PERCEIVED STRESS AND EMOTIONAL EATING BEHVIOURS IN FIRST YEAR UNDERGRADUATE STUDENTS

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Foods and Nutrition

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CERTIFICATE

This is to certify that the research work presented in this thesis has been carried out independently by Ms. Isha Patel under the guidance of Dr. Shonima Venugopal in pursuit of the Degree of Master of Science (Family and Community Sciences) with major in Foods and Nutrition (Dietetics) and this is her original work.

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Isha Patel

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ABBREVIATIONS

ACHA – American College Health Association

ASQ – Adolescent Stress Questionnaire

BMI – Body Mass Index

CVD – Cardiovascular Disease

DALYs – Disability Adjusted Life Years

DEBQ – Dutch Eating Behaviour Questionnaire

ESSA – Educational Stress Scale for Adolescents

FFQ – Food Frequency Questionnaire

GHO – Global Health Observatory

HFSS – High Fat, Salt and Sugar

ICMR – Indian Council of Medical Research

IOTF – International Obesity Task Force

IPAQ – International Physical Activity Questionnaire

NCDs – Non-communicable Diseases

NFHS – National Family Health Survey

PSQ – Perceived Stress Questionnaire

PSS – Perceived Stress Scale

SSBs – Sugar Sweetened Beverages

WHO – World Health Organization

ABSTRACT

ABSTRACT

The nation that has a reputation for malnutrition is gaining weight; Indians are now more regularly diagnosed with overweight and obesity, along with its effects, which ultimately lead to non-communicable diseases (NCDs). One of the most important health problems in the world, particularly among adolescents and young adults, is obesity. Obesity is linked to a variety of eating patterns, including the inability to control one's food intake and the propensity to overeat, which frequently arises in stressful situations. During the first year of university, students may be more vulnerable to weight change because of the change in lifestyle and commencing university also is a time of increased stress, which may make students more susceptible to weight change. According to the WHO, 20% of adolescents (10-19 years old) experience mental health difficulties. Uncontrolled eating, food cravings, a rise in the consumption of high-calorie, high-fat snacks, as well as the types of foods chosen and the amount eaten, have all been linked to stress. Eating in response to psychosocial elements including stress, happiness, sadness, anger, boredom, fear, loneliness, etc. affects a person's eating behaviour.

Thus, with this background, the present study was planned with the following objectives:

- To identify the stress level of first – year university students.
- To understand the emotional eating behaviours of the first – year university students.
- To understand the association between stress and eating behaviour.

This cross-sectional survey was carried out among first-year undergraduate students in the Faculty of Family and Community Sciences. All students who had given their consent were enrolled for the study. Information related to sociodemographic information, anthropometric measurements, emotional eating behaviour, 24 – hour dietary recall, HFSS food frequency and perceived stress was collected using a pre – tested questionnaire. Physical activity data was collected using the International Physical Activity Questionnaire (IPAQ). From 250 total students 22.9% belonged to underweight (<18.5 kg/m^2) category, 36.6% students were normal weight (18.5 – 22.9

kg/m^2), 16.1% were overweight (23 – 24.9 kg/m^2) and 24.1% were obese (≥25 kg/m^2).

Approximately half of the participants (56.0%) stated that they consume <3 meals/ day. About 66.9% and 43.5% of students were skipping their breakfast and lunch respectively. Mean eating score of the students was 3.42±1.41. In the previous week, approximately 74.6% of students consumed fast food, 65.0% consumed tea or coffee, 54.0% dined out, and 28.6% consumed soft drinks twice or more than twice/week. Majority (47.9%) of the students were emotional eaters, whereas 1.6% were in the very emotional eaters category. Majority of the students craved for foods high in fat, foods high in fat and sugar, foods high in fat and salt and foods high in salt. Most students had a tendency to eat when they are happy, bored, or stressed. In response to these psychosocial factors, students had a tendency to eat foods high in fat, high in sugar and fat, and high in salt and fat. Majority of students reported eating as usual when they feel sad, angry, bored, happy, stress, etc. More than half of the students reported moderate level of stress. Females had higher mean stress scores than males. Greater perceived stress was associated with a greater intake of fat as well as reduced intake of carbohydrates. There was a significant difference observed in the frequency of consumption of high fat foods in females between moderate to high stress category and low stress category. Higher average stress levels were observed in students who eat in response to psychosocial factors such as happiness, boredom, fear, stress, loneliness and so on compared to those who do not eat. Physical activity data revealed that around 61.7% of total students were in the sedentary category, followed by 35.4% of students who were in the moderate category. The mean MET minutes/week in males (1383.8) was significantly ($p<0.001$) higher as compared to females (624) and more females (62.4%) as compared to males (52.6%) were sedentary. Majority of students sit for more than 7 hours per day (75.8%). The relationship between the perceived stress and BMI was found to be statistically significant ($p<0.05$).

Thus, it can be concluded that majority of the students were moderately stressed. Trend of poor eating practices was observed among students. More than half of the students were emotional eaters. Majority of students tend to eat in response to psychosocial factors such as happiness, boredom, and, stress. The study's findings indicate that general public health initiatives should focus on the issue of emotional eating and educate students about stress and ways to cope with it. The association

between low stress levels and healthy eating habits should be adequately addressed in policies and education for vulnerable groups, such as females and overweight/obese teenagers, in order to improve their lives. Students should be encouraged to adopt healthy lifestyles, increasing regular physical activity and lower consumption of energy dense nutrient poor foods. Students should be educated about stress- relieving approaches and encouraged to practice them on a daily basis, such as meditation, leisure activities and getting enough sleep.

INTRODUCTION

INTRODUCTION

STRESS

Stress is a condition in which "environmental demands exceed the adaptive capacity of an organism, resulting in psychological and biological changes which may increase risk for disease" (Cohen 1997). Stress can come in different ways in an individual's daily life. Stress is also viewed as the body's reaction, both neurologically and physiologically, to adapt to a new condition (Franken, 1994). According to the WHO, 20% of teenagers (10–19 years old) struggle with their mental health. It is believed that going to college will be a very difficult experience that will change the path of a student's life and bring about genuine satisfaction. The first year seems to be the most crucial for transitioning to college because there are so many possible transitional problems there. Many students struggle emotionally or psychologically as they adjust to life in higher education after high school (Robotham D, 2008). The transition to a new physical and social setting, frequently accompanied by new connections, financial demands, and expectations, which result in higher degrees of psychological distress (Khwaja & Dempsey, 2008). An examination of the adjustment literature indicates a number of pertinent concepts associated with university/college adjustment, such as anxiety, depression, stress vulnerability, rage, mood, and mental disease, which are indicators of poor adaptation (Clinciu, 2013).

First-year students may experience stress from peer pressure, academic overload, adjusting to a new living environment, meeting new people, and occasionally financial difficulty. They may also experience pressure to achieve academically. Students in their first year of college were shown to be especially vulnerable to stress (Towbes & Cohen,1996; Pancer et al., 2000; Wintre & Yaffe, 2000). They feel a lot of stress as they adjust to college life (Wintre & Yaffe, 2000 ,Towbes & Cohen, 1996). Being in university is different from being in school, which causes a culture shock for many of them. Failure to manage transitional stresses may result in a decline in academic performance and an increase in psychological suffering (Dwyer & Cummings, 2001). A poorer grade point average (GPA) and a decline in overall adjustment were predicted by the first year's increased stress (Wintre & Yaffe, 2000). Students frequently experience self-confidence issues when attempting to develop new social connections while still juggling the mounting academic responsibilities

(Tao et. al., 2000; Dwyer & Cummings, 2001). According to ACHA, 2018 41.3% students claim stress is the biggest reason for poor academic performance.

Adolescence is a vital period of biological, emotional, and psychological growth, as well as social development. During this time, a person develops their independence, makes new friends, learns how to interact with others, and picks up lifelong habits. This time frame can also be one of the most challenging (WHO, 2018).

Adolescent emotional difficulties are caused by four factors: intrapersonal, interpersonal, academic, and environmental. Academic stress is the most significant source of stress for adolescents when compared to other stressors (Akande et al., 2014).

The senior year of high school is a crucial time for pupils as they start to choose their desired subject area. The outcomes of learning, or values, become a deciding factor in whether one can be in the desired subject area. Teenagers are under pressure because of this to perform well academically. Also, there is a sense of strain because they have to master courses that are unquestionably harder than those junior high school kids must study (Subramani and Kadhiravan, 2017; Sripongwiwat et al., 2018).

Academic stress is defined as situations in which students find it difficult to meet academic responsibilities and view those demands as diversions (Sayekti, 2017). The findings of academic stress and mental health are significantly associated, according to Subramani and Kadhiravan's (2017) investigation.

Students claim stress is the biggest reason for poor academic performance (ACHA, 2018).

In a 2019 national poll of United States 67,972 post-secondary students, 13.4% of respondents said they had experienced extreme stress, and 45.3% said they had experienced more stress than usual in the previous 12 months .In addition, 87.4% of respondents felt overburdened by the task at hand, 70.8% expressed extreme sadness, 55.9% expressed hopelessness, and 45% reported being so depressed that functioning was impossible. About 20% of college students were receiving treatment for depression (ACHA, 2019).

STRESS AND EMOTIONAL EATING BEHAVIOUR

There is substantial evidence that stress can affect an individual's health not only through direct physiological processes but also by changing behaviours which affect health (Morales et al., 2006 & Unusan, 2006). One such health behaviour is dietary behaviour (Unusan, 2006). Stress has been associated with affecting the amount of food consumed. Some studies have shown that individuals tended to increase consumption of high caloric and high fat snack foods when stressed (Morales et al, 2006 & Unusan, 2006). Stress has also been associated with selection of food and with the amount of food consumed (Morales et al., 2006).

According to a survey, stress is linked to both an imbalanced eating pattern and emotional eating (Adam & Epel, 2007; Dallman et al., 2003; Macht, 2008). Several researches indicated that stress was linked to higher carbohydrate and fat intake, which led to the development of obesity, whereas other studies found that stress, was linked to inferior dietary decisions, such as less consumption of fruits and vegetables (Vaez et al., 2006; McCann et al., 1990; Liu et al., 2007).

According to one survey, the most common unhealthy habits indicated by students were skipping breakfast and eating infrequently during the day. Unhealthy eating habits were strongly connected with higher levels of stress, especially among female students. Women and those from low-income families had much higher stress scores than other groups. Female students were much more likely than male students to experience stress-related eating. Obesity and overweight were strongly linked to stress-induced conditions (Asadi, 2014).

Studies have shown that stress adaptively changes eating behaviour as it increases appetite and high caloric food intake (Jurvain et al., 2017). Increase in stress has been partially attributed to relationship between carbohydrate intake and serotonin brain activity (Oliver & Wardle, 1999).

The combination of behavioural changes in hunger, spikes in cortisol and drops in serotonin, which activate the brain's reward system and cause insulin to be suppressed and ghrelin to rise, is the process through which stress leads to overeating. When under stress or emotional stress, a powerful confluence of hormonal and physiological changes causes the insatiable craving for harmful meals (Jurvain et al., 2017).

Several studies show that people who eat without restraint, uncontrollably, or emotionally are likely to consume items that are unhealthy (Beydoun, 2014; Michels et al., 2012; Michel, 2007). Also, people who frequently engage in restrained, uncontrolled, and emotional eating have a higher body mass index (BMI) than people who don't or who engage in these activities less frequently (Guillain et al., 2006; Konttien et al., 2019; Sztainer et al., 2007).

It is well established that restricted, impulsive, and emotional eating behaviours are influenced by perceived stress (Cohen et al., 1983), often known as the subjective experience of stress. Restrained eating can be induced by increases in perceived stress (Diggins et al., 2015). While consuming hyper palatable foods like high-fat and sugary foods, stress can make it difficult to maintain control over one's appetite (Yau et al., 2013).

Emotional eating is explained by the Psychosomatic Theory of Obesity (Kaplan and Kaplan, 1957), which states that individuals with an emotional eating style use food as a dysfunctional coping strategy to reduce stress. Furthermore, having not learned to distinguish between hunger and negative emotions, they would respond to stress as if it were hunger and, consequently, by eating. However, as reported by Cardi et al. (2015), positive emotions (e.g., happiness) also can change food consumption, leading people to eat more than usual. Further the intake of snack type foods, prepared ready to eat foods and sweet foods such as chocolate, ice – cream and cakes was found to increase in students experiencing stress (Morales et al, 2006; Oliver & Wardle, 1999; Greeno & Wing, 1994) because consumption of sugar increases the activity in brain reward regions and reduces stress – induced rise in cortisol. Thus, people under stress consume more sugar to reduce their stress (Tryon, 2015)

Studies have shown that perceived stress was associated with higher fat intake, and this association was stronger among males than females. More than 40% of students reported having high fat consumption (Vidal et al., 2018).

The university transition period is crucial for the establishment of future health behaviours (Unusan, 2006; Hu et al., 2011; MC et al., 2008). Therefore, a negative association between stress and healthy dietary behaviour would be particularly concerning for young university students.

If the stress situation lasts or continues, the adrenals will increase the blood's level of cortisol, which could result in an increase in appetite (Finch and Tomiyama, 2015). Stress-related problems are linked to emotional eating and unhealthy eating habits (Tahir, 2016). In addition, stress issues brought on by poor academic achievement are linked to emotional eating behaviour (Kim and Kye, 2017) (Figure 1.1).

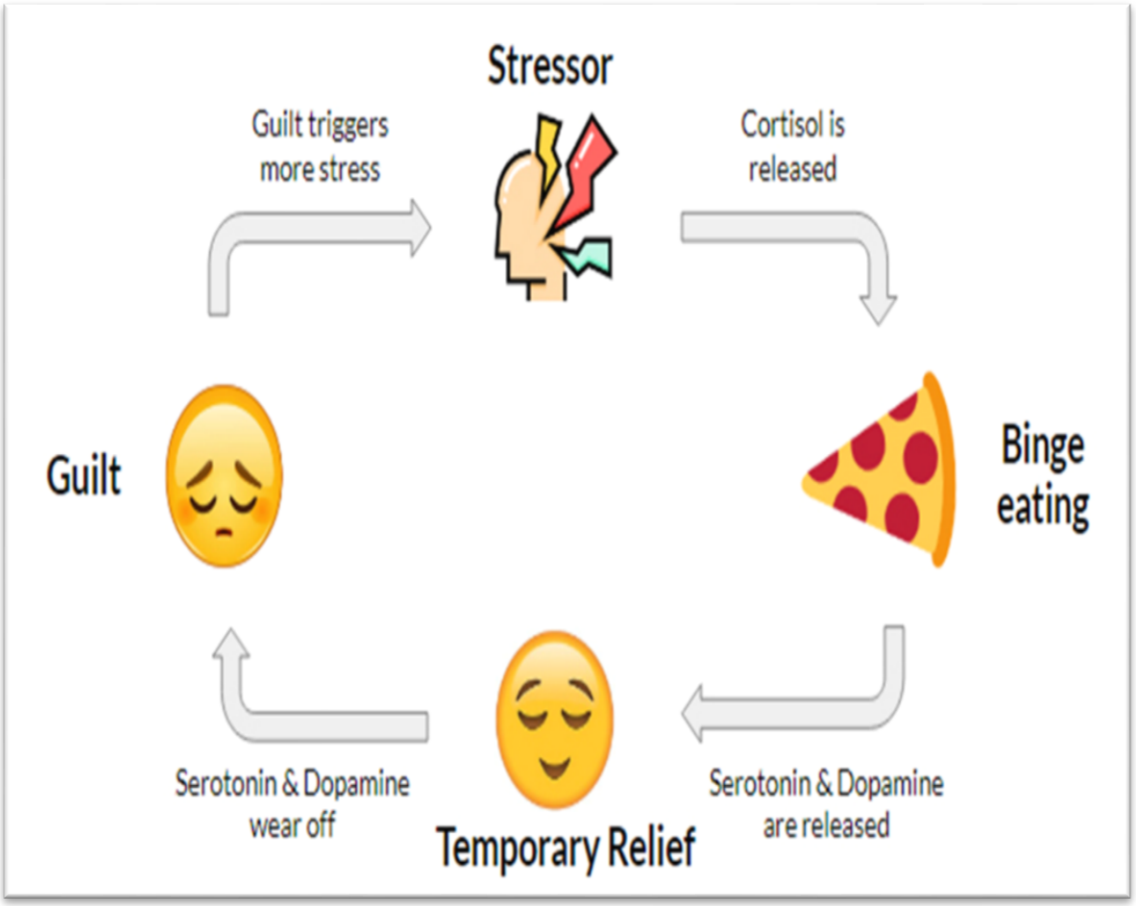
Emotional eating is also linked to increased levels of perceived stress (Shen et al., 2020), and the interplay between stress and emotional eating has a detrimental impact on BMI (Diggins et al., 2015; Usubini et al., 2020). When considered as a whole, the evidence points to the possibility that higher levels of perceived stress may lead to an increase in the frequency of maladaptive eating habits, such as emotional, unrestrained, and constrained eating (Guillain et al., 2006; Michel et al., 2012; Konttien et al., 2019).

According to one study, women stress scores to be higher than men. Emotional eaters made up nearly 64% of subjects who showed signs of perceived stress. Emotional eating is correlated with stress. Long-term issues associated with an improper diet may arise when dietary intake is influenced by emotions rather than physiological hunger (Arias et al., 2022).

In one Study, it was reported that positive relationships exist between eating habits, life stress, and emotional symptoms. In addition, after controlling for gender, age, BMI, parental education level, and self-reported family economic situation, depressive symptoms, anxiety symptoms, and life stress were substantially linked with unhealthy eating behaviours (Hou et al., 2013).

Emotional eating is a typical emotion-focused coping mechanism that is defined as a predisposition to eat in response to unpleasant emotions (Spoor et al., 2007). People who participate in emotional eating do so to alleviate emotions of distress, regardless of internal sensations of hunger and satiety (Conner et al., 1999). Affect-related hypotheses, like the escape from self-awareness model, contend that emotional eating in reaction to unpleasant affect may stifle bad emotions by focusing attention only on food intake (Heatherton and Baumeister, 1991; Wallis and Hetherington, 2004). Very appetising, filling snacks with lots of energy and high levels of sugar, sodium, and fat are the foods that people tend to eat the most to make themselves feel better (Dallman 2010; Kandiah et al., 2006; Zellner et al., 2006).

FIGURE 1.1 EMOTIONAL EATING BEHAVIOUR



Source: myhealthbuddy.co

In a study that looked at how acute stress affected 68 men and women's eating habits, it was discovered that stressed emotional eaters consumed more sweet, high-fat, and energy-dense foods than stressed non-emotional eaters and individuals who were not under stress (Oliver et al., 2000). An overall satisfying feeling, or sentiments of nostalgia, is said to be produced by tasty foods, which may assist in reducing the discomfort of perceived stress (Dallman, 2010; Polivy et al., 1994).

Undergraduate students who report high levels of stress are more likely to report increased consumption of cookies, cake, and chocolate (Oliver & Wardle, 1999), as well as a higher frequency of fast-food consumption (Almogbel et al., 2019). Although repeated use of this tactic may be unadaptive in the long run and may increase the effects of stress on psychological and physical health outcomes, emotional eating may temporarily comfort and divert attention (Lazarus & Folkman, 1984).

According to one study, perceived stress and emotional eating may have a synergistic relationship with depression symptoms among undergraduate students. Low, moderate, and high levels of emotional eating inclinations were all associated with greater levels of perceived stress and depressed symptoms (Amestoy & Fiocco, 2021).

Emotional eating is when a person overeats in response to distressing emotional stimuli. This is being done in an attempt to deal with unpleasant emotions, but it will be detrimental for one's physical, emotional, and self-esteem (NEDA, 2004).

One study found that 51.1% of students engaged in emotional eating and 47.4% of students reported moderate academic stress. Academic stress significantly increased the likelihood of emotional eating. Consumption of fast food or canned food, sweet food or cakes, dairy goods, and sweet beverages were strongly connected with emotional eating behaviour (Ramadhani & Mahmudiono, 2021).

STRESS AND PHYSICAL ACTIVITY

Physical activity refers to “any bodily movement that is produced by skeletal muscle that results in a substantial increase over the resting energy expenditure." (WHO, 2000).

Sedentary lifestyle, or physical inactivity, is usually defined as “a state, when body movement tends to be minimal, and also the total energy expenditure is approximately equal to the Resting metabolic rate” (Augustine et al., 2003).

Physical activity is often recommended as strategy to managing stress. About 40%–50% of college students are physically inactive. Physical activity is often recommended as a strategy for managing stress. Physical activity has the potential to reduce stress, but research indicates that only about half of college students engage in the recommended amount of physical activity each week (150 minutes) (Burke et al., 2006; Irwin, 2004). There have been few studies that link exercise to a decline in depression among American college students. In a study done in 2000, Skirka looked into the impact of sports activity on the mental health of 270 college athletes and non-athletes. Sport participation and perceived stress were found to be inversely correlated.

In another study, 135 undergraduate psychology and kinesiology students were selected to examine the effects of leisure-time physical activity on stress management. It was discovered that participants' levels of stress were significantly lowered by physical activity (Carmack et al., 1999).

According to one study, college students' perceived stress vulnerability and degree of physical activity were inversely associated. This underlines once more the possibility that engaging in physical activity can help college students feel less stressed, which will lessen their sadness and anxiety. Also, it was discovered that male college students engaged in greater physical activity than their female counterparts did (Xu et al., 2018).

Two studies (Angst et al., 2004; Matud, 2004) indicated that male college students had higher levels of physical activity and lower levels of stress and depression than female students, which appears rational given that physical exercise is commonly found to be inversely related to stress vulnerability.

According to one study, exercising lowers people's stress and anxiety levels.This is due to the fact that practising physical activity releases frustration and lowers muscle tension while also assisting in lowering energy levels (Stubbs et al., 2017).

Also, it raises levels of norepinephrine and cortisol, two hormones connected to stress and anxiety, as well as endorphins, the hormone that makes you feel good (Reber et al., 2015). Also, they have demonstrated that exercise supports the management of complicated emotional processes and depressive moods (McMahon et al., 2017).

Positive effects of yoga (as a mind-body intervention) on stress reduction in college students were found in numerous systematic reviews and various studies on its impact on stress management in college students (Thangavel et al., 2014; Goldstein et al., 2016; Brems et al., 2016). Suryanamaskara, a form of yoga, was found to be helpful in promoting dispositions of relaxation such as physical relaxation, mental quietness, ease/peace, rested and rejuvenated, strength and awareness, and joy, and it also lessens drowsiness, somatic stress, concern, and negative emotions on a dispositional level (Rocha et al., 2012).

According to a review study, yoga provides good psychophysiological benefits that improve college students' academic performance (Tripathi et al., 2018). Yogic techniques are crucial for improving students' emotional sensitivity, focus over time, mental performance, and sense of balance, all of which are prerequisites for their academic success. Also, yoga helps college students feel less stressed and less negatively affected, which enhances their psychological well-being (Godse et al., 2015; Ganpat et al., 2014; Sheela et al., 2013; Ganpat et al., 2013).

According to one study, among all subjects, 21.5% were considered sedentary. Depression and sedentary behaviour were found to have a significant correlation. For participants who engaged in sedentary behaviour and those who did not, there was a significant mean difference in depression levels (Chellaiyan et al., 2018).

According to research, persons who engage in regular physical activity experience less stress and anxiety (Dunn et al., 2001). Those who are less active or inactive tend to be more vulnerable to the negative effects of stress in life (Crews et al., 1987).

According to studies, increasing one's level of physical activity from low to moderate or high was connected with a reduction in stress (Moljord et al., 2011).

While research reveals that students, even young people, are not achieving the normal requirements for physical exercise, it does suggest that physical activity may help students to some extent deal with perceived stress and other related psychological

disorders. In Canada and the United States, more than half of students did not engage in enough physical exercise to be healthy, according to Irwin's (2004) analysis of physical activity patterns. Similar results were seen in other nations.

In one study, it was found that just 22.5% of students reported high levels of physical activity, while 42.5% of the students overall had poor levels. Around 39% of students have high levels of stress, while 36% have moderate levels of stress. It was shown that students who engaged in low levels of physical exercise experienced high levels of perceived stress, whereas students who engaged in high levels of physical activity experienced low levels of stress. It was discovered that there is statistically significant correlation between physical exercise and stress (Raj & Kanagasabapathy, 2020).

Ebrahim (2016) found that 12% of the study sample indicated they were under a lot of stress. The most typical physical sign of academic stress was headache, and the most typical psychological symptoms were sadness and anxiety. Women, obese or overweight students, nursing students, and students with poor health status and low levels of physical exercise were more likely to experience high levels of academic stress. There were correlations between students' subjective health state, physical activity, and perceived stress and gender. Female students who report having a bad subjective health state and who engage in little physical activity appear to be under the most stress.

STRESS AND OBESITY

The worldwide prevalence of obesity nearly tripled between 1975 and 2006 (World health statistics, WHO 2022). Being overweight or obese is related to a variety of major health problems throughout one’s life. Obesity is associated with an increased risk of numerous NCDs such as hypertension, diabetes, coronary heart disease, stroke and various types of cancers (WHO, 2015). According to WHO in 2016 more than 1.9 billion adults aged 18 years and older were overweight, of these over 650 million were obese. WHO estimated 20% of adolescents (10–19 years) have mental health problems.

Obesity, a multifactorial disease in which genetic, biological, and environmental factors are involved in its aetiology, basically develops with an increase in adipose tissue due to the energy taken with the diet being more than the expenditure. Various

types of eating behaviours, such as the loss of control over food intake, and the tendency to overeat, which often develops in the presence of emotional stress, are associated with obesity (Acosta, 2017).

A person's nutritional state can be utilised as a health status indicator. The Body Mass Index (BMI) can be used to calculate nutritional status from height and weight. Purwanti et al., (2017) discovered a correlation between stress levels and BMI values. Teenage stress can contribute to the emergence of obesity, which is a global public health issue in adulthood (Tajik et al., 2016).

Being physically and psychologically healthy has been shown to improve quality of life. Despite the benefits of being healthy, the rate of obesity has increased two- to three-fold in the last 20 years (Headly et al., 2004). Notably, data published in 2008 by the American College Health Association's National College Health Assessment indicated that 36.7% of college students were overweight or obese (ACHA, 2008).

Studies have shown that stress causes emotional and uncontrolled eating and increases food cravings, resulting in higher intake of sugar and fat leading to consumption of an additional 151 calories per day. This results in weight gain of up to 17kg (37 lbs) per year (Jurvain et al., 2017). During first year of university, students may be more vulnerable to weight change because of the change in lifestyle and commencing university also is a time of increased stress, which may make students more susceptible to weight change.

According to the psychosomatic hypothesis of obesity, overweight or obese persons are more likely than lean people to turn to food as a coping mechanism for stress and unpleasant feelings (Kaplan and Kaplan, 1957). Studies on the connection between stress and BMI, however, have revealed inconsistent findings. In a sample of male Japanese employees, Nishitani and Sakakibara (2006) discovered a link between obesity and workplace stress, whereas Kouvonen et al., (2005) found only a weak link between work stress and BMI. On the other hand, multiple studies (Diggins et al., 2015; Lazarevich et al., 2016; Lluch et al., 2000; Porter and Johnson, 2011) discovered a consistent link between BMI and eating style.

One study looked at the effects of BMI, eating habits, and nationality in moderation to assess the link between stress and unhealthy eating among undergraduate students.

With regard to negative emotional eating, academic stress (particularly stress related to academic expectations and stress related to academic self-perceptions), and unhealthy eating (particularly junk food consumption and snacking), overweight people were found to exhibit higher levels among Italian and French students. Also, only students with a higher BMI were predicted to snack, indicating the moderation role of BMI in the link between academic stress and unhealthy eating (Caso et al., 2020).

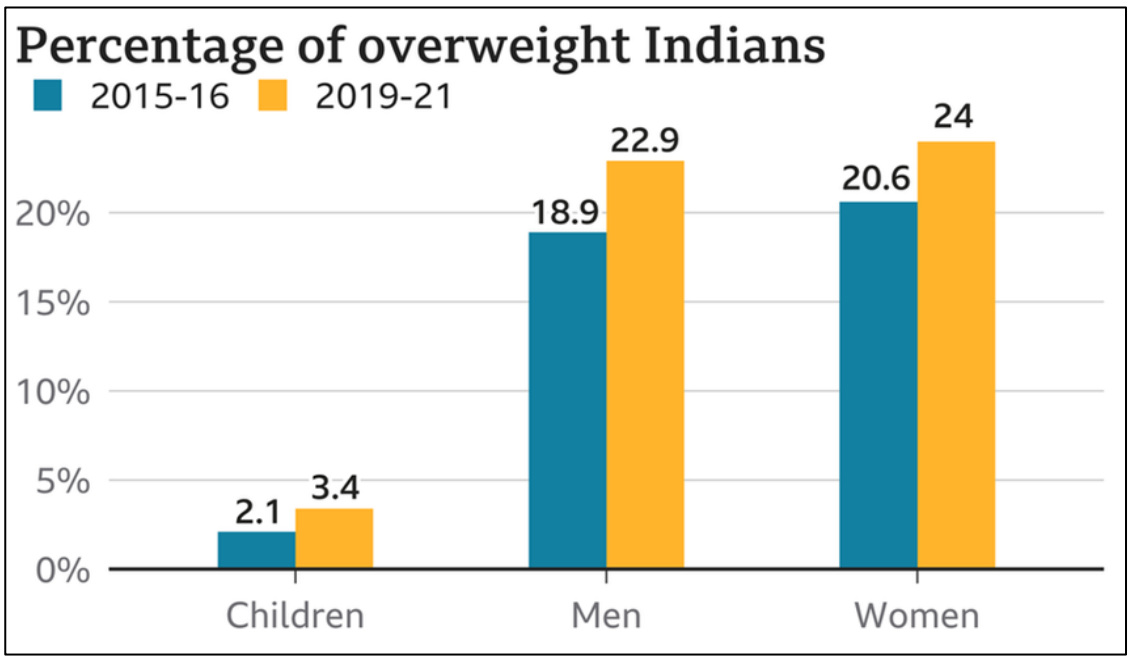
According to one study, the majority of the sample's adolescents (61.5%) had moderate-to-extremely high levels of stress, while 28.2% were overweight or obese, only 2.7% led very active lifestyles, and 30.5% were inactive. While physical activity was strongly correlated with the incidence of overweight/obesity and high stress, perceived stress was significantly and positively correlated with eating habits and body mass index. Males were more likely to be overweight or obese (53.8%) and to report significant levels of stress (52.5%) (Roy et al., 2021).

As per NFHS – 5 (2019) data 24% women and 22.9 % men are overweight and obese in India which is 4% higher than the last survey conducted in 2015 – 16 (NFHS – 4)(Figure 1.2).

According to one study, emotional eating is widespread among adolescents as they experiment with and indulge in a variety of life events that place them in stressful situations. Adolescents deal with a lot of negativity and confusion in their daily lives, and to cope, they turn to food as a stress reliever, diversion, dopamine booster, etc. Researchers discovered that obese adolescents experience emotional eating to a greater extent than non-obese adolescents(Koshy et al., 2022).

In a review, 25 observational studies (23 cross-sectional and 2 longitudinal) were examined, and 11 of them indicated no correlation between stress and BMI or weight change. Moreover, no significant correlation between anxiety and BMI was found in five investigations. A few studies have shown that stress and anxiety may be linked to either greater or lower weight status. As a result, there is a chance that stress may lead to an increase or decrease in weight, showing that there may be a bidirectional effect on BMI (Haidar et al., 2018).

FIGURE 1.2 PREVALANCE OF OVERWEIGHT IN INDIA



Source: NFHS – 4 (2015 – 16) and NFHS – 5 (2019 – 21)

According to a study carried out in Mumbai, medical 36.8% of students were found to be overweight and 11.1% of students were obese. Males were more likely than females to be overweight or obese, with rates of 48.3% and 11.5% compared to 30.1% and 10.6%, respectively. About 45.6% and 30.8% of survey participants thought their stress levels were high and medium, respectively. Around 39.04% of study participants who reported feeling stressed out were overweight, and 18.86% were obese (Sonawane et al., 2021).

As per NFHS – 5(2019) data indicates that 4.9% women and 8.8% men are overweight or obese in Gujarat which is 2.1% higher than the last survey conducted in 2015 – 16 (NFHS – 4).

Out of many well - known etiological factors ever increasing stress in life remains a poorly understood cause of obesity. Although the World Health Organization has aimed to reduce the prevalence of obesity by 2025, it does not seem possible to reach this target at the current rate of increase (OAG, 2022). Obesity is an important health problem in our country.

Around 11.90% of college students in Vadodara were overweight, and 20.83% were obese, according to one survey. Males were more likely to be obese (25.53%) than females (20.53%), whereas females were more likely to be overweight (12.14%) than males (9.80%) (Venugopal and Raithatha, 2022).

RATIONALE OF THE STUDY

For many students, the transition from the high school environment into the university environment is accompanied by emotional and/or psychological distress. The transfer into a new physical and social environment, often accompanied by new relationships, financial demands and expectations may bring with it increased levels of stress, which may make students more susceptible to weight change. Overweight and obesity is a critical problem. A troubling fact is the amount of weight gain as student's dietary behaviour changes in response to stress. Increased stress levels are related to unhealthy food choices. Emotional eating habit puts a person at risk to become overweight/obese. Psychosocial Factors [Stress, Happy, Sad, or Bored] affect an individual's dietary habits.

BROAD OBJECTIVE OF THE STUDY

To study perceived stress and emotional eating behaviour of undergraduate first year university students.

SPECIFIC OBJECTIVES

- To identify the stress level of the first-year university students.
- To identify the emotional eating behaviours of the first-year university students.
- To understand the association between stress and eating behaviour.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

GLOBAL PREVALENCE OF NON – COMMUNICABLE DISEASES

Non-communicable diseases (NCDs) are a broad category of illnesses that include chronic respiratory conditions, cancer, diabetes, and cardiovascular conditions. NCDs continue to be important public health problems in the world, being responsible for sizeable mortality and morbidity. NCDs are the leading causes of death and disability worldwide. In 2005 NCDs caused an estimated 35 million deaths, 60% of all deaths globally, with 80% of the deaths in low income and middle-income countries and approximately 16 million deaths in people less than 70 years of age. It is predicted that these diseases will be causing seven out of every 10 deaths in developing countries (Habib et al., 2010).

Currently, Non-communicable diseases (NCDs) are the leading cause of death globally, the majority of these being due to cardiovascular disease, cancer, chronic respiratory diseases, or diabetes. Mortality from many NCDs continues to increase worldwide, with a disproportionately larger impact in low-middle income countries (LMIs), where almost 75% of global deaths occur from these causes (Gowshall et al., 2018).

NCDs are becoming more common and have a greater impact.60% of deaths globally are caused by chronic diseases, and 80% of these deaths take place in low- or middle-income nations, where the death count is statistically higher during the peak productive years of youth and middle age. Trends also suggest that the major risk factors for non-communicable diseases — hypertension, high glucose levels, obesity, and inactivity — are on the rise, especially in developing countries (Narayan et al., 2010).

Figure 1 illustrates the global mortality (%) of all ages, both sexes. NCDs are estimated to account for 71% of the 57 million global deaths. CVD accounts for the highest percentage i.e., 31% of all death, followed by communicable, maternal, perinatal & nutritional conditions, cancers, other NCDs, injuries, chronic respiratory diseases and diabetes.

The global prevalence of NCDs remains very high. NCDs contribute to the low income country's 41 million deaths compared to the world's 57 million deaths, i.e., 71% of premature death from age 30 to 70 years old account for almost 15 million of these deaths. The NCDs burden is found to be highest within low and middle – income countries. They account for 78% of all NCDs deaths and 85% of premature deaths in the age group between 30 to 70 years. The disease burden of NCDs in poor countries is going to increase by more than 80%, and younger people will be more vulnerable to suffering from NCDs (Bollyky et al., 2017)

By the dawn of the third millennium, NCDs are sweeping the entire globe, with an increasing trend in developing countries where, the transition imposes more constraints to deal with the double burden of infective and non-infective diseases in a poor environment characterised by ill-health systems.(A Boutayeb & S Boutayeb, 2005).

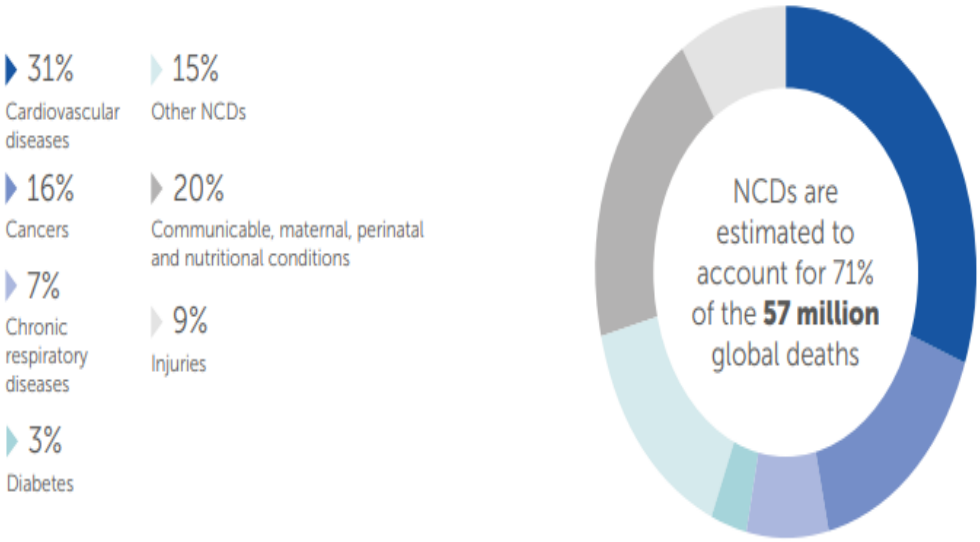
NATIONAL PREVALENCE OF NON – COMMUNICABLE DISEASES

The prevalence of NCDs is rising in India. In many industrialised nations, people with NCDs often present around age 55 or older, however their beginning in India happens a decade sooner (at around age 45).

Around 38 million (68%) of all deaths worldwide and 5.87 million (60%) of all fatalities in India are a result of NCDs. Cardiovascular diseases, chronic respiratory diseases, malignancies, and diabetes account for around 82% of all NCD deaths and account for the majority of NCD mortality and morbidity (World Health Organization - WHO, 2014).

India is undergoing a significant epidemiological transformation at the same time as its fast social and economic development. The country's disease patterns have changed over the past 26 years: Mortality from communicable, maternal, neonatal, and nutritional diseases (CMNNDs) has significantly decreased, and since India's population is ageing, NCDs and injuries are now making up a larger portion of the country's overall disease burden (ICMR,2017).

FIGURE 2.1 GLOBAL MORTALITY (% OF TOTAL DEATHS), ALL AGES, BOTH SEXES,2016



Source: Non – Communicable disease country profile 2018 (WHO)

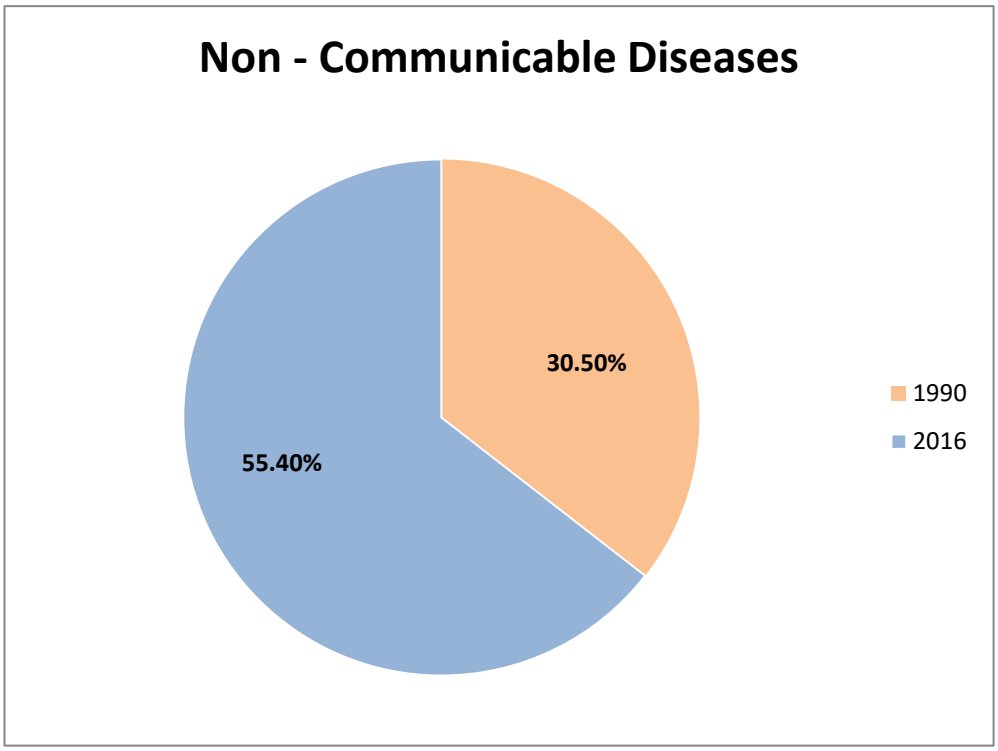
In India, NCDs accounted for 65% of all fatalities in 2019 (IHME, 2019) and the burden of disease has shifted from communicable to non-communicable diseases over a 26-year period (1990-2016). The overall number of adjusted life years with a disability due to NCDs grew from 30.5% in 1990 to 55.4% in 2016 (Dendoana et al., 2017) (Figure 2)

According to a study done in Kerala, majority of persons in the 18-64 age range in the sample (82.4%) had at least one of the NCD risk factors, and 47.1% had multiple risk factors. In Kerala, elevated BP and FBG were found in 30.4% and 19.2% of cases, respectively. Up to 30.4% of people were overweight, and 60.2% of them had abdominal obesity, which was much more common in women. Furthermore, it was discovered that 54.5% of the adult population had dysglycaemia (increased FBG and pre-diabetes combined) (Sarma et al., 2019).

Self-reported NCDs are currently 55 per thousand people in India. At the national level, it is noted that women have a substantially higher frequency of NCDs than males do. Kerala has the greatest frequency of NCDs among Indian states, followed by Goa, Andhra Pradesh, and Tamil Nadu (Patra and Bhise, 2016).

The ICMR-WHO study on disease burden examined research on NCDs up until 2003(ICMR, 2006). In south India's rural population, a cross-sectional study was carried out. According to the study, 8.6% of participants had diabetes, 12.4% had hypertension, 6.8% had cardiovascular illnesses, 26.1% were obese, 23.8% were overweight, 74.9% consumed a lot of salt in their diets, 10.5% was a smoker, and 14.8% drank alcohol. Lower socioeconomic groups ($p < 0.05$) had statistically greater rates of ischemic heart disease, diabetes mellitus, hypertension, and high salt intake than higher socioeconomic groups, and illiterate people had a higher burden than literate people ($p<0.005$)(Venkatachalam et al., 2014).

FIGURE 2.2 BURDEN OF NON – COMMUNICABLE DISEASES



Source: Institute for Health Metrics and Evaluation (IHME), 2019

A cross-sectional research was carried out in Kerala to calculate the prevalence of several behavioural risk factors for NCDs and chronic illnesses. They discovered that smoking and alcohol use were two of the main risk factors seen in males. About two fifths of them (40%) and 41%, respectively, were current drinkers and smokers. The median age at which smoking and drinking habits first emerged was 21, respectively. Based on job and leisure activities, over a quarter of the target group (23% men and 22% women) were inactive. 23% of them said they were stressed out. Compared to men (17%), women (33%) were more likely to be obese. Low socioeconomic status was found to be a strong predictor of unhealthy eating habits, stress, and alcohol use (Sugathan et al., 2008).

In India, NCDs are not just seen in metropolitan areas like cities and towns. According to a research conducted in the southern Indian state of Andhra Pradesh by Joshi et al., 2006 even in rural India, NCDs are the top cause of mortality (32%) and are followed by accidents and external causes of death (12%).

Another revealed that the population in rural Nagpur, Maharashtra, had a significant burden of NCD risk factors. It was shown that while men were more likely to smoke and use alcohol, women were more likely to be overweight and inactive. Both genders consumed less fruit and vegetables than average (Bhardwaj et al., 2012).

Numerous studies have revealed that the frequency of NCD risk factors in the early stages of life, i.e. early life and adolescence have important potential for illness to develop in adulthood (Whietaker et al., 1997; MCCarron et al., 2000; Kurpad et al., 2004) High incidence of obesity and hypertension among school children, along with unsuitable eating habits (fast food intake, low fruit consumption), poor physical activity, increased levels of alcohol experimentation and, to a lesser extent, smoking, are all present (Singh et al., 2006; Sogarwal et al., 2014; Gujjarlpaudi et al., 2013).

REGIONAL PREVALENCE OF NON – COMMUNICABLE DISEASES

In order to map the prevalence of NCDs in the free-living population of Vadodara and Godhra, Iyer et al. (2011) conducted a study. Anthropometric data, medical histories, and food habits were collected while employing multistage sampling (cluster and systematic random sampling) to obtain a sample of 351 persons. In both cities, obesity and overweight were equally common (obesity 45% vs. 42%; overweight 24% vs. 25%). Diabetes and hypertension were more prevalent in Godhra (19% and 36%) respectively than in Vadodara (12% and 24%). High BMI, waist circumference, hypertension, physical activity, cigarette use, drinking alcohol, eating poorly balanced meals, and a lack of green leafy vegetables were all risk factors, as was a family history of diabetes. Most of the people (79%) had between two and five risk factors.

Bhagyalaxmi et al. (2013) did a study to determine the prevalence and distribution of NCDs risk factors among urban and rural populations in Gujarat, India. A cross-sectional study involving 1,805 urban and 1,684 rural people aged between 15– 64 was performed using the WHO stepwise technique. A systematic approach was used to gather data on the behavioural and physiological risk factors of NCDs. In comparison to urban men (smoking 12.8% and smokeless tobacco intake 23.1%), a greater prevalence of smoking (22.8%) and use of smokeless tobacco (43.4%) was seen among rural men. Average fruit and vegetable consumption varied significantly between urban areas (2.18 ±1.59 servings) and rural areas (1.78 ± 1.48 servings). In comparison to rural men and women, urban men and women were shown to have a higher prevalence of overweight and obesity across all age categories. In both areas, the prevalence of behavioural risk factors, overweight, and obesity increased with increasing years. About 15.4% of rural residents and 29% of urban residents, respectively, had elevated blood pressure. For both men and women, the urban population had considerably higher rates of overweight and obesity, hypertension, and a lack of physical activity, while the rural population had higher rates of smoking, the use of smokeless tobacco, and inadequate fruit and vegetable consumption.

In Gujarat's Sabarkantha district and among sampled schools, a cross-sctional study was conducted in order to determine the prevalence of risk factors among school-going adolescents. A total of 484 adolescent students were assessed for their body

weight, height, and blood pressure, as well as sociodemographic data, lifestyle habits, and family history. The two biggest risk factors for NCDs in school-age adolescents were not eating fruits and not engaging in regular physical activity (Puwar et al., 2018).

The Faculty Members of the Teaching Institute of Ahmedabad City were the subject of a cross-sectional study to ascertain the prevalence of risk factors and its association with NCDs. Each zone of Ahmedabad was regarded as a cluster, and 96 faculty members, 48 males and 48 females, were selected as the study population from each zone, resulting in the collection of data from 576 faculty members. The major prevalent risk factors were: smoking, usage of smokeless tobacco, and alcohol consumption: 5.21%, 12.15%, and 5.90% respectively. For hypertension, diabetes, overweight, and obesity, respectively, the disease-specific prevalence for males compared to females was: 23.40% vs. 26.38%, 4.51% vs. 3.10%, 30.55% vs. 22.91%, and 10.41% vs. 7.29%. Being overweight and obese were risk factors with rising rates of tobacco use, job stress, physical inactivity. (Chhaya et al., 2015).

According to a survey by Kumar et al. (2019), there were 89755 people living in 18269 homes in 26 villages in Anand district of Gujarat, India, with an average family size of 4.91. About 70.2% of the population was made up of adults over the age of 20. Around 5.3% of people in the population had NCDs, with women having a slightly higher prevalence (5.4%) than men (5.2%). About 50.7% of hypertensives and 94.9% of diabetics utilised medication. Males (78.3%) received considerably more treatment for hypertension than did hypertensive females (82.59%).

STRESS AND OBESITY

GLOBAL PREVALENCE OF OBESITY

Throughout one's life, being overweight or obese is linked to a number of serious health issues. Obesity raises risk the for many NCDs, including hypertension, diabetes, coronary heart disease, stroke, and different types of cancer. Over 1.9 billion people aged 18 and older were overweight in 2016, with over 650 million of these being obese (WHO, 2017).

According to Chooi et al., (2019) obesity is a complex multifactorial disease. Since 1980, the prevalence of overweight and obesity has increased significantly over the world, nearly tripling, to the point that a third of the global population is now considered to be overweight or obese. Regardless of geographic location, race, or financial position, the prevalence of obesity has increased in people of all ages and genders, however it tends to be higher in older people and women. Despite significant differences in the absolute prevalence rates of overweight and obesity, this pattern was consistent across regions and nations. The prevalence rates of obesity appear to have plateaued in a few wealthy nations over the past several years. In epidemiological research, overweight and obesity are commonly defined using the body mass index (BMI). Although age, sex, and ethnicity are somewhat to blame for the high inter-individual variability in % body fat for any given BMI number, BMI has low sensitivity. For instance, for the same BMI, Asians have a higher percentage of body fat than Caucasians. Increased fat to lean mass ratios, visceral adipose tissue localisation of extra fat, and ectopic depots (such as muscle and liver) have all been linked to higher cardio metabolic risk (e.g. metabolically-obese normal-weight).

The population's diet has seen a significant change over the last few decades of the 20th century. They now consume more processed foods, dine more outside, and use a lot of edible oils and beverages with added sugar. With an increase in sedentary behaviour and a decrease in daily physical activity, people's lifestyles have also changed. Compared to the population of high-income countries, the number of overweight and obese people is rapidly increasing in rural and urban areas of low-income countries (Popkin et al., 2011).

In 2016, 13% of adults over the age of 18 were obese and 39% were overweight. Most individuals in the world reside in countries where being overweight or obese is more deadly than being underweight. In 2016, near to 340 million kids and teenagers between the ages of 5 and 19 were overweight or obese. A massive 38.2 million kids under the age of five were reportedly overweight or obese in 2019. Overweight and obesity, once thought to be an issue only in high-income nations, are increasingly becoming more prevalent in low- and middle-income nations, especially in metropolitan areas. In 2020, there were 39 million under-fives who were overweight or obese (WHO factsheet on overweight and obesity, 2021).

Since 1980, there has been a more than doubling in the prevalence of overweight and obesity, with 600 million obese individuals and 21.9 billion overweight adults in 2014 (Shamnmawaz et al., 2018).

According to data from the Global Health Observatory (GHO), at least 2.8 billion people die each year as a result of being overweight or obese. Nearly two billion of the world's five billion adults are overweight or obese (WHO, 2014).

In 2010, it was reported that worldwide, overweight and obesity accounted for 3.8% of DALYs (Disability Adjusted Life Years), 3.9% of years of life lost, and 3.4 million deaths. Numerous demands for regular monitoring of changes in overweight and obesity prevalence in all groups have been made in response to the rise in obesity. As per the systematic review, the proportion of persons with a BMI of 25 or higher grew globally from 28.8% in 1980 to 36.9% in 2013 for males and from 29.8% to 38.0% for women. Both developed and developing countries saw increases. In developed nations, the prevalence of overweight and obesity among children and adolescents has substantially increased. In 2013,23.8% of boys and 22.6% of girls who were either overweight or obese. Children and adolescents in developing nations are becoming more likely to be overweight or obese; in 2013, this prevalence increased for males from 8.1% to 12.9% and girls from 8.4% to 13.4% (Ng et al., 2014).

The obesity pandemic appeared to have started almost simultaneously in the majority of high-income countries in the 1970s and 1980s; since then, the majority of middle-income and many low-income countries have joined the global increase in the prevalence of obesity in both adults and children. In 2008, it was projected that 502 million persons worldwide were obese (body mass index [BMI] >30 kg/m^2) and that 146 billion adults were overweight (BMI >25 kg/m^2). Furthermore, 170 million youngsters (under the age of 18) were thought to be overweight or obese globally. In certain countries, this estimate, which is more than double the proportions at the beginning of the pandemic, covers more than 25% of all children (Swinburn et al., 2011).

The prevalence of overweight and obesity is highest in the region of America. About 61% were overweight in both sexes and 27% were obese and lowest in the Southeast Asia region, where 22% were overweight in both sexes and 5% were obese (Global status report on non – communicable diseases, 2014).

There are gender disparities within and between countries. A review study found that when the 105 different countries and territories examined were grouped by categories of world bank income, all income groups had a grater overall prevalence of female obesity compared with male obesity (Kanter et al., 2012). In addition to obesity, abdominal obesity is also increasing worldwide, especially in developing countries, at a rapid rate, exacerbating the existing health burden (Balkau et al., 2007).

NATIONAL OBESITY AND OVERWEIGHT SCENARIO

According to the data of ICMR India, in all the four regions - Tamil nadu, Jharkhand, Chandigarh, and Maharastra, the urban population, when compared to the rural population, has a significantly higher weight, waist circumference, BMI, fasting glucose. In general, women overall had higher mean BMI values than rural and urban areas, but the waist circumference values were much higher in men than women.

According to a systematic review conducted from 1998 to 2018, the prevalence of obesity in India is quickly rising as a result of the intake of high-energy-density foods and physical inactivity resulting in a variety of health issues connected to cardiovascular illnesses. In India, there are more than 35 million people who suffer from obesity (Ahriwar et al., 2019). A study was done by Asthana et al. (2019) to understand the prevalence of underweight, overweight, and obesity among Indian women through a comparison between NFHS 2, 3, and 4 data. The study reported that the overall prevalence of overweight and obesity has increased among women over different survey areas. A higher burden of obesity was seen in urban areas (9.1%) than rural areas (3.1%).

In order to determine the prevalence of overweight and obesity, as defined by the International Obesity Task Force (IOTF), among school-age children in Hyderabad, India, a cross-sectional and institutional study using a multistage stratified cluster sampling procedure was performed in 2003 on adolescents 12 to 17 years of age of both sexes. According to the findings, the general prevalence of overweight was 6.1% among boys and 8.2% among girls, with 1.6% and 1.0% being obese, respectively. The prevalence was significantly higher among adolescent who watched television for more than three hours per day (10.4%) or who came from fortunate households (14.9%), whereas it was significantly lower among those who regularly engaged in

outdoor activities for more than six hours per week (3.1%) and household chores for more than three hours per day (4.7%). According to the findings of the logistic regression analysis, the prevalence of overweight among adolescents with high socioeconomic status was 4 times higher, it was 3 times higher in those who did not participate in outdoor sports, and it was 1.92 times higher in those who watched television for more than three hours per day. (Laxmaiah et al., 2012).

To assess the prevalence of overweight and obesity among children and adolescents in Chennai, India, using age- and gender-specific BMI cut-off points from national and international sources, Jagdeshan et al. (2014) conducted a cross-sectional study with a sample size of 18,955 children (ages 6-11 years) and teenagers (ages 12-17 years) from 51 schools (31 private and 20 government) in Chennai. Their research indicates that, according to both the IOTF criteria (private schools: 21.4%, government schools: 3.6%) and the Khadilkar criteria (private schools: 26.4%, government schools: 4.6%), the prevalence of overweight/obesity was significantly greater in private than in public schools. Overweight/obesity was higher in females (IOTF: 18%, Khadilkar: 21.3%) than in boys (IOTF: 16.2%, Khadilkar: 20.7%) and in adolescents (IOTF: 18.1%, Khadilkar: 21.2%) than in children (IOTF: 15.5%, Khadilkar: 20.7%). The prevalence of hypertension was 20.4% in obese/overweight people and 5.2% in non-obese people.

A study was conducted to assess the pan – India prevalence of obesity, stratified by non- modifiable (age and gender) and modifiable (education and physical activity levels) characteristics, as well as zone and urban/rural differences. It was found that the prevalence of obesity in India is 40.3%. The following zonal difference were observed, the south had the most at 46.51% and east had the lowest at 32.96%. Obesity rates were greater in urban than rural areas (44.17% vs. 36.08%), among women than men (41.88% vs. 38.67%), and among people over 40 than those under 40 (45.81% vs. 34.58%). Greater levels of education (college at 44.6% vs. no education at 38%) and lower levels of physical activity (43.71% vs. 32.56% vigorously active) were associated with higher levels of obesity (Venkatrao et al., 2020).

A cross – sectional study was conducted to determine the prevalence and sociodemographic correlates of childhood obesity and increased blood pressure

among 979 adolescent school children aged 11 to 19 years in Gangtok, Sikkim, India. Children with obesity, overweight, and hypertension had respective prevalence rates of 2.04%, 14.3%, and 5.12%. Obesity was shown to be substantially related to average fast – food intake, screen time, and a lack of outside activity. An increase in abdominal obesity was associated with an increase with an increase in BMI and body fat (Kar et al., 2015).

A study was conducted in urban and rural population of Gujarat and found that the prevalence of overweight and obesity was observed to be high among urban men and women in all age groups compared to rural men and women. The behavioural risk factors such as overweight and obesity has increased (Bhagyalaxmi et al., 2013).

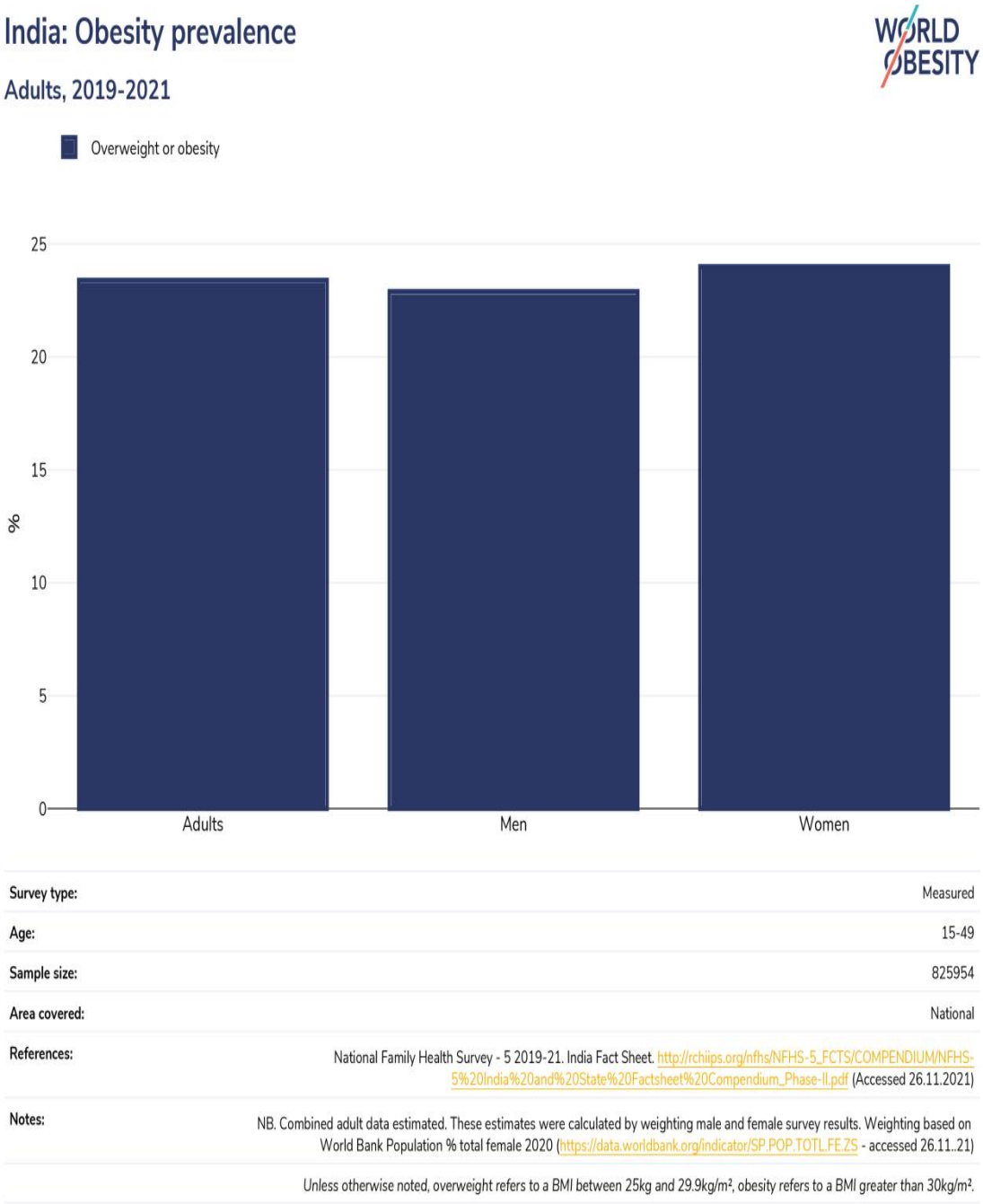
According to Figure 2.3, NFHS 5 (2019) survey.4.9% women and 8.8% men are overweight or obese in Gujarat, which is 2.1% higher than the last survey conducted in 2015 – 16 [NFHS – 4].

REGIONAL PREVALENCE OF OVERWEIGHT AND OBESITY

A study was conducted in the city of Ahmedabad to learn more about the prevalence and determinants of obesity and overweight and it was found that the prevalence of obesity was 5.62% and that of overweight was 9.99%. Children who spent more than two hours watching TV, who had daily calorie intake over the RDA and those whose parents had a history of obesity were more likely to be obese and overweight than children who were more active and children who spent less than two hours in front of the television (Thaddanee et al., 2016).

A study was carried out in Surat, Gujarat, India to learn about the prevalence of overweight and obesity among Surat's urban and rural adolescents. Information was gathered from a cross-sectional sample of 213 urban and 176 rural students in government schools who were between the ages of 14 and 16. Overweight and obesity were determined based on age, gender, and body BMI. Obesity prevalence considerably increased from 12.8% in rural areas to 14.6% in urban areas, while underweight prevalence fell from 13.6% to 4.6%. After adjusting for age and gender, there was a noticeably increased chance of being overweight and obese in urban areas

FIGURE: 2.3 NATIONAL PREVALENCE OF OBESITY



Source: World Obesity Federation

compared to rural areas. Urban males experienced a noticeably higher rise in obesity prevalence and risk (Parekh et al., 2012).

A cross sectional study was conducted by Vadera et al. (2010) to determine the prevalence of overweight and obesity in Jamnagara's urban population and to investigate the influence of dietary determinants on people's weight status. Obesity and overweight were found to be common in 5.20% and 22.04% of the population, respectively. Males were more overweight than females. The incidence increased with age, up to 60 years among dietary determinants, overall calorie intake and snacking habits were associated with weight growth ($P< 0.05$). The mean vegetable intake was lower and the mean oil intake was higher in overweight subjects compared to non-overweight subjects.

To investigate the prevalence and specific factors that contribute to obesity in school-aged adolescents a cross-sectional survey was conducted among a purposefully chosen group of schools from various socioeconomic tiers in Surat. Data were collected from 1079 school-aged teenagers over the course of eight months, from January to August 2013. Height, weight, waist, and hip circumferences were all measured. Overall, there were 10.2% and 6% more people who were overweight or obese than average. For boys, the prevalence of overweight and obesity was 12.4% and 8.2%, respectively, while for girls, the rates were 7.2% and 2.7%. In comparison to lower income group (LIG) schools, where 7.4% of students were overweight and 4.2% were obese, and middle income group (MIG) schools, where 6.3% of students were overweight and 3% were obese, the majority of overweight and obese students—11.2% and 17.7%, respectively—were from upper income group (UIG) schools. There was a statistically significant difference in the BMI between the three groups. Students whose parents had higher levels of education were more likely to be overweight and obese. An association was discovered between parents' work and BMI. The prevalence of obesity (7.2%) and overweight (12.5%) was higher in students who used a vehicle to get to school (Gamit et al., 2014).

In Ahmedabad, Western India, a study was carried out to determine the prevalence of overweight and obesity among adolescents, as well as its correlations and potential

treatments. A community-based cross-sectional survey was undertaken in all six zones of the Ahemdabad Municipal Corporation. There were 900 subjects including all, ranging in age from 10 to 19. A pre-tested semi-structured questionnaire was utilised to gather information on individual characteristics. It was found that out of the 900 participants in the study, 439 (48.8%) were women and 461 (51.2%) were men. A total of 120 adolescents (13.3%) were overweight, and 49 (5.4%) were obese. Overweight-obesity was substantially connected with higher socioeconomic class, inadequate sleep duration at night, lack of physical exercise, and junk food consumption (Brahmbhatt & Oza, 2012).

A study was conducted to determine the prevalence and determinants of obesity in college students from Vadodara and Patan cities in Gujarat, India. It was cross – sectional research conducted at five colleges in Vadodara and Patan, Gujarat. A total of 1330 students between the ages of 18 and 23 were assessed, and their BMI was computed. About 49.6% of the 1330 students were male. Overweight and obesity rates were 6.1% and 11.0%, respectively. Less active people were more likely to be obese and overweight (6.5% and 13.4%, respectively). In the group of students who spent more than two hours per day in front of the television or computers, the prevalence of obesity and overweight was much greater. Students who consumed more daily calories than the required dietary allowance had considerably higher rates of obesity and overweight (21.5% and 22.8%, respectively). Those who consumed junk food were substantially more likely to be overweight and obese (9.3% and 14.8%, respectively)(Panchal et al., 2019).

An exploratory descriptive cross-sectional study was carried out in Rajkot. to look at the incidence of obesity and its risk factors among public and private sector bank employees. In total, 800 bank employees took part in the survey. Overweight and obese employees were found to be 36.4% and 11.5% of all employees, respectively. In total, 23.4% of employees were addicted. In total, 88% of workers ate a prepared lunch, while 28.3% skipped it. 82.2% of people chose junk food as a snack. At the time of the study, more than half of the employees were not exercising in any way (Savani et al., 2022).

A study was carried out in Surat City, south Gujarat, to identify the risk factors for overweight and obesity among affluent adolescents. Participants in the cross-sectional

study ranged in age from 12 to 15 years. Data were collected on eating habits and physical activity. BMI was computed after taking measurements of height and weight. By using the BMI for age, overweight and obesity were evaluated. Obesity and overweight were prevalent in 6.55% and 13.9% of the population, respectively (boys: 6.7% and 15.1%; girls: 6.4% and 13.35%). Low levels of physical exercise, watching television or playing computer games, eating junk food, snacking, and drinking carbonated beverages were significant risk factors for overweight and obesity (Goyal et al., 2011).

A study was carried out in vadodara to determine the prevalence of obesity in urban and rural school-going adolescents. 188 students (89 from rural schools and 99 from urban ones) were enrolled. Children that were obese, overweight, normal weight, and underweight were represented by 17.6%(33), 20.2%(38), 59%(111), and 3.2%(6) respectively. In comparison to 15.78% of rural males and 3.92% of females, 65.22% of males and 62.26% of females in urban areas were obese or overweight. The odds ratio (OR) was 17.7% in favour of city living. Differences that are statistically significant (p0.05 are discovered in terms of family yearly income, the frequency of school-based physical education classes, and the frequency of restaurant and school cafeteria meals. No statistically significant correlation between two groups (higher BMI & normal BMI) and additional characteristics, such as eating breakfast before school, enjoying fast food, participating in outdoor activities, using technology during meals, and having obese family members, was discovered(Pathak et al., 2018).

In Gujarat's rajkot city, one study was carried out. To assess prevalence, determine factors responsible for Obesity. This cross-sectional study involved 405 slum women who were at least 35 years old. All participants underwent an interview and had their height and weight measured. all, 93 (22.96% of the women) were obese, and 119 (29.38%) were pre-obese. There was a statistically significant relationship between socioeconomic status, eating a fat-rich diet, walking, stress, parental history, sibling history, and obesity (Lunagariya & Patel, 2019).

In a study undertaken to investigate the prevalence of obesity and the effect of various risk variables on obesity among first-year medical students at Government Medical College in Bhavnagar, Gujarat, India. It was a cross-sectional study, and in-person interviews were used to get the data. It was discovered that 11.53% of the study

population was obese. Boys were more likely to have it than girls, and people in socioeconomic class II (73.33%) were more likely to have it. Sedentary lifestyle was practised by 7.70% of the sample group, and 34.60% had no understanding of BMI and obesity (Mehta et al., 2015).

STRESS AND EMOTIONAL EATING BEHAVIOUR

One study was carried out to look Animal and human studies have looked into how stress affects people's eating habits. Researchers concluded that stress appears to affect total calorie intake in two ways, leading to under- or overeating, which may be affected by the intensity of the stressor. Chronic life stress appears to be linked to a stronger desire for meals that are heavy in sugar and fat and are also nutrient and energy packed. Evidence from long-term studies indicates that men are more likely than women to experience a causal relationship between chronic life stress and weight gain. Obesity development may be influenced by a number of factors, including stress-induced eating ((Torres & Nowson, 2007).

Early children's dietary habits, emotional eating behaviour, and stress have all been researched in relation to one another. The roots of dietary habits are set beginning in childhood and may last into adulthood, hence research in children is crucial. Stress was assessed in 437 children (5–12 years old) in the ChiBS study using questionnaires on troubling situations, emotions (happy, angry, sad, and worried), and issues (emotional, peer, conduct and hyperactivity). Children's emotional eating behaviour and dietary patterns, such as how often they consume fatty foods, sweet foods, snacks (both fatty and sweet), fruits, and vegetables, both were studied. Emotional eating was positively correlated with stressful situations, unpleasant feelings, and problems. Positive correlations between difficulties and eating sweet or fatty foods have been shown. Events and the eating of fruits and vegetables were found to be negatively correlated. Overall, stress was linked to emotional eating and a more harmful dietary pattern, which may help to cause obesity, in youngsters(Michels et al., 2012).

A study looked at how common stress-related eating was among 16-year-olds and how it connected to other health behaviours including diet and weight management. The study also looked into whether early life characteristics like birth size and the

health of the mother during pregnancy can predict stress-related eating. The study population comprised 3598 girls and 3347 boys. A postal questionnaire was used to examine their stress-related eating behaviour, nutritional habits, and other health behaviours. According to the findings, stress-related eating behaviour was more common in girls (43%) than in boys (15%). Stress-driven eaters exhibited a greater prevalence of overweight, obesity, and abdominal obesity compared to non-stress-driven eaters. They did not discover any conclusive links between stress eating and early life variables. Girls who ate under stress were more likely to smoke, sleep less, skip family dinners, consume chocolate, sweets, light sodas, and alcohol frequently. Among boys, the proportion of those who consumed sausages, chocolate, sweets, hamburgers, and pizza on a regular basis were higher among stress-driven eaters (Jaaskelainen et al., 2014).

A systematic study was conducted to assess the strength of the stress-eating link in healthy people and to investigate the impact of potential modifiers. The studies that were included used a defined measure of stress that was associated with non-disordered eating, i.e., any unpleasant incident or episode in one's environment but not mental distress. The link between stress and total food consumption was shown to have a small, positive effect size. Stress was linked to an increase in the consumption of unhealthy foods, whereas it was linked to a decrease in the consumption of healthy foods. The stress-related eating constraint was the only significant moderator found (Hill et al., 2022).

One study looked at the relationships between adolescent stress levels and unhealthy eating patterns both within and between individuals. Daily diary assessments were utilized to evaluate whether daily perceived stress and unpleasant life events were connected with naturally occurring eating behaviours in a community-based sample of 88 adolescents over the period of one week. Findings show that adolescents who, on average over a one-week period, endorsed higher perceived stress and more daily negative life events also reported higher rates of desiring good meals and problems putting them down. Results from within-person studies revealed that various eating habits were linked to daily variations in stressful events. Adolescents indicated a stronger tendency to eat to cope with difficult emotions on days with higher than usual perceived stress (compared to one's own typical levels during the week). Daily fluctuations in stress may contribute to unhealthy eating behaviours during

adolescence, and connections between stress and eating behaviour may alter depending on whether they are examined within-person or between-person (Hsu & Raposa, 2019).

A longitudinal study investigated the changes in stress levels and eating habits between the third and final years of college, as well as the association between stress levels and eating habits. For the study 89 undergraduate students (27 men and 62 women) were given a questionnaire to fill up on their eating habits and their perceived levels of stress using the Perceived Stress Scale (PSS-10). The results revealed that students' stress levels were noticeably greater in their final year than in their third year. Findings also revealed that, when compared to their third year, students' eating when stressed, overeating, consuming fast food, and missing meals increased significantly in their final year. There was also a considerable decline in healthy food consumption during the final year compared to the third year. Academic workload strain elevated stress levels throughout the third year of study; meanwhile, sex and undergraduate thesis pressure affected them during the final year of study. These findings suggest that different amounts of academic pressure experienced during different academic years can affect college students' stress levels and eating habits (Ulhaq et al., 2023).

During Covid-19, one study was carried out to examine the association between stress, emotional eating, and food choices among university students. This cross-sectional survey included 273 college students in total. The level of stress, emotional eating, and eating habits was assessed using online self-administered questionnaires. Nearly half of the (49.8%) individuals reported feeling extremely stressed. Among comparison to the low-stress group, the high-stress group in men consumed sweets or sugars more frequently. Females in the high-stress group ingested more sweets or sugar, cakes or cookies, but fewer milk products and fresh fruits than those in the low-stress group. Conversely, Students who scored higher on positive emotion (i.e. cheerful) ate more fast food, sweet desserts, cakes, and cookies, whereas students who scored higher on negative emotion (i.e. sad) ate fewer cooked vegetables. Unfavourable feelings, negative circumstances, and overall negative Emotional Appetite Questionnaire (EMAQ) scores all had a positive correlation with BMI (Cheng & Wong, 2021).

A cross-sectional study was undertaken in Bangladesh to investigate the prevalence and risk predictors of overweight/obesity and perceived stress utilising eating behaviours and physical activity among school- and college-age urban adolescents. 4609 adolescent students, ranging in age from 13 to 19, were enrolled. Data were obtained using a self-administered questionnaire that included the Turconi Physical Activity Questionnaire (PAQ), Adolescent Stress Questionnaire (ASQ), Dutch Eating Behavior Questionnaire (DEBQ), and anthropometric measures. Results indicate that 28.2% of adolescents were overweight or obese, 61.5% of them reported moderate-to-extremely high levels of stress, only 2.7% of them lived very active lives, and 30.5% of them had sedentary ones. While physical activity was strongly correlated with the incidence of overweight/obesity and high stress, perceived stress was significantly and positively correlated with eating habits and body mass index. Males were more likely to be overweight or obese (53.8%) and to report significant levels of stress (52.5%). Obesity was 2.21 times more prevalent in adolescents who had a sedentary lifestyle (95%), 1.13 times more likely in those who had experienced stress owing to school/leisure conflict (95%), and 1.634 times more likely in those tempted by restrained eating behaviour (95%) (Roy et al., 2021).

A cross-sectional study was undertaken to assess unhealthy and healthy food consumption and its relationship with felt stress in teenagers. Dietary habits were documented on a proforma, and perceived stress levels were measured using Cohen's perceived stress scale. According to the findings, 96 (42.5%) of the 226 participants were males and 130 (57.5%) were females. Males consumed sweet snacks, fried foods, soft drinks, sports drinks, energy drinks, and vegetables at a higher frequency per week than females . Consumption of such unhealthy foods significantly correlated positively with perceived stress levels, but consumption of healthy foods, such as fresh fruits and vegetables, significantly negatively correlated with it in only males. Higher use of sports drinks and lower consumption of fresh fruits were the main predictors of perceived stress score (Tariq et al., 2019).

In a cross-sectional study carried out to examine the relationship between stress and teenage body mass index while accounting for physical activity and stress-related eating patterns. Self-administered questionnaires were used to collect the data, and they included questions about physical activity, Dutch Eating Behavior Questionnaire (DEBQ), Adolescent Stress Questionnaire (ASQ), and conventional anthropometric

measurements. Results show that men made up the majority of the responders. Approximately 12.23% of the female respondents were overweight or obese, which was 4.1% more than of their male peers. The normal and high BMI adolescents in the study had significantly different proportions of gender, father's education, and smoking status. A negative connection between physical activity score and body mass index was found in this study (Ahmed, 2017).

Another study carried out to investigate the relationship between academic stress and emotional eating habit in adolescents. a cross-sectional design was employed and 133 people served as samples. The Dutch Eating Behavior Questionnaire (DEBQ), Educational Stress Scale for Adolescents (ESSA), and Food Frequency Questionnaire (FFQ) were used to collect data. The findings revealed that 51.1% of students engaged in emotional eating and 47.4% of students reported moderate academic stress. Academic stress significantly increased the risk of emotional eating. The use of fast food or canned food, sweet food or cakes, dairy goods, and sweet beverages were all positively connected with emotional eating behaviour (Ramadhani & Mahmudiono, 2021).

A study was undertaken to investigate adolescents' emotional eating behaviours. The study's population included 600 high school-aged adolescents aged 15 to 18. The data suggested that among the teenagers who engaged in physical activity, 34.60% engaged in very vigorous physical activity, 21.60% in moderate physical activity, and 13.50% in vigorous physical activity. It was discovered that those with Class I Obesity BMI had a higher mean score on the emotional scale's cognitive constraint subscale, whereas those with underweight BMI had a lower mean score. The scale's cognitive constraint subscale and BMI were found to differ statistically significant. The mean score of those who did not engage in physical activity was high on the uncontrolled eating subscale, while the mean score of those who did engage in physical activity was low on the uncontrolled eating subscale. (Deniz & Ozgen, 2021).

A survey was administered to a sample of 666 minority adolescents to evaluate the association between emotional eating and three academic factors: academic self-esteem, grade point average (GPA), and academic anxieties. The results showed that

academic self-esteem, academic anxieties, and grade point average were connected to emotional eating scores in adolescents (Chemberlin et al., 2018).

A study looked into the relationship between emotional eating and teenage consumption patterns of fast food, high-fat snacks, processed meats, dessert foods, and sugar-sweetened beverages (SSBs). In their analysis of 18,461 participants (48.5% men, 51.5% women), it was discovered that emotional eaters were more likely to consume fast food, high-fat snacks, processed meats, desserts, and sugar-sweetened beverages. Eating while engaging in other activities, binge drinking, smoking, and a sedentary lifestyle were all connected with eating unhealthy meals. The only covariate that showed an inverse relationship with often consuming unhealthy foods was reading nutrition labels (Bui et al., 2021).

A study was undertaken in Korea to investigate the impact of perceived stress on eating patterns and oral health behaviours in Korean adolescents. They discovered that, as compared to teenagers with lower levels of stress, those with higher levels of stress were more likely to increase the risk of poor eating habits (low consumption of fruits, vegetables, and milk, high consumption of carbonated soft drinks, fast food, and cookies). In terms of the connection between oral health practices and perceived stress, teenagers who reported feeling more stressed were less likely to wash their teeth before bed or after eating a snack than those who reported feeling less stressed. This finding suggests that the bad eating patterns and oral hygiene practices among adolescents may be significantly influenced by their perception of stress (Lee et al., 2013).

To determine the impact of perceived stress and emotional eating behaviour on BMI, a cross-sectional study was carried out. There were 517 students in the sample. The findings revealed no differences in emotional eating between students who were normal weight and those who were overweight. Due to the absence of a moderating influence from BMI status, it could be concluded that perceived stress is a substantial predictor of emotional eating, independent of BMI status. Findings showed that emotional eating affects people of all weights and is not just a problem for the overweight and obese (Rodriguez et al., 2008).

A study was conducted by Pinto et al., (2017) to analyze the association between perceived stress in adolescence, body weight and romantic relationships. Participants

were 2,571 teenagers who attended Amazonian public schools, with a mean age of 16.6±1.2 years and a female gender ratio of 56.1%. The adolescents completed a questionnaire that included sociodemographic questions (sex, age group, school year, study shift, maternal schooling, and family income) as well as questions about body weight dissatisfaction, romantic relationships (determined by relationship status - with or without a partner), and perceived stress (dependent variable). The prevalence of felt stress was 19.0% and it was higher in girls (23.2%) than in boys (13.6%). Adolescents who wished to lose weight and those with partners were more likely to think they were stressed out.

A study was undertaken in Hyderabad, India, to investigate the association between stress and female student's food habits. From Hyderabad's Junior College, 300 teenage ladies (15–18 years old) were chosen.The stress levels of the adolescent girls were measured using Cohen's perceived stress scale. Results show that more than half of the students reported some degree of stress, with 13% experiencing severe stress, 30.0% experiencing moderate stress, and another 15.6% experiencing mild stress. When under severe to moderate stress, students were more likely to consume cereal products, fried foods, and highly processed foods. The students who reported experiencing severe and moderate stress had considerably lower average intakes of fruits and vegetables. The severe and moderately stressed students were observed to consume considerably more fat and carbohydrates (Pareek & Mehta, 2020).

In another study, the relationship between college students' reported stress levels and their physical activity and nutritional habits was examined. Additionally, the demographic details of the students were contrasted to determine their influence on eating habits. Self-reported surveys were delivered to college students in Korea. The 10-item Perceived Stress Scale was used to measure perceived stress. According to the findings, there are differences between college students' food and physical activity habits based on factors like sex, academic year, and type of housing. Students with low and high perceived stress levels had significantly different food habits. Stressed-out students ate more prepared meals and engaged in other unhealthy eating behaviours. These findings imply that college students should be provided with stress management training. In order to encourage healthy eating habits, programs that aid first-year students in adjusting to college life should also be made available (Choi, 2020).

A cross-sectional survey was undertaken (N = 2810 undergraduates from 11 faculties at Assiut University, Egypt) to assess two composite food intake pattern scores (one unhealthy: sweets, cakes, snacks; and one healthy: fruits and vegetables), as well as two markers of healthy eating (subjective importance of healthy eating; and dietary guideline adherence index). Results showed that in both men and women, higher perceived stress scores were strongly correlated with less frequent consumption of fruits and vegetables. In contrast to women, the association was stronger in men. Stress and the sweets, cakes, and snacks score did not significantly correlate. While the subjective assessment of healthy eating was consistently negatively associated with stress, the dietary guideline adherence index of the two markers of healthy eating was not. There was stress-related eating reduction (Ansari & Beckhoff, 2015).

A study examined the relationship between the degree of perceived stress as measured by the perceived stress scale and BMI and waist circumference among female students. The Perceived Stress Scale was used. The prevalence of overweight, obesity, and abdominal obesity was 19.9%, 4.1%, and 10.1%, respectively, according to the findings. The categories of waist circumference and perceived stress level showed a statistically significant correlation. Even though it was not statistically significant, a similar trend was observed with BMI. The influence of high perceived stress was identified as a controllable risk factor for obesity (Eknayake et al., 2020).

A cross-sectional study was carried out in South India to determine the prevalence and relationship between perceived stress and body mass index. The study's participants were 613 medical college students. The PSSI (Perceived Stress Scale Index) was computed using standard PSQ14 (14 item Perceived Stress Questionnaire). Standard methods were used to evaluate height, weight, and BMI. Perceived stress was also examined. High stress levels were recorded among female students and students in their last year, with a frequency of perceived stress of 57.7%. The most frequent source of stress was academics and curriculum, and students employed healthy coping strategies to reduce their stress. Obesity and overweight were prevalent in 13% and 9.5% of people, respectively. The relationship between felt stress and BMI was highly positive (Kumar, 2020).

A study looked at the effects of BMI, eating habits, and nationality in moderation to assess the link between stress and unhealthy eating among undergraduate students.

Self-report questionnaires on dietary practises, academic stress, emotional eating, restrained eating, BMI, and emotional eating were filled out by 748 students from France and Italy. The findings showed that whereas academic stress decreased junk food consumption in French students, it increased in Italian ones(Caso et al., 2020).

A longitudinal study was conducted to determine the relationships between psychological stress, eating, physical activity, sedentary behavior, and body weight in women. The Resilience for Eating and Activity Despite Inequality study, which included a cohort of 1382 women aged 18 to 46 from Victoria, Australia's most socioeconomically disadvantaged neighbourhoods, provided the study with baseline and follow-up self-report survey data. At baseline and three years later, women reported their height, weight, sociodemographic characteristics, perceived stress, and leisure-time physical activity, sedentary and dietary habits. In cross-sectional and longitudinal analyses, it was found that higher perceived stress in women was linked to higher BMI and higher likelihood of being obese. Stress was linked to both less leisure-time physical activity and more frequent fast food consumption in cross-sectional and longitudinal studies (Mouchacca et al., 2013).

At the University of Sharjah, a cross-sectional study including 529 students was carried out. A self-administered questionnaire on food practices, social circumstances, and psychological aspects was filled out by participants. Additionally, the height and weight were assessed. About 37.6% of participants met the criteria for being overweight or obese, while 39.1% said they did not exercise frequently. Less than half of the individuals (45.4%) regularly ate breakfast, and 83.2% drank fewer than two litres of water each day. Only 28.7% and 34.0% of individuals said they regularly ate fruits and vegetables. Nearly 80% of participants said they ate when they were bored, 83.7% said they ate when they were happy, and 56.5% said they ate when they were depressed. Smokers, those who do not regularly engage in physical activity, unmarried participants, those who do not live with their family, and those who reported eating uncontrollably all had significantly lower eating habits scores than the general population (Ismail et al., 2022).

A cross-sectional analysis was done. A self-administered questionnaire was employed, which included questions about socio-demography, anthropometry, and eating habits. To measure stress, they employed Cohen's Perceived Stress Scale.

Around 723 students in all, with a mean age of 20.6 ±1.9 years, were enrolled. The most prevalent unhealthy behaviours indicated by the students (60.4% and 56.7%, respectively), notably among female students, were skipping breakfast and eating only occasionally during the day. Unhealthy eating behaviours were strongly linked to greater levels of stress. Women and those from low-income families had much higher stress scores than other groups. Female students were much more likely than male students to experience stress-induced eating (33.6% vs. 24.4%), and it was significantly linked to obesity and overweight (Asadi, 2014).

A cross-sectional study was conducted to better understand the relationship between high perceived stress and unfavourable eating behaviour in obese and overweight people. Out of the 339 study participants, 297 (84% of whom were female) had all the necessary data. The mean body mass index was 31.3 kg/m^2, and the mean age was 48.9 years. Self-reported questionnaires were utilised to measure felt stress and eating behaviour, including the Perceived Stress Scale (PSS), Intuitive Eating Scale, Three-Factor Eating Questionnaire, Health and Taste Attitude Scales, and ecSatter Inventory. The 48-hour dietary recall and the Index of Diet Quality were used to assess alcohol consumption and diet. In comparison to those expressing less perceived stress, those reporting the most perceived stress (i.e., those in the highest PSS tertile) ate less intuitively, more uncontrollably, and emotionally. Furthermore, people in the highest PSS tertile reported less cognitive constraint and eating competence than those in the lowest tertile. Those with the highest PSS tertile consumed the least whole grain items. Other than that, there were no differences in the PSS tertiles for food quality or alcohol consumption (Reijonen et al., 2016).

In order to determine whether first-year university students in Britain experience a similar weight change, a cross-sectional survey was carried out, and the hypothesis that stress plays a role was explored. At the conclusion of their first year of college, 258 University College London students answered the questionnaire. Despite wide variation, students generally reported gaining weight (1.53 kg ±2.70 kg), with 55% of the sample reporting weight gain, 12% reporting weight loss, and 33% reporting stability. The results of logistic regression studies showed that stress increased the chance of both gaining and losing weight, but the relationships were stronger in women (Serlachius et al., 2007).

A study looked at how adults' body weight and eating patterns were affected by emotional nutrition. This cross-sectional study included 2461 participants with ages ranging from 18 to 65 (40.7±13.6 years) (M=677, F=1784). A face-to-face questionnaire was used to gather research data. At the conclusion of the study, it was shown that 25.1% of participants were obese and 34.5% were overweight. Hunger and unrestrained eating both scored much higher, but individuals who consumed grains at the recommended level or higher showed low cognitive control. A higher score for cognitive constraint was also discovered in people who claimed they eat the necessary amounts of milk and dairy products, vegetables, and fruits, but less of the grain group. Additionally, cognitive restraint, fasting, and dietary disinhibition, TFEQ (Three Factor Eating Questionnaire) sub-factor scores have been found to significantly raise the likelihood of becoming overweight or obese (Asil et al., 2022).

A study was carried out to determine the prevalence of perceived stress, eating habits, and overweight and obesity among urban adolescents. 4609 teenage students from all eight divisions of Bangladesh were chosen using a multistage sample procedure. They ranged in age from 13 to 19 years. Data were obtained using a self-administered questionnaire that included the Turconi Physical Activity Questionnaire (PAQ), Adolescent Stress Questionnaire (ASQ), Dutch Eating Behavior Questionnaire (DEBQ), and anthropometric measures. Majority of (61.5%) teenagers reported moderate-to-extremely high levels of stress, 28.2% of them were overweight or obese, only 2.7% had very active lifestyles, and 30.5% were inactive. While perceived stress and eating habits were significantly correlated with one another, physical activity was significantly correlated with both the prevalence of overweight/obesity and high-stress levels. Males were more likely to be overweight or obese (53.8%) and to report significant levels of stress (52.5%). Adolescent obesity was 2.212 times more prevalent in those who led sedentary lifestyles, 1.13 times more prevalent in those who felt stressed out by the tension between school and extracurricular activities, and 1.634 times more prevalent in those who felt tempted by restrained eating habits (Roy et al., 2021).

A study was conducted to understand the connection between role stress, eating habits, and obesity. The response rate for the randomised, cross-sectional, web-based study (N = 430) was 38%. The Dutch Eating Behavior Questionnaire's emotional and restrained eating behaviour scales, the role conflict and ambiguity scales, and self-

reported height and weight for BMI calculation were used to measure the variables. There was a significant rate of obesity (overweight/obese 81.4%, obese 36.7%). Restrained eating was not a mediator, and emotional eating behaviour only partially mediater the relationship between role stress and obesity (between 77 and 78%). Restrained eating was discovered in an auxiliary analysis to moderate the relationship between emotional eating and obesity. Role stress was moderate and was significantly influenced by low social support (Manister, 2012).

A study was undertaken to determine the prevalence of stress among medical students and to track the relationship between stress level, gender, Grade Point Average (GPA), and BMI among medical students at Taibah University. All medical students from the second to the sixth year were included in a cross-sectional review conducted at Taibah University. The stress score was calculated using a perceived stress scale-10 questionnaire. Measurements of height and weight were taken based on self-reported values. A total of 257 students, with a mean age of 21 and a gender split of 84 men and 173 women, indicated that they were interested in the review. About 23.3% of students reported having high levels of stress. Third-year female students reported experiencing higher levels of stress, but there was statistically no difference between the sexes (Khalil et al., 2020).

To better understand how stress affects undergraduate students' body weight, a study was undertaken. A total of 114 medical students (70 men and 44 women) were enrolled in the study. Names, ages, sexes, entrance year, type of diet (vegetarian/non-vegetarian), dietary habit (regular/irregular), physical activity (present/absent), and any addiction (present/absent) were all included in the information schedule. Out of 70 male students, 11 were overweight and four were obese, whereas nine were found to be overweight but none to be obese among the 44 female students. Obesity prevalence was estimated to be 3.4%, with an overall prevalence of overweight at 17.5%. Stress contributed to 11.8% of the difference in male BMI. However, the correlation was not shown to be significant in the case of females (Gupta et al., 2009).

A study looked at the relationship between emotional eating, depressive symptoms, and BMI. In order to evaluate emotional eating and identify depressive symptoms, a total of 1453 students at a public university in Mexico City completed the Self-Efficacy in Emotion- and Stress-Related Eating scale of the Eating and Appraisal Due

to Emotions and Stress Questionnaire (EADES). Emotional eating was evaluated using structural equation models (SEM) as a potential mediator between depressed symptoms and BMI by sex. Emotional eating was linked to depressive symptoms in both men and women. In turn, both men and women's BMIs were linked to emotional eating. When age was taken into account, emotional eating was a mediator between depression and BMI in both sexes (Lazarevich et al., 2016).

A study looked at how women's body weight affected their levels of stress and nutrition. Data were collected from 889 Turkish women. A questionnaire including demographic information, anthropometric measures, daily calorie and macronutrient consumption, and the Stress Scale were given to the subjects. BMI and daily energy and nutrient intake were significantly correlated with the Stress Symptom Scale, Stress Related Factors, Susceptibility to Stress Scale, and Total Score. Compared to women who were of normal weight, those who were underweight, overweight, or obese scored more stressfully. Women of average weight showed a greater level of stress susceptibility to stress scale compared to underweight and obese women. Additionally, it was shown that there was a relationship between women's daily food and energy intake and their stress-related factors, stress symptoms scale, susceptibility to stress scale, and overall stress scores (Sanlier & Unusan, 2007).

A cross-sectional study was done to look at correlations between the characteristics of nursing students in terms of their demographics, academic performance, health, stress, and overweight and obesity. A total of 95 students were enrolled, and data were collected using demographic, academic, and health characterization questionnaires, as well as the Assessment of Stress in Nursing Students (ASNS) scale. Measures of anthropometry were taken. In this study, female students made up the majority; the mean age was 25.6 ±5.87 years. About 52.6% of the pupils had gained weight, and the "Professional training" session reported high (29.5%) and extremely high (36.8%) stress levels (Urbanetto et al., 2019).

To evaluate food intake, eating habits, and physical activity in connection to stress in university students, one review study was conducted.Stress and unhealthy weight-related behaviours, in particular emotional eating and binge eating, were positively correlated. In college students, there was evidence to support both a positive correlation between stress and unhealthy dietary intake and a negative correlation with

good dietary intake. Before exams, there were also noticeable increases in these unhelpful behaviours and food consumption. Due to the small number of investigations, the evidence was weaker for physical exercise (Lyzwinski et al., 2018).

A study was undertaken to explore the influence of stress on body weight (BMI) and eating patterns in a sample of 889 Turkish adolescents (14-25 ages). About adolescents and their families, information was gathered using a "personal information form." The stress level and concerns of adolescents were assessed using the "forms of coping with stress scale." To gather data on their eating behaviours, the "eating behaviour scale" was created. According to the study, female adolescents experience stress at a higher rate than male adolescents. Additionally, there were statistically significant differences between males and females in terms of the perception of the need for social support and eating in both positive and negative moods (Sanller & Ogretlr, 2008).

A study was carried out to assess the level of stress among Kuwait University's undergraduate students and to look at the connection between eating habits and stress. In total, 407 undergraduate students from Kuwait University's four colleges—164 men and 243 women—were included in this cross-sectional study. They were all under the age of 18 and represented four colleges. A self-administered questionnaire with three sections was used to gather the data: sociodemographic data, stress assessments, and a seven-day food frequency questionnaire. There were a total of 43% of individuals who reported experiencing some form of stress, with somewhat more women (44%) than men (40.9%) reporting this condition. When the amount of stress was assessed, 22% of the men and 28.4% of the women showed moderate to severe levels of stress. Female students who were under stress had higher odds of consuming fast food, snacks, and beverages compared to female students who were not under stress. None of the food consumption categories were linked to stress among male students (Ahemed et al., 2014).

Another study looked at how stress affected meal preferences of first-year undergraduate students studying at an Australian university by gender. In total, 728 first-year students, aged >18, (331 men and 397 women), took part in this cross-sectional study. A self-administered questionnaire with three sections was used to gather the data: sociodemographic data, stress assessments, and a seven-day food

frequency questionnaire. It was discovered that more than half of the participants (52.9%), more specifically women (57.4%) than men (47.4%), experienced some level of stress. Male students who reported mild to moderate levels of stress consumed protein powder, fish/seafood, and cereal meals 2-3 times more frequently than the less stressed male students did. They also tended to consume more meat substitutes, highly processed foods, and alcohol. But in contrast to the males who weren't under stress, they had lower rates of vegetable and fruit consumption. The trend analysis findings showed significant dose-response relationships between stress levels and consumption of cereal foods, meat alternatives, vegetables and fruit (negative trend), highly processed foods, protein powder, beverages, and alcoholic beverages. Female students who were under mild to moderate stress had a 2.22% higher likelihood of eating processed foods than female students who weren't under stress. Women who were under a lot of stress were less likely to eat meat substitutes than women who weren't under a lot of stress (Papier et al., 2015).

A study was carried out to evaluate the relationship between emotional eating and body mass as well as variations in body mass over the COVID-19 pandemic. There were 1126 Polish adolescents in all, ranging in age from 15 to 20. Emotional eating was evaluated using the Emotional Eater Questionnaire (EEQ) in a random quota sampling within a nationwide sample. The respondents' body mass (malnourished, normal weight, overweight, and obese) and changes in body mass during the COVID-19 pandemic (lost weight, no change in body mass, gained weight) were classified based on the claimed height and weight before and after the pandemic. Female respondents had higher EEQ scores than men, respondents who said they gained weight during the pandemic compared to those who said they lost weight or did not change their body mass index, and overweight and obese people. The respondents were compared with underweight and normal sized people. The percentage of emotional eaters and very emotional eaters was higher among females, Those who said their weight increased during the pandemic and those who were overweight or obese were differed from the other respondents. (Skolmowska et al., 2022).

Cross-sectional research was done to investigate whether emotional eating could serve as a mediator between inadequate sleep and calorie intake or macronutrients intake. Around 150 female school-age students from 13 to 19 years old from Tabriz, Iran, participated in the study. For the purpose of gathering data, the Pittsburgh Sleep

Quality Index (PSQI) and EEQ were completed. A semi-quantified food frequency questionnaire was used to assess energy intake and the percentage of calories that were from fat, protein, and carbohydrates. Results indicated that there was no statistically significant difference between bad and good sleepers in terms of age, weight, or BMI on average. The subjects had a mean PSQI score of 6.73± 2.88, with 75.3% reporting poor sleep quality. Students who had less sleep had higher energy intake and a larger percentage of calories from fat. Poor sleep quality and emotional eating were positively correlated, although the association between poor sleep and energy and macronutrient intake was not mediated by emotional eating (Ghadimi et al., 2019).

A cross-sectional study was carried out to analyse the pattern of eating habits and the associated social and psychological aspects among medical students. Around 132 pre-clinical medical students from a Malaysian institution participated in the study. The research team used a self-administered questionnaire that asked questions on sociodemographic, anthropometry, eating patterns, and psychological aspects. The results show that the respondents' ages ranged from 18 to 30, with a mean age of 22.7 (2.4) years. Breakfast and regular meals were consumed by more than half (57.6% and 56.1%, respectively). The majority (73.5%) ate fruits less than three times per week, 51.5% had fried foods at least twice per week, and 59.8% drank less than two litres of water each day. The eating habits score was significantly lower for students between the ages of 18 and 22, smokers, drinkers of alcohol, and non-exercisers. Out of the six psychological variables, eating habits were significantly correlated with four of them. Age and "eating because I'm happy" were substantially correlated with eating habits score in multivariate analysis (Ganasegeran et al., 2012).

A study was conducted to evaluate how University of Bahrain students' eating habits are influenced by their emotions. An online survey with items based on the Emotional Appetite Questionnaire was completed by 169 undergraduates, ranging in age from 17 to 36 (average age: 20 ±3 years). The findings demonstrated that reported eating behaviour under various emotional states was unaffected by gender or marital status. Additionally, the majority of students claimed to eat less when they felt unhappy (fear, sadness, anger, stress and depression). However, when faced with loneliness and happiness, students typically either maintain or increase their food consumption (45.6% and 55.0%, respectively). The majority of students (71.6%) recognised

boredom as a trigger for emotional eating, but were less likely to feel guilty about it, according to the results. Furthermore, during emotional eating episodes, students frequently reach for high-calorie, high-fat foods (Alalwan et al., 2019).

A study was undertaken to assess the relationship between stress, food behaviour, and food consumption in a college population. Thirty students were included in the sample, and their ages ranged from 18 to 30. Self-administered questionnaires were utilised to evaluate stress symptoms PSS (Perceived Stress Scale) and eating (Three-Factor Eating Questionnaire-21, Portuguese version). Three-day food records were used to evaluate the quantitative (energy and macronutrients) and qualitative (frequency of consumption of food groups: (1) high in sugars, (2) ready-to-eat snacks and sandwiches of the fast food variety, and (3) fruits and vegetables) food intake. Using the perceived stress score) PSS results, college students were divided into two groups: First PSS tertile score for the lower stress group; third PSS tertile score for the higher stress group. Findings reveal that students with higher levels of stress scored higher for emotional eating (46.0 ± 28.1 x 22.8 ± 17.9, respectively) and uncontrolled eating (41.7 ±14.9 x 26.3 ± 12.3, respectively), as well as for consuming ready-to-eat sandwiches and snacks of the fast food variety more frequently (2.7 ± 1.8 x 1.0 ± 1.3, respectively) There were no noticeable changes in the groups' quantitative food intake (Penaforte et al., 2016).

A study was done to better understand the association between perceived stress and emotional eating. Adults of both sexes filled out validated online questionnaires about perceived stress and emotional eating. Around 2333 participants made up the sample, and the median age was 25. (Interquartile range 21–37 years). Compared to men, women reported feeling more stressed (77.91% vs. 22.09%). Emotional eaters made up nearly 64% of subjects who showed signs of perceived stress. The correlation between the emotional eating score and perceived stress was statistically significant, with the result that the emotional eating score increased by 0.44 points for every perceived stress point. The emotional eating score increased by 0.26 units for every unit increase in BMI and dropped by 0.27 units for every unit increase in age (Arias et al., 2022).

A cross-sectional study was carried out to investigate the relationship between ultra-processed food consumption and perceived stress. A survey of 1270 participants was

administered by an interviewer. The Perceived Stress Scale was used to measure stress levels. The amount of ultra-processed food consumed each week was recorded. Four categories of ultra-processed foods were created: sugary drinks, sugary foods, quick foods, and canned, frozen, or processed meat. Findings show that factors like youth, singledom, smoking, high-risk alcohol use, poor opinion of one's health, and high felt stress levels were associated with greater rates of ultra-processed food intake. High stress levels were linked to a higher likelihood of consuming more ultra-processed foods (Cortes et al., 2021).

A study looked into the function of coping in the relationship between perceived stress and night-eating syndrome (NES) in college students. 95 undergraduates, most of whom were white or Caucasian, between the ages of 18 and 29, were participants. Significant correlations between perceived stress and NES, between perceived stress and maladaptive coping, and between maladaptive coping and NES have been discovered. According to mediation analyses, using unhealthy coping mechanisms when under higher levels of stress may result in eating at night. Additionally, studies on moderation show that those who experienced stress and had less effective coping mechanisms were more prone to participate in night-eating behaviours (versus those who engaged in more adaptive coping) (Wichianson et al., 2009).

In Karnataka, India, a study was carried out to evaluate the perception of stress among undergraduate students who were majoring in their field of study and those who were not, as well as to determine the association between eating habits and perceived stress. 400 undergraduates from professional and nonprofessional colleges in the Udupi District of Karnataka were used as a sample. Results show that there was a statistically significant difference in the stress levels experienced by professional and nonprofessional students. perceive stress and disordered eating in both professional and nonprofessional students, there was a marginally favourable connection. There was no relationship established between perceived stress and selected demographic characteristics such as age, gender, study course, year of study, family type, and parental occupation (Thomas et al., 2019).

A cross-sectional investigation was conducted to look at eating behaviour and stress levels. 237 college-bound youths between the ages of 18 and 24 were chosen at random for the sample. An online survey was used to gather data on age, sex,

household income, place of residence, self-reported weight, and height. Both the Three-Factor Eating Questionnaire and the Perceived Stress Scale were used to evaluate eating habits and stress levels. Two-thirds of the pupils had normal body mass indices, according to the results (BMI). The majority of individuals (81.4%) reported moderate levels of stress. Uncontrolled eating (UE) (45%) was the most common eating habit among college students, according to their research. Male gender and perceived stress both predicted emotional eating and UE, according to a linear regression study. Contrarily, female gender and BMI were predictive of the cognitive restriction eating pattern (Aneesh & Roy, 2022).

A cross-sectional study was done to examine the link between perceived stress and dietary pattern among Rawalpindi Medical University's final-year MBBS students. study was done among MBBS students at Rawalpindi Medical University who were in their final year. Data on demographics and food habits were gathered using the perceived stress scale and a self-structured questionnaire. Students who had inconsistent eating patterns were excluded. There were differences in perceived stress across gender and boarding status that were statistically significant. While differences were non-significant across three intake frequency levels of fast foods and fruits and vegetables, significant differences in perceived stress were detected across intake three frequency levels of sweet foods, snack foods, and ready-to-eat foods. Multinomial logistic regression suggested decreasing intake of fruits and vegetables and increasing intake of sweet foods, snack foods, ready-to-eat meals, and fast foods as perceived stress increased (Khan et al., 2020).

Undergraduate medical students were the subjects of a cross-sectional study to ascertain the relationship between stress and eating problems. In a cross-sectional study, 320 respondents, who were Year 3, Year 4, and Year 5 medical students at a private medical college in Malaysia, were evaluated using self-administered questionnaires that included social demographic information, the EAT-26, and the Cohen Perceived Stress Scale. This study had a response rate of 77.4%.According to the EAT-26 study, 11.0% of medical students were at risk of developing an eating disorder. Of these students, those with an obese BMI status (25%) had a 3.9 times higher risk of doing so (95% CI: 1.4 - 10.9). Unsatisfactory social relationships with friends and peers were significantly associated with an increased risk of developing

eating disorders. 75.5% of responders on the Cohen Perceived Stress Scale (CPSS) reported high levels of stress (Ngan et al., 2017).

A cross-sectional study was done to find out how medical interns felt about their eating habits and level of stress. 188 interns working at the Gandhi Medical College in Secunderabad, Telangana participated in the study. Data were gathered using a semi-structured questionnaire and a scale for measuring perceived stress. The data shows that the majority of the respondents, 156 (83%) went to fast food restaurants and 167 (88.82%) placed online food orders. 162 (86.1%) interns reported irregular meals, and only females were capable of self-cooking after joining. Male and female participants ate three times a day in the majority of cases. Only 12 (21%) men and 33 (24.79%) women identified as vegetarians or vegans. A change in food habits and patterns as a result of perceived stress in interns could end up causing further physiological and psychological complications in their life (Majid et al., 2021).

A study was conducted to evaluate emotional eating tendency among Turkish individuals. The study had 1626 adults in it, ranging in age from 18 to 65 (69.6% females and 30.4% males). All individuals had an average BMI of 24.4± 4.7 kg/m2, with 6% being underweight and 11.6% being obese. 32.7% of the subjects overall reported an increase in appetite, and 34.4% reported gaining weight. The majority of the individuals (75.7%) were discovered to be emotional eaters on various levels. Obese people (43.5%) experienced emotional eating more frequently than people of normal weight (33.5%) or underweight (18.4%) did (Madali et al., 2021).

Another investigation was carried out. To determine whether and how stress affects the eating habits of female college students.62 women comprised up the sample, and their ages ranged from 19 to 22. These college-aged females' stress levels were evaluated, and it was discovered that not only were they stressed, but also their normal eating patterns were being affected by their stress levels. For this group of women, looks was essential. Family problems, academic obligations, and social constraints were only a few of the common sources of stress (Russom & Fontenot, 2017).

A descriptive cross-sectional study with 578 adults (422 [73%] women and 156 [27%] men) without a diagnosis or treatment for COVID-19. The study was carried out utilizing the Google Forms survey platform. The participants completed a

questionnaire that included sociodemographic details, the Turkish version of the Emotional Eater Questionnaire (EEQ-TR), and the Attitude Scale for Healthy Nutrition (ASHN). It was found that people moved from being low-level emotional eaters to emotional eaters, with average emotional eating scores rising in comparison to pre-COVID-19 values (p 0.000). On the other hand, individuals moved from having a middle-level healthy eating attitude to having a low level (p 0.000) and the average ASHN scores dropped. Body weight, body mass index (BMI), emotional eating, and body mass decreased as the quarantine period lengthened (p 0.05) (Ozcan & Yesllyka, 2021).

In a Kerala medical college, a cross-sectional study was done among the students. Out of 600 students, 573 took part in the study in total. Data were gathered using a standardised questionnaire. About 483 medical students, including 173 men and 310 women, who were in the 20-year-old and older age range had their BMI calculated. According to the WHO BMI classification, 2.1% and 18.2% of people were obese. 18.2% of people in the Asia-Pacific region had an excessive BMI, while 20.3% were obese. More male students than female students were fat. Obese students frequently engage in harmful eating behaviours such as skipping breakfast, eating on an empty stomach, consuming soft beverages, eating fatty foods and snacks, and eating more when stressed (Kumar, 2019).

Among undergraduate college students, a study was conducted to investigate the connections between perceived stress, eating self-regulation, emotional eating, and nutritional intake. 523 students were chosen from Amazon Mechanical Turk for this cross-sectional study. All participants filled out an online questionnaire that measured perceived stress, nutritional consumption, emotional eating, eating self-regulation, and demographics. About 80% exhibited low to medium levels of eating self-regulation skills, and nearly 83% said they were under moderate to high amounts of stress. Students eat sweets and soft drinks about once every other day and fruits and vegetables 2.42 times per day on average. A negative correlation between perceived stress and eating self-regulation (p=001) and a positive correlation between perceived stress and emotional eating were found (p= 0.005). The connection between perceived stress and emotional eating was somewhat mediated by eating self-regulation (p=001). Consumption of sweets and soft drinks was strongly correlated with emotional eating. Consumption of sweets was inversely correlated with eating self-

control (p =001). The connection between perceived stress and sugar intake was fully moderated (p =001) by eating self-regulation and emotional eating (Ling & Zahry, 2021).

A study was conducted. In order to examine the connection between emotional eating and three academic variables—academic self-esteem, grade point average (GPA), and academic worries—a survey of minority teenagers (N = 666) was conducted. Several linear regressions with forced entries were employed to look for correlations. The results show that academic self-esteem, academic anxieties, and grade point average were connected to emotional eating scores in teenagers. Academic variables did not significantly differ between emotional eaters and non-emotional eaters (Chamberlin et al., 2018).

METHODS AND MATERIALS

METHODS AND MATERIALS

The prevalence of obesity is rising globally these days. In 2016, about 1.9 billion people aged 18 and up were overweight, with over 650 million of these persons being obese (WHO factsheet 2021). In India, obesity is becoming a significant public health issue, especially in metropolitan areas where it paradoxically coexists with under nutrition.

Obesity, a multifactorial disease in which genetic, biological, and environmental factors are involved in its aetiology, basically develops with an increase in adipose tissue due to the energy taken with the diet being more than the expenditure. Various types of eating behaviours, such as the loss of control over food intake, and the tendency to overeat, which often develops in the presence of emotional stress, are associated with obesity (Acosta, 2017). Stress causes emotional and uncontrolled eating and increases food cravings, resulting in higher intake of sugar and fat leading to consumption of an additional 151 calories per day. This results in weight gain of up to 17kg (37 lbs) per year (Jurvain et al., 2017).

Stress can affect an individual's health not only through direct physiological processes but also by changing behaviours which affect health (Morales et al., 2006; Unusan, 2006). One such health behaviour is dietary behaviour (Unusan, 2006). Stress has been associated with affecting the amount of food consumed. Some studies have shown that individuals tended to increase consumption of high caloric and high fat snack foods when stressed (Morales et al, 2006; Unusan, 2006).

Many students experience emotional and/or psychological hardship as they transfer from the high school setting to the university environment. Transferring to a new physical and social setting can elevate stress levels, which may make students more sensitive to weight change. This is frequently accompanied by new relationships, financial pressures, and expectations. Obesity and overweight are serious issues. Unhealthy dietary choices are correlated with higher levels of stress. A person who has an emotional eating habit runs the danger of getting overweight or obese. The psychosocial factors of stress, happiness, sadness, or boredom influence a person's eating behaviours. Hence this study was planned to evaluate perceived stress and emotional eating behaviours of university students.

The study was approved by the Institutional Ethics Committee for Human Research, Faculty of Family and Community Sciences, Baroda and the allotted ethical approval number is IECHR/FcSc/Msc/2022/40.

BROAD OBJECTIVE OF THE STUDY

To study perceived stress and emotional eating behaviour of undergraduate first year university students.

SPECIFIC OBJECTIVES

- To identify the stress level of the first-year university students.
- To identify the emotional eating behaviours of the first-year university students.
- To understand the association between stress and eating behaviour.

PLACE OF THE STUDY

The study was carried out in the Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda.

STUDY DESIGN

Figure 3.1 depicts the study design. The study was a cross – sectional study. A pretested questionnaire was used to collect information related to anthropometric measurements, emotional eating behaviour, 24 – hour dietary recall, HFSS food frequency. Data on perceived stress was collected using Cohen's perceived stress scale and data on physical activity was collected using the International Physical Activity Questionnaire (IPAQ).

ENROLLMENT OF SUBJECTS

All the first year undergraduate students were enrolled for the study based on the inclusion and exclusion criteria.

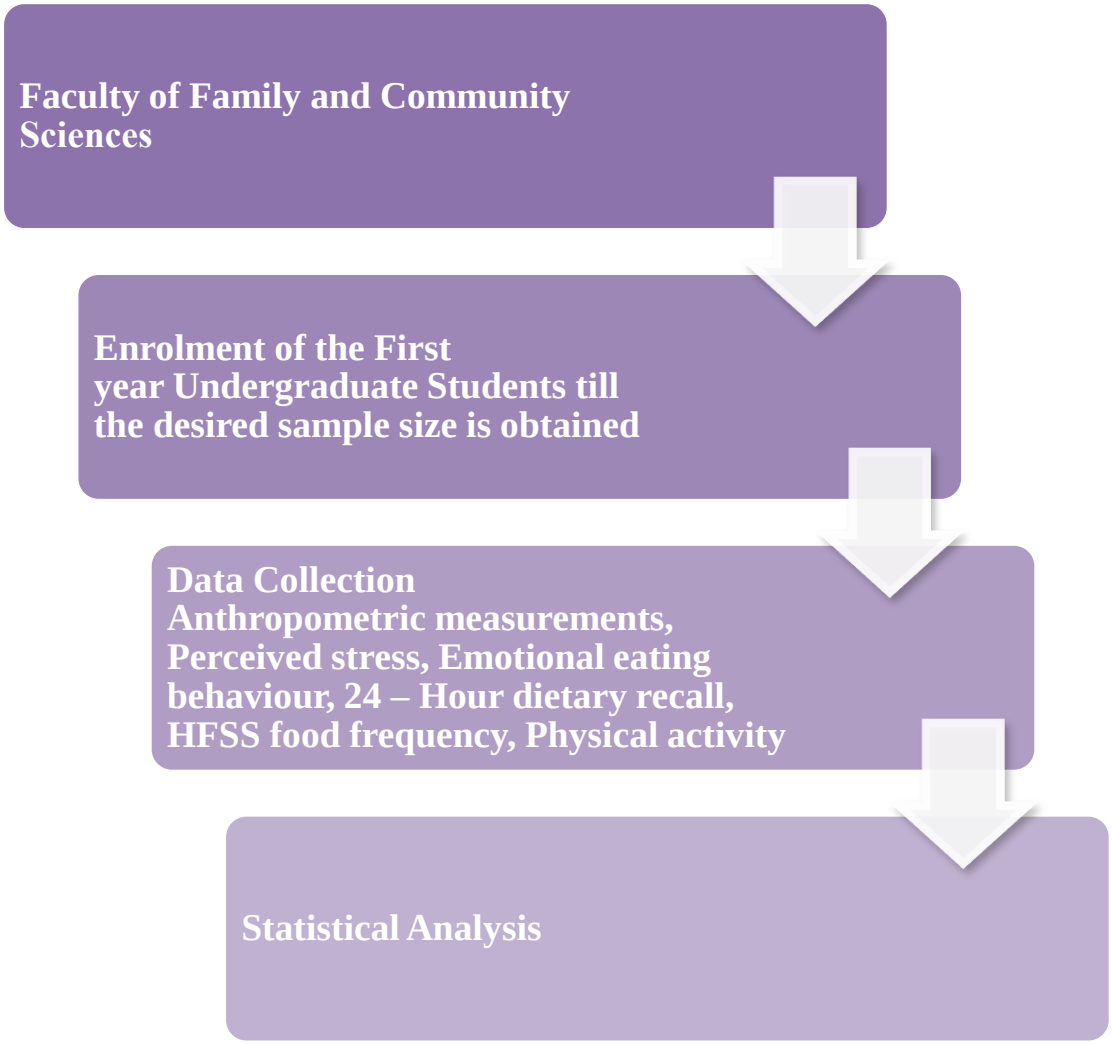
INCLUSION CRITERIA

- Undergraduate first year university students
- Students' consent

EXCLUSION CRITERIA

- Students' with any disease. E.g. Diabetes, Hypertension, Asthma etc.

FIGURE 3.1 STUDY DESIGN



DATA COLLECTION

Table 3.1 shows the tools and techniques used for data collection. Data were collected from the enrolled subjects using a pretested questionnaire. Data related to socio – demographic information, anthropometric measurements, emotional eating behaviour, 24 – hour dietary recall, HFSS food frequency, perceived stress etc. was collected. Using IPAQ data on physical activity pattern were taken.

Methodology for data collection

Socio – demographic data were collected for the following information using pre – tested questionnaire.

- Age
- Sex
- Date of birth
- Place of residence
- Type of family
- Monthly family income
- Smoking status

Anthropometric measurements

Following anthropometric measurements were measured through standardized methods

- Height
- Weight
- Hip circumference
- Waist circumference

TABLE 3.1 TOOLS AND TECHNIQUES USED FOR DATA COLLECTION

PARAMETERS	METHODS/TOOLS
Socio – Demographic information	Pre – tested semi structured questionnaire
Anthropometric Measurements	Standard methods
Perceived Stress	Sheldon Cohen's perceived stress scale (1983)
Emotional Eating Behaviour	Pre – tested semi structured questionnaire
24 – Hour Dietary Recall	Pre – tested semi structured questionnaire
HFSS Food Frequency	Pre – tested semi structured questionnaire
Physical Activity	International Physical Activity Questionnaire

Data related to the following information was collected using a pre – tested questionnaire

- Emotional eating behaviour
- Perceived stress
- 24 – hour dietary recall
- HFSS food frequency
- Physical activity pattern (IPAQ)

EMOTIONAL EATING BEHAVIOUR

It comprises of ten questions, each question has given score from 0 to 3.

- Score ranging from 0 – 5 was considered as non – emotional eater.
- Score ranging from 6 – 10 was considered as low – emotional eater.
- Score ranging from 11 – 20 was considered as an emotional eater.
- Score ranging from 21 – 30 was considered as very emotional eater.

PERCEIVED STRESS

Information regarding the perceived stress of the student was collected using Sheldon Cohen's perceived stress scale. It comprises of ten Likert-like scale questions ranging from 0 to 4. The level of stress increases as the score index increases. Also indicates how much respondents believe their current circumstances are stressful, unexpected, unmanageable, and overpowering.

- Score ranging from 0-13 was considered low stress.
- Score ranging from 14-26 was considered moderate stress.
- Score ranging from 27-40 was considered high stress.

HFSS FOOD FREQUENCY

Information on consumption of HFSS food was collected using a 7-day HFSS food frequency questionnaire. A range of food and beverage items were included which were high in fat, salt and sugar.

PHYSICAL ACTIVITY PATTERNS

Using the International Physical Activity Questionnaire (IPAQ), information was gathered regarding the student's physical activity habits. The IPAQ short form inquires about three distinct activity types carried out across three domains (heavy, moderate, and walking) and sitting. The specific types of activities that are assessed, are walking, moderate intensity activities and vigorous intensity activities; frequency (measured in days per week) and duration (time per day) are collected separately for each specific type of activity. The volume of activity can be computed by weighting each type of activity by its energy requirements defined in METs (METs are multiples of the resting metabolic rate) to get a score in MET minutes.

The categorical scoring is proposed for three levels:

1. Inactive (Sedentary) : no activities reported

   This is the lowest level of physical activity. Those individuals who not meet the criteria for categories 2 or 3 are considered insufficiently active [CATEGORY 1].

2. Minimally active (Moderate): subjects with a minimum of at least 600 MET – minutes/week [CATEGORY 2].

3. HEPA active (Heavy) : subjects with a minimum of at least 3000 MET – minutes/ week

   A separate category labelled ‘HEPA’ level, which is more active category [CATEGORY 3] can be computed for people who exceed the minimum public health physical activity recommendations, and are accumulating enough activity for a healthy lifestyle.

STATISTICAL ANALYSIS

The data was entered into Microsoft Excel sheet (2010). The data will be segregated appropriately and the calculation of the following was done.

- Mean and standard deviation
- Median
- Percentages
- T – test
- Chi – square test

RESULTS AND DISCUSSION

RESULTS AND DISCUSSION

A pre-tested questionnaire was utilized for gathering information on sociodemographic traits, anthropometric measurements, emotional eating behaviour, HFSS food frequency, and 24-hour dietary recall. Information on perceived stress was obtained using Cohen's Perceived Stress Scale. Using the International Physical Activity Questionnaire, data on physical activity was gathered (IPAQ). The study enrolled all the participants who provided consent.

First year students of the Faculty of Family and Community Sciences were recruited as subjects for the study. There were 250 subjects in all.

The results are covered in the following major areas.

1) Sociodemographic Information
2) Anthropometric Measurements
3) Emotional eating behaviour
4) HFSS Food Frequency
5) 24 – Hour Dietary recall
6) Perceived stress
7) IPAQ

SOCIO-DEMOGRAPHIC INFORMATION

A pre-tested questionnaire was used to gather sociodemographic data from the subjects utilising the manual forms. The majority of the students were under the age of 20 (78.2%) and 21.7% of the students were 20 years of age or older (Table 4.1). Majority of the students (70.1%) were residing at home with their families; followed by 21.3% of those living in PGs or off-campus accommodation, and 8.4% of those living in on-campus accommodation. Around 95.9% of the students were non-smokers, with 4.0% of them reporting that they were smokers. 58.8% of the students were from the nuclear family type, followed by 33.8% from the joint family type and 7.2% from the extended family type.

TABLE 4.1 SOCIO – DEMOGRAPHIC INFROMATION

Variables	Female N=229	Male N=19	Total N=248	Chi – Square	p- Value
Age Group (years)					
<20 Years	184(80.3)	10(52.6)	194(78.2)	7.913	0.0049**
≥ 20 Years	45(19.4)	9(47.3)	54(21.7)		
Place of Residence					
On – Campus Accommodation	19(8.2)	2(10.5)	21(8.4)	0.482	0.785
Off - Campus Accommodation	48(20.7)	5(26.3)	53(21.3)		
At Home with Family	162(70.7)	12(63.1)	174(70.1)		
Family Type					
Nuclear	135(58.9)	11(57.8)	146(58.8)	0.338	0.844
Joint	78(34.0)	6(31.5)	84(33.8)		
Extended	16(6.9)	2(10.5)	18(7.2)		
Total Monthly Family Income					
< 5000	0(0)	0(0)	0(0)	5.689	0.127
5001 – 20, 000	26(11.3)	2(10.5)	28(12.2)		
20, 001 – 35, 000	59(25.7)	6(31.5)	65(28.3)		
35,001 – 50, 000	92(40.1)	3(15.7)	95(41.4)		
>50,001	52(22.7)	8(42.1)	60(26.2)		
Smoking Status					
Yes	6(2.6)	4(21.05)	10(4.0)	15.4	0.00008***
No	223(97.3)	15(78.94)	238(95.9)		

**p<0.01, ***p<0.001

ANTHROPOMETRIC MEASUREMENTS

The student's average height was found to be 158.03±7.01 cm. The average height of males was 170±6 cm and that of females was 157.08±6.19 cm. The majority of students (36.6%) had a normal BMI, followed by 16.1% who were overweight, 22.9% who were underweight, and 24.1% who were obese (Table 4.2).

Prevalence of obesity was higher in males (31.5%) as compared to females (23.5%), whereas the prevalence of overweight was higher among females (16.5%) than males (10.5%) (Table4.3). Figure 4.1 shows prevalence of overweight and obesity among students.

A study was undertaken in Bangladesh to investigate the prevalence and related risk factors of overweight/obesity and perceived stress utilising eating behaviour and physical activity among school- and college-aged urban adolescents. The study included a total of 4609 participants. A majority of adolescents—61.5%—were experiencing moderate to extreme stress. Only 2.7% of people had a very active lifestyle, while about 28.2% were overweight or obese. About 28.5% of the highly stressed adolescents were overweight or obese, 8.3% were cigarette smokers, and 38.1% had a sedentary lifestyle. In general, urban adolescents were more likely to engage in external eating. Males were more likely to be overweight/obese (53.8%) and stressed (52.5%) (Roy et al., 2021).

A study was conducted on students from the Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Vadodara. There were 504 total students enrolled, of which 453 were female and 51 were male. According to the data, the prevalence of obesity was higher in men (25.53%) than in women (20.53%), whereas the prevalence of overweight was higher in women (12.14%) than in men (9.80%) (Venugopal & Raithatha, 2022).

TABLE 4.2 ANTHROPOMETRIC PROFILES OF THE SUBJECTS (MEAN ± SD)

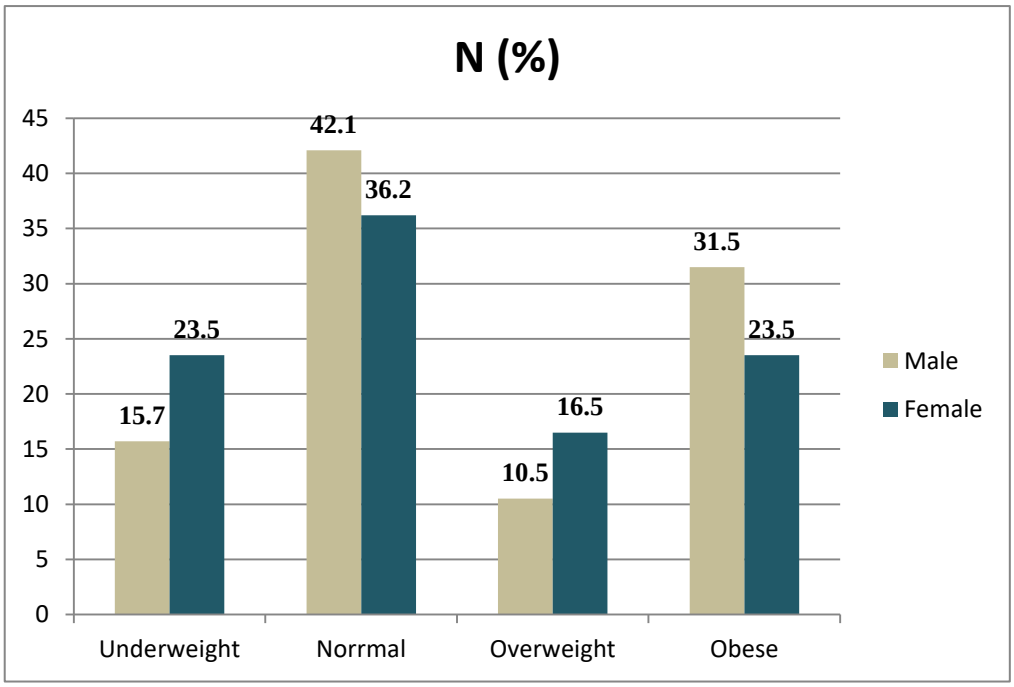
Variable	Female N = 229	Male N=19	Total N = 248	p-value
Age (years)	18.8±2.2	19.4±1.5	18.8±2.1	0.292
Height (cm)	157±6.19	170±6	158±7.01	1.71
Weight (Kg)	54±12.04	63±14	55±12.37	0.002**
BMI (Kg/m^2)	22±4.75	22±5	22±4.73	0.990
Waist Circumference (cm)	79±12.07	87±10	80±12.06	0.007**
Hip Circumference (cm)	94±9.53	96±9	94±9.52	0.238

**p<0.01

TABLE 4.3 PREVALENCE OF OVERWEIGHT AND OBESITY AMONG THE STUDENTS BASED ON THE ASIA – PACIFIC CLASSIFICATION N (%)

Variable	BMI	Females N = 229	Males N = 19	Total N = 248	Chi-square	p-value
Underweight	<18.5	54(23.5)	3(15.7)	57(22.9)	1.492	0.684
Normal Weight	18.5 – 22.9	83(36.2)	8(42.1)	91(36.6)		
Overweight	23 – 24.9	38(16.5)	2(10.5)	40(16.1)		
Obesity	≥25	54(23.5)	6(31.5)	60(24.1)		

FIGURE 4.1 PREVALENCE OF OVERWEIGHT AND OBESITY AMONG THE STUDENTS



EMOTIONAL EATING BEHAVIOUR

Table 4.4 presents the eating habits of the students. When participants were asked how many meals they consumed every day, approximately half of the participants (56.0%) stated that they consume <3 meals/ day. Females (57.2%) are more likely than males (42.1%) to have <3 meals/day.

More than half of (66.9%) the study participants reported skipping breakfast; this habit is more common in females (68.1%). Around 43.5 % participants reported that they were skipping lunch; it was more frequently seen in men (57.8%). About 16.5% of the students reported skipping dinner, which was more common in women (16.5%) than in men (15.7%).

Furthermore, a higher percentage stated that they do not consume fruits and GLVs on a daily basis (74.5% and 75.0% respectively). Males were more likely to not consume fruits on a daily basis (78.9% vs 74.2% respectively), whereas females were more likely to not consume GLVs on a daily basis (75.1%).A higher percentage reported eating other vegetables (75.8%) on a daily basis.

The mean eating score of the students was 3.42 ±1.41. The eating score did not significantly differ between male and female (Table 4.5).

Ismail et al. (2022) carried out a similar study in the UAE to look at the psychosocial aspects influencing eating patterns of university students. When participants were asked how many meals they ate each day, it was discovered that 35.4% said they ate 1-2 meals each day. Only 45.4% of the participants claimed to eat breakfast every day. While the majority of them (58.2%) stated that they typically ate with friends and family. Moreover, just 28.7% of individuals ingested fruits every day, and only 16.8% drank two litres or more of water each day. Vegetables, dairy products, and proteins were consumed daily by a higher number of people (34%, 44.8%, and 55.4%, respectively). About 56.1% of the participants admitted to not eating homemade meals every day. While the majority (53.5% and 56.9%, respectively) frequently ate fast food and fried meals. Majority of the participants (72.8%) said they hardly ever ate canned food. The overall mean eating habit score for the study sample was 5.44 (SD = 2.4). Better eating habits were indicated by a higher score. The mean eating

TABLE 4.4 EATING HABITS OF THE STUDENTS N (%)

Variable	Females N = 229	Males N =19	Total N= 248	Chi – square	p-value
Frequency of Daily Meals					
< 3 Meals/ day	131(57.2)	8 (42.1)	139(56.0)	1.624	0.202
>3 Meals/ day*	98(42.7)	11(57.8)	109(43.9)		
Skipping Breakfast					
Yes	156(68.1)	10(52.6)	166(66.9)	1.902	0.168
No*	73(31.8)	9(47.3)	82(33.0)		
Skipping Lunch					
Yes	97(42.3)	11(57.8)	108(43.5)	1.723	0.189
No*	132(57.6)	8 (42.1)	140(56.4)		
Skipping Dinner					
Yes	38(16.5)	3(15.7)	41(16.5)	0.008	0.927
No*	191(83.4)	16(84.2)	207(83.4)		
Daily Fruit Consumption					
Yes*	59(25.7)	4(21.0)	63(25.4)	0.205	0.650
No	170(74.2)	15(78.9)	185(74.5)		
Daily Consumption of GLVs					
Yes*	57(24.9)	5(26.3)	62(25.0)	0.019	0.890
No	172(75.1)	14(73.6)	186(75.0)		
Daily Consumption of Other vegetable					
Yes*	174(75.9)	14(73.6)	188(75.8)	0.05	0.822
No	55(24.0)	5(26.3)	60(24.1)		

*Favourable eating habits. The eating habit score was calculated based on the sum of favourable responses and it ranged between 0 and 7. A higher score indicate better eating habits.

TABLE 4.5 MEAN EATING SCORE OF THE STUDENTS

Variable	Females N = 229	Males N= 19	Total N= 248	p-value
Eating Habit Score	3.41±1.37	3.52±1.83	3.42±1.41	0.806

habit score was higher for non-Arab individuals, those who were married, lived with family, were not smokers, and were active in sports.

Another study was conducted to learn more about eating patterns and the impact of emotional eating on weight. According to the study, 66.2% of participants said they eat three main meals a day, 32.2% said they eat two main meals a day, and 89.5% said they had a tendency of snacking between meals. Those who ate meat and cereals as much as or more than is advised had considerably higher uncontrolled eating scores. Those that consumed grains more than is advised scored much higher on the hunger scale. It was shown that individuals with greater cognitive restraint scores reported consuming grains less than suggested while consuming the necessary amounts of milk and dairy products, vegetables, and fruits. Except for the cognitive restraint score, it was discovered that people who consume fast food and sugary beverages at least once a week have higher scores for emotional eating, uncontrolled eating, and hunger (Asil et al., 2022).

FREQUENCY OF FAST FOOD CONSUMPTION OVER THE PAST WEEK

The number of students who consumed fast food in the past week is shown in Table 4.6. Approximately 74.6% of students reported eating fast food twice or more in the previous week. The percentage of females (75.9%) who ate fast food were higher than those of males (57.8%).

FREQUENCY OF SOFT DRINKS CONSUMPTION IN THE PAST ONE WEEK

Table 4.7 shows how frequently students consumed soft drinks over the past week. In comparison to females (27.0%), more males (47.3%) consumed soft drinks twice or more in the previous week.

TABLE 4.6 HOW FREQUENTLY DID YOU CONSUME FAST-FOOD IN THE PAST ONE WEEK? N (%)

Variable	Females N = 229	Males N =19	Total N=248	Chi-square	p-value
Never or Once	55(24.0)	8(42.1)	63(25.4)	3.029	0.081
Twice or More than Twice	174(75.9)	11(57.8)	185(74.6)		

TABLE 4.7 HOW FREQUENTLY DID YOU CONSUME SOFT DRINKS IN THE PAST ONE WEEK? N (%)

Variable	Females N=229	Males N =19	Total N=248	Chi-square	p-value
Never or Once	167(72.9)	10(52.6)	177(71.4)	3.536	0.060
Twice or More than Twice	62(27.0)	9(47.3)	71(28.6)		

FREQUENCY OF TEA/COFFEE CONSUMPTION IN THE PAST ONE WEEK

In the previous week, about 65.0% of the students consumed tea or coffee more than twice/week. Males (73.6%) were more likely than females (64.2%) to have had tea or coffee twice or more times in the previous week (Table 4.8).

FREQUENCY OF EATING OUT OVER THE PAST WEEK

Table 4.9 illustrates the frequency of students eating out in the past week. About 54.0% of students reported eating out twice or more number of times in the past week. In comparison to males (42.1%), females (55.0%) were more likely to have eaten out twice or more times in the past week.

A study was carried out to look at the consumption patterns of fast food among Saudi girls in their adolescence and young adult years who reside in Riyadh. The study included 127 adolescent Saudi females (13-18 years) and 69 young adult Saudi girls (19-29 years), and it was discovered that 95.4% of study participants consume fast food from restaurants, with 79.1% eating fast food at least once a week. The most common fast food meals and beverages consumed by girls were burgers and carbonated soft drinks (Faris et al., 2015).

SLEEPING HOURS OF THE SUBJECTS

Approximately 69.7% of students slept for 6 to 8 hours each night, followed by 16.5% who slept for 4-5 hours, 12.5% who slept for more than 8 hours, and 1.21% who slept for less than 3 hours. Males (21.0%) were more likely than females (11.8%) to sleep for longer periods of time (more than 8 hours) (Table 4.10).

TABLE 4.8 HOW FREQUENTLY DID YOU CONSUME COFFEE/TEA IN THE PAST ONE WEEK? N (%)

Variable	Females N=229	Males N =19	Total N =248	Chi - square	p-value
Never or Once	82(35.8)	5(26.3)	87(35.0)	0.694	0.404
Twice or More than Twice	147(64.2)	14(73.6)	161(65.0)		

TABLE 4.9 HOW FREQUENTLY DID YOU GO OUT TO EAT IN THE PAST ONE WEEK? N (%)

Variable	Females N=231	Males N=19	Total N=250	Chi - square	p-value
Never or Once	103(45.0)	11(57.8)	114(45.9)	1.178	0.278
Twice or More than Twice	126(55.0)	8(42.1)	134(54.0)		

FIGURE 4.2 FREQUENCY OF THE CONSUMPTION OF THE VARIOUS TYPES OF FOODS IN THE PAST ONE WEEK

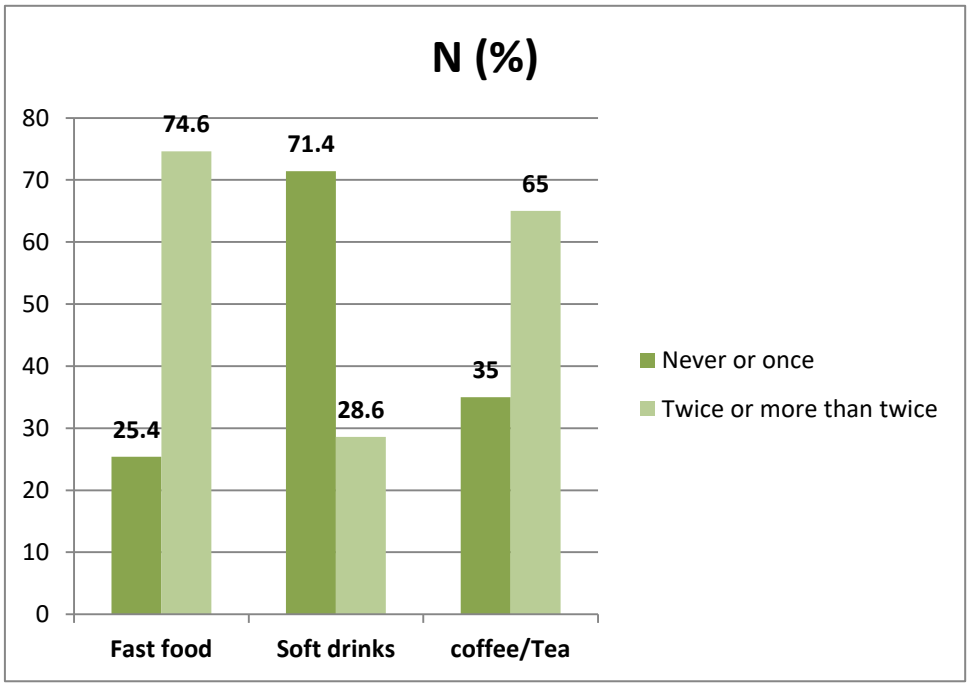


TABLE 4.10 SLEEPING HOURS OF THE STUDENTS N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
3 Hours or Less	2(0.8)	1(5.2)	3(1.2)	4.576	0.205
4 – 5 Hours	39(17.0)	2(10.5)	41(16.5)		
6 – 8 Hours	161(70.3)	12(63.1)	173(69.7)		
More than 8 Hours	27(11.8)	4(21.0)	31(12.5)		

DO WEIGHT SCALES HAVE GREAT POWER OVER YOU? CAN THEY CHANGE YOUR MOOD?

Table 4.11 shows how weight scales affect students and their mood. About 46.4% of students said that sometimes weight scales have an impact on them, followed by 27.8% of students who reported that weight scale have no impact on them, 14.1% of students always get affected by weight scales, while 11.7% of students generally get affected.

FREQUENCY OF CRAVINGS FOR SPECIFIC FOODS AMONG THE SUBJECTS

Table 4.12 shows the frequency of cravings for specific foods among the students. Majority of the students crave specific foods sometimes (47.6%), followed by those who always crave (25.2%), generally crave (22.4%), and 4.8% of students never crave specific foods. Gender was found to be associated with the frequency of craving foods.

When students were asked to mention a specific food item that they were craving for, the majority of the students (81.5%) responded that they crave foods high in fat, followed by 45.7% of students who crave foods high in sugar and fat, 36.9% who crave foods high in salt and fat, 5.8% who crave other food items, 4.2% who crave non-vegetarian food, 2.2 % who crave foods high in sugar, and 1.2% who crave for fruits (Table 4.13).

Students reported a strong craving for food items like fast food, junk food, non – vegetarian foods, ice cream, milkshakes, cold coffee, and other such items.

A similar study was carried out to investigate the association between within- and between-person perceptions of everyday stress and food cravings and consumption. On days when they felt more stressed, people said they had more of a sweet tooth and consumed more carbohydrates and starches. Those with higher levels of tension experienced more cravings, particularly for sweets and quick foods, and they also admitted to eating more of these foods (Leow et al., 2021).

TABLE 4.11 DO WEIGHT SCALES HAVE A GREAT POWER OVER YOU? CAN THEY CHANGE YOUR MOOD? N (%)

Variable	Females N=229	Males N= 19	Total N= 248	Chi-square	p-value
Never	59 (25.7)	10(52.6)	69(27.8)	6.689	0.08
Sometimes	109(47.6)	6(31.5)	115(46.4)		
Generally	27(11.8)	2(10.5)	29(11.7)		
Always	34(14.8)	1(5.2)	35(14.1)		

TABLE 4.12 FREQUENCY OF CRAVINGS AMONG STUDENTS N (%)

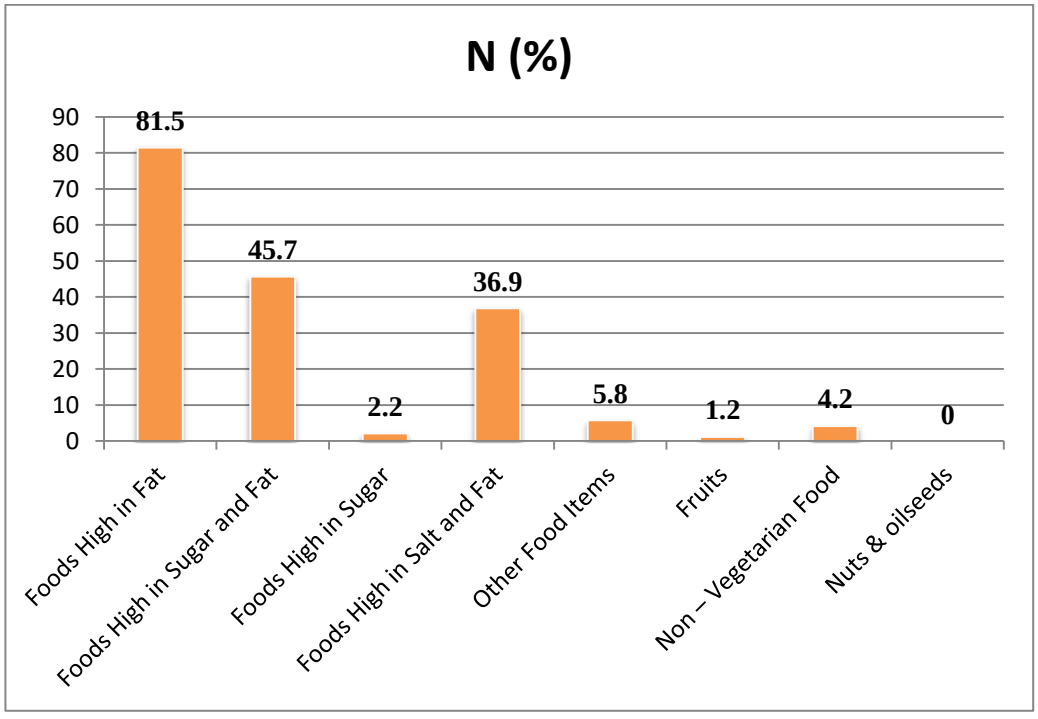
Variable	Females N=229	Males N=19	Total N =248	Chi square	p-value
Never	8(3.5)	4(21.0)	12(4.8)	19.9	0.00017***
Sometimes	113(49.3)	5(26.3)	118(47.6)		
Generally	55(24.0)	1(5.2)	56(22.4)		
Always	53(23.1)	9(47.3)	62(25.2)		

***p<0.001

TABLE 4.13 FOOD ITEMS STUDENTS WERE CRAVING N (%)

Variable	Females N=223	Males N=15	Total N=238	Chi-square	p-value
Foods High in Fat	182(81.6)	12(80)	194(81.5)		
Foods High in Sugar and Fat	101(45.2)	8(53.3)	109(45.7)		
Foods High in Sugar	5(2.2)	0(0)	5(2.2)		
Foods High in Salt and Fat	82(36.7)	6(40)	88(36.9)	0.91	0.98
Other Food Items	13(5.8)	1(6.6)	14(5.8)		
Fruits	3(1.3)	0(0)	3(1.2)		
Non – Vegetarian Food	9(4.0)	1(6.6)	10(4.2)		

FIGHURE 4.3 FOOD ITEMS STUDENTS WERE CRAVING



IS IT DIFFICULT FOR YOU TO STOP EATING SWEET THINGS, ESPECIALLY CHOCOLATE?

Table 4.14 shows how students found it difficult to stop eating sweet things. Approximately 37.9% of respondents said it was tough to stop consuming sweets sometimes, with males (42.1%) finding it more difficult than females (37.5%). About 16.1% of students reported that they always find it challenging to stop eating sweets.

DO YOU HAVE PROBLEMS CONTROLLING THE AMOUNT OF CERTAIN TYPES OF FOOD YOU EAT?

Approximately 51.6% of students admitted that they sometimes found it difficult to regulate their portion sizes when consuming particular foods or their favourite foods, followed by 10% of students who generally found it difficult and 5.6% of students who always found it difficult (Table 4.15).

DO YOU EAT WHEN YOU ARE STRESSED, ANGRY OR BORED?

Table 4.16 shows students' tendency to eat while they are stressed, angry, or bored. Approximately 35.4% of respondents said that they ate sometimes when they were stressed, angry, or bored, followed by 31.8% who never ate in such psychosocial situations, 17.7% of students who generally ate, and 14.9% of students who always ate in such situations.

DO YOU EAT MORE OF YOUR FAVOURITE FOOD AND WITH LESS CONTROL WHEN YOU ARE ALONE?

Table 4.17 depicts students' tendency to eat more of their favourite foods and with less control when they are alone. Almost 54% of students responded that sometimes they tend to eat more of their favourite food with less control when they are alone, followed by 26.2% who never do that, 10.8% who always tend to eat their favourite food with less control, and 8.8% who generally do that.

TABLE 4.14 IS IT DIFFICULT FOR YOU TO STOP EATING SWEET THINGS, ESPECIALLY CHOCOLATE? N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
Never	83(36.2)	7(36.8)	90(36.3)	0.513	0.915
Sometimes	86(37.5)	8(42.1)	94(37.9)		
Generally	22(9.6)	2(10.5)	24(9.6)		
Always	38(16.6)	2(10.5)	40(16.1)		

TABLE 4.15 DO YOU HAVE PROBLEMS CONTROLLING THE AMOUNT OF CERTAIN TYPES OF FOOD YOU EAT? N (%)

Variable	Females N=229	Males N=19	Total N = 248	Chi-square	p-value
Never	75(32.7)	6(31.5)	81(32.6)	4.12	0.248
Sometimes	120(52.4)	8(42.1)	128(51.6)		
Generally	23(10.0)	2(10.5)	25(10.0)		
Always	11(4.8)	3(15.7)	14(5.6)		

TABLE 4.16 DO YOU EAT WHEN YOU ARE STRESSED, ANGRY OR BORED? N (%)

Variable	Females N=229	Males N=19	Total N =248	Chi-square	p-value
Never	73(31.8)	6(31.5)	79(31.8)	5.08	0.166
Sometimes	84(36.6)	4(21.0)	88(35.4)		
Generally	41(17.9)	3(15.7)	44(17.7)		
Always	31(13.5)	6(31.5)	37(14.9)		

TABLE 4.17 DO YOU EAT MORE OF YOUR FAVOURITE FOOD AND WITH LESS CONTROL WHEN YOU ARE ALONE? N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
Never	57(24.9)	8(42.1)	65(26.2)	3.187	0.363
Sometimes	126(55.0)	8(42.1)	134(54.0)		
Generally	20(8.7)	2(10.5)	22(8.8)		
Always	26(11.3)	1(5.2)	27(10.8)		

DO YOU FEEL GUILTY WHEN YOU EAT "FORBIDDEN" FOODS, LIKE SWEETS OR SNACKS?

Table 4.18 depicts students' tendency to feel guilty after eating forbidden foods such as sweets or snacks. About 36.2% of students responded that sometimes they felt guilty after eating forbidden foods, followed by 13.3% who generally felt guilty after eating and 5.2% who always felt guilty after eating forbidden foods. Whereas, 45% of students who never felt the same.

DO YOU FEEL LESS CONTROL OVER YOUR DIET WHEN YOU ARE TIRED AFTER WORK AT NIGHT?

Table 4.19 shows students' tendency to feel less control over their diet when they are tired after work at night. Approximately 42.3% of students responded that sometimes they felt less control over their diet after work at night, followed by 22.9% who never felt that way, 19.3% who on a general basis felt that way, and 15.3% who always felt that way.

WHEN YOU OVEREAT WHILE ON A DIET, DO YOU GIVE UP AND START EATING WITHOUT CONTROL, PARTICULARLY FOOD THAT YOU THINK IS FATTENING?

Table 4.20 illustrates how students are prone to overeating when on a diet, giving up on it, and starting to eat carelessly, especially when it comes to fatty foods. About 35% of students reported that they do that sometimes, followed by 10.4% who do that on a general basis, 5.6% who always do that, and 48.8% who never do that.

HOW OFTEN DO YOU FEEL THAT FOOD CONTROLS YOU, RATHER THAN YOU CONTROLLING FOOD

Table 4.21 depicts how often students feel that food controls them rather than they controlling food. Approximately 39.5% of students reported that sometimes they felt that food was controlling them, followed by 10% who felt generally the same way and 10% who always felt the same way.

TABLE 4.18 DO YOU FEEL GUILTY WHEN YOU EAT "FORBIDDEN" FOODS, LIKE SWEETS OR SNACKS? N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
Never	104(45.4)	8(42.1)	112(45.1)	1.36	0.715
Sometimes	84(36.6)	6(31.5)	90(36.2)		
Generally	30(13.1)	3(15.7)	33(13.3)		
Always	11(4.8)	2(10.5)	13(5.2)		

TABLE 4.19 DO YOU FEEL LESS CONTROL OVER YOUR DIET WHEN YOU ARE TIRED AFTER WORK AT NIGHT? N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
Never	53(23.1)	4(21.0)	57(22.9)	4.156	0.245
Sometimes	99(43.2)	6(31.5)	105(42.3)		
Generally	41(17.9)	7(36.8)	48(19.3)		
Always	36(15.7)	2(10.5)	38(15.3)		

TABLE 4.20 WHEN YOU OVEREAT WHILE ON A DIET, DO YOU GIVE UP AND START EATING WITHOUT CONTROL, PARTICULARLY FOOD THAT YOU THINK IS FATTENING? N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
Never	115(50.2)	6(31.5)	121(48.8)	5.464	0.140
Sometimes	76(32.1)	11(57.8)	87(35.0)		
Generally	24(10.4)	2(10.5)	26(10.4)		
Always	14(6.1)	0(0)	14(5.6)		

TABLE 4.21 HOW OFTEN DO YOU FEEL THAT FOOD CONTROLS YOU, RATHER THAN YOU CONTROLLING FOOD? N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
Never	96(41.9)	4(21.0)	100(40.3)	4.677	0.197
Sometimes	89(38.8)	9(47.3)	98(39.5)		
Generally	21(9.1)	4(21.0)	25(10.0)		
Always	23(10.0)	2(10.5)	25(10.0)		

A study was conducted to analyse association between emotional eating and body mass index. Females had a higher tendency than males to always crave specific meals, to always have difficulties stopping eating sweet things, especially chocolate, and to always eat more of their favourite food with less control when they were alone. Those gaining weight reported having less control over their diet when they were tired after work at night, compared to those reporting no body mass change (Skolomowaska et al., 2022).

Another study was conducted to know the perception of emotional eating among college students. Women reported that stress was the main cause of their emotional eating, with guilt following closely behind. However, compared to women, men were less likely to feel guilty following an emotional eating session. Men were mostly triggered by negative feelings like boredom or worry turning to food as a distraction. Both sexes ate what they considered to be unhealthy foods when they experienced emotional eating episodes (Bennett et al., 2013)

Table 4.22 Indicates whether students were emotional eaters or not. Majority (47.9%) of the students were emotional eaters, followed by 39.1% who were low-emotional eaters, 11.3% who were non-emotional eaters, and 1.6% who were very emotional eaters.

TABLE 4.22 EMOTIONAL EATING BEHAVIOUR OF THE STUDENTS N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi-square	p-value
Non – emotional eater	26(11.4)	2(10.5)	28(11.3)	1.062	0.786
Low – emotional eater	91(39.7)	6(31.5)	97(39.1)		
Emotional eater	108(47.1)	11(57.8)	119(47.9)		
Very emotional eater	4(1.7)	0(0)	4(1.6)		

Scores: Value "0" = Never; Value "1" = Sometimes; Value "2" = Generally; Value "3" = Always.

Score between 0-5: **non-emotional eater**.

Score between 6-10: **low emotional eater**.

Score between 11-20: **emotional eater.**

Score between 21-30: **very emotional eater**.

PSYCHOSOCIAL FACTORS AND EATING HABITS OF THE STUDNETS

DO YOU EAT WHEN YOU ARE IN FEAR?

Table 4.23 depicts respondents' eating habits when they experience fear. Approximately 11.6% of students said they eat in response to fear, while 88.3% did not eat in response to fear.

Among the students who tend to eat when they experience fear, about 75.8% of them chose foods that are rich in fat, followed by 62% who tend to eat foods that are high in sugar and fat, 20.6% who tend to eat foods that are high in salt and fat, and 17.2% who tend to eat other food items (Table 4.24).

The food intake of students who tend to eat in response to fear can be observed in Table 4.25. Around 41.4% of students consume less food than usual, followed by 34.4% who consume the same amount as usual, and 24.1% who consume more food than usual.

DO YOU EAT WHEN YOU FEEL BORED?

Table 4.26 shows respondents' eating habits when they feel bored. Around 51.6% of students said that they eat in response to boredom; among them, in comparison to males (42.1%), females (52.4%) were more likely to eat in response to boredom.

Students who tend to eat due to boredom preferred foods high in salt and fat (73.4%), followed by 35.1% who preferred foods high in fat, 28.1% who preferred other food items, 24.2% who preferred foods high in sugar and fat, 3.1% who preferred fruits, 1.5% who preferred foods high in sugar, and 1.5% who preferred nuts and oil seeds (Table 4.27).

Table 4.28 depicts the food intake of respondents who tend to eat due to boredom. Around 57.8% of students consume the same amount as usual, followed by 22.6% who eat more than usual, and 19.5% who eat less than usual.

TABLE 4.23 DO YOU EAT WHEN YOU ARE IN FEAR? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi-square	p-value
Yes	25(10.9)	4(21.0)	29(11.6)	1.745	0.186
No	204(89.0)	15(78.9)	219(88.3)		

TABLE 4.24 FOODS THAT STUDENTS TEND TO EAT WHEN THEY EXPERIENCE FEAR N (%)

Variable	Females N= 25	Males N= 4	Total N= 29	Chi-square	p- value
Foods High in Fat	18 (72)	4(100)	22(75.8)	0.463	0.926
Foods High in Sugar and Fat	16(64)	2(50)	18(62.0)		
Foods High in Sugar	0(0)	0(0)	0(0)		
Foods High in Salt and Fat	5(20)	1(25)	6 (20.6)		
Other Food Items	4(16)	1(25)	5(17.2)		

TABLE 4.25 FOOD INTAKE OF STUDENTS WHILE THEY EXPERIENCE FEAR N (%)

Variable	Female N = 25	Male N = 4	Total N = 29	Chi-square	p-value
Less than usual	11(44.0)	1(25.0)	12(41.4)	0.626	0.731
Same as usual	8(32.0)	2(50.0)	10(34.4)		
More than usual	6(24.0)	1(25.0)	7(24.1)		

TABLE 4.26 DO YOU EAT WHEN YOU FEEL BORED? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi-square	p-value
Yes	120(52.4)	8(42.1)	128(51.6)	0.744	0.388
No	109(47.6)	11(57.8)	120(48.3)		

TABLE 4.27 FOODS THAT STUDENTS TEND TO EAT WHEN THEY FEEL BORED N (%)

Variable	Females N=120	Males N=8	Total N=128	Chi - square	p-value
Foods High in Fat	44(36.3)	1(12.5)	45(35.1)	5.116	0.529
Foods High in Sugar and Fat	29(24.1)	2(25)	31(24.2)		
Foods High in Sugar	2(1.6)	0(0)	2(1.5)		
Foods High in Salt and Fat	88(73.3)	6(75)	94(73.4)		
Other Food Items	31(25.8)	5(62.5)	36(28.1)		
Fruits	4(3.3)	0(0)	4(3.1)		
Nuts & oilseeds	2(1.6)	0(0)	2(1.5)		

TABLE 4.28 FOOD INTAKE OF STUDENTS WHILE THEY FEEL BORED N (%)

Variable	Female N = 120	Male N = 8	Total N = 128	Chi - square	p-value
Less than usual	23(19.1)	2(25.0)	25(19.5)	1.57	0.456
Same as usual	71(59.2)	3(37.5)	74(57.8)		
More than usual	26(21.6)	3(37.5)	29(22.6)		

DO YOU EAT WHEN YOU FEEL HAPPY?

Table 4.29 shows respondents' eating habits while they feel happy. Males (73.6%) were more likely than females (69.8%) to eat when they were happy, but more than half of the students (70.1%) admitted to doing so.

Table 4.30 displays the food preferences of students who tend to eat when they are happy. Around 56.3% of students choose high-fat foods, followed by 51.1% who tend to eat foods high in sugar and fat, 25.8% who tend to eat foods high in salt and fat, and 9.1% who prefer other food items.

Table 4.31 indicates the food intake of students who tend to eat in response to happiness. Around 60.9% of students eat the same as usual, followed by 32.7% who eat more than usual, and 8% who eat less than usual.

DO YOU EAT WHEN YOU FEEL LONELY?

Table 4.32 depicts students' eating patterns while they felt lonely. Men (36.8%) were more likely than females (26.6%) to eat when they were lonely, but approximately 27.4% of students acknowledged doing the same.

Students who ate due to loneliness reported eating foods high in salt and fat (63.2%), followed by 52.9% who tend to eat foods high in sugar and fat, 22% who tend to eat foods high in fat, and 5.8% who tend to eat foods high in sugar (Table 4.33).

Table 4.34 indicates the food intake of students who tend to eat when they are lonely. Approximately 68.9% of students eat the same as usual, followed by 19.7% who eat less than usual, and 11.3% who eat more than usual.

DO YOU EAT WHEN YOU FEEL SAD?

Table 4.35 shows students’ eating patterns when they feel sad. Approximately 12.9% of students said they eat in response to sadness, while 87.1% of students said they did not eat in response to sadness.

TABLE 4.29 DO YOU EAT WHEN YOU FEEL HAPPY? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi-square	p-value
Yes	160(69.8)	14(73.6)	174(70.1)	0.122	0.726
No	69(30.1)	5(26.3)	74(29.8)		

TABLE 4.30 FOODS THAT STUDENTS TEND TO EAT WHEN THEY FEEL HAPPY N (%)

Variable	Females N=160	Males N= 14	Total N=174	Chi-square	p-value
Foods High in Fat	92(57.5)	6(42.8)	98(56.3)	5.155	0.524
Foods High in Sugar and Fat	81(50.6)	8(57.1)	89(51.1)		
Foods High in Sugar	2(1.2)	1(7.1)	3(1.7)		
Foods High in Salt and Fat	39(24.3)	5(35.7)	44(25.2)		
Other Food Items	14(8.7)	2(14.2)	16(9.1)		
Fruits	2(1.2)	0(0)	2(1.1)		
Non – Vegetarian Food	3(1.8)	1(7.1)	4(2.2)		

TABLE 4.31 FOOD INTAKE OF STUDENTS WHEN THEY FEEL HAPPY N (%)

Variable	Female N = 160	Male N = 14	Total N = 174	Chi-square	p-value
Less than usual	12(7.5)	2(14.3)	14(8.0)	0.829	0.660
Same as usual	95(59.4)	8(57.1)	106(60.9)		
More than usual	53(33.1)	4(28.5)	57(32.7)		

TABLE 4.32 DO YOU EAT WHEN YOU FEEL LONELY? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi-square	p-value
Yes	61(26.6)	7(36.8)	68(27.4)	0.918	0.338
No	168(73.3)	12(63.1)	180(72.5)		

TABLE 4.33 FOODS THAT STUDENTS TEND TO EAT WHEN THEY FEEL LONELY N (%)

Variable	Females N=61	Males N=7	Total N=68	Chi-square	p-value
Foods High in Fat	12(19.6)	3(42.8)	15(22.0)	3.525	0.740
Foods High in Sugar and Fat	33(54.0)	3(42.8)	36(52.9)		
Foods High in Sugar	4(6.5)	0(0)	4(5.8)		
Foods High in Salt and Fat	39(63.9)	4(57.1)	43(63.2)		
Other Food Items	7(11.4)	0(0)	7(10.2)		
Fruits	2(3.2)	0(0)	2(2.9)		
Nuts & oilseeds	1(1.6)	1(14.2)	2(2.9)		

TABLE 4.34 FOOD INTAKE OF STUDENTS WHILE THEY FEEL LONELY N (%)

Variable	Female N = 61	Male N = 7	Total N = 68	Chi - square	p-value
Less than usual	10(16.4)	1(14.2)	11(16.1)	1.99	0.36
Same as usual	39(63.9)	3(42.8)	42(61.7)		
More than usual	12(19.6)	3(42.8)	15(22.0)		

TABLE 4.35 DO YOU EAT WHEN YOU FEEL SAD? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi-square	p-value
Yes	28(12.2)	4(21.0)	32(12.9)	1.216	0.271
No	201(87.7)	15(78.9)	216(87.1)		

Table 4.36 shows the food choices of students who tend to eat in response to sadness. Around 62.5% of students tend to eat foods high in sugar and fat, followed by 28.1% who tend to eat foods high in fat and foods high in salt and fat, and 12.5% tend to eat other food items.

Table 4.37 depicts the food intake of students who tend to eat when they feel sad. Around 64.1% of students consume the same as usual, followed by 31.4% who eat less than usual, and 4.4% who eat more than usual.

DO YOU EAT WHEN YOU FEEL ANGRY?

Table 4.38 shows students' eating patterns when they feel angry. Around 19.3% of students' said that they were eating in response to anger. Males (42.1%) were more likely than females (17.4%) to eat while they were angry.

Table 4.39 shows the food choices of the students who ate in response to anger. Approximately 50% of students tend to eat foods high in sugar and fat, followed by 29.1% who tend to eat foods high in salt and fat, 22.9% who tend to eat foods high in sugar, 20.8% who tend to eat foods high in fat, and 18.7% who tend to eat other food items.

While experiencing anger, around 63.3% of students reported eating the same as usual, followed by 29.8% eating less than usual, and 6.8% tending to eat more than usual (Table 4.40).

DO YOU EAT WHEN YOU EXPERIENCE STRESS?

The eating habits of students experiencing stress are shown in Table 4.41. Roughly 25.8% of students reported eating in response to stress.

Table 4.42 shows the food preferences of the students who ate under stress. About 53.1% of students tend to eat foods high in fat, followed by 54.6% who tend to eat foods high in salt and fat, 46.8% who tend to eat foods high in sugar and fat, and 24.4% who tend to eat other food items.

Table 4.43 depicts food intake of students who tend to eat under stress. Approximately 60.8% of students consume the same as usual, followed by 22.3% who eat less than usual, and 16.1% who eat more than usual.

TABLE 4.36 FOODS THAT STUDENTS TEND TO EAT WHEN THEY FEEL SAD N (%)

Variable	Females N=28	Males N=4	Total N=32	Chi - square	p-value
Foods High in Fat	9(32.1)	0(0)	9(28.1)		
Foods High in Sugar and Fat	17(60.7)	3(75)	20(62.5)		
Foods High in Sugar	2(7.1)	1(25)	3(9.3)	3.623	0.604
Foods High in Salt and Fat	8(28.5)	1(25)	9(28.1)		
Other Food Items	4(14.2)	0(0)	4(12.5)		
Fruits	1(3.5)	0(0)	1(3.1)		

TABLE 4.37 FOOD INTAKE OF STUDENTS WHILE THEY FEEL SAD N (%)

Variable	Female N = 28	Male N = 4	Total N = 32	Chi - square	p-value
Less than usual	3(10.7)	2(50.0)	5(15.6)		
Same as usual	20(71.4)	1(25.0)	21(65.6)	4.702	0.095
More than usual	5(17.8)	1(25.0)	6(18.7)		

TABLE 4.38 DO YOU EAT WHEN YOU FEEL ANGRY? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi - square	p-value
Yes	40(17.4)	8(42.1)	48(19.3)	6.823	0.008**
No	189(82.5)	11(57.8)	200(80.6)		

**p<0.01

TABLE 4.39 FOODS THAT STUDENTS TEND TO EAT WHEN THEY FEEL ANGRY N (%)

Variable	Females N=40	Males N=8	Total N=48	Chi-square	p-value
Foods High in Fat	8(20)	2(25)	10(20.8)	1.099	0.954
Foods High in Sugar and Fat	20(50)	4(50)	24(50)		
Foods High in Sugar	10(25)	1(12.5)	11(22.9)		
Foods High in Salt and Fat	11(27.5)	3(37.5)	14(29.1)		
Other Food Items	7(17.5)	2(25)	9(18.7)		
Non – Vegetarian Food	1(2.5)	0(0)	1(2.0)		

TABLE 4.40 FOOD INTAKE OF STUDENTS WHEN THEY FEEL ANGRY N (%)

Variable	Female N = 40	Male N = 8	Total N = 48	Chi-square	p-value
Less than usual	5(12.5)	2(5.0)	7(14.5)	1.314	0.518
Same as usual	28(70.0)	4(10.0)	32(66.6)		
More than usual	7(17.5)	2(5.0)	9(18.7)		

TABLE 4.41 DO YOU EAT WHEN YOU EXPERIENCE STRESS? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi - square	p-value
Yes	59(25.7)	5(26.3)	64(25.8)	0.002	0.957
No	170(74.2)	14(73.6)	184(74.2)		

TABLE 4.42 FOODS THAT STUDENTS TEND TO EAT WHEN THEY ARE STRESSED N (%)

Variable	Females N=59	Males N= 5	Total N= 64	Chi - square	p-value
Foods High in Fat	33(55.9)	1(20)	34(53.1)	4.491	0.481
Foods High in Sugar and Fat	28(47.4)	2(40)	30(46.8)		
Foods High in Sugar	3(5.0)	1(20)	4(6.2)		
Foods High in Salt and Fat	33(55.9)	2(40)	35(54.6)		
Other Food Items	12(20.3)	2(40)	15(24.4)		
Fruits	3(5.0)	0(0)	3(4.6)		

TABLE 4.43 FOOD INTAKE OF STUDENTS WHEN THEY ARE STRESSED N (%)

Variable	Female N = 59	Male N = 5	Total N = 64	Chi - square	p-value
Less than usual	10(16.9)	0(0)	10(15.6)	1.07	0.545
Same as usual	32(54.2)	3(60.0)	35(54.6)		
More than usual	17(28.8)	2(40.0)	19(29.6)		

DO YOU EAT WHEN YOU ARE DEPRESSED?

Table 4.44 displays the dietary habits of students when they felt depressed. Around 13.7% of students reported to eating when they are depressed.

Table 4.45 shows the food preferences of students who ate when they felt depressed. Around 61.7% of students tend to eat foods high in sugar and fat, followed by 52.9% who tend to eat foods high in fat, 29.4% who tend to eat foods high in salt and fat and other food items, and 11.7% who tend to eat foods high in sugar.

Table 4.46 shows the food intake of students who tend to eat when depressed. Around 73.0% of students eat the same as usual, followed by 21.7% who eat less than usual, and 5.2% who tend to eat more than usual.

In response to psychosocial factors, students tend to eat foods high in fat such as pani puri, puff, sandwich, Chinese food, etc.; foods high in sugar and fat such as ice cream, chocolate, puddings, cakes, Indian sweets, etc.; foods high in sugar such as cold beverages, fruit drinks, etc.; foods high in salt and fat such as biscuits, fries, pizza, burgers, chips, food packets, etc.; other food items such as tea, coffee, milkshakes etc.; non vegetarian food such as chicken biryani, fried fish etc.

Similar study was conducted to assess how emotions affect eating behaviour. According to the findings, majority of students reported eating less when they were experiencing unpleasant emotions (fear, sadness, anger, stress, and depression). Yet, students typically either maintain or increase their food intake when they are feeling lonely or happy. The majority of students (71.6%) identified boredom as a trigger for emotional eating, but were less likely to feel guilty about it. Furthermore, during emotional eating episodes, students frequently reach for items that are high in calories and fat (Alalwan et al., 2019).

Another study was conducted to determine the effect of sociodemographic characteristics of university students on emotional eating behaviour. Emotional eating was discovered to have a favourable correlation with weight and body mass index. It was discovered that characteristics like willpower, anger, BMI, and weight were predictors of emotional eating. Emotional eating is a coping mechanism for dealing with bad emotions (Isik & Cengi, 2021).

TABLE 4.44 DO YOU EAT WHEN YOU FEEL DEPRESSED? N (%)

Variable	Females N = 229	Males N= 19	Total N =248	Chi - square	p-value
Yes	29(12.6)	5(26.3)	34(13.7)	2.765	0.09
No	200(87.3)	14(73.6)	214(86.2)		

TABLE 4.45 FOODS THAT STUDENTS TEND TO EAT WHEN THEY FEEL DEPRESSED N (%)

Variable	Females N=29	Males N= 5	Total N= 34	Chi - square	p-value
Foods High in Fat	17(58.6)	1(20)	18(52.9)	2.141	0.829
Foods High in Sugar and Fat	18(62.0)	3(60)	21(61.7)		
Foods High in Sugar	3(10.3)	1(20)	4(11.7)		
Foods High in Salt and Fat	8(27.5)	2(40)	10(29.4)		
Other Food Items	9(31.0)	1(20)	10(29.4)		
Fruits	1(3.4)	0(0)	1(2.9)		

TABLE 4.46 FOOD INTAKE OF STUDENTS WHEN THEY FEEL DEPRESSED N (%)

Variable	Female N = 29	Male N = 5	Total N = 34	Chi - square	p-value
Less than usual	3(10.3)	2(40.0)	5(14.7)	0.882	0.087
Same as usual	20(68.9)	1(20.0)	21(61.7)		
More than usual	6(20.6)	2(40.0)	8(23.5)		

IN THE PAST 24 HOURS DID YOU EXPERIENCE ANY EMOTIONAL SITUATION?

Table 4.47 indicates how many students experienced any emotional situation in the previous 24 hours. More than half of the students (58.4%) experienced various emotional states, including stress, anger, boredom, sadness, and happiness, etc.

IF YES, DID YOU EAT SOMETHING TO DEAL WITH SITUATION?

Table 4.48 shows that of the students who went through an emotional experience, 20% ate something in order to deal with the situation.

IF YES, WHAT DID YOU EAT AND HOW MUCH?

Table 4.49 illustrates the foods that students consumed within the past 24 hours in response to any emotional circumstance. Majority (55.2%) of students who ate in response to any emotional condition ate foods high in fat, followed by 27.5% who ate foods high in fat and salt, 24.1% who ate foods high in fat, and 3.4% who ate other food items.

Foods high in fat like vada- pav, pani-puri, Frankie, Manchurian, pav bhaji, etc.; foods high in sugar and fat like chocolate, cake, ice cream, waffles, brownies, gajar halwa, and foods high in salt and fat like biscuits, pizza, burgers, subway, and food packets were consumed by students who felt any emotional situation the day before and who ate in response to that situation.

TABLE 4.47 IN THE PAST 24 – HOURS DID YOU EXPERIENCE ANY EMOTIONAL SITUATION? N (%)

Variable	Female N = 229	Male N= 19	Total N= 248	Chi - square	p-value
Yes	135(58.9)	10(52.6)	145(58.4)	0.288	0.5911
No	94(41.0)	9(47.3)	103(41.5)		

TABLE 4.48 IF YES, DID YOU EAT SOMETHING TO DEAL WITH THE SITUATION? N (%)

Variable	Female N = 135	Male N = 10	Total N = 145	Chi - square	p-value
Yes	26(19.2)	3(30.0)	29(20.0)	0.671	0.412
No	109(80.7)	7(70.0)	116(80.0)		

TABLE 4.49 IF YES, WHAT DID YOU EAT AND HOW MUCH? N (%)

Variable	Females N=26	Males N = 3	Total N = 29	Chi-square	p-value
Foods high in fat	6(23.0)	1(33.3)	7(24.1)		
Foods high in sugar and fat	14(53.8)	2(66.6)	16(55.2)		
Foods high in salt and fat	7(26.9)	1(33.3)	8(27.5)	0.163	0.983
Other food items	1(3.8)	0(0)	1(3.44)		

LEVEL OF PERCEIVED STRESS AMONG STUDENTS ACCORDING TO COHEN'S PERCEIVED STRESS SCALE

Stress levels among students are seen in Table 4.50. Stress levels among students were measured using Sheldon Cohen's perceived stress scale. Approximately 89.1% of students reported moderate levels of stress, followed by 6.4% who had low levels of stress and 4.4% who had high levels of stress. The average stress score was 19.8± 4.4. Females had higher mean stress scores than males (Table 4.51).

A similar study was conducted to investigate the relationship between eating patterns and stress. Skipping breakfast and eating infrequently were the most common unhealthy practises indicated by students (60.4% and 56.7%, respectively), notably among female students, and were substantially associated with greater levels of stress. Females and people with low family income had much greater stress levels. Female students were much more likely than male students to experience stress-induced eating, which was also significantly linked to obesity and overweight (Asadi, 2014).

Another study looked into the connection between perceived stress and obesity. The prevalence of overweight, obesity and abdominal obesity were 19.9%, 4.1%, and 10.1%, respectively, according to the findings. There was a significant association between perceived stress level and waist circumference categories ($p<0.05$). BMI showed a similar trend, however it was not statistically significant ($p < 0.05$) (Ekanayake & Mudiyanse, 2020).

A study was done to determine how common stress is and how it relates to weight. The findings revealed that 257 students, with a mean age of 21, volunteered to participate in the study. 173 of the 257 students were female, and 84 were male. Around 23.3% of students reported having high levels of stress. Third-year female students reported more stress, although there was no statistically significant difference between the sexes. Whereas there is a positive correlation between stress and body mass index (BMI) (Khalil et al., 2020

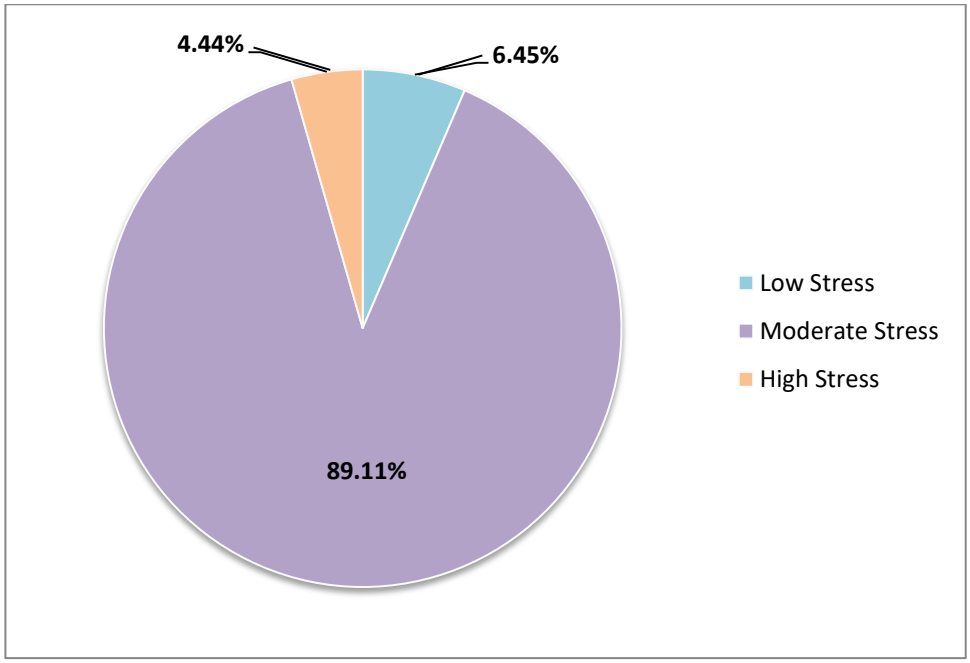
TABLE 4.50 LEVEL OF STRESS AMONG STUDENTS

Stress					
Variable	**Females N =229**	**Males N=19**	**Total N=248**	**Score**	
				Range	**Mean ± SD**
Low Perceived Stress	14(6.11)	2(10.53)	16(6.45)	0 – 13	11.62±1.36
Moderate Perceived Stress	204(89.08)	17(89.47)	221(89.11)	14 – 26	19.93±3.34
High Perceived Stress	11(4.80)	0(0)	11(4.44)	27 – 40	30.18±2.78
Chi – Square	X^2	1.442			
	p-Value	0.4861			

TABLE 4.51 TOTAL STRESS AMONG STUDENTS (MEAN±SD)

Variable	**Females N=229**	**Males N = 19**	**Total N= 248**	**p-value**
Total stress	19.95±4.45	18.57±3.81	19.85±4.42	0.192

FIGURE 4.4 LEVEL OF STRESS AMONG STUDENTS N (%)



NUTRIENT INTAKE OF THE STUDENTS

Table 4.52 displays the average nutrient intake of students. A 24-hour dietary recall was used to gather detailed dietary intake data. The students' nutritional intake was examined using the IFCT, 2017. In this group of students, fats accounted for a surprisingly large portion of calories (41.29%) which was on the higher side. Approximately 42.6% of calories are obtained from CHO, while 13.9% are obtained from protein (Figure.4.5)

The association between students' dietary intake of nutrients and perceived stress is shown in Table 4.53. Students who fell under moderate to high stress category tend to consume more fat as compared to students who were in the low stress category.

A similar investigation was carried out in Hyderabad to look at the connection between stress and eating habits among female students. It was discovered that students were under some amount of stress: 13% were experiencing severe stress, 30.0% were experiencing high stress, and another 15.6% were experiencing mild stress. When under severe to moderate stress, students were more likely to consume cereal products, fried foods, and highly processed foods ($P< 0.05$). Students who experienced severe and moderate stress had considerably lower average intakes of fruits and vegetables ($P <0.05$). The severe and moderately stressed students were observed to consume considerably ($P <0.05$) more fat and carbohydrates (Pareek & Mehta, 2022).

A study was done to determine the relationship between self-reported stress levels and dietary nutrient intakes (percentage energy from fat, carbs, and added sugar) and dietary behaviours (number of eating occasions and servings of fruits and vegetables, high-fat snacks, fast-food items, and sweetened drinks) by sex, obesity status, and stress vulnerability. Greater perceived stress was associated with a greater intake of fat, high-fat snacks, and fast-food items, as well as a reduced intake of carbs. Perceived stress was linked to decreased eating occasions among those with high perceived stress susceptibility (Barrington et al., 2014).

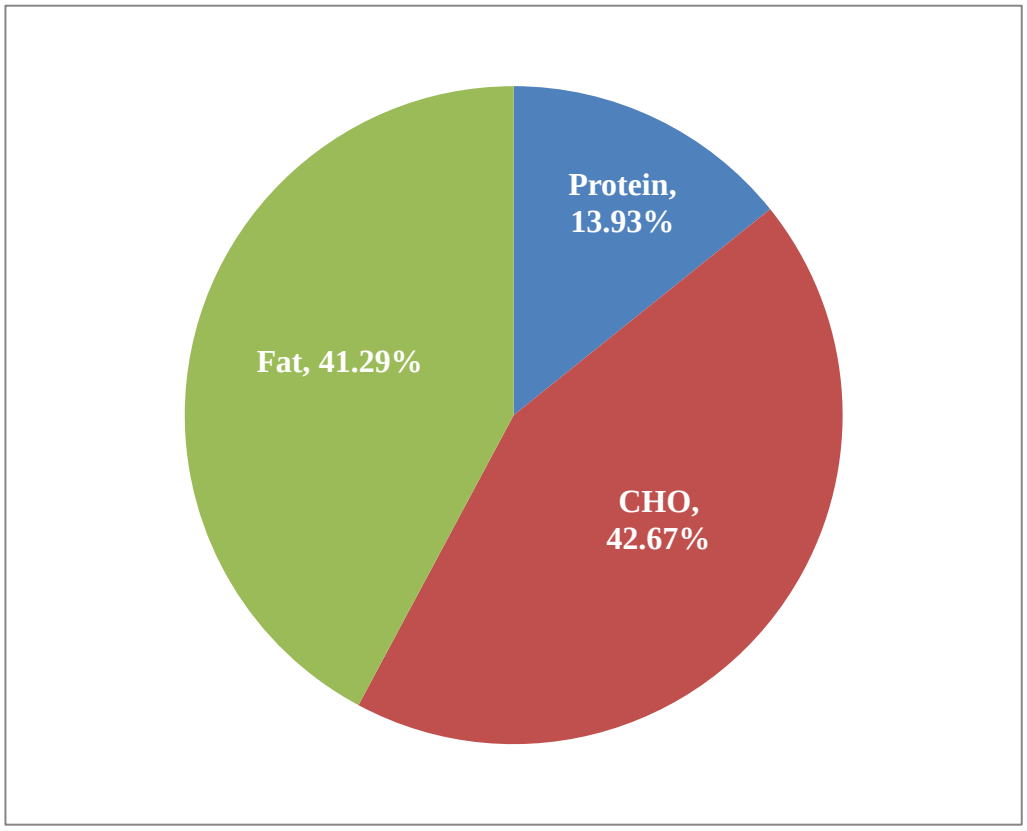
TABLE 4.52 MEAN NUTRIENT INTAKE OF STUDENTS' (MEAN±SD)

Nutrient	EAR Female	Female N = 229	EAR Male	Male N = 19	Total (N = 248)
Energy (kcal)	1660	1509±505	2110	1809±582	1532±516
Protein (g)	36.3	42±17.8	42.9	63±37.0	43±20.6
Carbohydrate (g)	100	176±66	100	193±70	178±66
Fat (g)	20	66±27	25	83±32	68±28
Iron (mg)	15	16±7	11	16±8	8.34±16
Calcium (mg)	800	430±209	800	497±365	435±224
β- Carotene (μg)	390	1664±1404	460	1452±1280	1648±1393
Total Dietary Fiber (g)	33.2	22±4	42.2	22±9	48±11

Table 4.53 ASSOCIATION BETWEEN STRESS LEVELS AND DIETARY NUTRIENT INTAKE

Variable	Low Stress	Moderate& High Stress	p- Value
Protein	43.6±19.5	43.4±20.7	0.978
CHO	191.3±73.1	176.8±65.8	0.396
Fat	65.4±28.0	67.8±27.9	0.738

FIGURE 4.5 CALORIES OBTAINED FROM MACRO NUTRIENTS AMONG STUDENTS



DIFFERENCES IN CONSUMPTION FREQUENCY OF VARIOUS HFSS FOODS BETWEEN STUDENTS WITH LOW STRESS AND STUDENTS WITH MODERATE TO HIGH STRESS BY GENDER

Table 4.54 shows the difference in the frequency of HFSS food consumption between groups with and without stress. The frequency of consumption of high fat foods was significantly higher in females in the moderate to high stress category as compared to female in the low stress category (p=0.01) (Table 4.55). In contrast, no statistically significant difference in intake of any of the food items was observed between similar categories in male students.

A similar study was conducted to find association between stress and eating behaviour among undergraduate students. It found differences in consumption of different foods within gender groups by stress. Female students who were stressed had significantly higher frequency of intakes of burger (P=0.005), french fries (P=0.02), cake/brownies/cookies/ chocolate (P=0.04), muffins/doughnuts/pastries (P=0.006), tea (P=0.03), coffee (P=0.007) and energy drinks (P=0.001) than unstressed female students. When diverse food items were combined into similar food group categories, stressed female students consumed significantly more total fast foods (P = 0.01), total snack foods (P = 0.002), and total beverages (P = 0.001) than unstressed female students. In contrast, there was no statistically significant difference between stressed and unstressed male students in the amount of any of the food items consumed. However, among anxious male students, the frequency of overall fast food consumption was significantly higher (P = 0.04) (Ahemed et al., 2014).

Another study was conducted to examine the relationship between stress and food selection patterns by gender. The findings revealed significant dose-response patterns in the link between stress level and consumption of cereal food, meat alternatives, vegetables and fruit (negative trend), highly processed food, protein powder, beverages, and alcoholic beverages. In comparison to female students who were not stressed, female students who reported mild to moderate stress were more likely to consume processed foods (p =0.01). Women who were under a lot of stress were less likely to eat meat substitutes (p= 0.05) than women who weren't stressed out. The association between stress levels and the consumption of processed foods, meat

substitutes, and vegetables and fruit (both of which showed negative trends) was found to be significant (Papier et al., 2015).

TABLE 4.54 DIFFERENCES IN FREQUENCY OF VARIOUS HFSS FOODS BETWEEN STUDENTS WITH LOW STRESS AND STUDENTS WITH MODERATE TO HIGH STRESS BY GENDER

	Female					Male				
	Low stressed		Moderate & High stressed			Low stressed		Moderate & High stressed		
	Median	Range	Median	Range	p-value	Median	Range	Median	Range	p-value
Puff	0.00	0.0 – 0.5	0.00	0.0 – 1.0	0.491	0.14	0.14 – 0.14	0.00	0.0 – 0.7	-
Samosa	0.07	0.0 – 0.7	0.14	0.0 – 1.0	0.654	0.245	0.14 – 0.35	0.14	0.0 – 0.7	0.614
Vadapav	0.14	0.0 – 0.7	0.14	0.0 – 1.0	0.923	0.42	0.14 – 0.7	0.00	0.0 – 0.35	0.438
Frankie	0.00	0.0 – 0.7	0.00	0.0 – 1.0	0.276	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.750
Sandwich (cheese)	0.00	0.0 – 0.35	0.14	0.0 – 1.0	0.006**	0.50	0.0 – 1.0	0.14	0.0 – 0.7	0.597
Sabudanavada	0.00	0.0 – 0.7	0.00	0.0 – 1.0	0.929	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Panipuri	0.14	0.0 – 0.35	0.14	0.0 – 1.0	0.073	0.50	0.0 – 1.0	0.14	0.0 – 1.0	0.664
Chaat	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.011*	0.07	0.0 – 0.14	0.00	0.0 – 0.14	0.449
Sevusal	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.171	0.07	0.0 – 0.14	0.00	0.0 – 0.14	0.578
Kachori	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.215	0.07	0.0 – 0.14	0.00	0.0 – 0.14	0.541
Dabeli	0.00	0.0 - 0.35	0.00	0.0 – 1.0	0.017	0.07	0.0 – 0.14	0.00	0.0 – 0.14	0.578
Chinese	0.14	0.0 – 0.7	0.14	0.0 – 1.0	0.429	0.175	0.0 – 0.35	0.00	0.0 – 1.0	0.836
Pasta	0.00	0.0 – 0.35	0.14	0.0 – 1.0	0.005**	0.175	0.0 – 0.35	0.14	0.0 – 1.0	0.826
Pav bhaji	0.00	0.0 – 0.35	0.14	0.0 – 1.0	0.042*	0.14	0.14 – 0.14	0.00	0.0 – 0.35	-
Egg items	0.14	0.0 – 0.35	0.00	0.0 – 1.0	0.263	0.07	0.0 – 0.14	0.14	0.0 – 1.0	0.412
Bhajiyas	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.182	0.07	0.0 – 0.14	0.00	0.0 – 0.35	0.816
Batakavada	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.196	0.00	0.0 – 0.0	0.00	0.0 – 0.35	-
Puri	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.006**	0.07	0.0 – 0.14	0.00	0.0 – 0.14	0.449

Wafers	0.14	0.0 – 0.7	0.14	0.0 – 1.0	0.002**	0.57	0.0 – 1.0	0.14	0.0 – 1.0	0.198
Pune missal	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.432	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.924
Bread (Brown)	0.07	0.0 – 0.14	0.14	0.0 – 1.0	0.571	0.07	0.0 – 0.14	0.14	0.0 – 1.0	0.412
Bread(White)	0.00	0.0 – 0.7	0.14	0.0 – 0.7	0.552	0.07	0.0 – 0.14	0.00	0.0 – 0.35	-
Foods High in Fat	**1.36**	**0.84 – 6.44**	**2.24**	**0.0 – 15**	**0.007****	**3.70**	**1.26 – 6.15**	**2.54**	**0.84 – 5.08**	**0.708**
Gulabjamun	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.006**	0.14	0.14 – 0.14	0.00	0.0 – 0.35	-
Kala jam	0.00	0.0 – 0.14	0.00	0.0 – 0.7	0.038*	0.00	0.0 – 0.0	0.00	0.0 – 0.7	-
Bundi	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.001**	0.07	0.0 – 0.14	0.00	0.0 – 0.35	0.451
Ladoo	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.001**	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.815
Peda	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.020*	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.904
Ras gulla	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.024*	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.923
Rasmalai	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.036*	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.871
Rabdi	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.0005***	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Jalebi	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.041*	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Basundi	0.00	0.0 – 0.7	0.00	0.0 – 1.0	0.619	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.866
Ice cream	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.071	0.14	0.14 – 0.14	0.35	0.0 – 1.0	-
Chocolates	0.14	0.0 – 1.0	0.35	0.0 – 1.0	0.334	0.14	0.14 – 0.14	0.35	0.0 – 1.0	-
Puddings	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.008**	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.950
Bun	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.004**	0.14	0.14 – 0.14	0.00	0.0 – 0.35	-
Cakes	0.00	0.0 – 0.14	0.14	0.0 – 1.0	0.0001***	0.14	0.14 – 0.14	0.00	0.0 – 0.7	-
Pastry	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.046*	0.14	0.14 – 0.14	0.00	0.0 – 0.35	-
Foods High in Sugar and Fat	**0.80**	**0.14 – 2.42**	**1.14**	**0.0 – 10.82**	**0.090**	**1.61**	**1.12 – 2.1**	**1.4**	**0.0 – 8.19**	**0.812**
Colas	0.00	0.0 – 0.0	0.00	0.0 – 1.0	6.7	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.750
Fruit syrups	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.004**	0.14	0.14 – 0.14	0.00	0.0 – 0.35	-

Fruit drinks-Mazza, slice	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.776	0.14	0.14 – 0.14	0.00	0.0 – 0.35	-
Fruit juices-Tropicana	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.777	0.07	0.14 – 0.14	0.14	0.0 – 1.0	0.554
Fruit crush/sherbets-Mapro/malas	0.00	0.0 – 0.7	0.00	0.0 – 1.0	0.919	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.753
Tang	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.001**	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Red bull	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.608	0.00	0.0 – 0.0	0.00	0.0 – 0.7	-
Alcoholic beverages	0.00	0.0 – 0.0	0.00	0.0 – 0.14	-	0.00	0.0 – 0.0	0.00	0.0 – 0.14	-
Ketchups	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.932	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.888
Jam	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.181	0.07	0.0 – 0.14	0.00	0.0 – 0.14	0.588
Breakfast cereals	0.00	0.0 - 0.7	0.00	0.0 – 1.0	0.316	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.986
Sweet pickle	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.646	0.00	0.0 – 0.0	0.00	0.0 – 0.14	-
Sweet chutney	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.543	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Foods High in sugar	**0.98**	**0.14 – 2.14**	**0.70**	**0.0 – 9.42**	**0.317**	**0.70**	**0.56 – 0.84**	**0.70**	**0.0 – 4.49**	**0.720**
Noodles (maggie/yippie /chings)	0.14	0.0 – 0.35	0.14	0.0 – 1.0	0.004**	0.14	0.14 – 0.14	0.14	0.0 – 1.0	-
Mayonnaise	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.416	0.07	0.0 – 0.14	0.14	0.0 – 1.0	0.415
Cheese spreads	0.00	0.0 – 0.7	0.00	0.0 – 1.0	0.858	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Other sauces	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.332	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Mccain(frozen foods)	0.00	0.0 - 0.14	0.00	0.0 – 0.7	0.030*	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Biscuits -salty	0.14	0.0 –1.0	0.14	0.0 – 1.0	0.317	0.14	0.14 – 0.14	0.00	0.0 – 0.35	-

-cream										
Fries	0.00	0.0 – 1.0	0.14	0.0 – 1.0	0.370	0.14	0.14 – 0.14	0.14	0.0 – 1.0	-
Chips	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.462	0.14	0.14 – 0.14	0.35	0.0 – 1.0	-
Kurkure	0.00	0.0 – 0.35	0.14	0.0 – 1.0	1.596	0.14	0.14 – 0.14	0.14	0.0 – 1.0	-
Kahkhra	0.00	0.0 – 0.7	0.14	0.0 – 1.0	0.026*	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Soya sticks	0.00	0.0 – 0.7	0.00	0.0 – 1.0	0.241	0.07	0.0 – 0.14	0.14	0.0 – 1.0	0.443
Gathiya	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.392	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.575
Papdi	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.413	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Chawanu	0.00	0.0 – 0.7	0.00	0.0 – 1.0	0.423	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Sev	0.00	0.0 – 0.7	0.14	0.0 – 1.0	0.292	0.14	0.14 – 0.14	0.14	0.0 – 1.0	-
Sevmamra	0.00	0.0 – 0.7	0.14	0.0 – 1.0	0.009**	0.14	0.14 – 0.14	0.00	0.0 – 1.0	-
Mcd burger	0.07	0.0 – 0.7	0.00	0.0 – 1.0	0.670	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.807
Pizza	0.07	0.0 – 0.35	0.00	0.0 – 1.0	0.556	0.07	0.0 – 0.14	0.00	0.0 – 0.35	0.963
Subway	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.008**	0.00	0.0 – 0.0	0.00	0.0 – 0.35	-
Fafda	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.002**	0.07	0.0 – 0.14	0.00	0.0 – 0.7	0.974
Khaman	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.283	0.07	0.0 – 0.14	0.00	0.0 – 0.35	0.912
Sour pickle	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.022*	0.00	0.0 – 0.0	0.00	0.0 – 0.7	-
Chinese foods	0.14	0.0 – 0.7	0.14	0.0 – 1.0	0.796	0.245	0.14 – 0.35	0.14	0.0 – 1.0	0.923
Foods high in salt and fat	**1.62**	**0.42 – 8.61**	**2.4**	**0.0 – 16**	**0.075**	**2.41**	**2.1 – 2.73**	**3.68**	**0.7 – 9.52**	**0.366**
Soups	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.343	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.853
Oats	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.823	0.00	0.0 – 0.0	0.00	0.0 – 0.14	-
Papad	0.00	0.0 – 1.0	0.14	0.0 – 1.0	0.501	0.07	0.0 – 0.14	0.14	0.0 – 1.0	0.438
Masala Mixes	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.353	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Rasoi magic	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.718	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Foods High in Salt	**0.34**	**0.0 – 5.0**	**0.42**	**0.0 – 3.7**	**5.4**	**0.14**	**0.0 – 0.28**	**0.28**	**0.0 – 4.0**	**0.486**
GLV	0.35	0.0 – 1.0	0.35	0.0 – 1.0	0.512	0.85	0.7 – 1.0	0.14	0.0 – 1.0	0.116
Other	0.70	0.0 – 1.0	0.70	0.0 – 1.0	0.834	0.85	0.7 – 1.0	0.35	0.0 – 1.0	0.250

vegetables										
Root and tubers	0.35	0.0 – 1.0	0.35	0.0 – 1.0	0.684	0.85	0.7 – 1.0	0.14	0.0 – 1.0	0.145
Milk(gold/shakti/ slim trim, cow)	1.00	0.0 – 1.0	1.0	0.0 – 1.0	0.874	1.0	1.0 – 1.0	1.0	0.0 – 1.0	-
Curd	0.14	0.0 – 1.0	0.35	0.0 – 1.0	0.262	0.245	0.14 – 0.35	0.14	0.0 – 1.0	0.809
Paneer	0.14	0.0 – 0.35	0.14	0.0 – 1.0	0.056	0.245	0.14 – 0.35	0.14	0.0 – 1.0	0.819
Cheese	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.895	0.42	0.14 – 0.7	0.14	0.0 – 1.0	0.465
Butter	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.964	0.245	0.14 – 0.35	0.14	0.0 – 1.0	0.869
Sugar	0.245	0.0 – 1.0	1.0	0.0 – 1.0	0.032*	0.00	0.00 – 1.0	1.0	0.0 – 1.0	0.816
Honey	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.861	0.50	0.0 – 0.35	0.00	0.0 – 1.0	0.682
Jaggery	0.07	0.0 – 1.0	0.14	0.0 – 1.0	0.398	0.175	0.14 – 0.7	0.00	0.0 – 1.0	0.662
Ghee	0.525	0.0 – 1.0	0.70	0.0 – 1.0	0.463	0.245	0.14 – 0.35	1.0	0.0 – 1.0	0.308
Oil	0.70	0.0 – 1.0	1.0	0.0 – 1.0	0.128	1.0	1.0 – 1.0	1.0	0.0 – 1.0	-
Cereals	0.525	0.0 – 1.0	1.0	0.0 – 1.0	0.411	1.0	1.0 – 1.0	1.0	0.0 – 1.0	-
Pulses	0.525	0.0 – 1.0	0.70	0.0 – 1.0	0.664	1.0	1.0 – 1.0	1.0	0.0 – 1.0	-
Other Food Items	**5.77**	**1.68 – 12.42**	**7.12**	**0.0 – 15**	**0.309**	**9.045**	**8.84 – 9.25**	**6.05**	**0.0 – 12.35**	**0.332**
Banana	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.282	0.675	0.35 – 1.0	0.14	0.0 – 1.0	0.253
Apple	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.960	0.14	0.14 – 0.14	0.14	0.0 – 1.0	-
Papaya	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.723	0.07	0.0 – 0.14	0.00	0.0 – 1.0	0.613
Muskmelon	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.759	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Pineapple	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.901	0.42	0.14 – 0.7	0.00	0.0 – 1.0	0.094
Orange	0.07	0.0 – 1.0	0.14	0.0 – 1.0	0.650	0.57	0.14 – 1.0	0.00	0.0 – 1.0	0.150
Sweet Lime	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.726	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Other fruits	0.14	0.0 – 1.0	0.14	0.0 – 1.0	0.504	0.57	0.14 – 1.0	0.00	0.0 – 1.0	0.165
Fruits	**0.84**	**0.0 – 8.0**	**1.12**	**0.0 – 8.0**	**0.830**	**2.445**	**1.7 – 3.19**	**0.98**	**0.0 – 8.0**	**0.520**
Egg	0.14	0.0 – 0.7	0.00	0.0 – 1.0	0.769	0.00	0.0 – 0.0	0.14	0.0 – 1.0	-
Chicken	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.243	0.00	0.0 – 0.0	0.14	0.0 – 1.0	-

Mutton	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Fish	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.964	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Prawns	0.00	0.0 – 0.0	0.00	0.0 – 1.0	0.254	0.00	0.0 – 0.0	0.00	0.0 – 0.14	-
Chicken nuggets	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.665	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Fried fish	0.00	0.0 – 0.70	0.00	0.0 – 1.0	0.459	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Chicken/mutton kebabs	0.00	0.0 – 0.35	0.00	0.0 – 1.0	0.568	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Non Vegetarian Food	**0.42**	**0.0 – 2.1**	**0.00**	**0.0 – 7.0**	**0.992**	**0.00**	**0.0 – 0.0**	**0.70**	**0.0 – 7.0**	**-**
Groundnuts	0.07	0.0 – 1.0	0.00	0.0 – 1.0	0.598	0.175	0.0 – 0.35	0.00	0.0 – 0.35	0.197
Flaxseeds	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.961	0.50	0.0 – 1.0	0.00	0.0 – 0.35	0.519
Fennel seeds	0.00	0.0 – 0.14	0.00	0.0 – 1.0	0.0001***	0.50	0.0 – 1.0	0.00	0.0 – 1.0	0.367
Chia seeds	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.916	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Sesame seeds	0.00	0.0 – 1.0	0.00	0.0 – 1.0	0.657	0.50	0.0 – 1.0	0.00	0.0 – 0.7	0.534
Coconut	0.07	0.0 – 1.0	0.14	0.0 – 1.0	0.492	0.57	0.14 – 1.0	0.00	0.0 – 1.0	0.125
Cashewnuts	0.07	0.0 – 1.0	0.14	0.0 – 1.0	0.762	0.57	0.14 – 1.0	0.00	0.0 – 1.0	0.266
Almonds	0.525	0.0 – 1.0	0.35	0.0 – 1.0	0.327	0.57	0.14 – 1.0	0.14	0.0 – 1.0	0.412
Pistachio nut	0.07	0.0 – 1.0	0.00	0.0 – 1.0	0.865	0.57	0.14 – 1.0	0.00	0.0 – 1.0	0.139
Walnuts	0.07	0.0 – 1.0	0.14	0.0 – 1.0	0.864	0.57	0.14 – 1.0	0.00	0.0 – 1.0	0.314
Niger seeds	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-	0.00	0.0 – 0.0	0.00	0.0 – 1.0	-
Nuts and oilseeds	**1.525**	**0.14 – 7.42**	**1.54**	**0.0 – 11**	**0.766**	**4.525**	**0.7 – 8.35**	**1.0**	**0.0 – 8.19**	**0.586**

*P<0.05,**p<0.01,***p<0.001

TABLE 4.55 DIFFERENCES IN FREQUENCY OF VARIOUS HFSS FOOD CATEGORIES BETWEEN STUDENTS WITH LOW STRESS AND STUDENTS WITH MODERATE TO HIGH STRESS BY GENDER

Food Category	Females			Males		
	Low stressed	Moderate & High stressed	P - Value	Low stressed	Moderate & High stressed	P - Value
Foods High in fat	1.36	2.24	0.007**	3.70	2.54	0.708
Foods high in sugar and fat	0.80	1.14	0.090	1.61	1.4	0.812
Foods high in Sugar	0.98	0.70	0.317	0.70	0.70	0.720
Foods high in salt and fat	1.62	2.4	0.075	2.41	3.68	0.366
Foods high in salt	0.34	0.42	5.4	0.14	0.28	0.486
Other food items	5.77	7.12	0.309	9.04	6.05	0.332
Fruits	0.84	1.12	0.830	2.44	0.98	0.520
Non – Vegetarian food	0.42	0.00	0.992	0.00	0.70	-
Nuts & oilseeds	1.525	1.53	0.766	4.52	1.0	0.586

**p<0.01

ASSOCIATION BETWEEN PERCEIVED STRESS AND EMOTIONAL EATING BEHAVIOUR

Table 4.56 depicts an association between perceived stress and emotional eating behaviour. Students who eat in reaction to psychosocial elements such as stress, boredom, happiness, loneliness, sadness, and so on have greater average stress levels than those who do not eat.

A study was carried out among undergraduate college students to investigate the associations between perceived stress, eating self-regulation, emotional eating, and nutritional intake. About 33% of people were obese or overweight. About 80% reported low to medium levels of eating self-regulation skills, and nearly 83% said they were under moderate to high levels of stress. Students eat sweets and soft drinks approximately once every other day and fruits and vegetables 2.42 times per day on average. The correlation between perceived stress and emotional eating and the correlation between perceived stress and eating self-regulation was significant (p .001). The connection between perceived stress and emotional eating was somewhat mediated by eating self-regulation (p=001). Consumption of sweets and soft drinks was strongly correlated with emotional eating. Consumption of sweets was inversely correlated with eating self-control (Ling & Zahry, 2021).

The relationship between the eating habit score and perceived stress is seen in Table 4.57. In comparison to low stressed students (3.871.08), the mean eating score of moderately and highly stressed students was low (3.391.43).

A study was done to examine the relationship between a group of adults' perceived stress and emotional eating. The sample consisted of 2333 people, with a median age of 25. Compared to men, women reported feeling more stressed (77.91% vs. 22.09%). Emotional eaters made up nearly 64% of subjects who showed signs of perceived stress. Most of the population was categorised as either low-emotional (31.8%) or non-emotional (36.6%) eaters. In terms of perceived stress, the majority of individuals who weren't stressed were either non-emotional or low-emotional eaters, whereas the majority of participants who were stressed were either emotional or extremely emotional eaters. The relationship between the emotional eating score and perceived stress was discovered to be statistically significant ($p < 0.001$) (Carpio -Arias et al., 2022).

TABLE 4.56 ASSOCIATION BETWEEN PERCEIVED STRESS AND EMOTIONAL EATING BEHAVIOURS (MEAN ± SD)

Variable	**Yes**	**No**	**p-Value**
Do you eat when you are in **fear**?			
Stress (Mean ±SD)	19.96±2.47	19.83±4.62	0.815
Do you eat when you are **bored**?			
Stress (Mean ±SD)	19.96±4.62	19.73±4.20	0.686
Do you eat when you are **happy**?			
Stress (Mean ±SD)	20.19±4.24	19.04±4.75	0.059
Do you eat when you are **lonely**?			
Stress (Mean ±SD)	19.94±4.37	19.81±4.45	0.843
Do you eat when you are **sad**?			
Stress (Mean ±SD)	20.21±4.33	19.79±4.44	0.614
Do you eat when you are **angry**?			
Stress (Mean ±SD)	19.33±4.17	19.97±4.48	0.367
Do you eat when you are **stressed**?			
Stress (Mean ±SD)	20.23±4.58	19.71±4.36	0.421
Do you eat when you are **depressed**?			
Stress (Mean ±SD)	19.85±4.09	19.85±4.48	0.952

TABLE 4.57 ASSOCIATION BETWEEN EATING HABIT SCORE AND PERCIVED STRESS (MEAN ± SD)

Variable	**Low stress**	**Moderate & High Stress**	**p- value**
Eating Habit Score	3.87±1.08	3.39±1.43	0.191

Association between perceived stress and craving for specific foods

Table 4.58 depicts the relationship between perceived stress and craves for particular foods among students. Majority (48.3%) of the students who occasionally had food cravings fell into the moderate and high stress categories.

TABLE 4.58 ASSOCIATION BETWEEN PERCEIVED STRESS AND CRAVINGS FOR SPECIFIC FOOD IN STUDENTS N (%)

Variable	Low stress N= 16	Moderate & high stress N=232	Chi - square	p-value
Never	1(6.3)	11 (4.7)	3.611	0.30
Sometimes	6(37.5)	112(48.3)		
Generally	2(12.5)	54(23.3)		
Always	7(43.7)	55(23.7)		

PHYSICAL ACTIVITY

Physical activity, in conjunction with a balanced diet, is the prerequisite for maintaining and strengthening health throughout one's life. The physical, motor, and psychosocial development of children and adolescents is stimulated by proper levels of activity. Physical activity lowers the risk of the majority of chronic diseases, particularly those involving the cardiovascular system, overweight and obesity, and type - 2 - diabetes (World Health Organization, 2010).

In the present study, we conducted the physical activity profile of the students. The mean MET minutes /week was 683±913.3. The mean of MET minutes/week in males is 1383.8±1715.2 and in females, 624±791.9. The mean MET minutes/week in males was significantly higher as compared to females ($p<0.001$) (Table 4.59).

Table 4.60 shows the physical activity profile of the students. Around 61.7% of total students were in the sedentary category, followed by 35.4% of students who were in the moderate category. More females (62.4%) as compared to males (52.6%) were in the sedentary category. Out of all the students, only 2.8% qualified for the heavy category.

The mean of the sitting minutes of the students is illustrated in Table 4.61. The mean of the total sitting minutes was found to be 531±140.9 minutes. Females (535±142.8) mean sitting minutes were higher compared to males (483.1±106.7). The sitting hours per day spent by the students are depicted in Table 4.62. The majority of students sit for more than 7 hours per day (75.8%), and the percentage of females (76.4%) who sit for more than 7 hours per day is higher compared to males (68.4%). Whereas, the percentage of males (31.5%) sitting for 5 – 7 hours is higher compared to females (20.0%).

A study was carried out to investigate the relationship between leisure-time physical exercise and stress susceptibility. Less than 150 minutes of physical activity per week were reported by 40% of the sample, placing them in the category of being physically inactive. About 21% of the sample showed signs of anxiety or depression. An analysis found a strong link between depression and leisure time physical exercise. Also, a substantial association between social networks and leisure time physical activity was discovered (Xu et al., 2018).

TABLE 4.59 MET MINUTES/WEEK (MEAN ± SD)

Variable	Females N=229	Males N=19	Total N=248	p-value
MET Minutes/Week	624±791.90	1383.86±1715.21	683±913.36	0.0004***

***p<0.001

TABLE 4.60 PHYSICAL ACTIVITY PROFILE OF THE SUBJECTS N (%)

Variable	Females N = 229	Males N = 19	Total N = 248	Chi – square	p-value
Sedentary	143(62.45)	10(52.63)	153(61.70)	4.611	0.099
Moderate	81(35.38)	7(36.84)	88(35.48)		
Heavy	5(2.19)	2(10.53)	7(2.82)		

TABLE 4.61 TOTAL SITTING MINUTES (MEAN ±SD)

Variable	Females N=229	Males N=19	Total N=248	p-value
Sitting Minutes	535±142.88	483.15±106.72	531±140.94	0.123

TABLE 4.62 TOTAL SITTING HOURS N (%)

Variable	Females N=229	Males N=19	Total N=248	Chi - square	p-value
< 2 Hours	0(0)	0(0)	(0)	1.917	0.383
2 – 4 Hours	8(3.50)	0(0)	8(3.23)		
5 – 7 Hours	46(20.08)	6(31.57)	52(20.97)		
>7 Hours	175(76.42)	13(68.42)	188(75.80)		

A study was conducted to examine the association between sitting time and obesity, while controlling for physical activity, in a large international sample. Around 5338 adults from the UK, USA, Germany, Spain, Italy, France, Portugal, Austria, and Switzerland had self-reported their total daily sitting time (hours/day), physical activity (MET minutes/week), age, height, and weight. Respondents were grouped into quartiles based on their daily sitting time (8 hours per day). It was found that respondents in the highest sitting time quartile (≥ 8 hours/day) had 62% higher odds of obesity compared to participants in the lowest quartile (<4 hours/day). Sitting time is associated with obesity in adults, independent of physical activity (Bullock et al., 2017).

Table 4.63 shows the association between sitting time and obesity. Majority of students who were overweight/obese (74.0%) or normal weight (75.8%) had ≥8 sitting hours.

Table 4.64 shows the association between students' perceived stress and physical activity. Mean stress levels were high in females & males (19.98±4.33 & 18.90±3.85, respectively) who engaged in sedentary behaviour compared to those who did not (19.86±4.84 & 18.12±3.97 respectively).

Table 4.65 shows the association between students' perceived stress levels and BMI. The BMI of students in the moderate and high stress category was significantly higher as compared to students in the low stress category (p=0.05).

Another study was conducted in Chennai, India, to find associations between sedentary behaviour and depression, stress, and anxiety among college students. Out of 507 study participants, 21.5% were sedentary. Depression and sedentary behaviour were found to have a significant correlation. For participants who engaged in sedentary behaviour and those who did not, there was a significant mean difference in depression levels (Chellaiyan et al., 2018).

According to research, persons who engage in regular physical activity experience less stress and anxiety (Dunn et al., 2001). Those who are less active or inactive tend to be more vulnerable to the negative effects of stress in life (Crews et al., 1987). Sports participation has been linked to improved mental health, and researchers

discovered that collegiate athletes felt less stress than non-athletes did at the university (Skrika, 2000).

Table 4.66 depicts the comparison of the eating habits scores and BMI among different psychosocial factors. For most of the psychosocial factors, there was no significant difference in eating habit score and BMI between students who ate or did not eat in response to the psychosocial factors.

TABLE 4.63 ASSOCIATION BETWEEN SITTING TIME AND OVERWEIGHT/OBESITY N (%)

Variable	Overweight/Obesity N=100	Normal N=91	Chi-square	p-value	OR
<8 hours	26 (26.0)	22(24.2)	0.084	0.771	1.102
≥8 hours	74(74.0)	69(75.8)			

TABLE 4.64 ASSOCIATION BETWEEN PERCEIVED STRESS LEVELS AND PHYSICAL ACTIVITY PROFILE (MEAN ±SD)

Variable	Sedentary	Non – Sedentary	p-value
Males (Stress levels)	18.90±3.85	18.12±3.97	0.671
Females(stress levels)	19.98±4.33	19.86±4.84	0.852
Total (stress levels)	19.92±4.30	19.65±4.75	0.912

TABLE 4.65 ASSOCIATION BETWEEN PERCIVED STRESS AND BMI (MEAN±SD)

Variable	Low stress	Moderate and High stress	p-value
BMI (Males)	20.68±0.03	22.29±4.89	0.195
BMI (Females)	20.03±3.51	22.27±4.79	0.086
BMI (Total)	20.11±3.27	22.27±4.78	0.022*

*p<0.05

TABLE 4.66 COMPARISONS OF THE EATING HABITS SCORES AND BMI AMONG DIFFERENT PSYCHOSOCIAL FACTORS (N= 248)

Psychosocial Factor	Eating Habit Score Mean (SD)	p-Value	BMI Mean (SD)	p-Value
Do you eat when you are in fear?				
Yes	3.55(1.52)	0.609	20.32(3.88)	0.029*
No	3.41(1.40)		22.37(4.79)	
Do you eat when you are bored?				
Yes	3.39(1.48)	0.706	22.04(4.60)	0.657
No	3.46(1.35)		22.30(4.93)	
Do you eat when you are happy?				
Yes	3.49(1.35)	0.254	21.90(4.23)	0.306
No	3.27(1.53)		22.66(5.73)	
Do you eat when you are happy?				
Yes	3.61(1.64)	0.241	21.84(5.09)	0.556
No	3.35(1.31)		22.24(4.59)	
Do you eat when you are sad?				
Yes	3.84(1.37)	0.074	21.44(3.30)	0.221
No	3.36(1.41)		22.27(4.93)	
Do you eat when you are angry?				
Yes	3.87(1.43)	0.014*	20.63(4.40)	0.011*
No	3.32(1.39)		22.54(4.77)	
Do you eat when you are stressed?				
Yes	3.64(1.47)	0.162	22.11(4.65)	0.971
No	3.35(1.39)		22.14(4.77)	
Do you eat when you are depressed?				
Yes	3.88(1.47)	0.043*	22.08(5.22)	0.948
No	3.35(1.39)		22.14(4.66)	

*$p<0.05$

SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

The World Health Organisation has declared obesity as one of the most neglected diseases. One of the biggest global issues today is obesity. People's lifestyles are changing dramatically as they move from rural to urban setting, which has been related to a rise in obesity. Diabetes, heart disease, back pain, depression, and asthma all closely correlated with being overweight or obese. Numerous factors, including a lack of physical activity, unhealthy eating habits, lifestyle modifications, emotional eating, and consuming junk food and fast food in response to psychosocial factors, such as stress, depression, anger, boredom, happiness, loneliness, sadness, and fear, are linked to obesity. All of this has become more prevalent among college students as a result of increased stress. Stress can have an impact on a person's health not just through direct physiological processes but also by altering health-related behaviors, one of which includes eating behaviour. It has been proven that stress can have an impact on how much food is eaten. According to certain studies, people often consume more high-calorie, high-fat foods when they are stressed. Stress has also been associated with the selection of food and the amount of food consumed. This study aimed to study perceived stress and emotional eating behaviour of undergraduate first year university students. Thus, with this background the present study was planned with the following objectives:

- To identify the stress level of the first-year university students.
- To identify the emotional eating behaviours of the first-year university students.
- To understand the association between stress and eating behaviour.

The study was a cross- sectional study. The study was conducted in the Faculty of Family and Community Sciences. All undergraduate first year students who gave their consent were enrolled for the study. Data was collected using a pre – tested questionnaire.

ENROLLMENT OF THE SUBJECTS

All the first year undergraduate students from Faculty of Family and Community Sciences who met the inclusion and exclusion criteria and who gave their consent to participate were enrolled in the study.

DATA COLLECTION

Data related to their socio – demographic information, anthropometric measurements, emotional eating behaviour, 24 – hour dietary recall, HFSS food frequency, perceived stress using Sheldon Cohen's perceived stress scale, and their physical activity patterns using the International Physical Activity Questionnaire were collected through pre – tested questionnaires.

OBSERVATIONS

Socio – demographic information of the students

- The mean age of the students was 18.8 years. The majority of the students were under the age of 20 (78.2%) and 21.7% of the individuals were 20 years of age or older.
- The majority of students (70.1%) were residing at home with their families, 21.3% were living in PGs or off-campus accommodation, and 8.4% were living in hostels.
- Around 95.9% of the students were non-smokers.

Anthropometric measurements

- Based on Asia pacific classification of BMI, 22.9% students belonged to underweight (<18.5 kg/m^2) category, 36.6% students were normal weight (18.5 – 22.9 kg/m^2), 16.1% were overweight (23 – 24.9 kg/m^2) and 24.1% were obese (≥25 kg/m^2).
- Prevalence of obesity was higher in males (31.5%) as compared to females (23.5%), whereas the prevalence of overweight was higher among females (16.5%) than males (10.5%).

Eating habits of the students

- Around 56.0% of the students were consuming <3 meals/day.
- More than half of the students (66.9%) were skipping breakfast, 43.5% were skipping lunch.
- Around 74.5% of students did not eat fruits every day and 75.0% did not eat GLVs every day.
- The mean eating score was 3.42±1.41.

Emotional eating behaviour

- In the previous week, approximately 74.6% of students consumed fast food, 65.0% consumed tea or coffee, 54.0% dined out, and 28.6% consumed soft drinks twice or more than twice/week.
- Weight scales have an impact on about 46.4% of students sometimes, with more females (47.6%) than males (31.5%) experiencing this. Almost 11.7% students are often affected and 14.1% students are always affected by their weight scales.
- The majority of students (47.6%) crave specific foods sometimes. Gender was associated with the frequency of craving foods.
- Approximately 37.9% of respondents said it was tough to stop consuming sweets sometimes, with males (42.1%) finding it more difficult than females (37.5%).
- Approximately 51.6% of students admitted that they sometimes found it difficult to regulate their portion sizes when consuming particular foods or their favourite foods.
- Approximately 35.4% of respondents said that they tend to eat sometimes when they are stressed, angry, or bored, while, 14.9% of students reported that they always tend to eat when they are stressed, angry or bored.
- Almost 54% of students responded that sometimes they tend to eat more of their favourite food with less control when they are alone.
- Around 36.2% of students responded that sometimes they felt guilty after eating forbidden foods such as sweets or snacks.
- Approximately 42.3% of students responded that sometimes they felt less control over their diet after work at night, while,15.3% always felt that way.
- Around 35% of students reported that sometimes they are prone to overeating when on a diet, giving up on it, and starting to eat carelessly, especially when it comes to fatty foods.
- Approximately 39.5% of students reported that sometimes they felt that food was controlling them, rather than them controlling food.
- Majority (47.9%) of the students were emotional eaters, followed by 39.1% who were low-emotional eaters, 11.3% who were non-emotional eaters, and 1.6% who were very emotional eaters.

Psychosocial factors and eating habits of the students'

- Almost 70.1% of students reported eating when they are happy, followed by 51.6% when they are bored, 27.4% when they are lonely, 25.8% when they are stressed, 19.3% when they are angry, 13.7% when they are depressed, 12.9% when they are sad, and 11.6% when they are afraid.
- Most students tend to eat foods high in fat, foods high in salt and fat, and foods high in sugar and fat, in response to psychosocial factors such as fear, happiness, boredom, and loneliness.
- Majority of the students typically eat items high in fat and sugar, high in fat, and high in salt and fat, when experiencing psychosocial factors like anger, sadness, stress and depression.
- Majority of the students continue to eat as usual when experiencing psychosocial factors like happiness, boredom, loneliness, sadness, anger, stress, and depression. However, 32.7% of students stated that they consumed more than usual when they were happy, 29.6% when they were under stress and 23.5% when they were depressed.

Level of perceived stress among students

- Approximately 89.1% of students were found to be under moderate levels of stress, followed by 6.4% who had low levels of stress and 4.4% who had high levels of stress.
- The average stress score of the students was 19.8± 4.4. Females had higher mean stress scores than males.

Nutrient intake of the students

- Fats made up a very high percentage of calories (41.29%) in this sample of students, which was on the higher side. Carbohydrates accounted for 42.6% of calories, while protein accounted for 13.9%.
- Moderately to highly stressed students tend to consume more fat as compared to low stressed students.

Difference in frequency of various HFSS foods between students with low stress and students with moderate/high stress by gender

- There was a significant difference in females between the low stressed and moderate to highly stressed categories. Yet, those who eat a lot of fat fall into the stress category, ($p = 0.01$). In contrast, no statistically significant difference in intake of any of the food items was observed between moderate to high stressed and low stressed male students.

Association between stress and emotional eating behaviour

- Students who eat in response to psychosocial elements such as stress, anger, boredom, happiness, loneliness, sadness, and so on have greater average stress levels than those who do not eat.

Physical Activity

- The mean MET minutes/week was 683±913.3.
- Mean MET minutes/week in males (1383.8) was significantly ($p<0.001$) higher as compared to females (624).
- Around 61.7% of total students were in the sedentary category, followed by 35.4% of students who were under moderate category of physical activity.
- Higher percentages of females (62.4%) as compared to males (52.6%) were sedentary.
- Out of all the students, only 2.8% qualified for the 'Heavy' category.
- The mean of the total sitting minutes was found to be 531±140.9 minutes.
- Mean sitting minutes in females (535±142.8) was higher compared to males (483.1±106.7).
- Majority of students sit for more than 7 hours per day (75.8%)
- Mean stress levels were higher in females & males (19.98±4.33 & 18.90±3.85, respectively) who engaged in sedentary behaviour as compared to those who did not (19.86±4.84 & 18.12±3.97 respectively), though non – significant.
- The relationship between the perceived stress and BMI was discovered to be statistically significant ($p<0.05$).

CONCLUSION

University students face many stresses such as pressure to succeed, competition with peers, academic overload, adjusting to new living situation, meeting new people and sometimes financial burden. Stress can affect an individual's health not only through direct physiological processes but also by altering behaviours which affect health. One such behaviour is dietary behaviour. The present study found that the majority of the students had moderate levels of stress. Trend of poor eating practices was observed among students, including skipping breakfast, lunch and dinner, inadequate consumption of fruits and vegetables and having less than three meals per day. Majority of students tend to eat in response to happiness. Students who tend to eat in response to psychosocial factors tend to eat foods like those high in fat, high in sugar and fat, high in salt and fat, or high in sugar. Thus, predisposing them to conditions like overweight, obesity and hypertension. Students tend to consume more than usual when they are happy. Students who eat in response to psychosocial factors (e.g. happiness, boredom, sadness, anger, fear etc.) had higher mean stress levels (though non – significant) compared to those who do not eat. Sedentary lifestyle was observed in majority of the students, and 75.8% of students spent more than 7 hours sitting.

RECOMMENDATIONS

- Sensitising people about stress and emotional eating behaviour is necessary to stop the rising prevalence of NCDs and their related problems.
- The youth needs to be sensitized about the health effects of consumption of fast food and food which is high in fats, salts and sugar (HFSS). Awareness needs to be created regarding the consumption of healthy diets, reducing the intake of HFSS foods, and eating out in response to psychosocial factors such as stress, anger, boredom, happiness, loneliness, etc.
- Stress-relief programmes for students should be developed and implemented.
- Students should be encouraged to make healthy food choices and develop healthy lifestyle habits like engaging in regular physical activity.

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APPENDICES

APPENDIX - I

PERMISSION LETTER

DEPARTMENT OF FOODS AND NUTRITION
FACULTY OF FAMILY & COMMUNITY SCIENCES
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA
VADODARA 390 002 - INDIA

Phone : 0265-2795526
Tele. 0265-2795522 [Ext.33]
Grams : "HOMSCIENCE"

Date: 29/09/2022

No. F. C. Sc./ FND /

To,
Prof. Anjali Karolia
Offg. Dean
Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda

Subject: Permission for carrying out dissertation work in the Faculty of Family and Community Sciences

Respected ma'am

This is to request you to grant permission to Ms. Isha Patel for carrying out her MSc. dissertation work under my guidance on Perceived Stress and Emotional Eating Behaviour in university students. In the study, students from the faculty of Family and Community Sciences who give informed consent would be enrolled. Dietary data, anthropometric data and information related to Perceived Stress and Emotional Eating Behaviour would be collected from the students. The data would be kept confidential and only the pooled data would be used for publishing.

We would be obliged if you could grant us permission for the same.

Thanking you,

Shonima

Dr. Shonima Venugopal
Guide
Department of Foods and Nutrition

Through

Prof. Mini Sheth
I/c Head
Department of Foods and Nutrition
Faculty of Family and Community Sciences

Permitted
Karolia.

APPENDIX - II

ETHICAL COMPLIANCE CERTIFICATE

Institutional Ethics
Committee for Human
Research
(IECHR)

FACULTY OF FAMILY AND COMMUNITY SCIENCES
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

Ethical Compliance Certificate 2022 – 2023

This is to certify that Ms. Isha Patel's study titled, "**Perceived stress and Emotional eating behaviours in first year undergraduate students**" from Department of Foods and Nutrition has been approved by the Institutional Ethics Committee for Human Research (IECHR), Faculty of Family and Community Science, The Maharaja Sayajirao University of Baroda. The study has been allotted the ethical approval number **IECHR/FCSc/MSc/2022/40.**

Prof Mini Sheth
Member Secretary
IECHR

Prof Shagufa Kapadia
Chairperson
IECHR

APPENDIX - III

INFORMED CONSENT FORM

STUDY TITLE: PERCEIVED STRESS AND EMOTIONAL EATING BEHAVIOUR IN FIRST YEAR UNDERGRADUATE STUDENTS

INVESTIGATORS

Dr. Shonima Venugopal
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Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda, Vadodara
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Ms. Isha Patel
Department of Foods and Nutrition
Faculty of Family and Community Sciences
The Maharaja Sayajirao University of Baroda, Vadodara
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PURPOSE OF THE STUDY

Stress levels are increasing nowadays and increased stress levels leads to numerous other health problems. An increase in stress levels leads to an unhealthy eating pattern and unhealthy eating leads to obesity. Eating food as a strategy to cope with stress has been associated with a higher intake of energy- dense & high sugary foods. This study plans to evaluate perceived stress levels and eating behavior of first year undergraduate university students.

PROTOCOL OF THE STUDY

If you decide to join this study, information on anthropometric measurements (height, weight, waist circumference, hip circumference), perceived stress, emotional eating behavior, physical activity etc. will be collected using a questionnaire

COSTS

This study requires only your time and co-operation. All the costs included will be borne by the researcher and there is no financial compensation for your participation

in this research.

POSSIBLE BENEFITS AND RISKS

The study will help in understanding the association between perceived stress and emotional eating behavior. We believe that there is no risk associated with participation in this research study.

CONFIDENTIALITY

In the study, your identity will be kept confidential. Results of the study may be published for scientific purposes but will not reveal your name or include any identifiable references to you.

VOLUNTARY PARTICIPATION:

Your cooperation is important for the success of this study. Unless many volunteers like you participate in this study it will not be possible.

RIGHT TO WITHDRAW:

Your decision to join this study is voluntary. You can quit the study at any time, for any reason, without notice. We hope you will take part for the entire study period because we need all the information to draw a correct conclusion.

AVAILABILITY OF RESULTS:

At the end of the study, relevant information will be shared with you.

CONTACT:

If you have any questions regarding this study, you can contact the investigators.

CERTIFICATE OF CONSENT

I have read this information (or had the information read to me) and understood the description of the study, I agree to take part in the research being carried out by Dr. Shonima Venugopal and her student, Ms Isha Patel, on Perceived Stress and Emotional Eating Behaviour of the first year undergraduate university students. I understand that the study involves collection of information on anthropometric measurements, perceived stress, emotional eating behavior, physical activity using a questionnaire. I understand that I may ask questions about the study at any time. I am also aware of my right to opt out of the study anytime.

Name of the student and signature: _____ **Date:**

APPENDIX - IV

QUESTIONNAIRE FOR PERCEIVED STRESS AND EMOTIONAL EATING BEHAVIORS

Socio – Demographic Data

1. Name: _____
2. Age (Years): _____
3. DOB: _____
4. Sex: □ Male □ Female □ Others
5. Place of Residence: □ On Campus Accommodation
   □ Off Campus Accommodation/PG
   □ At Home with Family
6. Family type: □ Nuclear □ Joint □ Extended
7. Monthly Family Income (Rupees): _____
8. Smoking Status: □ Yes □ No
9. Contact No: _____
10. Residential Address: _____
11. Do you have any of the following condition?
    Diabetes □ Yes □ No
    Hyperthyroidism □ Yes □ No
    Hypertension □ Yes □ No
    Dyslipidaemia (High TG/LDL/Total Cholesterol, Low HDL) □ Yes
    □ No
    □ Any Other _____

Anthropometric Measurements

12. Height(cm): _____
13. Weight(kg): _____
14. BMI: _____
15. Waist Circumference(cm): _____
16. Hip Circumference(cm): _____

Emotional Eating

17. How many meals do you consume in a day?

    o < 3 meals/day o >3 meals/day

18. Do you skip breakfast?

    o Yes o No

19. Do you skip lunch?

- Yes
- No

20. Do you skip dinner?

- Yes
- No

21. Do you consume fruits daily?

- Yes
- No

22. Do you consume GLVs daily?

- Yes
- No

23. Do you consume other vegetables daily? (Bitter Gourd, Carrot, Potato, Onion, Pumpkin, Okra, Beans etc.)

- Yes
- No

24. How frequently did you consume fast- food in the past one week?

- Never or Once
- Twice or more than twice

25. How frequently did you consume soft drinks in the past one week?

- Never or Once
- Twice or more than twice

26. How frequently did you consume Coffee/Tea in the past one week?

- Never or Once
- Twice or more than twice

27. How frequently did you go out to eat in the past one week?

- Never or Once
- Twice or more than twice

28. On an average how many hours do you sleep every day?

- 3 Hours or Less
- 4 – 5 Hours
- 6 – 8 Hours
- More than 8 Hours

29. Do weight scales have a great power over you? Can they change your mood?

- Never
- Sometimes
- Generally
- Always

30. Do you Crave Specific foods?

- Never
- Sometimes
- Generally
- Always
- If yes, which food item?

31. Is it difficult for you to stop eating sweet things, especially chocolate?

- Never
- Sometimes
- Generally
- Always

32. Do you have problems controlling the amount of certain types of food you eat?

- Never
- Sometimes
- Generally
- Always

33. Do you eat when you are stressed, angry or bored?

- Never
- Sometimes
- Generally
- Always

34. Do you eat more of your favourite food and with less control when you are alone?

- Never
- Sometimes
- Generally
- Always

35. Do you feel guilty when you eat “forbidden” foods, like sweets or snacks?

- Never
- Sometimes
- Generally
- Always

36. Do you feel less control over your diet when you are tired after work at night?

- Never
- Sometimes
- Generally
- Always

37. When you overeat while on a diet, do you give up and start eating without control, particularly food that you think is fattening?

- Never
- Sometimes
- Generally
- Always

38. How often do you feel that food controls you, rather than you controlling food?

- Never
- Sometimes
- Generally
- Always

39. Do you eat when you are in fear?

- Yes
- No

- If yes, which food item?

40. Does your food intake change when you are in fear?

- Less than usual
- Same as usual
- More than usual

41. Do you eat when you are Bored?

- Yes
- No
- If yes, which food item?

42. Does your food intake change while you are bored?

- Less than usual
- Same as usual
- More than usual

43. Do you eat when you are Happy?

- Yes
- No
- If yes, which food item?

44. Does your food intake change while you are Happy?

- Less than usual
- Same as usual
- More than usual

45. Do you eat when you are lonely?

- Yes
- No
- If yes, which food item?

46. Does your food intake change while you are lonely?

- Less than usual
- Same as usual
- More than usual

47. Do you eat when you are Sad?

- Yes
- No
- If yes, which food item?

48. Does your food intake change while you are Sad?

- Less than usual
- Same as usual
- More than usual

49. Do you eat when you are Angry?

- Yes
- No
- If yes, which food item

50. Does your food intake change while you are Angry?

- Less than usual
- Same as usual
- More than usual

51. Do you eat when you are in stress?

- Yes
- No
- If yes, which food item?

52. Does your food intake change while you are in Stress?

- Less than usual
- Same as usual
- More than usual

53. Do you eat when you are depressed?

- Yes
- No
- If yes, which food item?

54. Does your food intake change while you are depressed?

- Less than usual
- Same as usual
- More than usual

55. In last 24 – hours did you experience any emotional situation?

- Yes
- No

56. If yes, did you eat something to deal with the situation?

- Yes
- No

57. If yes, what did you eat and how much?

FREQUENCY OF CONSUMPTION OF THE FOLLOWING FOOD ITEMS

Sr. no.	Food item	Once Daily	Twice Daily	Thrice Or More Daily	Once A Week	2 – 3 times a week	4 – 6 times a week	Never
Foods high in fat								
1.	Puff							
2.	Samosa							
3.	Vadapav							
4.	Frankie							
5.	Sandwich (cheese)							
6.	Sabudanavada							
7.	Panipuri							

8.	Chaat							
9.	Sevusal							
10.	Kachori							
11.	Dabeli							
12.	Chinese							
13.	Pasta							
14.	Pav bhaji							
15.	Egg items							
16.	Bhajiyas							
17.	Batakavada							
18.	Puri							
19.	Wafers							
20.	Pune missal							
21.	Bread (Brown)							
22.	Bread(White)							
23.	Gulabjamun							
24.	Kala jam							
25.	Bundi							
26.	Ladoo							
27.	Peda							
28.	Ras gulla							
29.	Rasmalai							
30.	Rabdi							
31.	Jalebi							
32.	Basundi							
33.	Ice cream							
34.	Chocolates							
35.	Puddings							
36.	Bun							
37.	Cakes							
Sr. no.	**Food item**	**Once Daily**	**Twice Daily**	**Thrice Or More Daily**	**Once A Week**	**2 – 3 times a week**	**4 – 6 times a week**	**Never**
38.	Pastry							
Foods High in Sugar								
39.	Colas							
40.	Fruit syrups							
41.	Fruit drinks- Mazza, slice							
42.	Fruit juices- Tropicana							

43.	Fruit crush/sherbets- Mapro/mala							
44.	Tang							
45.	Red bull							
46.	Alcoholic beverages							
47.	Ketchups							
48.	Jam							
49.	Breakfastcereals							
50.	Sweet pickle							
51.	Sweet chutney							
Foods high in salt and fat								
52.	Noodles (maggie/yippie /chings)							
53.	Mayonnaise							
54.	Cheese spreads							
55.	Other sauces							
56.	Mccain(frozen foods)							
57.	Biscuits -salty -cream							
58.	Fries							
59.	Chips							
60.	Kurkure							
61.	Kahkhra							
62.	Soya sticks							
63.	Gathiya							
64.	Papdi							
65.	Chawanu							
66.	Sev							
67.	Sevmamra							
68.	Mcd burger							
69.	Pizza							
70.	Subway							

Sr. no.	Food item	Once Daily	Twice Daily	Thrice Or More Daily	Once A Week	2 – 3 times a week	4 – 6 times a week	Never
71.	Fafda							
72.	Khaman							
73.	Sour pickle							
74.	Chinese foods							
Foods high in salt								
75.	Soups							
76.	Oats							
77.	Papad							
78.	Masala Mixes							
79.	Rasoi magic							
Other food items								
80.	GLV							
81.	Other vegetables							
82.	Root and tubers							
84.	Milk(gold/shakti/ slim trim, cow)							
85.	Curd							
86.	Paneer							
87.	Cheese							
88.	Butter							
89.	Sugar							
90.	Honey							
91.	Jaggery							
92.	Ghee							
93.	Oil							
94.	Cereals							
95.	Pulses							
Fruits								
96.	Banana							
97.	Apple							
98.	Papaya							
99.	Muskmelon							
100.	Pineapple							

101.	Orange							
102.	Sweetlime							
103.	Other fruits							
Non – Vegetarian food								
104.	Egg							
105.	Chicken							
106.	Mutton							
107.	Fish							
108.	Prawns							
Sr. no.	**Food item**	**Once Daily**	**Twice Daily**	**Thrice Or More Daily**	**Once A Week**	**2 – 3 times a week**	**4 – 6 times a week**	**Never**
109.	Chicken nuggets							
110.	Fried fish							
111.	Chicken/mutton kebabs							
Nuts and oilseeds								
112.	Groundnuts							
113.	Flaxseeds							
114.	Fennel seeds							
115.	Chia seeds							
116.	Sesame seeds							
117.	Coconut							
118.	Cashewnuts							
11	Almonds							

9.								
120.	Pistachio nut							
121.	Walnuts							
122.	Niger seeds							
123.	Others (specify)							

24 – Hour Dietary Recall

Meal time	Name of the food stuff	Ingredients	Raw weight (g)	Cooked volume (ml)
Morning				
Mid-morning				
Lunch				
Evening tea				
Dinner				

Cohen's Perceived Stress Scale

1. In the last month, how often have you been upset because of something that happened unexpectedly?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

3. In the last month, how often have you felt nervous and "stressed"?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

5. In the last month, how often have you felt that things were going your way?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

6. In the last month, how often have you found that you could not cope with all the things that you had to do?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

7. In the last month, how often have you been able to control irritations in your life?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

8. In the last month, how often have you felt that you were on top of things?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

9. In the last month, how often have you been angered because of things that were outside of your control?
   □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?
    □ Never □ Almost Never □ Sometimes □ Fairly Often □ Very often

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

   _____ **Days per week**

   ☐ No vigorous physical activities → ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

   _____ **Hours per day**

   _____ **Minutes per day**

   ☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

   ____ **Days per week**

   ☐ No moderate physical activities → ***Skip to question 5***

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

   _____ **Hours per day**

   _____ **Minutes per day**

   ☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

   _____ **Days per week**

   ☐ No walking → ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

   _____ **Hours per day**

   _____ **Minutes per day**

   ☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

   _____ **Hours per day**

   _____ **Minutes per day**

   ☐ Don't know/Not sure