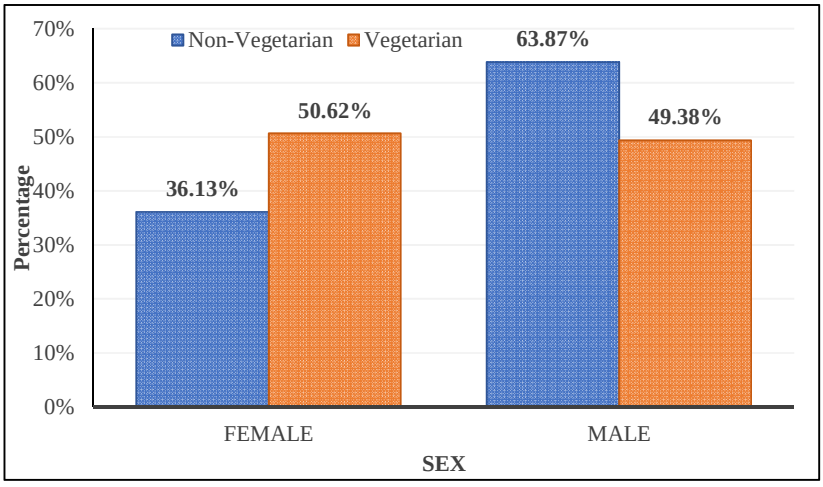

Figure 27: Distribution of sex over diet pattern.

The following table gives the comparison of lifestyle factors over diet pattern.

Table 16: Comparison of lifestyle factors over diet pattern.

Variables	**Sub Category**	**Non-Vegetarian**	**Vegetarian**	**p-value**
Alcohol	No	52 (43.7%)	51 (62.96%)	**0.0075[C]***
	Yes	67 (56.3%)	30 (37.04%)	
Smoking	No	90 (75.63%)	76 (93.83%)	**< 0.001[C]***
	Yes	29 (24.37%)	5 (6.17%)	
Exercise	None	4 (3.36%)	1 (1.23%)	0.3423[MC]
	Very Light Activity	24 (20.17%)	13 (16.05%)	
	Light Activity	28 (23.53%)	27 (33.33%)	
	Moderate Activity	47 (39.5%)	34 (41.98%)	
	Heavy Activity	16 (13.45%)	6 (7.41%)	

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, * indicates statistical significance.*

A higher percentage of non-vegetarians consumed alcohol (56.3%) compared to vegetarians (37.04%), with this difference being statistically significant (p-value = 0.0075). Similarly, smoking was more prevalent among non-vegetarians (24.37%) than vegetarians (6.17%), showing a highly significant association (p-value < 0.001). However, no significant difference was observed in exercise patterns between the two groups (p-value = 0.3423). While moderate activity was the most common level in both groups, non-vegetarians had a slightly higher percentage of heavy activity (13.45%) compared to vegetarians (7.41%).

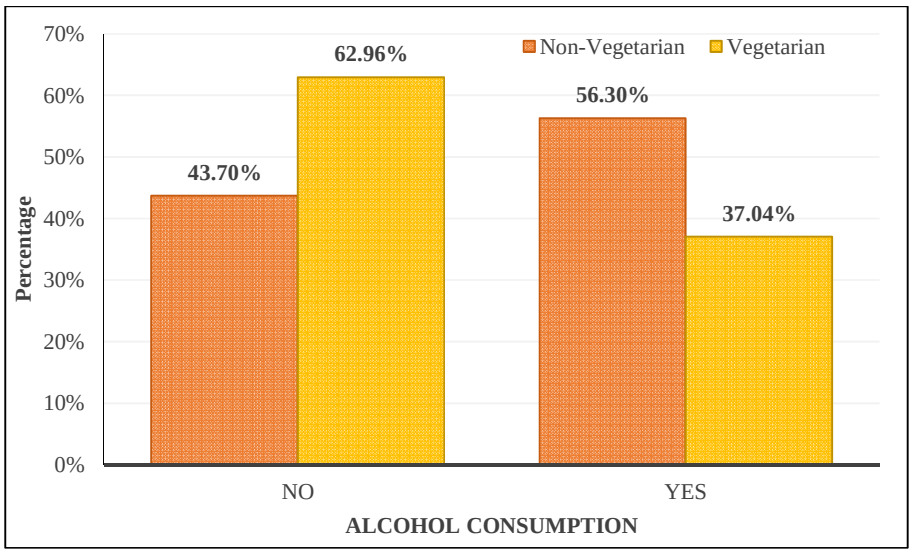

Figure 28: Distribution of alcohol over diet pattern.

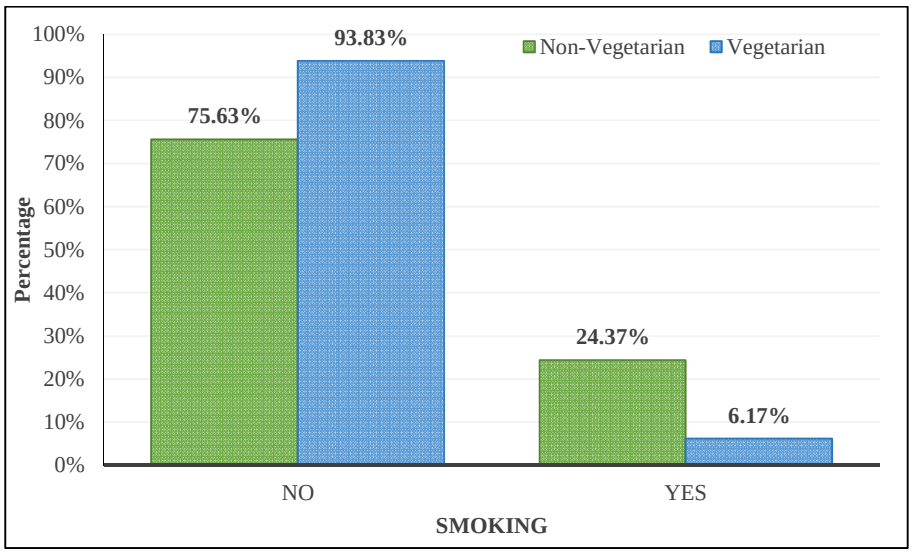

Figure 29: Distribution of smoking over diet pattern.

The following table gives the comparison of family history over diet pattern.

Table 17: Comparison of family history over diet pattern.

Family history	**Non-Vegetarian**	**Vegetarian**	**p-value**
DM	44 (36.97%)	26 (32.1%)	0.4779[C]
HTN	58 (48.74%)	30 (37.04%)	0.1017[C]
Hypothyroidism	30 (25.21%)	22 (27.16%)	0.7576[C]
Obesity	44 (36.97%)	22 (27.16%)	0.1473[C]
IHD	7 (5.88%)	7 (8.64%)	0.4527[C]
No History	36 (30.25%)	33 (40.74%)	0.1256[C]

Abbreviation: C – Chi square test.

There is no statistically significant association between diet pattern and family history of any of the listed conditions (p-values > 0.05).

The following table gives the comparison of vital signs over diet pattern.

Table 18: Comparison of vital signs over diet pattern.

Variables	**Non-vegetarian**	**Vegetarian**	**p-value**
Pulse Rate (bpm)	78.85 ± 8.85 78 (60, 98)	81.11 ± 8.68 82 (62, 98)	0.0898^{MW}
SBP (mmHg)	118.62 ± 9.12 118 (102, 138)	118.78 ± 7.47 120 (106, 136)	0.7024^{MW}
DBP (mmHg)	75.32 ± 7.51 74 (60, 90)	75.78 ± 6.28 76 (60, 90)	0.6415^{MW}

*Abbreviation: t – Two sample t test, MW – Mann Whitney U test, * indicates statistical significance.*

There is no significant difference in the distribution of pulse rate, SBP and DBP over diet pattern (p-values > 0.05).

The following table gives the comparison of anthropometric measurements over diet pattern.

Table 19: Comparison of anthropometric measurements over diet pattern.

Variables	Non-vegetarian	Vegetarian	p-value
Height (cm)	171.5 ± 9.94 173 (148, 190)	167.59 ± 9.25 167 (148, 186)	**0.0056^{t}***
Weight (kg)	70.56 ± 14.96 70 (40, 105)	71.72 ± 16.36 68.3 (46, 125)	0.9930^{MW}
BMI (kg/m2)	23.78 ± 3.54 23.81 (16.53, 30.67)	25.41 ± 4.63 25.2 (15.92, 39.64)	**0.0182^{MW}***
Neck Circumference (cm)	35.43 ± 3.71 36 (29, 43)	33.46 ± 3.1 34 (27, 43)	**< 0.001^{MW}***
Waist Circumference (cm)	86.37 ± 12.27 84 (61, 126)	84.04 ± 10.64 83 (61, 104)	0.1672^{t}
Hip Circumference (cm)	102.62 ± 12.4 102 (76, 147)	95.98 ± 9.88 95 (76, 124)	**< 0.001^{t}***
Waist/Hip Ratio	0.84 ± 0.06 0.85 (0.63, 0.94)	0.88 ± 0.08 0.86 (0.76, 1.17)	**0.0159^{MW}***

*Abbreviation: t – Two sample t test, MW – Mann Whitney U test, * indicates statistical significance.*

Non-vegetarians had a significantly greater height compared to vegetarians (p-value = 0.0056). Although vegetarians had a higher weight than non-vegetarians, the difference was not statistically significant (p = 0.9930). BMI was significantly higher in vegetarians than in non-vegetarians (p-value = 0.0182), suggesting a relatively

higher weight for height among vegetarians. Neck circumference was also significantly larger in non-vegetarians compared to vegetarians (p-value < 0.001). Hip circumference followed the same trend, being significantly larger in non-vegetarians than vegetarians (p-value < 0.001). Conversely, the waist-to-hip ratio was significantly higher in vegetarians compared to non-vegetarians (p-value = 0.0159). Waist circumference did not differ significantly between the two groups (p-value = 0.1672).

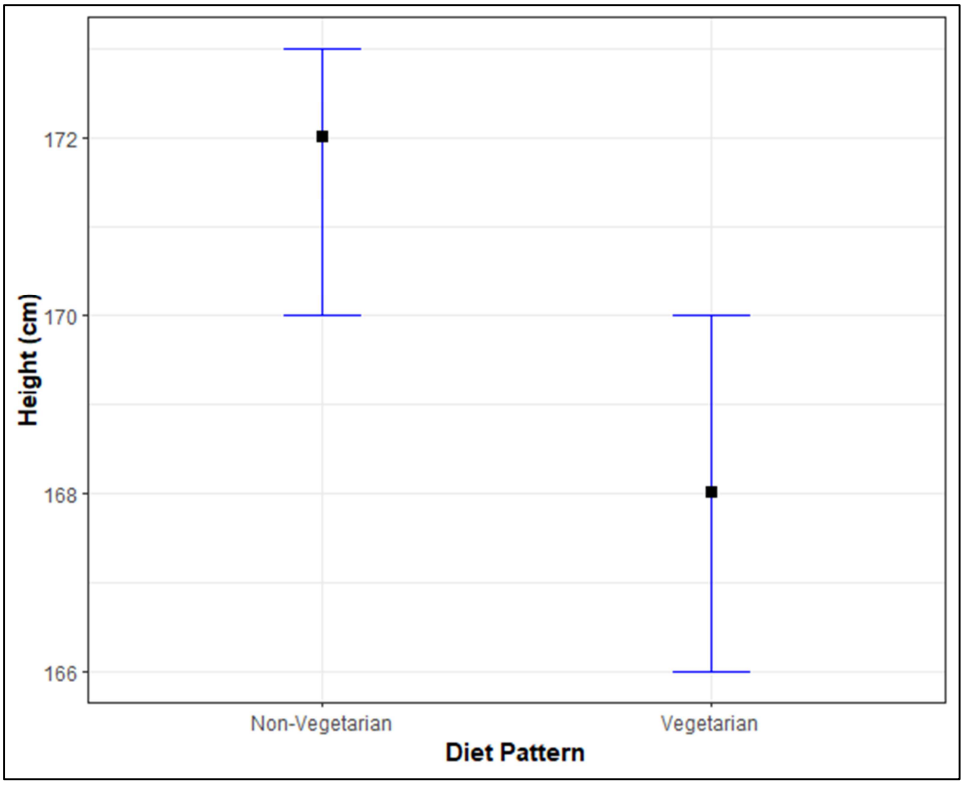

Figure 30: Mean plot of height over diet pattern.

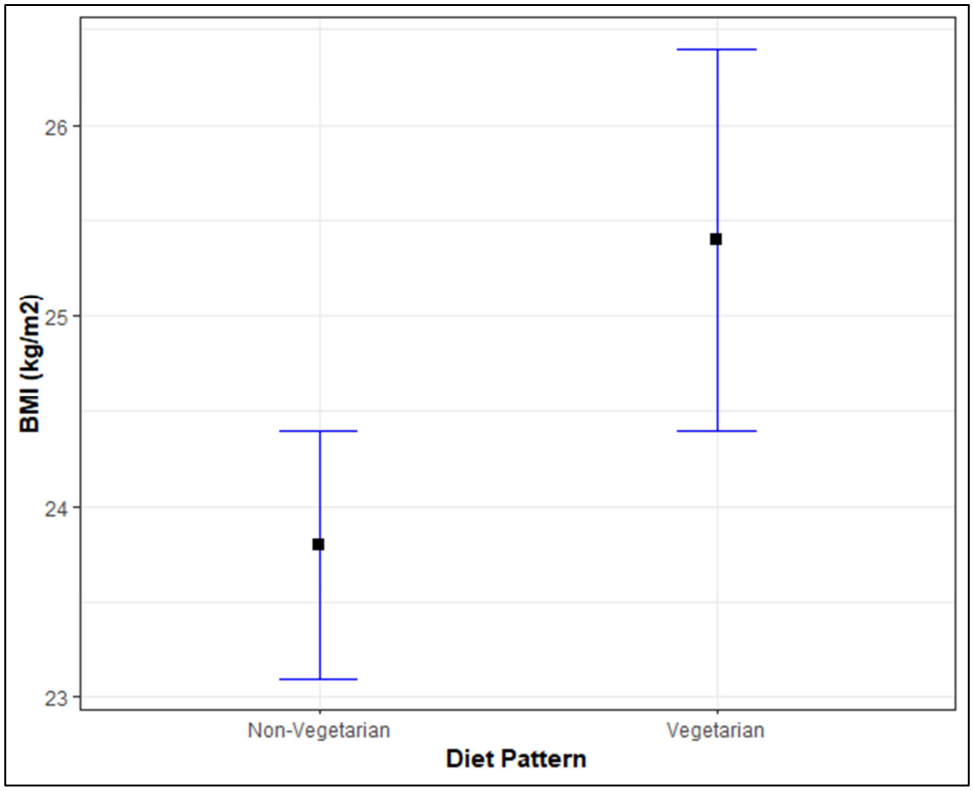

Figure 31: Mean plot of BMI over diet pattern.

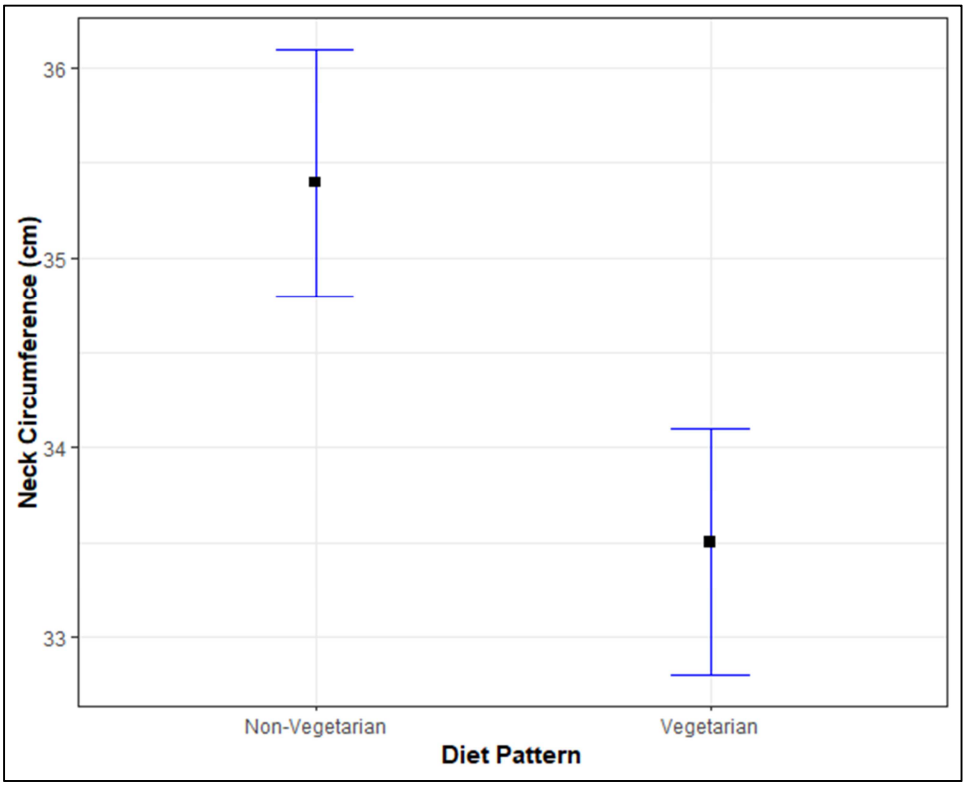

Figure 32: Mean plot of neck circumference over diet pattern.

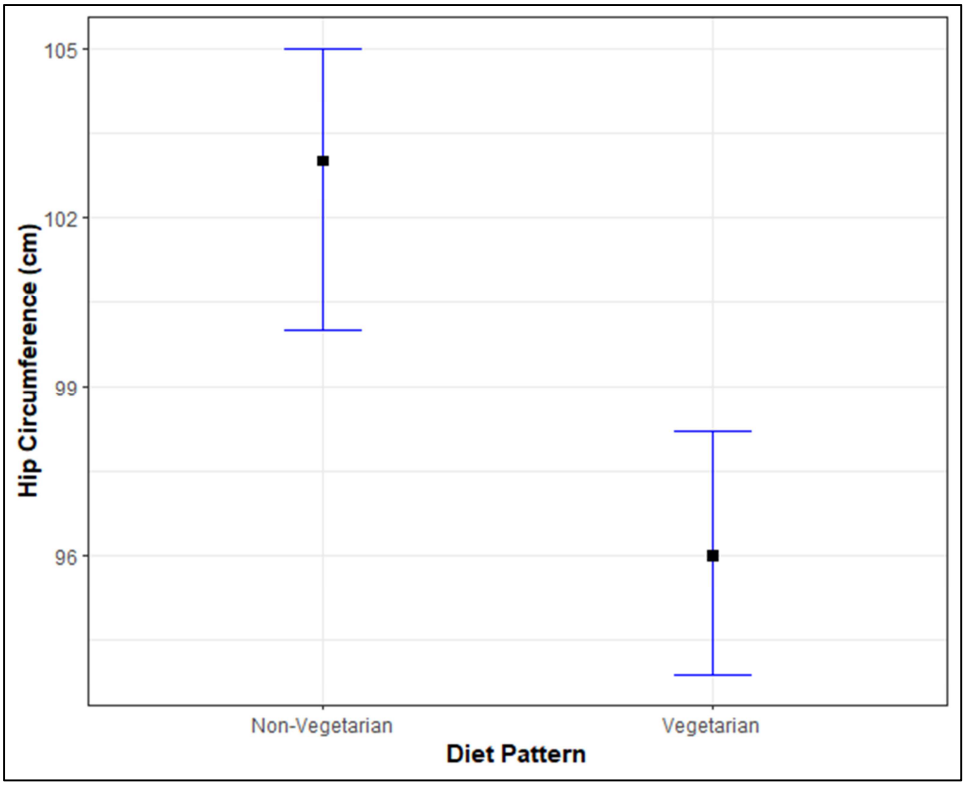

Figure 33: Mean plot of hip circumference over diet pattern.

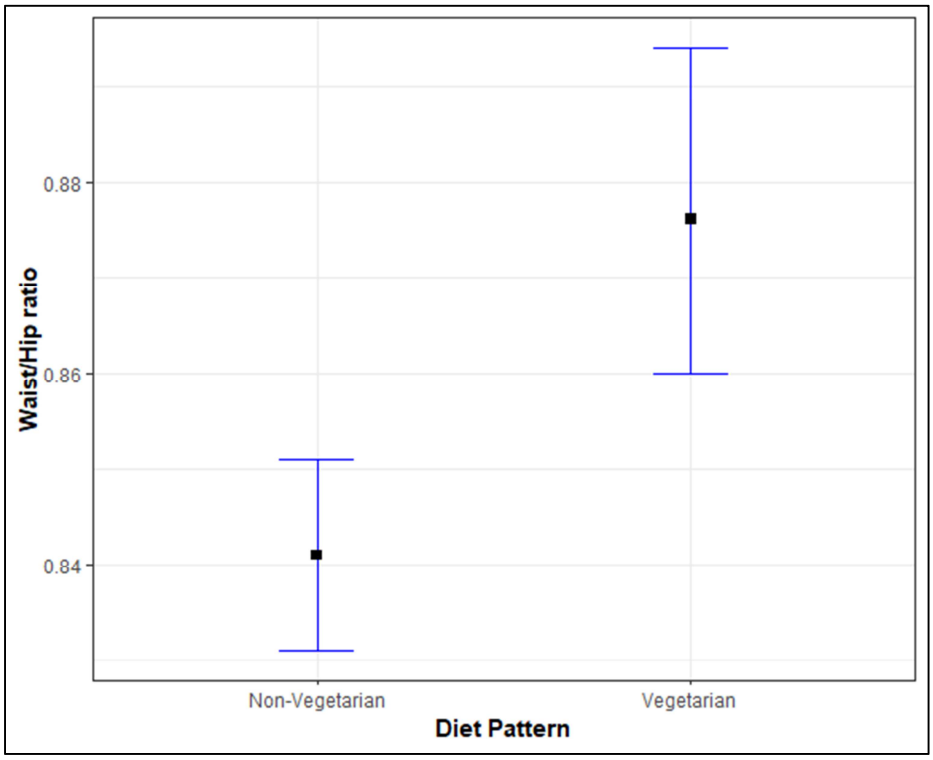

Figure 34: Mean plot of waist/hip ratio over diet pattern.

The following table gives the comparison of biochemical parameters over diet pattern.

Table 20: Comparison of biochemical parameters over diet pattern.

Variables	Sub Category	Non-vegetarian	Vegetarian	p-value
Fasting Sugar Level (mg/dl)	Mean ± SD Median (Min, Max)	83.9 ± 10.36 84 (63, 125)	83.89 ± 11.34 84 (63, 149)	0.8382^{MW}
Serum Cholesterol (mg/dl)	Mean ± SD Median (Min, Max)	153.39 ± 30.92 154 (84, 253)	151.33 ± 28.56 153 (86, 236)	0.6351^{t}
HDL-C (mg/dl)	Mean ± SD Median (Min, Max)	44.71 ± 13.71 42 (24, 120)	51.68 ± 23.3 44 (24, 127)	0.0938^{MW}
LDL-C (mg/dl)	Mean ± SD Median (Min, Max)	94.03 ± 26.25 90 (49, 157)	84.59 ± 22.17 85 (34, 124)	**0.0475^{MW*}**
Serum Triglycerides (mg/dl)	Mean ± SD Median (Min, Max)	121.75 ± 62.39 101 (48, 414)	99.4 ± 40.24 92 (24, 204)	**0.0262^{MW*}**

*Abbreviation: t – Two sample t test, MW – Mann Whitney U test, C – Chi square test, * indicates statistical significance.*

There was no significant difference in fasting sugar levels between non-vegetarians and vegetarians (p-value = 0.8382). Although serum cholesterol levels were higher in non-vegetarians than in vegetarians, the difference was not statistically significant (p-value = 0.6351). However, LDL-C levels were significantly elevated in non-vegetarians compared to vegetarians (p-value = 0.0475), and serum triglycerides were also notably higher in non-vegetarians (p-value = 0.0262). While HDL-C levels were higher in vegetarians, the difference was not statistically significant (p-value = 0.0938).

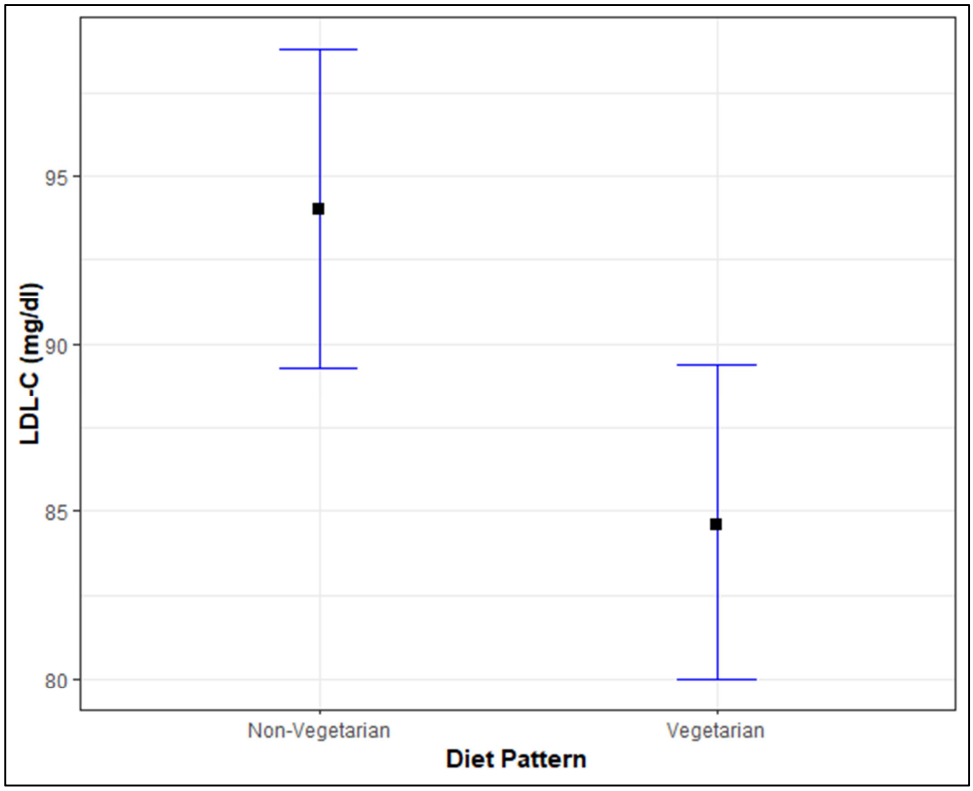

Figure 35: Mean plot of LDL-C over diet pattern.

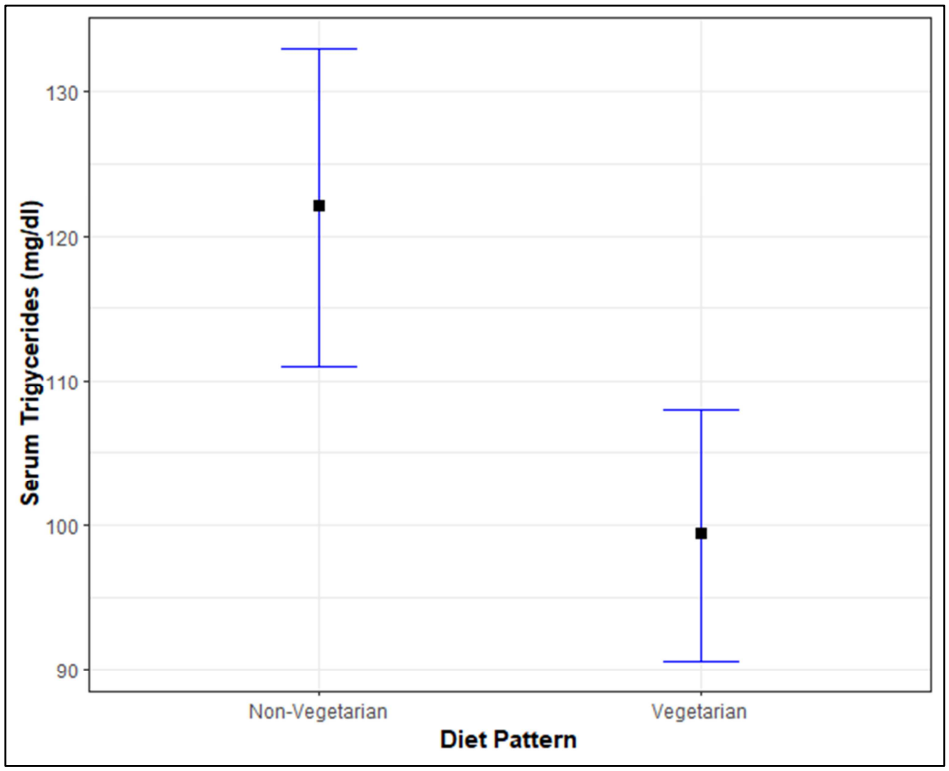

Figure 36: Mean plot of serum triglycerides over diet pattern.

The following table gives the diet pattern wise correlation of BMI with blood pressure and biochemical parameter.

Table 22: Diet pattern wise correlation of BMI with vitals and lipid profile.

Variables	Non-vegetarian		Vegetarian		Total	
	Correlation coefficient	**p-value**	**Correlation coefficient**	**p-value**	**Correlation coefficient**	**p-value**
Pulse Rate (bpm)	0.2808	**0.0024^{SP}***	0.1142	0.3162^{SP}	0.2151	**0.0026^{SP}***
SBP (mmHg)	0.1151	0.2208^{SP}	0.1303	0.2494^{SP}	0.1081	0.1326^{SP}
DBP (mmHg)	0.1349	0.1505^{SP}	0.2037	0.0700^{SP}	0.1647	**0.0214^{SP}***
Serum Cholesterol (mg/dl)	0.2133	**0.0209^{P}***	0.1075	0.3394^{SP}	0.1612	**0.0233^{SP}***
HDL-C (mg/dl)	-0.1413	0.1287^{SP}	0.0039	0.9722^{SP}	-0.0700	0.3270^{SP}
LDL-C (mg/dl)	0.0656	0.4823^{SP}	0.0619	0.5830^{SP}	0.0314	0.6606^{SP}
Serum Triglycerides (mg/dl)	0.3264	**< 0.001^{P}***	-0.0063	0.9552^{SP}	0.1502	**0.0347^{SP}***

*Abbreviation: SP – Spearman's rank correlation test, P – Pearson's correlation test, * indicates statistical significance.*

In non-vegetarians, BMI showed a significant positive correlation with pulse rate (p-value = 0.0024), serum cholesterol (p-value = 0.0209), and serum triglycerides (p-value < 0.001). In vegetarians, no significant correlations were observed between BMI and any of the measured parameters. When considering the total population, BMI was significantly positively correlated with pulse rate (p-value = 0.0026), diastolic blood pressure (p-value = 0.0214), serum cholesterol (p-value = 0.0233), and serum triglycerides (p-value = 0.0347). Systolic blood pressure showed a positive correlation with BMI, but this correlation was not statistically significant. Similarly, no significant correlation was found between BMI and HDL-C or LDL-C in either group.

The following table gives the year wise correlation of BMI with blood pressure and biochemical parameter.

Table 23: Year wise correlation of BMI with vitals and lipid profile.

Variables	First year		Second year		Third year		Fourth year	
	Correlation coefficient	**p-value**	**Correlation coefficient**	**p-value**	**Correlation coefficient**	**p-value**	**Correlation coefficient**	**p-value**
Pulse Rate (bpm)	0.2084	0.1646^{P}	0.3162	**0.0269^{SP}***	0.1773	0.2229^{P}	0.1999	0.1641^{SP}
SBP (mmHg)	-0.0746	0.6182^{SP}	0.1229	0.4000^{SP}	0.1752	0.2285^{SP}	0.1450	0.3149^{SP}
DBP (mmHg)	0.0519	0.7292^{SP}	0.2863	**0.0461^{SP}***	0.2203	0.1283^{P}	0.1381	0.3390^{SP}
Serum Cholesterol (mg/dl)	-0.0612	0.6763^{SP}	0.0840	0.5660^{SP}	0.3676	**0.0086^{P}***	0.2121	0.1393^{SP}
HDL-C (mg/dl)	-0.1021	0.4851^{SP}	-0.1573	0.2804^{SP}	0.0679	0.6395^{SP}	-0.0219	0.8802^{SP}
LDL-C (mg/dl)	-0.1380	0.3445^{P}	0.0750	0.6084^{SP}	0.0284	0.8450^{P}	0.1785	0.2148^{SP}
Serum Triglyceride(mg/dl)	0.1268	0.3853^{P}	0.3080	**0.0313^{SP}***	0.1054	0.4663^{SP}	0.0695	0.6315^{SP}

*Abbreviation: SP – Spearman's rank correlation test, P – Pearson's correlation test, * indicates statistical significance.*

Pulse rate showed a significant positive correlation with BMI in second-year students (p-value = 0.0269), while no significant correlation was observed in other years. Diastolic blood pressure was significantly correlated with BMI in second-year students (p-value = 0.0461), but not in other years. Serum cholesterol levels showed a significant positive correlation with BMI in third-year students (p-value = 0.0086). Serum triglycerides were significantly correlated with BMI in second-year students (p-value = 0.0313), whereas no significant correlation was observed in other years. No significant correlation was found between BMI and HDL-C or LDL-C across all years.

The following table gives the diet pattern wise correlation of waist to hip ratio with blood pressure and biochemical parameter.

Table 24: Diet pattern wise correlation of waist to hip ratio with vitals and lipid profile.

Variables	Non-vegetarian		Vegetarian		Total	
	Correlation coefficient	**p-value**	**Correlation coefficient**	**p-value**	**Correlation coefficient**	**p-value**
Pulse Rate (bpm)	0.0820	0.3834^{SP}	-0.1504	0.1859^{SP}	0.0045	0.9503^{SP}
SBP (mmHg)	0.0661	0.4827^{SP}	-0.1199	0.2896^{SP}	-0.0063	0.9307^{SP}
DBP (mmHg)	0.0261	0.7822^{SP}	-0.0655	0.5638^{SP}	-0.0038	0.9584^{SP}
Serum Cholesterol (mg/dl)	0.1830	**0.0482^{SP}***	0.1109	0.3245^{SP}	0.1510	**0.0337^{SP}***
HDL-C (mg/dl)	-0.1330	0.1529^{SP}	0.0889	0.4301^{SP}	-0.0066	0.9269^{SP}
LDL-C (mg/dl)	0.0758	0.4164^{SP}	0.1263	0.2610^{SP}	0.0677	0.3433^{SP}
Serum Triglycerides (mg/dl)	0.3425	**< 0.001^{SP}***	0.0083	0.9411^{SP}	0.1712	**0.0159^{SP}***

*Abbreviation: SP – Spearman's rank correlation test, * indicates statistical significance.*

Waist-to-hip ratio showed a significant positive correlation with serum cholesterol in non-vegetarians (p-value = 0.0482) and in the total population (p-value = 0.0337), but not in vegetarians. A significant positive correlation was also observed between waist-to-hip ratio and serum triglycerides in non-vegetarians (p-value < 0.001) and in the total population (p-value = 0.0159), whereas no significant correlation was found in vegetarians. No significant correlation was observed between waist-to-hip ratio and pulse rate, systolic blood pressure, diastolic blood pressure, HDL-C, or LDL-C in either group or the total population.

The following table gives the year wise correlation of waist to hip ratio with blood pressure and biochemical parameter.

Table 25: Year wise correlation of waist to hip ratio with vitals and lipid profile.

Variables	First year		Second year		Third year		Fourth year	
	Correlation coefficient	**p-value**	**Correlation coefficient**	**p-value**	**Correlation coefficient**	**p-value**	**Correlation coefficient**	**p-value**
Pulse Rate (bpm)	-0.1764	0.2410^{SP}	-0.1304	0.3718^{SP}	0.1573	0.2804^{P}	0.0880	0.5432^{SP}
SBP (mmHg)	-0.2596	0.0781^{SP}	-0.1957	0.1779^{SP}	0.1222	0.4029^{SP}	0.2926	$\mathbf{0.0392^{SP}*}$
DBP (mmHg)	-0.0275	0.8545^{SP}	-0.2009	0.1662^{SP}	-0.1058	0.4692^{P}	0.2542	0.0748^{SP}
Serum Cholesterol (mg/dl)	-0.1064	0.4668^{SP}	0.1284	0.3793^{SP}	0.3855	$\mathbf{0.0057^{P}*}$	0.2552	0.0737^{SP}
HDL-C (mg/dl)	0.0671	0.6469^{SP}	-0.1167	0.4247^{SP}	0.0287	0.8430^{SP}	-0.0897	0.5357^{SP}
LDL-C (mg/dl)	-0.0573	0.6958^{SP}	-0.1275	0.3827^{SP}	0.1509	0.2955^{P}	0.2879	$\mathbf{0.0426^{SP}*}$
Serum Triglyceride(mg/dl)	-0.0174	0.9055^{SP}	0.1653	0.2564^{SP}	0.3080	$\mathbf{0.0295^{SP}*}$	0.1647	0.2530^{SP}

*Abbreviation: SP – Spearman's rank correlation test, P – Pearson's correlation test, * indicates statistical significance.*

Waist-to-hip ratio showed a significant positive correlation with systolic blood pressure in fourth-year students (p-value = 0.0392). A significant positive correlation was also observed between waist-to-hip ratio and serum cholesterol in third-year students (p-value = 0.0057). Additionally, LDL-C levels were significantly correlated with waist-to-hip ratio in fourth-year students (p-value = 0.0426). Serum triglycerides exhibited a significant positive correlation with waist-to-hip ratio in third-year students (p-value = 0.0295). No significant correlation was observed between waist-to-hip ratio and pulse rate, diastolic blood pressure and HDL-C in any year.

The following table gives the comparison of BMI, Waist/Hip ratio and lipid profile over BP.

Table 26: Comparison of BMI, Waist/Hip ratio and lipid profile over BP.

Variables	**BP**		**p-value**
	Normal	**Prehypertension**	
BMI (kg/m2)	24.09 ± 3.53 24.16 (15.92, 31.2)	25.12 ± 4.93 24.52 (16.53, 39.64)	0.2455^{MW}
Waist/Hip ratio	0.86 ± 0.07 0.86 (0.63, 1.17)	0.85 ± 0.06 0.85 (0.67, 1.03)	0.7136^{MW}
Serum Cholesterol (mg/dl)	148.7 ± 28.73 149 (84, 236)	159.17 ± 30.76 156 (104, 253)	0.0709^{MW}
HDL-C (mg/dl)	47.2 ± 18.12 42 (24, 125)	47.5 ± 17.41 43 (28, 127)	0.7446^{MW}
LDL-C (mg/dl)	87.23 ± 24.67 83 (35, 156)	95.49 ± 25.51 96 (34, 157)	$\mathbf{0.0175^{MW}*}$
Serum Triglycerides (mg/dl)	108.36 ± 49.21 96 (24, 281)	119.72 ± 65.17 97 (42, 414)	0.5454^{MW}

*Abbreviation: MW – Mann Whitney U test, * indicates statistical significance.*

LDL-C levels were significantly higher in individuals with prehypertension compared to those with normal blood pressure (p-value = 0.0175). However, no significant differences were observed in BMI, waist-to-hip ratio, serum cholesterol, HDL-C, or serum triglycerides between the two groups (p-values > 0.05).

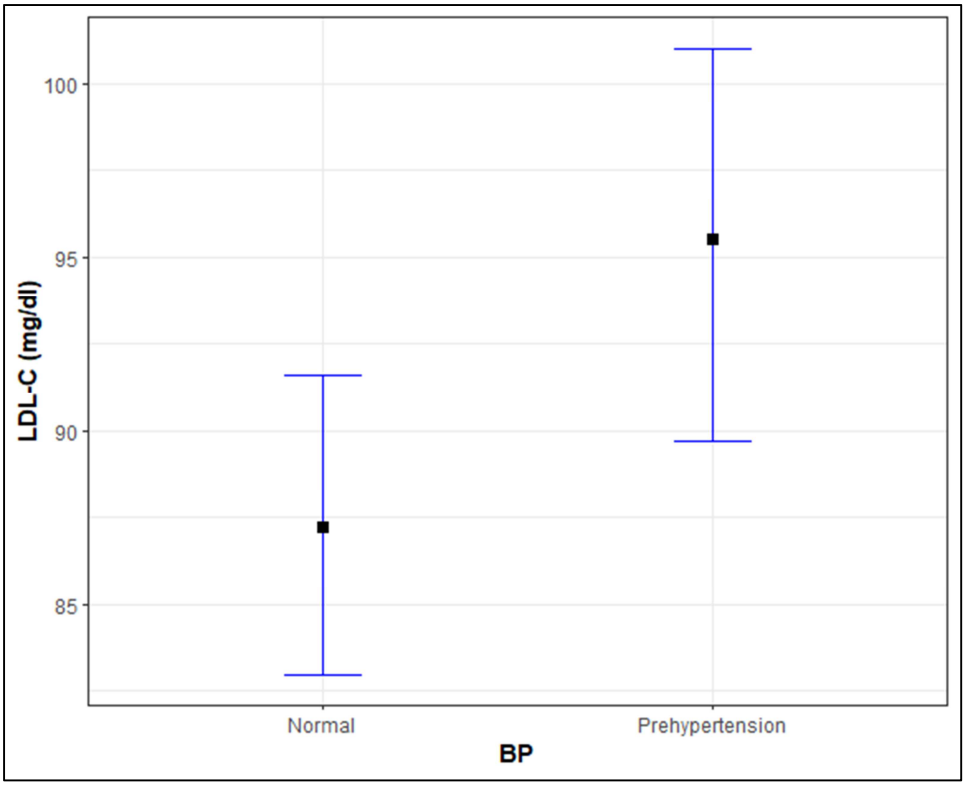

Figure 39: Mean plot of LDL-C over BP.

The following table gives the comparison of lipid profile over family history of IHD.

Table 28: Comparison of lipid profile over family history of IHD.

Variables	**IHD**		**p-value**
	No	**Yes**	
Serum Cholesterol (mg/dl)	153.11 ± 29.73 154 (84, 253)	145.21 ± 32.74 143.5 (86, 202)	0.3426^{t}
HDL-C (mg/dl)	47.73 ± 18.15 43 (24, 127)	45 ± 23.1 38 (28, 120)	0.1440^{MW}
LDL-C (mg/dl)	89.95 ± 24.87 88 (34, 157)	93.57 ± 28.16 82.5 (65, 145)	0.8895^{MW}
Serum Triglycerides (mg/dl)	111.34 ± 55.34 96 (30, 414)	130.71 ± 56.54 131.5 (24, 220)	0.0896^{MW}

Abbreviation: t – Two sample t test, MW – Mann Whitney U test.

There was no significant difference in serum cholesterol levels between individuals with and without a family history of IHD (p-value = 0.3426). HDL-C levels were slightly lower in individuals with a family history of IHD, but this difference was not statistically significant (p-value = 0.1440). Similarly, LDL-C levels did not show a significant difference between the two groups (p-value = 0.8895). Although serum triglyceride levels were higher in individuals with a family history of IHD, the difference was not statistically significant (p-value = 0.0896).

The following table gives the comparison of lipid profile over alcohol consumption.

Table 30: Comparison of lipid profile over alcohol consumption.

Variables	**Alcohol**		**p-value**
	No	**Yes**	
Serum Cholesterol (mg/dl)	151.67 ± 27.29 152 (104, 236)	153.49 ± 32.62 155 (84, 253)	0.5924^{MW}
HDL-C (mg/dl)	51.49 ± 20.34 47 (24, 127)	43.34 ± 15.29 40 (24, 121)	**$< 0.0001^{MW}$***
LDL-C (mg/dl)	87.24 ± 24.44 85 (34, 156)	93.35 ± 25.44 90 (39, 157)	0.0849^{t}
Serum Triglycerides (mg/dl)	103.44 ± 42.18 92 (42, 234)	122.53 ± 65.61 105 (24, 414)	**0.0161^{MW}***

*Abbreviation: t – Two sample t test, MW – Mann Whitney U test, * indicates statistical significance.*

Serum cholesterol and LDL-C levels were higher in individuals who consumed alcohol. However, the differences were not statistically significant (p-value = 0.5924 for serum cholesterol and p-value = 0.0849 for LDL-C). In contrast, HDL-C levels were significantly lower in alcohol consumers (p-value < 0.0001), while serum triglycerides were significantly higher in those who consumed alcohol (p-value = 0.0161).

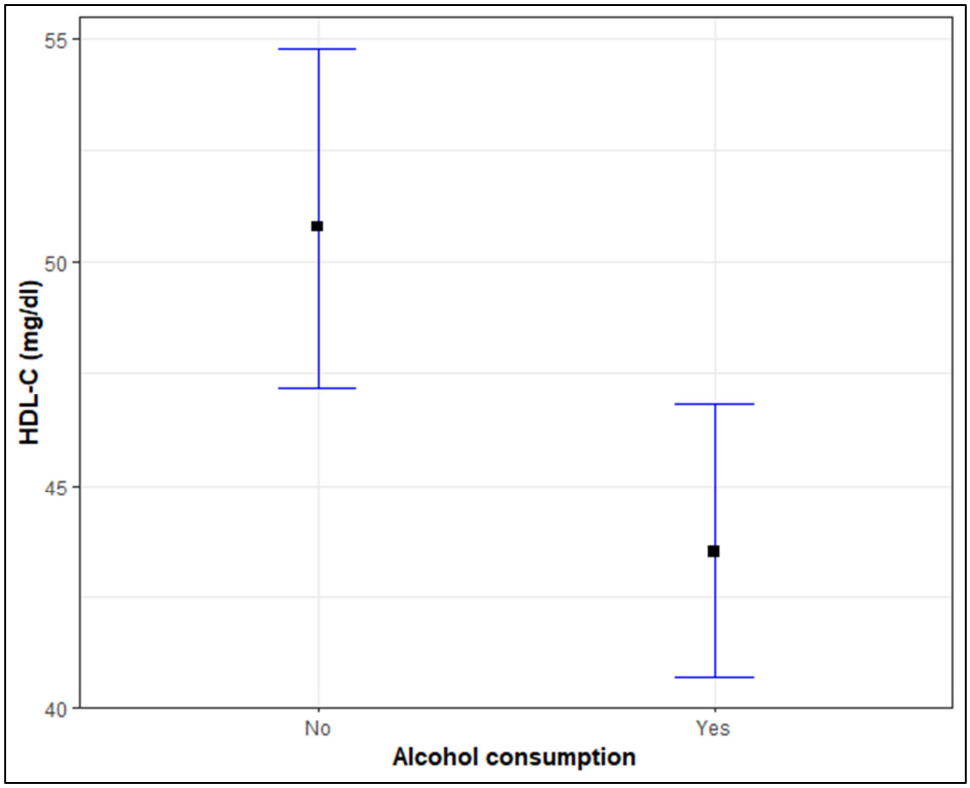

Figure 42: Mean plot of HDL-C over alcohol consumption.

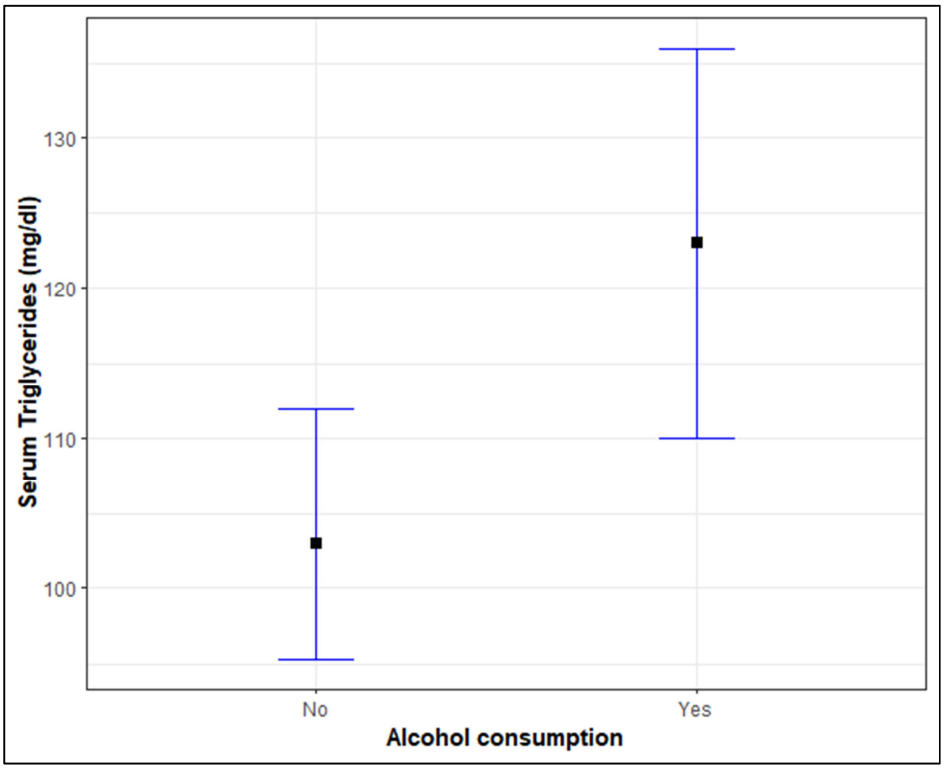

Figure 43: Mean plot of serum triglycerides over alcohol consumption.

The following table gives the comparison of different variables over diet pattern in first year.

Table 31: Comparison of different variables over diet pattern in first year.

Variables	Sub Category	Non-Vegetarian	Vegetarian	p-value
Age (years)	Mean ± SD	19.38 ± 1.02	20.69 ± 1.49	**0.0015^{MW}***
	Median (Min, Max)	19 (19, 23)	21 (19, 23)	
Sex	Female	5 (23.81%)	7 (24.14%)	0.9786^{C}
	Male	16 (76.19%)	22 (75.86%)	
Pulse Rate (bpm)	Mean ± SD	81.95 ± 7.06	80.43 ± 7.52	0.4900^{t}
	Median (Min, Max)	84 (70, 96)	83 (66, 94)	
SBP (mmHg)	Mean ± SD	120.74 ± 9.07	116.62 ± 6.46	0.0726^{t}
	Median (Min, Max)	120 (108, 138)	118 (106, 130)	
DBP (mmHg)	Mean ± SD	76.32 ± 6.81	74.97 ± 6.32	0.6269^{MW}
	Median (Min, Max)	76 (68, 90)	74 (60, 88)	
Alcohol	No	12 (57.14%)	18 (62.07%)	0.7256^{C}
	Yes	9 (42.86%)	11 (37.93%)	
Smoking	No	16 (76.19%)	28 (96.55%)	0.0785^{MC}
	Yes	5 (23.81%)	1 (3.45%)	
Exercise	Very Light Activity	4 (19.05%)	3 (10.34%)	0.6007^{MC}
	Light Activity	4 (19.05%)	7 (24.14%)	
	Moderate Activity	9 (42.86%)	16 (55.17%)	
	Heavy Activity	4 (19.05%)	3 (10.34%)	
Family history				
	HTN	8 (38.1%)	12 (41.38%)	0.8150^{C}
	Hypothyroidism	5 (23.81%)	12 (41.38%)	0.1955^{C}
	Obesity	8 (38.1%)	12 (41.38%)	0.8150^{C}

	IHD	1 (4.76%)	6 (20.69%)	0.2279[C]
	No History	11 (52.38%)	10 (34.48%)	0.2057[C]
Height (cm)	Mean ± SD Median (Min, Max)	174.05 ± 8.85 174.5 (152, 187)	169.62 ± 9.15 169 (148, 185)	0.0980[t]
Weight (kg)	Mean ± SD Median (Min, Max)	72.8 ± 13.88 73.95 (41.5, 98)	72.62 ± 15.03 70 (47.6, 115)	0.9669[t]
BMI (kg/m2)	Mean ± SD Median (Min, Max)	23.88 ± 3.45 23.41 (17.96, 30.04)	25.1 ± 3.97 25.44 (17.95, 37.55)	0.2715[t]
Neck Circumference (cm)	Mean ± SD Median (Min, Max)	36.75 ± 3.27 37 (30, 42)	34.12 ± 2.96 34 (30, 43)	**0.0052[MW]***
Waist Circumference (cm)	Mean ± SD Median (Min, Max)	85.4 ± 11.02 85.5 (61, 108)	84.21 ± 10.99 82 (61, 104)	0.7108[t]
Hip Circumference (cm)	Mean ± SD Median (Min, Max)	102.25 ± 11.86 101.5 (76, 127)	94.76 ± 10.51 94 (76, 120)	**0.0243[t]***
Waist/Hip Ratio	Mean ± SD Median (Min, Max)	0.83 ± 0.04 0.84 (0.76, 0.89)	0.89 ± 0.09 0.88 (0.76, 1.17)	**0.0224[MW]***
Fasting Sugar Level (mg/dl)	Mean ± SD Median (Min, Max)	84.67 ± 8.45 86 (64, 101)	85.31 ± 15.99 84 (63, 149)	0.6939[MW]
Serum Cholesterol (mg/dl)	Mean ± SD Median (Min, Max)	145.86 ± 29.07 152 (84, 183)	141.55 ± 29.85 141 (86, 190)	0.6132[t]
HDL-C (mg/dl)	Mean ± SD Median (Min, Max)	49.52 ± 22.36 42 (25, 120)	56.21 ± 31.19 41 (24, 127)	0.7605[MW]
LDL-C (mg/dl)	Mean ± SD Median (Min, Max)	89.05 ± 27.26 88 (49, 138)	77.55 ± 23.05 75 (34, 114)	0.1135[t]
Serum Triglycerides (mg/dl)	Mean ± SD Median (Min, Max)	110.05 ± 37.13 101 (48, 186)	90.86 ± 37.2 87 (24, 174)	0.0779[t]

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, t – Two sample t test, MW – Mann Whitney U test, * indicates statistical significance.*

In the first year, vegetarians were significantly older than non-vegetarians (p-value = 0.0015). Vegetarians also had a significantly lower neck circumference (p-value = 0.0052), while their hip circumference (p-value = 0.0243) and waist-to-hip ratio (p-value = 0.0224) were higher. However, other health parameters, including blood pressure, fasting sugar levels, lipid profile, showed no significant differences between the two groups. Lifestyle factors such as alcohol consumption, smoking, and exercise patterns were also similar. While some variations in body measurements were observed, overall metabolic and health parameters remained largely comparable between vegetarians and non-vegetarians in the first year.

The following table gives the comparison of different variables over diet pattern in second year.

Table 32: Comparison of different variables over diet pattern in second year.

Variables	Sub Category	Non-Vegetarian	Vegetarian	p-value
Age (years)	Mean ± SD Median (Min, Max)	20.48 ± 0.97 20 (20, 23)	20.71 ± 1.16 20 (20, 23)	0.4926^{MW}
Sex	Female	15 (45.45%)	10 (58.82%)	0.3705^{C}
	Male	18 (54.55%)	7 (41.18%)	
Pulse Rate (bpm)	Mean ± SD	75.09 ± 7.86	82.82 ± 9.75	**0.0039^{t}***
	Median (Min, Max)	76 (62, 92)	86 (68, 96)	
SBP (mmHg)	Mean ± SD	116.36 ± 8.1	120.12 ± 7.76	0.1226^{MW}
	Median (Min, Max)	114 (102, 134)	122 (108, 130)	
DBP (mmHg)	Mean ± SD	73.52 ± 6.98	75.76 ± 5.33	0.3043^{MW}
	Median (Min, Max)	74 (60, 84)	76 (70, 86)	
Alcohol	No	22 (66.67%)	13 (76.47%)	0.4736^{C}
	Yes	11 (33.33%)	4 (23.53%)	
Smoking	No	29 (87.88%)	17 (100%)	0.3043^{MC}
	Yes	4 (12.12%)	0	
Exercise	None	1 (3.03%)	0	0.5852^{MC}
	Very Light Activity	6 (18.18%)	3 (17.65%)	
	Light Activity	6 (18.18%)	5 (29.41%)	
	Moderate Activity	10 (30.3%)	7 (41.18%)	
	Heavy Activity	10 (30.3%)	2 (11.76%)	
Family history	DM	12 (36.36%)	6 (35.29%)	0.9405^{C}
	HTN	20 (60.61%)	6 (35.29%)	0.0897^{C}
	Hypothyroidism	9 (27.27%)	4 (23.53%)	0.9999^{MC}

	Obesity	11 (33.33%)	2 (11.76%)	0.1859^{MC}
	IHD	1 (3.03%)	0	0.9999^{MC}
	No History	7 (21.21%)	5 (29.41%)	0.7431^{C}
Height (cm)	Mean ± SD Median (Min, Max)	168.87 ± 9.78 169 (152, 190)	166.85 ± 10.87 170 (148, 182)	0.5114^{t}
Weight (kg)	Mean ± SD Median (Min, Max)	66.32 ± 12.14 65 (45, 97)	73.22 ± 20.7 65.8 (46, 120)	0.1466^{t}
BMI (kg/m2)	Mean ± SD Median (Min, Max)	23.15 ± 2.99 23.22 (16.53, 28.96)	26.13 ± 5.87 26.39 (15.92, 39.64)	**0.0322^{MW}***
Neck Circumference (cm)	Mean ± SD Median (Min, Max)	33.91 ± 3.09 34 (30, 41)	32.69 ± 3.34 32 (27, 38.5)	0.2145^{MW}
Waist Circumference (cm)	Mean ± SD Median (Min, Max)	84.94 ± 12.24 82 (68, 126)	80.82 ± 10.71 78 (66, 98)	0.3441^{MW}
Hip Circumference (cm)	Mean ± SD Median (Min, Max)	99.97 ± 13.72 96.5 (82, 147)	92.44 ± 9.4 93 (80, 110)	0.0557^{MW}
Waist/Hip Ratio	Mean ± SD Median (Min, Max)	0.85 ± 0.05 0.86 (0.69, 0.92)	0.87 ± 0.07 0.86 (0.78, 1.03)	0.5271^{MW}
Fasting Sugar Level (mg/dl)	Mean ± SD Median (Min, Max)	82.48 ± 10.12 82 (67, 112)	79.82 ± 5.83 79 (71, 92)	0.5052^{MW}
Serum Cholesterol (mg/dl)	Mean ± SD Median (Min, Max)	149 ± 25.5 148 (104, 214)	143.65 ± 23.13 140 (114, 207)	0.4721^{t}
HDL-C (mg/dl)	Mean ± SD Median (Min, Max)	48.64 ± 11.28 49 (26, 80)	54.41 ± 20.99 47 (30, 121)	0.4606^{MW}
LDL-C (mg/dl)	Mean ± SD Median (Min, Max)	89.97 ± 25.51 85 (56, 147)	82.47 ± 21.82 80 (44, 120)	0.4125^{MW}
Serum Triglycerides (mg/dl)	Mean ± SD Median (Min, Max)	113.7 ± 55.47 89 (55, 234)	96.06 ± 28.87 93 (42, 158)	0.9184^{MW}

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, t – Two sample t test, MW – Mann Whitney U test, * indicates statistical significance.*

In the second year, vegetarians and non-vegetarians showed some differences in physiological parameters. Pulse rate was significantly higher in vegetarians (p-value = 0.0039), and their BMI was also notably higher (p-value = 0.0322). However, there were no significant differences in age, sex distribution, blood pressure, fasting sugar levels, cholesterol levels. Lifestyle habits, including alcohol consumption, smoking, and exercise patterns, were also similar. Although vegetarians had lower neck and waist circumferences, these differences were not statistically significant. Overall, while certain body measurements varied, most metabolic and health parameters remained comparable between the two diet groups in the second year.

The following table gives the comparison of different variables over diet pattern in third year.

Table 33: Comparison of different variables over diet pattern in third year.

Variables	Sub Category	Non-Vegetarian	Vegetarian	p-value
Age (years)	Mean ± SD Median (Min, Max)	22.37 ± 0.56 22 (21, 23)	22.2 ± 0.41 22 (22, 23)	0.2118^{MW}
Sex	Female	13 (43.33%)	13 (65%)	0.1330^{C}
	Male	17 (56.67%)	7 (35%)	
Pulse Rate (bpm)	Mean ± SD Median (Min, Max)	78.93 ± 9.99 78 (60, 98)	78.53 ± 8.84 78 (62, 98)	0.8852^{t}
SBP (mmHg)	Mean ± SD Median (Min, Max)	118.67 ± 9.28 118 (106, 136)	117.47 ± 6.89 120 (106, 128)	0.7803^{MW}
DBP (mmHg)	Mean ± SD Median (Min, Max)	76.33 ± 8.54 77 (60, 90)	76.32 ± 5.97 76 (60, 86)	0.9670^{MW}
Alcohol	No	9 (30%)	12 (60%)	**0.0352^{C}***
	Yes	21 (70%)	8 (40%)	
Smoking	No	22 (73.33%)	18 (90%)	0.2959^{MC}
	Yes	8 (26.67%)	2 (10%)	
Exercise	None	1 (3.33%)	1 (5%)	0.7696^{MC}
	Very Light Activity	4 (13.33%)	3 (15%)	
	Light Activity	13 (43.33%)	7 (35%)	
	Moderate Activity	10 (33.33%)	9 (45%)	
	Heavy Activity	2 (6.67%)	0	
Family history	DM	12 (40%)	4 (20%)	0.1375^{C}
	HTN	16 (53.33%)	5 (25%)	**0.0467^{C}***
	Hypothyroidism	7 (23.33%)	3 (15%)	0.7326^{MC}
	Obesity	12 (40%)	3 (15%)	0.0588^{C}
	IHD	1 (3.33%)	1 (5%)	0.9999^{C}
	No History	6 (20%)	13 (65%)	**0.0013^{C}***
Height (cm)	Mean ± SD Median (Min, Max)	168.63 ± 10.59 168.5 (148, 188)	167.65 ± 9.2 165.5 (156, 186)	0.6343^{MW}
Weight (kg)	Mean ± SD Median (Min, Max)	69.26 ± 16.54 68.35 (40, 95)	66.41 ± 13.12 64.45 (47.2, 96.4)	0.5217^{t}

BMI (kg/m2)	Mean ± SD Median (Min, Max)	24.07 ± 3.98 23.75 (16.72, 30.67)	23.52 ± 3.5 23.5 (18.91, 30.49)	0.6122^{t}
Neck Circumference (cm)	Mean ± SD Median (Min, Max)	35.5 ± 3.88 36 (30, 43)	33.13 ± 3.29 33 (28.9, 39)	**0.0298^{t}***
Waist Circumference (cm)	Mean ± SD Median (Min, Max)	85.57 ± 12.17 84 (68, 110)	83.1 ± 10.31 84 (64, 102)	0.4599^{t}
Hip Circumference (cm)	Mean ± SD Median (Min, Max)	101.91 ± 12.2 100.5 (80, 133)	97.08 ± 10.4 95 (80, 124)	0.1528^{t}
Waist/Hip Ratio	Mean ± SD Median (Min, Max)	0.84 ± 0.07 0.86 (0.63, 0.92)	0.86 ± 0.08 0.84 (0.76, 1.03)	0.8660^{MW}
Fasting Sugar Level (mg/dl)	Mean ± SD Median (Min, Max)	85.7 ± 12.67 83 (63, 125)	83.5 ± 7.13 84 (71, 94)	0.9525^{MW}
Serum Cholesterol (mg/dl)	Mean ± SD Median (Min, Max)	155.3 ± 35.81 156 (85, 225)	157.7 ± 21.17 160 (104, 191)	0.7888^{t}
HDL-C (mg/dl)	Mean ± SD Median (Min, Max)	42.1 ± 7.43 43 (28, 57)	49 ± 17.75 45 (30, 98)	0.2979^{MW}
LDL-C (mg/dl)	Mean ± SD Median (Min, Max)	95.77 ± 22.55 93 (60, 156)	88.35 ± 22.24 84.5 (49, 124)	0.2576^{t}
Serum Triglycerides (mg/dl)	Mean ± SD Median (Min, Max)	122.5 ± 70.97 93.5 (58, 282)	101.65 ± 35.49 89.5 (52, 159)	0.7740^{MW}

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, t – Two sample t test, MW – Mann Whitney U test, * indicates statistical significance.*

No significant difference in age, pulse rate, blood pressure, height, weight, BMI, waist circumference, hip circumference, waist/hip ratio, fasting sugar levels, lipid profile were observed between vegetarians and non-vegetarians among third-year students. However, a few variables showed statistically significant differences. Alcohol consumption was significantly higher among non-vegetarians (70%) compared to vegetarians (40%) (p-value=0.0352). A higher proportion of non-vegetarians had a family history of hypertension (53.33% vs. 25%, p-value=0.0467), while vegetarians

were more likely to report no family history of diseases (65% vs. 20%, p-value=0.0013). Additionally, neck circumference was significantly higher in non-vegetarians compared to vegetarians (p-value=0.0298). No significant differences were found in other parameters, including smoking, exercise levels, and metabolic markers.

The following table gives the comparison of different variables over diet pattern in fourth year.

Table 34: Comparison of different variables over diet pattern in fourth year.

Variables	**Sub Category**	**Non-Vegetarian**	**Vegetarian**	**p-value**
Age (years)	Mean ± SD	22.31 ± 0.93	22.4 ± 0.51	0.7244^{MW}
	Median (Min, Max)	23 (20, 23)	22 (22, 23)	
Sex	Female	10 (28.57%)	11 (73.33%)	$\mathbf{0.0033^{C}*}$
	Male	25 (71.43%)	4 (26.67%)	
Pulse Rate (bpm)	Mean ± SD	80.63 ± 8.66	83.73 ± 8.97	0.2561^{t}
	Median (Min, Max)	78 (64, 96)	86 (66, 96)	
SBP (mmHg)	Mean ± SD	119.54 ± 9.83	123.07 ± 8.21	0.2385^{MW}
	Median (Min, Max)	118 (106, 138)	124 (106, 136)	
DBP (mmHg)	Mean ± SD	75.6 ± 7.42	76.67 ± 7.84	0.6489^{t}
	Median (Min, Max)	76 (64, 90)	80 (64, 90)	
Alcohol	No	9 (25.71%)	8 (53.33%)	0.0589^{C}
	Yes	26 (74.29%)	7 (46.67%)	
Smoking	No	23 (65.71%)	13 (86.67%)	0.1929^{MC}
	Yes	12 (34.29%)	2 (13.33%)	
Exercise	None	2 (5.71%)	0	$\mathbf{0.0070^{MC}*}$

	Very Light Activity	10 (28.57%)	4 (26.67%)	
	Light Activity	5 (14.29%)	8 (53.33%)	
	Moderate Activity	18 (51.43%)	2 (13.33%)	
	Heavy Activity	0	1 (6.67%)	
Family history	DM	14 (40%)	5 (33.33%)	0.6563[C]
	HTN	14 (40%)	7 (46.67%)	0.6616[C]
	Hypothyroidism	9 (25.71%)	3 (20%)	0.7531[MC]
	Obesity	13 (37.14%)	5 (33.33%)	0.7970[C]
	IHD	4 (11.43%)	0	0.3173[MC]
	No History	12 (34.29%)	5 (33.33%)	0.9481[C]
Height (cm)	Mean ± SD Median (Min, Max)	174.91 ± 9.01 175 (154, 190)	164.4 ± 7.16 163 (152, 179)	**< 0.001[t]***
Weight (kg)	Mean ± SD Median (Min, Max)	74.26 ± 15.89 75.2 (40.5, 105)	75.38 ± 17.19 75.35 (52.3, 125)	0.7347[MW]
BMI (kg/m2)	Mean ± SD Median (Min, Max)	24.05 ± 3.71 24.56 (16.53, 30.56)	27.72 ± 4.83 26.71 (20.43, 39.01)	**0.0053[t]***
Neck Circumference (cm)	Mean ± SD Median (Min, Max)	36 ± 3.97 36 (29, 42)	33.5 ± 2.83 33 (28, 39)	**0.0324[t]***
Waist Circumference (cm)	Mean ± SD Median (Min, Max)	88.92 ± 13.16 89 (62, 110)	88.6 ± 9.66 92 (73, 103)	0.9335[t]
Hip Circumference (cm)	Mean ± SD Median (Min, Max)	105.86 ± 11.36 104 (81, 128)	100.9 ± 6.56 102 (89, 114)	0.1216[t]
Waist/Hip Ratio	Mean ± SD Median (Min, Max)	0.84 ± 0.07 0.85 (0.63, 0.94)	0.88 ± 0.06 0.88 (0.76, 1.01)	0.0604[MW]

Fasting Sugar Level (mg/dl)	Mean ± SD Median (Min, Max)	83.23 ± 9.55 85 (63, 104)	86.27 ± 9.21 85 (66, 110)	0.4970^{MW}
Serum Cholesterol (mg/dl)	Mean ± SD Median (Min, Max)	160.4 ± 31.73 158 (111, 253)	170.47 ± 30.67 166 (126, 236)	0.2273^{MW}
HDL-C (mg/dl)	Mean ± SD Median (Min, Max)	40.37 ± 11.7 36 (24, 86)	43.4 ± 9.57 42 (28, 59)	0.1681^{MW}
LDL-C (mg/dl)	Mean ± SD Median (Min, Max)	99.34 ± 29.09 89 (64, 157)	95.6 ± 16.49 98 (66, 124)	0.9157^{MW}
Serum Triglycerides (mg/dl)	Mean ± SD Median (Min, Max)	135.71 ± 71.82 107 (66, 414)	116.67 ± 57.71 100 (56, 204)	0.1856^{MW}

*Abbreviation: C – Chi square test, MC – Chi square test with Monte Carlo simulation, t – Two sample t test, MW – Mann Whitney U test, * indicates statistical significance.*

Among fourth-year students, no significant difference was observed between vegetarians and non-vegetarians in age, pulse rate, blood pressure, fasting sugar levels, lipid profile. However, certain variables showed statistically significant differences. The proportion of females was significantly higher among vegetarians (73.33%) compared to non-vegetarians (28.57%) (p-value=0.0033). Non-vegetarians engaged in more moderate physical activity (51.43% vs. 13.33%), while vegetarians participated more in light activity (53.33% vs. 14.29%) (p-value=0.0070). Non-vegetarians had a significantly higher mean height (p-value<0.001), while vegetarians had a significantly higher BMI (p-value=0.0053). Neck circumference was also significantly larger in non-vegetarians compared to vegetarians (p-value=0.0324). No significant differences were found in alcohol consumption, smoking, family history of diseases, waist and hip circumference, waist/hip ratio, or other metabolic markers.

DISCUSSION

In this study, the mean age of participants was 21.34 years, with 58% males. The mean pulse rate and blood pressure values fall within the normal range; however, 36% of participants were prehypertensive, which aligns with studies showing an increasing prevalence of prehypertension among young adults, possibly due to lifestyle factors like stress, diet, and physical inactivity. A study by Kini et al. reported the prevalence of pre-hypertension as 45.2%.[50] Similarly, a study done by Vimala et al. reported the prevalence of pre-hypertension as 52.52% in the age group of 18–30 years.[51] These findings highlight the need for targeted interventions to promote cardiovascular health in this age group.

In this study, a majority (59.5%) followed a non-vegetarian diet. Alcohol consumption was reported by nearly half of the participants (48.5%), with 7.5% engaging in heavy drinking, which could contribute to long-term health risks, including hypertension and liver disorders. In line with our study, a study among medical students reported that 48% of students had ever consumed alcohol.[52] Similarly, a study by Gaikwad et al. reported the prevalence of substance use among undergraduate MBBS students to be 52.5%.[53] In this study, 17% were smokers. A study by Shrestha et al. reported the prevalence of current smoking among selected medical students as 30.1%.[54] Another study found the proportion of students who ever tried cigarette smoking to be 10.9%.[55] A study by Vankhuma et al. found the prevalence of tobacco (cigarette) smoking in medical students was 9.3%.[56]

In this study, physical activity levels varied, with 27.5% engaging in light activity, 40.5% in moderate activity and heavy activity by 11%. In line with our findings, a study by Joy et al. found that 71.1% were found as physically active.[57] Similarly, a

study by Padmapriya et al. reported that 41.3 % showed high levels of physical activity, and 43.2% of students showed moderate levels of physical activity.[58] In this study, we saw a high prevalence of a family history of hypertension (44%), diabetes (35%), and obesity (33%), suggesting a strong genetic component to disease risk, reinforcing the importance of early screening and preventive measures. The mean BMI of 24.45 kg/m² among this study's participants indicates that a substantial proportion of participants may be at risk for overweight or obesity-related complications.[59] Additionally, the mean waist-to-hip ratio of 0.86 suggests a tendency toward central obesity, which is an independent risk factor for metabolic syndrome and cardiovascular diseases.[60] Given the high prevalence of prehypertension and familial predisposition to metabolic diseases, early intervention strategies, such as routine health monitoring and educational programs, should be implemented to promote long-term well-being.

In the study participants, the mean fasting blood sugar was 83.89 ± 10.74 mg/dL, which is within the normal range. The mean serum cholesterol was 152.56 ± 29.93 mg/dL, LDL-C was 90.2 ± 25.06 mg/dL, and triglycerides were 112.69 ± 55.5 mg/dL. These values are also within normal ranges. However, the mean HDL-C among study participants was 47.53 ± 18.48 mg/dL, which is slightly lower than optimal levels (<40 mg/dL for males and <50 mg/dL for females). This is concerning, as low HDL-C is a risk factor for cardiovascular disease.[61]

Trends Across Academic Years

In this study, the statistically significant difference in age across academic years ($p < 0.001$) confirms that age distribution follows a structured pattern, likely reflecting the natural progression of students through their academic years. While minor variations in pulse rate and blood pressure were observed among different academic years, none

of these differences were statistically significant (p-values > 0.05). Most anthropometric measures, including height, weight, BMI, neck circumference, waist circumference, and waist/hip ratio, did not show statistically significant differences over years (p-values > 0.05). However, the hip circumference showed a statistically significant difference across academic years (p-value = 0.0047). As students progress through medical school, their academic workload increases, leading to stress and more sedentary behaviour.[62] This can result in weight gain and fat accumulation, particularly in the lower body. This is supported by the finding in our study that as physical activity levels declined across academic years, fourth-year students reported the highest proportion of very light activity (28%) and the lowest proportion of heavy activity (2%). A study by Joshi et al. reported that waist circumference ($p = 0.036$) and neck circumference ($p = 0.004$) were significantly correlated with levels of physical activity.[46] Along with this, the increase in non-vegetarian diets and alcohol consumption across academic years may also contribute to caloric surplus and fat accumulation.[63]

This study highlights significant lifestyle changes across academic years, with increasing non-vegetarianism, alcohol consumption, and smoking ($p < 0.05$). While fasting blood sugar remained stable ($p = 0.1977$), worsening lipid profiles—elevated cholesterol, LDL-C, and triglycerides, alongside lower HDL-C ($p < 0.05$) suggest an increased risk of cardiovascular issues. These findings indicate that academic progression is associated with lifestyle modifications that may negatively impact long-term health. Increased stress, changing social environments, and dietary shifts could contribute to these trends.[6] The decline in exercise and rise in unhealthy habits highlight the need for health promotion initiatives, including nutrition education,

physical activity programs, and stress management strategies, to encourage healthier behaviours among students.

Comparison over diet pattern

This study found no age differences between vegetarians and non-vegetarians ($p = 0.9206$), but significantly more females followed a vegetarian diet ($p = 0.0416$). Non-vegetarians exhibited higher alcohol consumption ($p = 0.0075$) and smoking prevalence ($p < 0.001$), though exercise patterns were similar ($p = 0.3423$). In line with our study, a study by Shridhar et al. reported that vegetarians were less likely to smoke or drink alcohol ($p<0.0001$).[64] Metabolically, in study participants, non-vegetarians had significantly higher LDL-C ($p = 0.0475$) and triglycerides ($p = 0.0262$), indicating a poorer lipid profile. This aligns with the findings of a study that conducted multivariate analysis and found that vegetarians had lower levels of total cholesterol ($p=0.006$), triglycerides ($p=0.02$), and LDL ($p=0.03$).[64]

Vegetarianism is linked to lower cardiovascular risk factors, including improved cholesterol profiles due to reduced intake of saturated fats and higher fibre consumption, which improves lipid metabolism.[65] These findings suggest dietary patterns are linked to metabolic and anthropometric differences.

In this study, among non-vegetarians, BMI correlated with pulse rate ($p = 0.0024$), cholesterol ($p = 0.0209$), and triglycerides ($p < 0.001$), while no such associations were seen in vegetarians. In the total population, BMI was linked to pulse rate ($p = 0.0026$), diastolic blood pressure ($p = 0.0214$), cholesterol ($p = 0.0233$), and triglycerides ($p = 0.0347$). Waist-to-hip ratio correlated with cholesterol in non-vegetarians ($p = 0.0482$) and the total population ($p = 0.0337$). A study by Tang et al. reported significant interactions between overweight/obesity and dyslipidaemia.[66] In

this study, prehypertension was associated with higher LDL-C ($p = 0.0175$), while alcohol consumption led to lower HDL-C ($p < 0.0001$) and higher triglycerides ($p = 0.0161$). A study by Wang et al. observed that total cholesterol, TG, LDL-C, and BMI were significantly higher and HDL-C levels were significantly lower in prehypertensive subjects ($p <0.05$).[67]

In this study, among first-years, vegetarians were older ($p = 0.0015$) with lower neck circumference ($p = 0.0052$) but higher hip circumference ($p = 0.0243$) and waist-to-hip ratio ($p = 0.0224$), with no metabolic or lifestyle differences. In the second year, vegetarians had a higher pulse rate ($p = 0.0039$) and BMI ($p = 0.0322$), but other parameters were similar. Among third-years, non-vegetarians had higher alcohol intake ($p = 0.0352$), more hypertension in family history ($p = 0.0467$), and larger neck circumference ($p = 0.0298$), while vegetarians reported fewer family diseases ($p = 0.0013$). In the fourth year, more females were vegetarian ($p = 0.0033$), non-vegetarians engaged in more moderate activity ($p = 0.0070$) and were taller ($p < 0.001$), while vegetarians had higher BMI ($p = 0.0053$). Metabolic markers showed no significant differences across years.

The findings suggest that while vegetarians and non-vegetarians exhibit some variations in anthropometric parameters, these differences do not translate into significant metabolic or cardiovascular disparities. The physical activity differences in fourth-year students suggest lifestyle shifts, potentially influenced by academic workload. Despite these differences, metabolic markers remained stable across the years, indicating that while dietary patterns influence anthropometric and lifestyle factors, their impact on metabolic health may take longer to manifest or may be mitigated by the relatively young age of the participants.

STRENGTHS AND LIMITATIONS

Strengths

1. The study ensures equal representation of vegetarians and non-vegetarians. This approach minimised selection bias and enhanced the generalizability of the findings to the broader medical student population.

2. The use of systematic sampling based ensured a fair and unbiased selection of participants.

3. Biochemical parameters, including lipid profiles and fasting blood glucose, were analysed using standardised laboratory methods, ensuring the accuracy and reliability of the results.

Limitations

1. Lifestyle factors such as diet, alcohol consumption, smoking, and physical activity were self-reported, which may introduce recall bias or inaccuracies.

2. Despite efforts to control for confounders, unmeasured factors such as stress levels, sleep patterns, and genetic predispositions could have influenced the results.

CONCLUSION

This study revealed significant shifts in lifestyle and health parameters across academic years. Non-vegetarianism, alcohol consumption, and smoking prevalence increased significantly, while physical activity levels declined, particularly in senior students. These changes were associated with worsening lipid profiles, including increased serum cholesterol, LDL-C, and triglycerides, and decreased HDL-C, indicating potential cardiovascular risks. Comparisons between vegetarians and non-vegetarians showed non-vegetarians had higher alcohol consumption, smoking rates, and poorer lipid profiles, while vegetarians exhibited higher BMI and waist-to-hip ratios but better lipid outcomes. Across academic years, vegetarians and non-vegetarians displayed varying trends in anthropometric measurements and lifestyle behaviors, but metabolic markers remained largely stable, highlighting the complex interplay between diet, lifestyle, and health. The study highlights the need for interventions to promote healthier lifestyles among medical students, particularly in later academic years when unhealthy habits and stress become more prevalent. Strategies such as nutritional counselling, stress management, and physical activity promotion could mitigate adverse health changes.

SUMMARY

- The mean age of participants was 21.34 ± 1.42 years, with a range of 19 to 23 years.
- The mean pulse rate was 79.76 ± 8.83 bpm. A majority (62.5%) had normal blood pressure, while 36% were prehypertensive.
- 59.5% followed a non-vegetarian diet, while 40.5% were vegetarians.
- 35% had a family history of diabetes mellitus (DM), 44% had a history of hypertension (HTN), and 33% had a history of obesity.
- Anthropometric Measurements: The mean height was 169.9 ± 9.83 cm, and the mean weight was 71.03 ± 15.52 kg. The mean BMI was 24.45 ± 4.09 kg/m^2. Waist-to-hip ratio had a mean of 0.86 ± 0.07.
- Metabolic Parameters: The mean fasting blood sugar was 83.89 ± 10.74 mg/dL. The mean serum cholesterol was 152.56 ± 29.93 mg/dL. The mean HDL-C was 47.53 ± 18.48 mg/dL, while LDL-C was 90.2 ± 25.06 mg/dL. The mean serum triglycerides level was 112.69 ± 55.5 mg/dL.
- **Trends Across Academic Years**
  i. The proportion of non-vegetarians increased from 42% in the first year to 70% in the fourth year (p-value = 0.0231).
  ii. Alcohol consumption increased significantly across years (p-value = 0.0010).
  iii. Exercise levels decreased over the years, with more fourth-year students engaging in very light activity (28%) compared to first-year students (14%).
  iv. Serum cholesterol, LDL-C, and triglyceride levels increased significantly across academic years, while HDL-C levels declined.

- **Comparison over diet pattern**

  i. More females followed a vegetarian diet (50.62%) compared to males (36.13%) (p-value = 0.0416).

  ii. Alcohol consumption (p-value = 0.0075) and smoking (p-value < 0.001) were significantly higher in non-vegetarians.

  iii. Non-vegetarians had significantly greater height (p-value = 0.0056) and larger neck and hip circumferences (p-value < 0.001).

  iv. Vegetarians had a significantly higher BMI than non-vegetarians (p-value = 0.0182).

  v. LDL-C (p-value = 0.0475) and serum triglycerides (p-value = 0.0262) were significantly higher in non-vegetarians.

- **Correlations and Associations**

  i. BMI was positively correlated with pulse rate, DBP, serum cholesterol, and triglycerides.

  ii. Waist-to-hip ratio showed a significant correlation with serum cholesterol and triglycerides in non-vegetarians.

  iii. LDL-C levels were significantly higher in individuals with prehypertension (p-value = 0.0175).

  iv. HDL-C levels were significantly lower in alcohol consumers (p-value < 0.0001), while triglycerides were significantly higher (p-value = 0.0161).

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ANNEXURE – I - INFORMED CONSENT FORM

"STUDY OF METABOLIC PARAMETERS IN THE MEDICAL STUDENTS OF JAWAHARLAL NEHRU MEDICAL COLLEGE – A ONE YEAR CROSS SECTIONAL STUDY IN KLE DR. PRABHAKAR KORE HOSPITAL AND MRC, BELAGAVI"

Name of Student/Principal Investigator:

Name of Guide/Co Investigators:

Introduction: The normal level of lipids in the blood certainly has an important function in the body, but an abnormal level of lipids in the blood (dyslipidaemia) may lead to the formation of atherosclerosis.

Atherosclerosis can cause the disruption of blood flow to the arteries in the heart, brain, kidney and lower extremities which in turn can lead to several disease such as Coronary heart disease (CHD), stroke and peripheral artery disease.

Cardiovascular disease (CVD) and type-II diabetes are major noncommunicable diseases (NCDs) accounting for 33.9% of total deaths and 15.7% of all disability-adjusted life years-(DALY's) in 2013 worldwide.

A person at risk for cardiovascular disease and stroke may be monitored by reviewing a lipid profile.

A lipid profile is a type of examination designed to verify blood lipid levels. Common lipid profiles used for clinical purposes include total cholesterol, high-density lipoprotein (HDL), low density lipoprotein (LDL), and triglycerides (TG).

The lipid profile may be influenced by several factors, including age, gender, diet, physical activity, and smoking.

Several previous epidemiological studies from developed countries have shown that an unhealthy dietary pattern affects plasma lipid levels, inflammation biomarkers and other cardiovascular risk factors.

Maintaining a good diet, by consuming a low-fat diet that primarily contains unsaturated fats with low cholesterol levels is a preventive measure against the development of atherosclerosis.

Numerous studies have demonstrated the benefits of diets high in fruit, vegetables, whole grains, and fish, as well as low in red meat, high-fat dairy products, and trans- and saturated fats.

According to epidemiological food and health studies, vegetarians have a protective effect on the body over non-vegetarians.

In recent years, there is an increasing worldwide inclining towards a vegetarian diet because of its proposed benefits, for example, higher content of fibres, high levels of unsaturated fats, antioxidants vitamins A, C, E, K, Folate, potassium, numerous phytochemicals, reduced blood pressure, BMI, serum total cholesterol levels and saturated fats. The plant products have low concentration and fat absorption.

However, the long-term omission of animal foods may lead to scarcity of certain nutrients which are not easily available through plant source, like red meat is valuable as a source of protein, iron, vitamin B12, and other B vitamins in the human diet, but high consumption of red meat as seen in many Western nations is associated with a greater risk of morbidity and mortality from CVD, some types of oncological

diseases, diabetes, obesity and other non-communicable diseases. Such diets may contain high levels of total and saturated fats in addition to cholesterol.

Explanation of procedure: Patient will be selected according to inclusion criteria and blood sample will be drawn for determination of metabolic analysis in various type of race and ethnicity and various diet pattern. This blood investigation will be done in routine complete count investigation.

Withdrawal from participation in the study: Participation in this study in voluntary. You will be free to decide whether to participate in this study or continue participation once enrolled. In case you decide to withdraw your participation, you are free to do so. However, please convey the decision to the principal investigator.

Possible benefits from participating in the study: You will get any benefits by participating in this study. As early diagnosis will be helpful to determine further course of treatment**.** The data gathered will help population at large.

Possible risks from participating in the study: There are no risks involved in participating in this study.

Privacy and confidentiality: The information collected from you will be coded, to prevent any person to identify you. Your identity will never be revealed. The data collected from you will be kept confidential and only processed or aggregated data will be used for publication.

Financial incentives: You will not receive any payment for participating in this study.

Cost of investigations done during the course of study will be paid by the principal investigator**.** (Strike out which is not applicable)

Authorization for publication of aggregated data: Results obtained after processing of the aggregated data will be published for scientific purpose and or presented to scientific groups. However, your identity will never be revealed.

Questions: In case of any questions with regard to this study, you are free to contact:

If you have any question or complaints with regard to your right as study participant you may contact Dr Harsha Hegde, Chairperson, Ethical committee of JNMC, 0831-2473777 Extension 4052.

Legal rights: By signing this consent form, we are not waving any of your legal rights

CONSENT STATEMENT

I am making a voluntary decision to participate in the **"STUDY OF METABOLIC PARAMETERS IN THE MEDICAL STUDENTS OF JAWAHARLAL NEHRU MEDICAL COLLEGE – A ONE YEAR CROSS SECTIONAL STUDY IN KLE DR. PRABHAKAR KORE HOSPITAL AND MRC, BELAGAVI"**

My signature below indicates that I have decided to participate and I have read the information provided above or the information provided above has been read to me in the language that I understand best. I was given the opportunity to ask questions and that they have been answered to my satisfaction.

Name of the participant:

Signature or left thumb impression of the participant:

Name of the witness:

Signature or left thumb impression of the witness:

Name of the investigator:

Signature of the investigator:

ANNEXURE -II RESEARCH QUESTIONNAIRE

INVESTIGATOR:

[Note: The personal data will be kept confidential. Only aggregated results will be presented/ published without revealing your personal identity.]

SL. No _____ Date: _____

1.SOCIODEMOGRAPHIC DETAILS:

1. NAME:
2. AGE:
3. SEX:
4. PERMANENT AREA OF RESIDENCE:
5. EDUCATION:
6. NO. OF FAMILY MEMBERS
7. FATHER'S OCCUPATION:
8. MOTHER'S OCCUPATION:
9. INCOME: ◯ LESS THAN 10,000 ◯ LESS THAN 50000 ◯ LESS THAN 1LAKH ◯LESS THAN 5 LAKHS ◯ LESS THAN 10 LAKHS ◯ LESS THAN 25 LAKHS ◯ LESS THAN 50 LAKHS

2.DIET-RELATED DETAILS:

[NOTE: MORE THAN ONE ANSWER CAN BE TICKED FOR THE SAME QUESTIONS]

1.) DO YOU CONSUME ANY KIND OF MEAT?

◯ YES ◯ NO

2.) IF YES TO THE ABOVE QUESTION, WHAT KIND OF MEAT DO YOU CONSUME?

◯ CHICKEN ◯ GOAT ◯ LAMB ◯ FISH ◯ SEAFOOD

◯ PORK ◯ TURKEY ◯ BEEF ◯ DUCK

◯ ANY OTHER KIND OF MEAT _____

3.) IF YES TO QUESTION, HOW FREQUENTLY DO YOU CONSUME ANY KIND OF MEAT?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

4.) IF YOU ARE A MEAT CONSUMER, HOW FREQUENT DO YOU EAT MEAT FROM OUTSIDE?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

5.) IF YOU ARE VEGETARIAN, SINCE HOW LONG HAVE YOU BEEN VEGETARIAN?

◯ SINCE LAST 6 MONTHS ◯ LESS THAN 1 YEAR ◯ LESS THAN 5 YEARS

◯ LESS THAN 10 YEARS ◯ ALWAYS BEEN A VEGETARIAN

6.) IF YOU ARE A VEGETARIAN, DO YOU CONSUME EGGS?

◯ YES ◯ NO

7.) IF THE ANSWER TO THE ABOVE QUESTION IS YES, HOW OFTEN DO YOU CONSUME EGGS?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

8.) DO YOU CONSUME MILK, IF YES HOW DO YOU CONSUME THE MILK?

◯YES ◯NO

IF YES,

◯DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

9.) DO YOU TAKE DAIRY PRODUCTS LIKE CHEESE, YOGHURT, PANEER, ETC. IN YOUR DIET, AND IF YES DO YOU EXCLUDE MILK FROM YOUR DIET?

◯YES ◯NO

IF YES, EXCLUSION OF THE MILK FROM THE DIET?

◯YES ◯NO

10.) HOW OFTEN DO YOU CONSUME DAIRY PRODUCTS IN YOUR DAILY DIET?

◯DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ONCE IN A MONTH ◯2-3 TIMES IN A MONTH◯ ONCE IN 2-3 MONTH

11.) DO YOU CONSUME FRUITS, AND IF YES HOW OFTEN IN YOUR DIET?

◯YES ◯NO

IF YES,

◯DAILY ◯ ONCE A WEEK◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ONCE IN 2-3 MONTH

12.) IF YOU CONSUME FRUITS, WHICH ARE THE MOST COMMON FRUITS DO YOU CONSUME?

13.) DO YOU CONSUME SUPER FOODS LIKE SEEDS, AND IF YES HOW OFTEN DO YOU CONSUME IT?

◯YES ◯ NO

IF YES,

◯DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

14.) HOW OFTEN DO YOU CONSUME GREEN, LEAFY VEGETABLES IN YOUR DIET?

◯DAILY ◯ONCE A WEEK ◯MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯2-3 TIMES IN A MONTH ◯ONCE IN 2-3 MONTH

15.) HOW OFTEN DO YOU CONSUME OILY FOOD?

◯DAILY ◯ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯2-3 TIMES IN A MONTH ◯ONCE IN 2-3 MONTH

HOW OFTEN DO YOU CONSUME FOOD FROM OUTSIDE LIKE STREET VENDORS, YOU BEING VEGETARIAN OR NON/ VEGEATRIAN?

◯DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯2-3 TIMES IN A MONTH◯ ONCE IN 2-3 MONTH

16.) HOW OFTEN DO YOU CONSUME SWEETS LIKE CHOCOLATE, PASTRIES, JALEBIS, LADOOS, ETC IN YOUR DIET?

◯DAILY ◯ONCE A WEEK ◯MORE THAN ONCE A WEEK

◯ONCE IN A MONTH ◯2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

17.) IF YOU ARE VEGETARIAN, DO YOU EAT ONLY ORGANIC FOODS?

◯YES ◯ NO

18.) DO YOU TAKE ANY KIND OF DIET SUPPLEMENTS, IF YES WHAT?

◯YES ◯ NO

19.) ARE YOU IN TRANSITION PERIOD OF VEGETARIAN TO NON-VEGETARIAN DIET OR VICE-VERSA?

◯YES ◯NO

SINCE WHEN?

3.GENERAL DETAILS:

[NOTE: MORE THAN ONE ANSWER CAN BE TICKED FOR THE SAME QUESTIONS]

20.) DO YOU CONSUME ALCOHOL, IF YES HOW FREQUENTLY AND HOW MUCH?

◯YES ◯ NO

IF YES,

◯DAILY ◯ ONCE A WEEK ◯MORE THAN ONCE A WEEK

◯ONCE IN A MONTH ◯2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

HOW MUCH?

21.) DO YOU SMOKE, IF YES HOW FREQUENTLY DO YOU SMOKE AND HOW MANY CIGARETTES?

◯YES ◯ NO

IF YES,

◯DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ONCE IN A MONTH ◯2-3 TIMES IN A MONTH ◯ONCE IN 2-3 MONTH

NO. OF CIGARETTES _____

22.) IF IT IS YES TO THE ABOVE QUESTION, SINCE WHEN ARE YOU SMOKING?

23.) DO YOU DO ANY OTHER KINDS OF DRUG ABUSE, IF YES WHICH ONE AND HOW FREQUENTLY?

◯YES ◯ NO

IF YES, WHAT KIND OF DRUG ABUSE?

◯DAILY ◯ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ONCE IN 2-3 MONTH

24.) DO YOU DO EXERCISE IN ANY FORM, IF YES WHICH ONE AND HOW FREQUENTLY DO YOU EXERCISE?

◯YES ◯ NO

IF YES,

KIND OF EXERCISE YOU DO_____

◯DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH◯ ONCE IN 2-3 MONTH

25.) DO YOU PLAY SPORTS, IF YES WHICH KIND OF SPORTS DO YOU PLAY?

◯YES ◯ NO

IF YES, WHICH KIND _____

26.) IF IT IS YES TO THE ABOVE QUESTION, HOW FREQUENTLY DO YOU PLAY?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ONCE IN 2-3 MONTH

27.) DO YOU GO TO THE GYM, IF YES HOW FREQUENTLY DO YOU GO TO THE GYM?

◯YES ◯ NO

IF YES,

◯DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

28.) IF IT IS YES TO THE ABOVE QUESTION, HOW MUCH TIME DO YOU SPENT IN THE GYM?

29.) DO YOU TAKE ANY KIND OF SUPPLEMENTS RECOMMENDED BY THE GYM OR THE TRAINERS?

30.) HOW WOULD YOU DESCRIBE YOUR DAILY ACTIVITY?

◯ SEDENTARY ◯MILD ◯MODERATE ◯VIGOROUS

31.) EXPOSURE TO SUNLIGHT?

◯ LESS THAN 15 MINS ◯15-30 MINS ◯MORE THAN 30MINS

32.) QUALITY OF VITAMIN D RICH FOOD?

◯ POOR ◯GOOD ◯EXTRAORDINARY

33.) DO YOU TAKE VITAMIN D SUPPLEMENTS?

◯YES ◯ NO

34.) DO YOU TAKE OMEGA 3 FATTY ACIDS RICH FOODS?

◯YES ◯ NO

35.) HAVE YOU RECENTLY INVESTIGATED YOUR VITAMIN D LEVELS?

◯ YES ◯ NO

36.) ARE YOU AWARE THAT LARGE NO. OF POPULATION IS VITAMIN D DEFICIET?

◯ YES ◯ NO

ANNEXURE III- PROFORMA

INVESTIGATOR:

1.NAME:

2.AGE/SEX:

3.PERMANENT AREA OF RESIDENCE:

4.ANY HISTORY OF PAST ILLNESS (PAST HISTORY):

5.ANY TREATMENT TAKEN:

6.FAMILY HISTORY:

FATHER'S HISTORY OF ILLNESS :-

DIABETES MELLITUS --- ◯ YES ◯ NO

HYPERTENSION ---- ◯ YES ◯ NO

THYROID DISORDERS --- ◯ YES ◯ NO

OBESITY --- ◯ YES ◯ NO

METABOLIC SYNDROME --- ◯ YES ◯ NO

ISCHEMIC HEART DISEASE --- ◯YES ◯ NO

IF ANY OTHER ILLNESS, PLS MENTION

MOTHER'S HISTORY OF ILLNESS: -

DIABETES MELLITUS -◯ YES ◯ NO

HYPERTENSION ---- ◯ YES ◯ NO

THYROID DISORDERS --- ◯ YES ◯ NO

OBESITY --- ◯ YES ◯ NO

METABOLIC SYNDROME --- ◯ YES ◯ NO

ISCHEMIC HEART DISEASE --- ◯YES ◯ NO

IF ANY OTHER ILLNESS, PLS MENTION-

_____

IF ANY OTHER FAMILY MEMBERS SUFFER FROM ANY KIND OF ILLNESS, PLEASE MENTION-

7.PERSONAL HISTORY: -

<u>TYPE OF DIET</u>--- ◯ VEGETARIAN ◯ NON- VEGETARIAN

1.) IF NON-VEGETARIAN, WHAT KIND OF MEAT DO YOU CONSUME?

◯ CHICKEN ◯ GOAT ◯ LAMB ◯ FISH ◯ SEAFOOD

◯ PORK ◯ TURKEY ◯ BEEF ◯ DUCK

◯ ANY OTHER KIND OF MEAT _____

2.) IF YES TO QUESTION, HOW FREQUENTLY DO YOU CONSUME ANY KIND OF MEAT?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

3.) IF YOU ARE A VEGETARIAN, DO YOU CONSUME EGGS?

◯ YES ◯ NO

4.) IF THE ANSWER TO THE ABOVE QUESTION IS YES, HOW OFTEN DO YOU CONSUME EGGS?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

5.) DO YOU CONSUME MILK?

◯ YES ◯ NO

IF YES, HOW OFTEN DO YOU CONSUME MILK?

◯DAILY ◯ ONCE A WEEK◯ MORE THAN ONCE A WE◯K

◯ ◯

ONCE IN A MONTH 2-3 TIMES IN A MONTH ONCE IN 2-3 MONTH

6.) DO YOU TAKE DAIRY PRODUCTS LIKE CHEESE, YOGHURT, PANEER, ETC. IN YOUR DIET, AND IF YES DO YOU EXCLUDE MILK FROM YOUR DIET?

◯YES ◯NO

IF YES, HOW OFTEN DO YOU CONSUME DAIRY PRODUCTS IN YOUR DIET?

◯DAILY ◯ ONCE A WEEK◯ MORE THAN ONCE A WE◯K

◯ ◯

ONCE IN A MONTH 2-3 TIMES IN A MONTH ONCE IN 2-3 MONTH

<u>EXERCISE</u>--- ◯ YES ◯NO

IF YES,

KIND OF EXERCISE YOU DO_____

◯DAILY ◯ ONCE A WEEK◯ MORE THAN ONCE A WE◯K

◯ ◯

ONCE IN A MONTH 2-3 TIMES IN A MONTH ONCE IN 2-3 MONTH

1.) DO YOU PLAY SPORTS, IF YES WHICH KIND OF SPORTS DO YOU PLAY?

◯YES ◯ NO

IF YES, WHICH KIND _____

2.) IF IT IS YES TO THE ABOVE QUESTION, HOW FREQUENTLY DO YOU PLAY?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

3.) DO YOU GO TO THE GYM, IF YES HOW FREQUENTLY DO YOU GO TO THE GYM?

◯ YES ◯ NO

IF YES,

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

4.) IF IT IS YES TO THE ABOVE QUESTION, HOW MUCH TIME DO YOU SPENT IN THE GYM EACH TIME YOU VISIT IT?

5.) DO YOU DO YOGA?

◯ ◯ YES NO

IF YES,

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

<u>HOBBIES AND INTEREST</u>---

1.) WHAT IS YOUR MAIN HOBBY AND HOW OFTEN DO YOU GET TO DO IT AFTER ENTERING COLLEGE?

◯ DAILY ◯ ONCE A WEEK ◯ MORE THAN ONCE A WEEK ◯

◯ ONCE IN A MONTH ◯ 2-3 TIMES IN A MONTH ◯ ONCE IN 2-3 MONTH

2.) DO YOU SPEND MOST OF YOUR TIME INDOORS OR OUTDOORS?

◯ INDOORS ◯ OUTDOORS

3.) HAVE YOU PICKED ANY NEW HOBBY AFTER JOINING COLLEGE LATELY, IF YES PLEASE MENTION AND HOW FREQUENTLT DO YOU DO IT?

◯DAILY ◯ ONCE A WEEK◯ MORE THAN ONCE A WEEK◯

◯ ◯

ONCE IN A MONTH 2-3 TIMES IN A MONTH ONCE IN 2-3 MONTH

4.) ON A SCALE OF 1-10, HOW HAPPY DO YOU THINK YOU ARE AFTER ENTERING COLLEGE?

HABITS---

DO YOU CONSUME ALCOHOL, IF YES HOW FREQUENTLY AND HOW MUCH?

◯YES ◯ NO

IF YES,

◯DAILY ◯ ONCE A WEEK◯ MORE THAN ONCE A WEEK◯

◯ ◯

ONCE IN A MONTH 2-3 TIMES IN A MONTH ONCE IN 2-3 MONTH

HOW MUCH?

1.) DO YOU SMOKE, IF YES HOW FREQUENTLY DO YOU SMOKE AND HOW MANY CIGARETTES?

◯YES ◯ NO

IF YES,

◯DAILY ◯ ONCE A WEEK◯ MORE THAN ONCE A WEEK◯

◯ ◯

ONCE IN A MONTH 2-3 TIMES IN A MONTH ONCE IN 2-3 MONTH

NO. OF CIGARETTES _____

2.) IF IT IS YES TO THE ABOVE QUESTION, SINCE WHEN ARE YOU SMOKING?

ANY OTHER KIND OF INFORMATION?

8.EDUCATION:

9.FATHER'S OCCUPATION:

10.MOTHER'S OCCUPATION:

GENERAL PHYSICAL EXAMINATION:

PULSE- TEMPERATURE-

RR-

BLOOD PRESSURE- SPO2-

SYSTEMIC EXAMINATION:

CARDIOVASCULAR SYSTEM (CVS)-

RESPIRATORY SYSTEM(RS)-

PER ABDOMEN SYSTEM(P/A)-

CENTRAL NERVOUS SYSTEM(CNS)-

ANTHROPOMETRIC MEASUREMENTS

HEIGHT:

WEIGHT:

BODY MASS INDEX(BMI):

WAIST CIRCUMFERENCE:

HIP CIRCUMFERENCE:

NECK CIRCUMFERENCE:

WAIST TO HIP RATIO:

LAB INVESTIGATIONS

FASTING SUGAR LEVELS:

LIPID PROFILE:

S. CHOLESTEROL-

S. TRIGLYCERIDES-

HDL-

LDL-

ANNEXURE IV-

MASTER CHART

SINo	Age	Sex	Year	Address	Pulse Rate	BP	SBP	BPCat	DBP	DietPattern	Alcohol	Alcoholic	Smoking	Smoker	Exercise	FamilyHistory	DM	HTN	Hypothyroidism	Obesity	IHD	No History	Height	Weight	BMI	NeckCircumference	WaistCircumference	HipCircumference	WaistHip Ratio	FastingSugarLevel	SerumCholesterol	HDLC	LDLC	SerumTriglycerides
1	22	Male	Third year	JNMC Campus	90	136/90	136	Prehypertension	90	Non-Vegetarian	Moderate	Yes	No	No	Moderate Activity	Father- Hypothyroidism+	No	No	Yes	No	No	No	188	80	22.63	42	110	122	0.9	103	159	39	96	123
2	23	Male	Fourth year	JNMC Campus	88	130/86	130	Prehypertension	86	Non-Vegetarian	None	No	No	No	Moderate Activity	Father- DM+ Mother-HTN+	Yes	Yes	No	No	No	No	187	103	29.45	41	102	120	0.85	85	196	48	147	75
3	23	Male	Third year	JNMC Campus	74	118/74	118	Normal	74	Non-Vegetarian	Moderate	Yes	No	No	Heavy Activity	Mother- Obesity+	No	No	No	Yes	No	No	163	67	25.22	33	69	109.2	0.63	82	96	45	107	73
4	21	Male	Third year	JNMC Campus	70	112/84	112	Normal	84	Non-Vegetarian	Heavy	Yes	2-3 Cig/Day	Yes	Moderate Activity	Father- HTN+ Grandfather- DM+	Yes	Yes	No	No	No	No	172	69.7	23.56	36	81	96	0.84	83	170	47	100	61
5	23	Male	Fourth year	JNMC Campus	94	132/80	132	Prehypertension	80	Non-Vegetarian	Heavy	Yes	4-5 Cig/Day	Yes	Moderate Activity	Mother- Hypothyroidism +	No	No	Yes	No	No	No	174	68	22.46	38	74	92	0.8	71	120	35	64	82
6	23	Male	Fourth year	JNMC Campus	78	130/80	130	Prehypertension	80	Vegetarian	Heavy	Yes	1-2 Cig/Day	Yes	Heavy Activity	Nil	No	No	No	No	No	Yes	179	125	39.01	36	95	102	0.93	81	166	47	93	62
7	23	Male	Fourth year	JNMC Campus	76	120/70	120	Normal	70	Non-Vegetarian	Moderate	Yes	3-4 Cig/Day	Yes	Moderate Activity	Nil	No	No	No	No	No	Yes	181	90	27.47	42	98	120	0.82	65	175	49	89	105
8	23	Male	Fourth year	JNMC Campus	80	120/66	120	Normal	66	Non-Vegetarian	Mild	Yes	No	No	None	Father -IHD+ / HTN+ Mother -Obesity+	No	Yes	No	Yes	Yes	No	176	89.2	28.8	38	89	108	0.82	85	181	34	145	220
9	23	Male	Third year	JNMC Campus	64	110/80	110	Normal	80	Non-Vegetarian	Heavy	Yes	2-3 Cig/Day	Yes	Light Activity	Father- HTN+ Mother- HTN+	No	Yes	No	No	No	No	183	56	16.72	30	71	94	0.76	76	166	45	60	96
10	23	Female	Third year	JNMC Campus	88	118/74	118	Normal	74	Non-Vegetarian	Mild	Yes	No	No	Light Activity	Father- Hypothyroidism+ Mother - Hypothyroidism+	No	No	Yes	No	No	No	159	56	22.15	31	72	82	0.88	84	185	53	108	68
11	23	Female	Third year	JNMC Campus	78	106/74	106	Normal	74	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	164	53.5	19.89	30	75	92	0.82	85	161	87	55	80
12	23	Male	Third year	JNMC Campus	78	120/70	120	Normal	70	Non-Vegetarian	None	No	No	No	Moderate Activity	Father-HTN+ / DM+	Yes	Yes	No	No	No	No	185	84.4	24.66	42	95	110	0.86	89	157	37	99	85
13	23	Female	Third year	JNMC Campus	84	122/76	122	Prehypertension	76	Vegetarian	Mild	Yes	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes	168	54	19.13	29	76	89	0.85	84	166	46	112	154
14	23	Female	Third year	JNMC Campus	80	122/82	122	Prehypertension	82	Vegetarian	None	No	No	No	None	Mother- HTN+	No	Yes	No	No	No	No	161	65	25.08	28.9	74	91	0.81	82	143	52	85	56
15	23	Female	Third year	JNMC Campus	98	110/80	110	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Father-DM+ Mother-HTN+	Yes	Yes	No	No	No	No	156	49	20.13	33	88	103	0.85	82	138	45	71	66
16	22	Female	Third year	JNMC Campus	70	132/72	132	Prehypertension	72	Non-Vegetarian	Mild	Yes	No	No	Heavy Activity	Father- HTN+/ DM+/ Obesity+ Mother-HTN/ DM+	Yes	Yes	No	Yes	No	No	154	40	16.87	30	68	82	0.83	84	143	49	77	58
17	22	Female	Third year	JNMC Campus	76	110/70	110	Normal	70	Vegetarian	Mild	Yes	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	167	53.3	19.11	30	89	90	0.99	75	159	61	77	106
18	22	Female	Third year	JNMC Campus	88	122/84	122	Prehypertension	84	Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	160	60.7	23.71	29	73	95	0.77	87	165	47	115	110
19	22	Male	Third year	JNMC Campus	98	124/80	124	Prehypertension	80	Vegetarian	Moderate	Yes	No	No	Light Activity	Father- HTN+	No	Yes	No	No	No	No	178	83.2	26.26	37	91	102	0.89	73	151	30	84	62
20	22	Female	Third year	JNMC Campus	76	120/80	120	Normal	80	Vegetarian	None	No	No	No	Very Light Activity	Father-DM+ Mother-HTN+ / Obesity+	Yes	Yes	No	Yes	No	No	158	47.2	18.91	29	68	89	0.76	86	152	45	80	95
21	22	Female	Third year	JNMC Campus	70	110/66	110	Normal	66	Non-Vegetarian	Moderate	Yes	No	No	Light Activity	Father-DM+/ Obesity+ Hypothyroidism+	Yes	No	Yes	Yes	No	No	169	55.4	19.4	30.5	73	95	0.77	100	98	33	78	71
22	22	Female	Third year	JNMC Campus	74	110/60	110	Normal	60	Vegetarian	None	No	No	No	Very Light Activity	Father-HTN+/ DM+ Mother- HTN+/ DM+	Yes	Yes	No	No	No	No	164	52.5	19.52	31	96	93	1.03	81	173	46	98	145
23	22	Female	Third year	JNMC Campus	76	112/64	112	Normal	64	Non-Vegetarian	None	No	No	No	Moderate Activity	Father- Obesity+	No	No	No	Yes	No	No	167	84	30.12	34	84	100	0.84	87	145	49	75	65
24	22	Female	Third year	JNMC Campus	72	116/80	116	Normal	80	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	160	54.5	21.29	33	88	95	0.93	94	159	41	87	70
25	22	Female	Third year	JNMC Campus	62	128/70	128	Prehypertension	70	Vegetarian	Moderate	Yes	No	No	Light Activity	Father- DM+/ Obesity+ Mother- Hypothyroidism+/	Yes	No	Yes	Yes	No	No	166	66	23.95	36	81	86	0.94	94	150	40	124	159
26	22	Female	Third year	JNMC Campus	74	110/70	110	Normal	70	Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	163	81	30.49	32.8	88	116	0.76	91	177	98	49	107
27	22	Male	Third year	JNMC Campus	88	124/76	124	Prehypertension	76	Non-Vegetarian	Moderate	Yes	1-2 Cig/Day	Yes	Light Activity	Father- HTN+/ DM+/ Obesity+	Yes	Yes	No	Yes	No	No	181	73	22.28	37	82	91	0.9	69	216	38	145	189
28	22	Female	Third year	JNMC Campus	66	110/70	110	Normal	70	Non-Vegetarian	None	No	No	No	None	Father- HTN+ Mother-DM+	Yes	Yes	No	No	No	No	148	47	21.46	31	68	80	0.85	82	160	43	92	89
29	23	Male	Third year	JNMC Campus	86	110/80	110	Normal	80	Non-Vegetarian	Heavy	Yes	2-3 Cig/Day	Yes	Moderate Activity	Father-HTN+ / Obesity+ Mother-DM+ / Obesity+	Yes	Yes	No	Yes	No	No	173	76	25.39	36	89	97	0.92	78	117	29	94	127
30	23	Female	Third year	JNMC Campus	74	124/80	124	Prehypertension	80	Non-Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	168	66	23.38	32	80	103	0.78	78	118	28	66	71
31	23	Male	Third year	JNMC Campus	72	108/74	108	Normal	74	Non-Vegetarian	Heavy	Yes	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	171	63.3	21.65	35	84	95	0.88	84	132	35	118	105
32	22	Female	Third year	JNMC Campus	60	106/60	106	Normal	60	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Father- HTN+/ IHD+ Mother- Hypothyroidism+	No	Yes	Yes	No	Yes	No	156	48	19.72	32	74	93	0.8	75	155	42	130	91
33	23	Female	Third year	JNMC Campus	82	126/86	126	Prehypertension	86	Non-Vegetarian	Mild	Yes	No	No	Very Light Activity	Father- Obesity+ Mother- Obesity+	No	No	No	Yes	No	No	163	63.6	23.94	38	75	109	0.69	81	155	43	86	60

34	22	Female	Third year	JNMC Campus	74	108/60	108	Normal	60	Non-Vegetarian	Mild	Yes	No	No	Very Light Activity	Father-DM+ Mother- DM+	Yes	No	No	No	No	No	158	47	18.83	30	86	98	0.88	125	85	40	101	100
35	23	Female	Third year	JNMC Campus	78	118/72	118	Normal	72	Non-Vegetarian	None	No	No	No	Light Activity	Father- HTN+/ DM+ Mother- Hypothyroidism+	Yes	Yes	Yes	No	No	No	150	49.3	21.91	32.5	71	92	0.77	82	106	48	115	102
36	23	Male	Fourth year	JNMC Campus	66	120/64	120	Normal	64	Vegetarian	Moderate	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	176	78	25.18	37	92	104	0.88	92	156	42	66	105
37	23	Female	Fourth year	JNMC Campus	70	124/74	124	Prehyper tension	74	Vegetarian	Moderate	Yes	No	No	Light Activity	Father- HTN+/ Obesity+/ TIA+/ DM+	Yes	Yes	No	Yes	No	No	160	75	29.3	31	83	98	0.85	81	183	44	115	90
38	23	Male	Fourth year	JNMC Campus	76	112/64	112	Normal	64	Non-Vegetarian	Moderate	Yes	2-3 Cig/Day	Yes	Very Light Activity	Grandmother- DM+	Yes	No	No	No	No	No	168	77.9	27.6	41	96	106	0.91	63	160	27	102	148
39	23	Female	First year	JNMC Campus	66	120/76	120	Normal	76	Vegetarian	Mild	Yes	No	No	Very Light Activity	Mother- Hyothyroidism+/ Obesity+	No	No	Yes	Yes	No	No	148	58	26.48	30	98	84	1.17	77	176	56	89	78
40	23	Male	Fourth year	JNMC Campus	84	116/74	116	Normal	74	Non-Vegetarian	Moderate	Yes	No	No	Very Light Activity	Father- Hypothyroidism+ Grandmother- HTN+	No	Yes	Yes	No	No	No	169	47.2	16.53	29	71	90	0.79	79	137	35	72	66
41	23	Male	Fourth year	JNMC Campus	84	106/70	106	Normal	70	Non-Vegetarian	Heavy	Yes	5-6 Cig/Day	Yes	Moderate Activity	Nil	No	No	No	No	No	Yes	185	88.5	25.86	29	79	92	0.86	90	163	35	100	67
42	23	Male	Fourth year	JNMC Campus	88	126/80	126	Prehyper tension	80	Non-Vegetarian	None	No	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes	164	55.1	20.49	34	78	91	0.86	89	162	28	82	109
43	23	Male	Fourth year	JNMC Campus	74	128/70	128	Prehyper tension	70	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	190	76.3	21.14	35	91	104	0.88	86	202	34	86	94
44	23	Female	Fourth year	JNMC Campus	78	110/76	110	Normal	76	Non-Vegetarian	None	No	No	No	Very Light Activity	Father- HTN+ Mother -DM+/ Obesitty+	Yes	Yes	No	No	No	No	168	69	24.45	32	67	107	0.63	94	150	56	83	68
45	23	Female	Fourth year	JNMC Campus	88	130/90	130	Prehyper tension	90	Vegetarian	None	No	No	No	Moderate Activity	Mother-Obesity+	No	No	No	Yes	No	No	170	76	26.3	33	96	106	0.91	85	191	45	102	100
46	23	Male	Fourth year	JNMC Campus	74	118/84	118	Normal	84	Non-Vegetarian	Moderate	Yes	1-2 Cig/Day	Yes	Very Light Activity	Father-Obesity+ Mother- DM+ / Obesity+	Yes	No	No	Yes	No	No	178	78	24.62	39	109	120	0.91	87	139	33	102	162
47	23	Female	Third year	JNMC Campus	78	110/80	110	Normal	80	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Father- HTN+ Mother- HTN+	No	Yes	No	No	No	No	168	70.4	24.94	36	103	133	0.77	88	147	37	90	80
48	23	Female	Fourth year	JNMC Campus	70	108/72	108	Normal	72	Vegetarian	None	No	No	No	Light Activity	Father- HTN+	No	Yes	No	No	No	No	163	75.35	28.36	36	93	106	0.88	86	174	37	98	191
49	23	Female	Third year	JNMC Campus	68	110/74	110	Normal	74	Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	156	69	28.35	31	86	96	0.9	90	155	69	91	52
50	23	Female	Fourth year	JNMC Campus	70	110/66	110	Normal	66	Non-Vegetarian	Moderate	Yes	No	No	Light Activity	Father-HTN+/ Obesity+ Mother- Hypothyroidism+/ IHD+	No	Yes	Yes	Yes	Yes	No	161	63.7	24.57	33	85	101	0.84	90	135	36	72	129
51	23	Male	Fourth year	JNMC Campus	90	124/76	124	Prehyper tension	76	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Father- HTN+/ Obesity+ Mother-DM+	Yes	Yes	No	Yes	No	No	175	78	25.47	36	81	90	0.9	78	146	38	72	105
52	23	Male	Third year	JNMC Campus	94	124/80	124	Prehyper tension	80	Non-Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	175	93	30.37	39	101	113	0.89	84	161	36	90	122
53	23	Female	First year	JNMC Campus	78	108/68	108	Normal	68	Non-Vegetarian	None	No	No	No	Heavy Activity	Mother- Hypothyroidism+/ Obesity+	No	No	Yes	Yes	No	No	152	41.5	17.96	30	61	76	0.8	86	171	64	70	84
54	23	Female	Second year	JNMC Campus	80	120/68	120	Normal	68	Non-Vegetarian	None	No	No	No	Very Light Activity	Father- Obesity+ Mother-HTN+	No	Yes	No	Yes	No	No	169	68	23.81	38	126	147	0.86	91	131	38	80	80
55	23	Female	Second year	JNMC Campus	70	110/70	110	Normal	70	Non-Vegetarian	None	No	No	No	Heavy Activity	Father-HTN+/ Obesity+	No	Yes	No	Yes	No	No	156	52.05	21.39	30	80	96	0.83	88	122	57	68	72
56	23	Female	Fourth year	JNMC Campus	64	106/80	106	Normal	80	Non-Vegetarian	Mild	Yes	No	No	Very Light Activity	Father - IHD+/ DM+ Mother- DM+	Yes	No	No	No	Yes	No	162	60	22.86	33	71.1	101	0.7	84	129	50	70	68
57	22	Female	Fourth year	JNMC Campus	96	136/84	136	Prehyper tension	84	Vegetarian	Mild	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	158	84.5	33.85	32	103	114	0.9	82	158	56	81	62
58	23	Male	Fourth year	JNMC Campus	96	116/66	116	Normal	66	Non-Vegetarian	Mild	Yes	3-4 Cig/Day	Yes	Moderate Activity	Father -HTN+ Mother- DM+/ Hypothyroidism+	Yes	Yes	Yes	No	No	No	179	87.7	27.37	36	83	104	0.8	87	130	27	83	108
59	22	Male	Second year	JNMC Campus	74	108/70	108	Normal	70	Non-Vegetarian	Moderate	Yes	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	187.5	83.6	23.78	37	92	108	0.85	83	121	45	63	64
60	22	Male	Second year	JNMC Campus	86	124/74	124	Prehyper tension	74	Vegetarian	None	No	No	No	Very Light Activity	Father-HTN+/ DM+	Yes	Yes	No	No	No	No	175	99	32.33	34	96	93	1.03	82	125	40	44	102
61	22	Male	Second year	JNMC Campus	92	130/80	130	Prehyper tension	80	Vegetarian	Mild	Yes	No	No	Moderate Activity	Father- HTN+	No	Yes	No	No	No	No	174	120	39.64	38.5	94	104	0.9	86	207	121	102	158
62	22	Male	Second year	JNMC Campus	76	112/80	112	Normal	80	Non-Vegetarian	None	No	No	No	None	Father-IHD+/ DM+ Mother-HTN+/ Obesity+	Yes	Yes	No	Yes	Yes	No	177	76	24.26	39	104	127	0.82	90	123	32	80	110
63	22	Male	Second year	JNMC Campus	72	122/78	122	Prehyper tension	78	Non-Vegetarian	None	No	No	No	Moderate Activity	Father- HTN+ Mother- Hypothyroidism+	No	Yes	Yes	No	No	No	162	61	23.24	30	70	102	0.69	82	139	80	98	94
64	22	Female	Fourth year	JNMC Campus	88	136/80	136	Prehyper tension	80	Non-Vegetarian	Mild	Yes	No	No	Light Activity	Father- HTN+	No	Yes	No	No	No	No	169	51	17.86	30	62	92	0.67	72	144	45	86	97
65	22	Female	Fourth year	JNMC Campus	88	106/64	106	Normal	64	Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	163	61.7	23.22	32	75	95	0.79	84	160	39	88	109
66	22	Female	Fourth year	JNMC Campus	78	112/64	112	Normal	64	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Father- Obesity+ Mother- Obesity+	No	No	No	Yes	No	No	173	75.2	25.13	33	95	109	0.87	81	136	36	81	97
67	22	Male	First year	JNMC Campus	86	118/74	118	Normal	74	Vegetarian	Moderate	Yes	No	No	Moderate Activity	Father-HTN+/ DM+ Mother- Hypothyroidism+/Obesity+	Yes	Yes	Yes	Yes	No	No	160	54	21.09	34	72	80	0.9	149	104	54	86	98

68	22	Female	Fourth year	JNMC Campus	82	122/80	122	Prehyper tension	80	Vegetarian	None	No	No	No	Very Light Activity	Father- Obesity+/ DM+	Yes	No	No	Yes	No	No	169	66	23.11	32	93	105	0.89	110	138	59	99	65
69	22	Female	Fourth year	JNMC Campus	94	128/88	128	Prehyper tension	88	Vegetarian	None	No	No	No	Very Light Activity	Father- HTN+/ DM+/ Hypothyroidism+/ Obesity+	Yes	Yes	Yes	Yes	No	No	161	79	30.48	31	85	95	0.89	89	126	34	98	75
70	22	Male	First year	JNMC Campus	82	116/74	116	Normal	74	Vegetarian	None	No	No	No	Very Light Activity	Father- HTN+	No	Yes	No	No	No	No	157	47.6	19.31	30	74	88	0.84	78	166	64	51	56
71	22	Female	Fourth year	JNMC Campus	88	116/74	116	Normal	74	Non-Vegetarian	Mild	Yes	No	No	Light Activity	Father- HTN+/ DM+ / Obesity+	Yes	Yes	No	Yes	No	No	164	82.2	30.56	34	97	117	0.83	79	161	45	65	188
72	22	Female	Fourth year	JNMC Campus	78	110/80	110	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Father-HTN+ Mother-HTN+/ DM+/ Obesity+	Yes	Yes	No	Yes	No	No	167	68.5	24.56	32	84	101	0.83	82	144	24	69	84
73	22	Female	Fourth year	JNMC Campus	86	122/80	122	Prehyper tension	80	Vegetarian	None	No	No	No	Light Activity	Mother-Hypothyroidism+/ Obesity+	No	No	Yes	Yes	No	No	164	62.1	23.09	33	73	95.5	0.76	84	155	57	79	66
74	22	Female	Fourth year	JNMC Campus	92	132/80	132	Prehyper tension	80	Vegetarian	Mild	Yes	No	No	Moderate Activity	Father-HTN+ Mother-Hypothyroidism+	No	Yes	Yes	No	No	No	157	62.1	25.19	28	103	102	1.01	85	166	32	106	178
75	22	Female	Fourth year	JNMC Campus	78	130/70	130	Prehyper tension	70	Non-Vegetarian	None	No	No	No	Very Light Activity	Father-Hypothyroidism+/ Obesity+ Mother-Hypothyroidism+	No	No	Yes	Yes	No	No	154	40.5	17.08	29	65	81	0.8	90	158	86	84	85
76	22	Male	Fourth year	JNMC Campus	86	118/80	118	Normal	80	Vegetarian	Mild	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	167	87	31.2	34	81	93	0.87	95	137	38	76	56
77	23	Male	Fourth year	JNMC Campus	66	106/80	106	Normal	80	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Father-DM+	Yes	No	No	No	No	No	181	88.1	26.89	37	91	110	0.83	99	115	31	64	106
78	23	Male	Fourth year	JNMC Campus	72	108/74	108	Normal	74	Non-Vegetarian	Moderate	Yes	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	170	63.3	21.9	35	86	98	0.88	90	132	40	75	68
79	23	Female	Second year	JNMC Campus	68	110/70	110	Normal	70	Vegetarian	None	No	No	No	Very Light Activity	Father- DM+/ Hypothyroidism+	Yes	No	Yes	No	No	No	149	65	29.28	27	70	80	0.88	91	149	60	73	89
80	23	Male	Second year	JNMC Campus	80	126/78	126	Prehyper tension	78	Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	177	106	33.83	38	95	110	0.86	84	135	57	120	119
81	22	Female	Fourth year	JNMC Campus	72	110/80	110	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Father- HTN+/ Obesity+/ Hypothyroidism+ Mother- DM+	Yes	Yes	Yes	Yes	No	No	170	64	22.15	32	89	101	0.88	72	148	35	103	82
82	22	Male	Fourth year	JNMC Campus	68	108/74	108	Normal	74	Non-Vegetarian	Moderate	Yes	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes	178	72	22.72	38	86	105	0.82	85	161	36	135	107
83	22	Male	Fourth year	JNMC Campus	86	120/68	120	Normal	68	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	186	90	26.01	40	101	120	0.84	81	160	59	120	213
84	22	Female	Second year	JNMC Campus	86	132/84	132	Prehyper tension	84	Non-Vegetarian	None	No	No	No	Moderate Activity	Father-DM+ Mother- Obesity+	Yes	No	No	Yes	No	No	177	82	26.17	34	91	113	0.81	95	164	53	125	155
85	22	Male	Fourth year	JNMC Campus	76	130/90	130	Prehyper tension	90	Non-Vegetarian	None	No	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes	186	98.4	28.44	42	109	120	0.91	89	177	42	118	181
86	20	Male	Fourth year	JNMC Campus	88	128/82	128	Prehyper tension	82	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Father- HTN+/DM+ Mother-Hypothyroidism+ Obesity+	Yes	Yes	Yes	Yes	No	No	169	69	24.16	39	89	104	0.86	86	158	37	105	161
87	20	Male	Fourth year	JNMC Campus	74	114/64	114	Normal	64	Non-Vegetarian	Moderate	Yes	5-6 Cig/Day	Yes	Very Light Activity	Nil	No	No	No	No	No	Yes	182	69	20.83	35	82	102	0.8	79	146	33	130	119
88	22	Male	First year	JNMC Campus	74	124/80	124	Prehyper tension	80	Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	165	64.5	23.69	31	72	86	0.84	80	140	37	68	83
89	22	Male	Fourth year	JNMC Campus	70	112/76	112	Normal	76	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	182	70	21.13	35	87	102	0.85	85	111	40	73	91
90	22	Female	Third year	JNMC Campus	78	122/78	122	Prehyper tension	78	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	158	62.9	25.2	34	79	99	0.8	84	132	43	115	78
91	22	Male	Second year	JNMC Campus	86	110/70	110	Normal	70	Non-Vegetarian	None	No	No	No	Light Activity	Mother- Obesity+ Father- HTN+/ Obesity+	No	Yes	No	Yes	No	No	156	70	28.76	33	94	104	0.9	97	214	49	147	210
92	20	Female	Second year	JNMC Campus	76	108/60	108	Normal	60	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Mother- HTN+/ Hypothyroidism+	No	Yes	Yes	No	No	No	176	73	23.57	32	82	104	0.79	71	152	52	85	150
93	20	Male	Second year	JNMC Campus	90	128/86	128	Prehyper tension	86	Vegetarian	None	No	No	No	Moderate Activity	Father-HTN+ Mother- HTN+	No	Yes	No	No	No	No	182	96	28.98	36	88	100	0.88	78	126	43	80	65
94	20	Male	Second year	JNMC Campus	72	118/60	118	Normal	60	Non-Vegetarian	None	No	No	No	Heavy Activity	Father-HTN+/ Obesity+ Mother- HTN+	No	Yes	No	Yes	No	No	174	66	21.8	36	82	89	0.92	91	129	61	56	101
95	20	Male	Second year	JNMC Campus	78	110/80	110	Normal	80	Vegetarian	Mild	Yes	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	170	70	24.22	36	88	102	0.86	74	139	34	81	140
96	20	Female	Second year	JNMC Campus	88	126/70	126	Prehyper tension	70	Vegetarian	None	No	No	No	Light Activity	Father-HTN+/ Hypothyroidism+	No	Yes	Yes	No	No	No	177	55.8	17.81	31	66	80	0.83	77	153	71	98	92
97	20	Male	Second year	JNMC Campus	64	124/70	124	Prehyper tension	70	Non-Vegetarian	Moderate	Yes	5-6 Cig/Day	Yes	Very Light Activity	Mother-DM+	Yes	No	No	No	No	No								67	150	40	103	122
98	20	Female	Second year	JNMC Campus	68	108/60	108	Normal	60	Non-Vegetarian	None	No	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes	165	45	16.53	32	80	88	0.91	83	148	47	102	58
99	20	Male	Second year	JNMC Campus	84	120/70	120	Normal	70	Non-Vegetarian	None	No	No	No	Very Light Activity	Father- HTN+ Mother-HTN+	No	Yes	No	No	No	No	173	58.3	19.48	37	73	87	0.84	87	137	75	79	79
100	20	Male	Second year	JNMC Campus	86	110/70	110	Normal	70	Non-Vegetarian	None	No	No	No	Moderate Activity	Father- Obesity+	No	No	No	Yes	No	No	183	97	28.96	36	106	117	0.91	90	166	40	106	166
101	20	Male	Second year	JNMC Campus	76	110/80	110	Normal	80	Non-Vegetarian	Mild	Yes	2-3 Cig/Day	Yes	Heavy Activity	Father-HTN+/Hypothyroidism+ Mother -Hypothyroidism+	No	Yes	Yes	No	No	No	174	73	24.11	34	76	95	0.8	73	163	52	90	57

102	20	Female	Second year	JNMC Campus	94	130/80	130	Prehyper tension	80	Vegetarian	None	No	No	No	Light Activity	Father- Hypothyroidism+	No	No	Yes	No	No	No	156	65	26.71	32	83	97	0.86	77	123	46	64	42
103	20	Female	Second year	JNMC Campus	78	112/74	112	Normal	74	Vegetarian	None	No	No	No	Very Light Activity	Grandfather- DM+	Yes	No	No	No	No	No	164.5	54	19.96	31	75	81	0.93	75	140	63	60	65
104	20	Female	Second year	JNMC Campus	78	108/80	108	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	155.4	62	25.67	32	82	91	0.9	81	126	38	66	83
105	20	Male	Second year	JNMC Campus	90	130/80	130	Prehyper tension	80	Non-Vegetarian	Mild	Yes	No	No	Light Activity	Father- HTN+	No	Yes	No	No	No	No	169	70	24.51	36	79	93	0.85	85	176	51	113	84
106	20	Female	Second year	JNMC Campus	68	102/68	102	Normal	68	Non-Vegetarian	Mild	Yes	3-4 Cig/Day	Yes	Moderate Activity	Father-HTN+ / DM+ Grandfather/Grandmother- HTN+ / DM+	Yes	Yes	No	No	No	No	173	60	20.05	30	72	89	0.81	71	169	62	120	55
107	20	Female	Second year	JNMC Campus	74	120/80	120	Normal	80	Non-Vegetarian	Mild	Yes	No	No	Very Light Activity	Mother-HTN+/ DM+	Yes	Yes	No	No	No	No	159	58	22.94	31	81	102	0.79	112	184	61	115	215
108	20	Male	Second year	JNMC Campus	96	118/84	118	Normal	84	Vegetarian	Mild	Yes	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	178	81	25.56	34	74	92	0.8	77	124	41	70	93
109	20	Female	Second year	JNMC Campus	68	110/70	110	Normal	70	Vegetarian	None	No	No	No	Moderate Activity	Grandparents- DM+/HTN+	Yes	Yes	No	No	No	No	164	65.8	24.46	29.7	98	96	1.02	73	169	71	114	94
110	20	Female	Second year	JNMC Campus	84	126/80	126	Prehyper tension	80	Non-Vegetarian	Mild	Yes	No	No	Very Light Activity	Father-HTN+ / DM+ Mother- Hypothyroidism+	Yes	Yes	Yes	No	No	No	165	62	22.77	32	84	92	0.91	71	156	49	69	64
111	20	Female	Second year	JNMC Campus	76	110/70	110	Normal	70	Non-Vegetarian	Moderate	Yes	No	No	Light Activity	Father-HTN+ / DM+/ Hypothyroidism+ Mother-HTN+ / DM+ / Hypothyroidism+/ Obesity+	Yes	Yes	Yes	Yes	No	No	173	74	24.73	32	93	104	0.89	87	184	55	143	200
112	20	Female	Second year	JNMC Campus	78	116/80	116	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Father-HTN+/ DM+	Yes	Yes	No	No	No	No	154	55	23.19	30	76	85	0.89	79	187	42	107	62
113	20	Male	Second year	JNMC Campus	66	116/74	116	Normal	74	Non-Vegetarian	None	No	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	167	62.9	22.55	36	82	93	0.88	72	160	41	105	123
114	20	Female	Second year	JNMC Campus	92	132/84	132	Prehyper tension	84	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	161	45	17.36	32	70	89	0.79	72	161	51	106	57
115	20	Male	Second year	JNMC Campus	66	110/74	110	Normal	74	Non-Vegetarian	None	No	No	No	Light Activity	Father -Obesity+ Mother- Hypothyroidism+/ Obesity+	No	No	Yes	Yes	No	No	169	75	26.26	37	96	112	0.86	82	128	26	60	234
116	20	Male	Second year	JNMC Campus	76	120/70	120	Normal	70	Non-Vegetarian	Moderate	Yes	10 Cig/Day	Yes	Heavy Activity	Nil	No	No	No	No	No	Yes	159	64	25.32	30	68	84	0.81	101	104	39	76	60
117	20	Male	Second year	JNMC Campus	72	108/70	108	Normal	70	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	176	68.3	22.05	36	84	103	0.82	92	145	30	74	130
118	20	Male	Second year	JNMC Campus	62	114/74	114	Normal	74	Non-Vegetarian	None	No	No	No	Moderate Activity	Mother- DM+/ Hypothyroidism+ / Obesity+	Yes	No	Yes	Yes	No	No	180	72	22.22	36	83	97	0.86	76	132	48	62	89
119	20	Female	Second year	JNMC Campus	78	124/82	124	Prehyper tension	82	Non-Vegetarian	None	No	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	167	70	25.1	34	90	112	0.8	82	135	54	61	63
120	20	Female	Second year	JNMC Campus	70	124/70	124	Prehyper tension	70	Vegetarian	Mild	Yes	No	No	Heavy Activity	Father-Obesity+	No	No	No	Yes	No	No	154	53	22.35	32	78	93	0.84	71	143	55	86	67
121	20	Male	Second year	JNMC Campus	70	112/84	112	Normal	84	Non-Vegetarian	None	No	No	No	Light Activity	Mother- DM+	Yes	No	No	No	No	No	165	55	20.2	37	93	107	0.87	75	107	33	57	89
122	20	Male	Second year	JNMC Campus	78	116/74	116	Normal	74	Non-Vegetarian	None	No	No	No	Heavy Activity	Father-HTN+	No	Yes	No	No	No	No	190	79.5	22.02	36	83	97	0.86	73	130	49	64	200
123	20	Female	Second year	JNMC Campus	68	112/70	112	Normal	70	Non-Vegetarian	None	No	No	No	Moderate Activity	Father-HTN+ / Obesity + Mother -HTN +/Obesity+ /Hypothyroidism+	No	Yes	Yes	Yes	No	No	162	54	20.58	30	86	96	0.9	78	139	42	76	122
124	20	Female	Second year	JNMC Campus	76	116/80	116	Normal	80	Vegetarian	None	No	No	No	Light Activity	Father-Obesity+ Mother- HTN+ / Obesity+	No	Yes	No	Yes	No	No	155	63.4	26.39	32	75	86	0.87	79	171	47	110	100
125	20	Male	Fourth year	JNMC Campus	94	138/90	138	Prehyper tension	90	Non-Vegetarian	Heavy	Yes	1-2 Cig/Day	Yes	Moderate Activity	Father-Obesity+	No	No	No	Yes	No	No	176	76	24.54	42	110	128	0.86	96	253	35	154	414
126	20	Female	Second year	JNMC Campus	64	112/64	112	Normal	64	Non-Vegetarian	None	No	No	No	Heavy Activity	Father-HTN+ / DM+ Mother-HTN+	Yes	Yes	No	No	No	No	152	50	21.64	30	74	82	0.9	76	134	50	65	142
127	20	Female	Second year	JNMC Campus	96	122/76	122	Prehyper tension	76	Vegetarian	None	No	No	No	Light Activity	Father-DM+	Yes	No	No	No	No	No	148	59.5	27.16	30	70	81	0.86	80	114	42	54	91
128	20	Male	Second year	JNMC Campus	74	134/78	134	Prehyper tension	78	Non-Vegetarian	Moderate	Yes	No	No	Light Activity	Mother-HTN+ / Hypothyroidism+	No	Yes	Yes	No	No	No	179	61.3	19.13	35	74	89	0.83	72	161	51	102	87
129	20	Female	Second year	JNMC Campus	88	128/76	128	Prehyper tension	76	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	167	77	27.61	30	72	86	0.84	80	156	60	73	96
130	20	Male	Second year	JNMC Campus	66	114/70	114	Normal	70	Non-Vegetarian	None	No	No	No	Heavy Activity	Father-HTN+/ DM+	Yes	Yes	No	No	No	No	175	87.5	28.57	41	96	108	0.89	89	185	42	120	205
131	21	Female	Fourth year	JNMC Campus	84	124/80	124	Prehyper tension	80	Non-Vegetarian	Moderate	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	165	45	16.53	37	102	126	0.81	73	202	51	103	200
132	22	Male	Fourth year	JNMC Campus	90	130/80	130	Prehyper tension	80	Non-Vegetarian	Moderate	Yes	2-3 Cig/Day	Yes	Moderate Activity	Nil	No	No	No	No	No	Yes	185	91	26.59	34	87	102	0.85	104	225	35	157	197
133	23	Female	Fourth year	JNMC Campus	88	126/70	126	Prehyper tension	70	Vegetarian	None	No	No	No	Light Activity	Father - HTN+	No	Yes	No	No	No	No	160	52.3	20.43	32.5	75	89	0.84	66	184	54	89	187

134	23	Male	Fourth year	JNMC Campus	90	130/70	130	Prehyper tension	70	Non-Vegetarian	Moderate	Yes	4-5 Cig/Day	Yes	Moderate Activity	Father - HTN+/DM+ Mother - hypothyroidism +	Yes	Yes	Yes	No	No	No	185	84.4	24.66	42	102	111	0.92	69	154	36	96	212
135	21	Female	First year	JNMC Campus	77	114/70	114	Normal	70	Vegetarian	None	No	No	No	Moderate Activity	Mother - hypothyroidism+	No	No	Yes	No	No	No	160	68	26.56	33	98	104	0.94	68	190	125	105	130
136	21	Female	First year	JNMC Campus	84	124/80	124	Prehyper tension	80	Vegetarian	None	No	No	No	Light Activity	Nil	No	No	No	No	No	Yes	165	70	25.71	32	79	99	0.8	75	175	35	85	133
137	21	Female	First year	JNMC Campus	86	130/70	130	Prehyper tension	70	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	170	65.25	22.58	32	88	106	0.83	76	179	67	85	67
138	21	Female	First year	JNMC Campus	88	120/70	120	Normal	70	Vegetarian	None	No	No	No	Light Activity	Father- HTN+/DM+ Mother- HTN+	Yes	Yes	No	No	No	No	181	65.5	19.99	37	82	96	0.85	84	178	52	100	54
139	22	Female	First year	JNMC Campus	78	120/70	120	Normal	70	Vegetarian	None	No	No	No	Moderate Activity	Mother- Hypothyroidism+/ Obesity+	No	No	Yes	Yes	No	No	167	58.6	21.01	32	87	88	0.99	71	108	38	75	68
140	21	Female	First year	JNMC Campus						Non-Vegetarian	None	No	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	174	68.9	22.76	34	74	94	0.79	85	183	120	93	128
141	21	Male	Fourth year	JNMC Campus	90	136/88	136	Prehyper tension	88	Non-Vegetarian	Heavy	Yes	4-5 Cig/Day	Yes	None	Father-Obesity+ Mother Obesity+	No	No	No	Yes	No	No	188	105	29.71	40	104	113	0.92	72	202	56	146	230
142	22	Male	Third year	JNMC Campus	78	116/70	116	Normal	70	Non-Vegetarian	Moderate	Yes	No	No	Light Activity	Father-HTN+/DM+	Yes	Yes	No	No	No	No	173	75.3	25.16	36	84	101	0.83	83	145	30	116	199
143	22	Male	Third year	JNMC Campus	74	114/86	114	Normal	86	Vegetarian	Mild	Yes	2-3 Cig/Day	Yes	Moderate Activity	Nil	No	No	No	No	No	Yes	186	96.4	27.86	39	102	124	0.82	83	184	45	120	140
144	22	Male	Third year	JNMC Campus	86	126/80	126	Prehyper tension	80	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	186	72.9	21.07	36	86	102	0.84	81	104	32	84	83
145	22	Female	Fourth year	JNMC Campus	86	120/70	120	Normal	70	Vegetarian	None	No	No	No	Very Light Activity	Father - HTN+/DM+	Yes	Yes	No	No	No	No	152	61.7	26.71	36	88	102	0.86	85	236	28	120	200
146	22	Female	First year	JNMC Campus	90	130/80	130	Prehyper tension	80	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	152	51.5	22.29	30	61	76	0.8	70	141	127	34	87
147	22	Female	Third year	JNMC Campus	92	130/80	130	Prehyper tension	80	Non-Vegetarian	Moderate	Yes	2-3 Cig/Day	Yes	Light Activity	Father - HTN+/ Obesity+ Mother-Obesity+	No	Yes	No	Yes	No	No	160	58.4	22.81	34	99	120	0.83	79	141	41	106	282
148	22	Female	Second year	JNMC Campus	88	120/70	120	Normal	70	Vegetarian	None	No	No	No	Moderate Activity	Mother-DM+/ Hypothyroidism+	Yes	No	Yes	No	No	No	170	46	15.92	28.5	68	87.5	0.78	81	123	44	99	90
149	22	Male	First year	JNMC Campus	84	118/80	118	Normal	80	Vegetarian	None	No	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	177	80	25.54	36	78	95	0.82	84	137	72	35	48
150	22	Male	Third year	JNMC Campus						Vegetarian	Mild	Yes	No	No	Light Activity	Father- HTN+/DM+ Mother-HTN+/ Hypothyroidism+	Yes	Yes	Yes	No	No	No	165	56.5	20.75	36	82	98	0.84	79	176	39	78	74
151	22	Male	Third year	JNMC Campus	78	108/76	108	Normal	76	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	170	74.7	25.85	33	64	80	0.8	86	161	39	62	84
152	22	Male	Third year	JNMC Campus	86	116/78	116	Normal	78	Vegetarian	Moderate	Yes	2-3 Cig/Day	Yes	Moderate Activity	Father-IHD+/ Hypothyroidism+ Mother-Hypothyroidism+/ Obesity+	No	No	Yes	Yes	Yes	No	183	78	23.29	38	90	104.5	0.86	71	175	32	75	156
153	22	Male	Third year	JNMC Campus	96	134/88	134	Prehyper tension	88	Non-Vegetarian	Moderate	Yes	2-3 Cig/Day	Yes	Light Activity	Father- HTN+/DM+ Mother-Obesity+	Yes	Yes	No	Yes	No	No	163	64	24.09	37	83	92	0.9	78	198	46	91	258
154	22	Male	Third year	JNMC Campus	78	110/78	110	Normal	78	Non-Vegetarian	None	No	4-5 Cig/Day	Yes	Light Activity	Father- HTN+/ Obesity+ Mother-Obesity+	No	Yes	No	Yes	No	No	177	89.6	28.6	39	95	108	0.88	63	220	52	156	184
155	22	Male	Third year	JNMC Campus	74	126/74	126	Prehyper tension	74	Non-Vegetarian	Mild	Yes	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes	166	80	29.03	40	98	110	0.89	94	180	35	80	218
156	22	Male	First year	JNMC Campus	68	108/78	108	Normal	78	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	165	80	29.38	34	82	85	0.96	88	105	58	71	67
157	22	Male	Third year	JNMC Campus	80	114/64	114	Normal	64	Non-Vegetarian	Heavy	Yes	4-5 Cig/Day	Yes	Moderate Activity	Father- HTN+/ Obesity+ Mother-Hypothyroidism+	No	Yes	Yes	Yes	No	No	176	95	30.67	43	101	113	0.89	75	195	44	72	225
158	22	Male	Third year	JNMC Campus	92	120/76	120	Normal	76	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	174	83	27.41	36	100	109	0.92	93	191	53	112	140
159	22	Male	First year	JNMC Campus	78	108/88	108	Normal	88	Vegetarian	None	No	No	No	Heavy Activity	Father- HTN+ Grandparents-DM+/HTN+	Yes	Yes	No	No	No	No	174	86.5	28.57	37	99	115	0.86	91	154	53	53	57
160	22	Male	First year	JNMC Campus		106/84	106	Normal	84	Vegetarian	Mild	Yes	2-3 Cig/Day	Yes	Very Light Activity	Father- HTN+/ Obesity+	No	Yes	No	Yes	No	No	161	80	30.86	36	79	86	0.92	95	171	100	68	122
161	22	Male	First year	JNMC Campus	86	120/78	120	Normal	78	Vegetarian	None	No	No	No	Moderate Activity	Father- IHD+/ DM+ Mother- DM+/ Obesity+/ Hypothyroidism+	Yes	No	Yes	Yes	Yes	No	167	67	24.02	35.5	74	84	0.88	74	184	120	65	134
162	22	Male	Third year	JNMC Campus	92	136/86	136	Prehyper tension	86	Non-Vegetarian	Moderate	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	178	88.3	27.87	38	83.5	95	0.88	104	177	43	71	60
163	22	Male	Fourth year	JNMC Campus	86	124/74	124	Prehyper tension	74	Vegetarian	Moderate	Yes	1-2 Cig/Day	Yes	Very Light Activity	Fatner- HTN+/ DM+	Yes	Yes	No	No	No	No	167	84.9	30.44	39	94	107	0.88	89	227	39	124	204
164	22	Male	First year	JNMC Campus	84	106/68	106	Normal	68	Vegetarian	Heavy	Yes	No	No	Light Activity	Father -HTN+/ Obesity+ Mother- DM+/ Hypothyroidism+	Yes	Yes	Yes	Yes	No	No	183	100	29.86	34	99	98	1.01	81	96	36	56	30
165	22	Male	Third year	JNMC Campus	66	130/90	130	Prehyper tension	90	Non-Vegetarian	None	No	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes	177	94	30	40	99.5	110	0.9	113	225	57	103	66
166	22	Male	First year	JNMC Campus	78	120/70	120	Normal	70	Vegetarian	Mild	Yes	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	179	85	26.53	30	81	92	0.88	86	184	120	72	89

167	22	Male	Third year	JNMC Campus	82	118/88	118	Normal	88	Non-Vegetarian	Mild	Yes	No	No	Light Activity	Father-Obesity+ Mother-Hypothyroidism+/ Obesity+	No	No	Yes	Yes	No	No	182	95	28.68	38	100	111	0.9	86	169	54	80	281
168	23	Male	Fourth year	JNMC Campus	76	112/74	112	Normal	74	Non-Vegetarian	Moderate	Yes	1-2 Cig/Day	Yes	Light Activity	Father-IHD+/ HTN+/DM+ Mother-Hypothyroidism+/ Obesity+	Yes	Yes	Yes	Yes	Yes	No	175	65	21.22	38	110	117	0.94	96	202	46	144	212
169	22	Male	First year	JNMC Campus	84	118/76	118	Normal	76	Vegetarian	Moderate	Yes	No	No	Moderate Activity	Father- IHD+/ HTN+/ DM+/ Obesity+ Mother-Hypothyoidism+/ Obesity+	Yes	Yes	Yes	Yes	Yes	No	169	65.5	22.93	34	80	94	0.85	97	86	36	72	24
170	22	Female	Third year	JNMC Campus	68	126/76	126	Prehyper tension	76	Vegetarian	Mild	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	166	63.9	23.19	34	74	91	0.81	71	120	35	64	82
171	19	Male	First year	JNMC Campus	80	110/70	110	Normal	70	Non-Vegetarian	Heavy	Yes	2-3 Cig/Day	Yes	Light Activity	Nil	No	No	No	No	No	Yes	180	78	24.07	40	101	121	0.83	82	102	41	50	98
172	19	Male	First year	JNMC Campus	77	120/80	120	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Father - HTN+ Mother - DM+	Yes	Yes	No	No	No	No	159	56	22.15	34	77	87	0.89	92	124	38	68	101
173	19	Male	First year	JNMC Campus	84	116/80	116	Normal	80	Vegetarian	None	No	No	No	Moderate Activity	Father - IHD+/ DM+ Mother- DM+	Yes	No	No	No	Yes	No	172	70	23.66	34	96	106	0.91	63	145	58	101	115
174	19	Male	First year	JNMC Campus	74	110/70	110	Normal	70	Non-Vegetarian	None	No	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	181	80	24.42	38	90	105	0.86	91	126	34	70	141
175	19	Male	First year	JNMC Campus	90	120/70	120	Normal	70	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	176	88	28.41	37	96	110	0.87	88	151	50	88	121
176	19	Male	First year	JNMC Campus	88	120/70	120	Normal	70	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	184	98	28.95	42	99	118	0.84	64	166	36	76	87
177	19	Male	First year	JNMC Campus						Non-Vegetarian	Mild	Yes	2-3 Cig/Day	Yes	Light Activity	Father- HTN+/ IHD+/ Obesity+ Mother- DM+	Yes	Yes	No	Yes	Yes	No	168	78	27.64	38	84	96	0.88	90	105	28	91	172
178	19	Male	First year	JNMC Campus	77	118/70	118	Normal	70	Vegetarian	Mild	Yes	No	No	Moderate Activity	Father - HTN+/Obesity+ Mother - Hypothyroidism +	No	Yes	Yes	Yes	No	No	180	90	27.78	34	70	92	0.76	81	140	24	39	76
179	19	Male	First year	JNMC Campus	80	120/70	120	Normal	70	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	187	70.5	20.16	35	83	102	0.81	74	176	25	102	119
180	19	Male	First year	JNMC Campus	88	110/70	110	Normal	70	Non-Vegetarian	Moderate	Yes	No	No	Heavy Activity	nil	No	No	No	No	No	Yes	168	61	21.61	36	77	101	0.76	84	135	30	99	57
181	19	Male	First year	JNMC Campus	68	110/80	110	Normal	80	Vegetarian	None	No	No	No	Light Activity	Father - HTN+ Mother - DM+	Yes	Yes	No	No	No	No	180	85	26.23	32	104	92	1.13	82	172	37	91	76
182	19	Male	First year	JNMC Campus	70	116/80	116	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	169	61	21.36	35	79	98	0.81	87	166	60	69	101
183	19	Male	First year	JNMC Campus	88	110/70	110	Normal	70	Vegetarian	None	No	No	No	Moderate Activity	Mother - HTN+/Obesity+	No	Yes	No	Yes	No	No	177	83.3	26.59	36	91	104	0.88	85	142	39	101	96
184	19	Male	First year	JNMC Campus	90	116/80	116	Normal	80	Vegetarian	Moderate	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	185	76.3	22.29	37	95	100	0.95	97	137	32	114	106
185	19	Male	First year	JNMC Campus	86	118/74	118	Normal	74	Vegetarian	Moderate	Yes	No	No	Moderate Activity	Father-HTN+/ DM+ Mother-Hypothyroidism+/Obesity+	Yes	Yes	Yes	Yes	No	No	176	78.8	25.44	34	86	108	0.8	91	121	41	91	148
186	19	Male	First year	JNMC Campus	86	120/68	120	Normal	68	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	169	71	24.86	36	86	108	0.8	64	119	38	100	96
187	19	Male	First year	JNMC Campus	88	120/86	120	Normal	86	Non-Vegetarian	Heavy	Yes	2-3 Cig/Day	Yes	Very Light Activity	Mother- Obesity+ Grandparents - HTN+/ DM+	Yes	Yes	No	Yes	No	No	175	92	30.04	40	87	100	0.87	89	84	42	49	48
188	19	Male	First year	JNMC Campus	78	134/86	134	Prehyper tension	86	Non-Vegetarian	None	No	No	No	Moderate Activity	Father- HTN+/ Obesity+ Mother-Hypothyroidism+	No	Yes	Yes	Yes	No	No	173	56.7	18.94	36	73	90	0.81	98	127	41	122	97
189	19	Male	First year	JNMC Campus	74	122/86	122	Prehyper tension	86	Vegetarian	None	No	No	No	Moderate Activity	Nil	No	No	No	No	No	Yes	166	61.4	22.28	35	76	98	0.78	79	107	32	108	97
190	19	Male	First year	JNMC Campus	86	130/90	130	Prehyper tension	90	Non-Vegetarian	Heavy	Yes	1-2 Cig/Day	Yes	Very Light Activity	Father -Obesity+ Mother-Hypothyroidism+/ Obesity+	No	No	Yes	Yes	No	No	168	81	28.7	41	108	127	0.85	84	159	33	58	114
191	19	Male	First year	JNMC Campus	96	138/84	138	Prehyper tension	84	Non-Vegetarian	Moderate	Yes	4-5 Cig/Day	Yes	Light Activity	Father-HTN+/Obesity+ Mother- DM+	Yes	Yes	No	Yes	No	No	182	83	25.06	39	90	106	0.85	101	152	34	106	186
192	19	Male	First year	JNMC Campus	84	116/78	116	Normal	78	Non-Vegetarian	Mild	Yes	No	No	Light Activity	Nil	No	No	No	No	No	Yes	179	77.4	24.16	39	87	107	0.81	74	162	46	115	85
193	19	Male	First year	JNMC Campus	72	132/78	132	Prehyper tension	78	Non-Vegetarian	None	No	No	No	Very Light Activity	Father- HTN+/ Obesity+	No	Yes	No	Yes	No	No	184	85.7	25.31	40	94	108	0.87	89	172	63	130	183
194	19	Female	First year	JNMC Campus	72	110/80	110	Normal	80	Non-Vegetarian	None	No	No	No	Moderate Activity	Father- HTN+/ Obesity+/ Hypothyroidism+ Mother- DM+	Yes	Yes	Yes	Yes	No	No	170	64	22.15	32	79	101	0.78	79	178	86	138	103
195	19	Female	First year	JNMC Campus	84	126/76	126	Prehyper tension	76	Non-Vegetarian	None	No	No	No	Very Light Activity	Nil	No	No	No	No	No	Yes								79	121	60	60	121
196	19	Male	First year	JNMC Campus	94	130/70	130	Prehyper tension	70	Vegetarian	Heavy	Yes	No	No	Light Activity	Father- IHD+/ Obesity+ Mother-Hypothyroidism+	No	No	Yes	Yes	Yes	No	175	115	37.55	43	101	120	0.84	97	142	32	110	174

197	19	Female	First year	JNMC Campus	76	114/60	114	Normal	60	Vegetarian	None	No	No	No	Moderate Activity	Father-IHD+/ HTN+/DM+ Mother- Hypothyroidism+/ Obesity+	Yes	Yes	Yes	Yes	Yes	No	169	75	26.26	30	83	95	0.87	97	116	40	85	65
198	19	Male	First year	JNMC Campus	86	124/74	124	Prehyper tension	74	Non-Vegetarian	Mild	Yes	No	No	Moderate Activity	Father -HTN+ Mother- DM+/ Hypothyroidism+	Yes	Yes	Yes	No	No	No	182	70	21.13	37	81	92	0.88	86	124	42	131	98
199	19	Male	First year	JNMC Campus	74	110/70	110	Normal	70	Vegetarian	Mild	Yes	No	No	Heavy Activity	Nil	No	No	No	No	No	Yes	169	66	23.11	38	86	93	0.92	99	114	30	54	68
200	19	Male	First year	JNMC Campus	68	108/70	108	Normal	70	Vegetarian	None	No	No	No	Moderate Activity	Father- IHD+/ DM+ Mother- Hypothyroidism+	Yes	No	Yes	No	Yes	No	171	52.5	17.95	35	73	82	0.89	91	155	44	70	160