PROJECT DISSERTATION REPORT On

"HEALTH AWARENESS AND OBESITY"

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CERTIFICATE

This is to certify that Ms. Khushi, has completed the project titled "Health Awareness and Obesity" under the guidance of Mr. Chandan Sharma as a part of Master of Business Administration (MBA) curriculum of Delhi School of Management, New Delhi. This is an original piece of work and has not been submitted elsewhere.

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DECLARATION

I hereby declare that this project report entitled 'HEALTH AWARENESS AND OBESITY' was carried out by me for the degree of Masters in Business Administration under the guidance and supervision of Mr. Chandan Sharma, Assistant Professor of Delhi School of Management, Delhi Technological University. The interpretations put forth are based on my reading and understanding of the original texts and they are not published anywhere in any form. The other books, articles and websites, which I have made use of are acknowledged at the respective place in the text. This research report is not submitted for any other degree or diploma in any other University.

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Year: 2nd Year, IV SEMESTER

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ABSTRACT

Obesity is a very real and worldwide concern, affecting millions today. It is a chronic condition in which individuals accumulate and carry fat exceeding 20% of their recommended weight. To combat the rising prevalence rates in a primary practice clinic, an evidence-based practice project was created that used a combinational approach to improve not only the rate of obesity but also the knowledge and self-awareness levels of those afflicted with obesity. A total of twenty participants, the majority female and Caucasian between the ages of eighteen and sixty years old, completed the project. The intervention used education, in group and individual sessions, a low-calorie diet, exercise sessions with thirty-minute gradual increases, and pharmacotherapy as needed. The outcomes were measured pre-and post-intervention, using knowledge and self-awareness questionnaires, as well as through physical measurements of weight and BMI. The overall average self-awareness and knowledge scores increased following the intervention, 35.40% (pre) to 84.75% (post) and 43.65% (pre) to 87.25% (post), respectively. In addition, there was an overall mean weight loss of 10.225 pounds from pre- to post-intervention. The project met and exceeded the set benchmarks for an increase in obesity knowledge and self- awareness with a corresponding reduction in weight. The results demonstrated improvement in weight short term, and with maintenance could impact the comorbidities related to obesity. The project will be sustained on a longer-term basis, and the intervention strategies will be added to the clinic's policies to create a more pronounced impact on obesity.

Obesity is at epidemic proportions in the United States and in other developed and developing countries. The prevalence of obesity is increasing not only in adults but especially among children and adolescents. In the United States in 2003 to 2004, 17.1% of children and adolescents were overweight, and 32.2% of adults were obese. Obesity is a significant risk factor for and contributor to increased morbidity and mortality, most importantly from cardiovascular disease (CVD) and diabetes, but also from cancer and chronic diseases, including osteoarthritis, liver and kidney disease, sleep apnea, and depression. The prevalence of obesity has increased steadily over the past 5 decades, and obesity may have a significant impact on quality-adjusted life years. Obesity is also strongly associated with an increased risk of all-cause mortality as well as cardiovascular and cancer mortality. Despite the substantial effects of obesity, weight loss can result in a significant reduction in risk for the majority of these comorbid conditions. Those comorbidities most closely linked to obesity must be identified to increase awareness of potential adverse outcomes. This will allow healthcare professionals to identify and implement appropriate interventions to reduce patient risk and mortality.

Key words: Obesity, lack of knowledge, lack of self-awareness, weight management, primarycare setting, and education.

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Chapter 1

INTRODUCTION

Obesity is and has been one of the most important health problems in the U.S. and in many other countries. There is strong evidence connecting obesity with a number of neurological, endocrine, and cardiovascular conditions as well as diabetes (Mazzeo et al. 2010). When the body mass index is greater than or equivalent to 30 kg of body weight/m2 of height, it is a medical condition. It is characterised by the buildup of extra fat, which can cause cancer, metabolic syndrome, diabetes mellitus type 2, osteoarticular system problems, stroke, and cardiovascular dysfunction (Berthoud 2005; Must et al. 1999). A combination of excessive food consumption, inactivity, and genetic predisposition results in obesity. The global epidemic of overweight and obesity is referred to by the WHO as "globesity". In actuality, obesity affects more nations and the entire population, including both children and adults (Wilborn et al. 2005). Indeed, especially in industrialised cultures, his frequency has risen over the past 20 years (Mazzeo et al. 2016; Ogden et al. 2006; Flegal et al. 2010). It has been established that childhood obesity has an adult counterpart (Mason et al. 2008; World Health Organisation Regional Office for Europe 2014). An obese person's body ages more quickly than it should. An obese person may pass away 13 years earlier than a healthy one (Fontaine et al. 2009), and the risk of death rises by 30% for every 15 kg of excess weight (Sassi et al. 2010; Schmid et al. 2005). According to Lakdawalla et al. (2002), a change in lifestyle brought on by technological advancement is the primary cause of weight gain in people. Consuming too many calories, which have increased by around 12% since 1980, is another factor. The entire civilization introduces more calories than people's bodies actually require. For instance, they arise from fatty food or fizzy drinks that are high in sugar (Putnam et al. 2002; Mazzeo et al. 2010). In addition, the improper practise of eating before main meals has grown over time (Nielsen et al. 2003). Additionally, this condition is influenced by hereditary variables (Finucane et al. 2011).

Evaluation of people's weight

Adults' weight varies depending on their sex, height, and age, and there are several ways to quantify it. A measurement of body fat based on a person's weight in relation to their height is called body mass index (BMI). The cube of the person's height is used to split it (Messina et al. 2015). Although it does not directly measure body fat, it is nonetheless affordable and simple to carry out. The index covers six weight categories, ranging from obese III to underweight, as shown in Table 1. If a person's BMI is 30 or more, they are deemed obese (Wilborn et al. 2005; Orzano et al. 2004). A person with a BMI of 29.9 is regarded to be overweight.

BMI	Classification
Below 18.5	Underweight
18.5-24.9	Healthy weight
25.0 -29.9	Overweight
30 – 34.9	Obesity I
35 – 39.9	Obesity II
≥40	Obesity III

Table 1 Classification BMI.

His paradox is the primary issue with this index. It suggested that bodybuilders might have the same BMI as obese, sedentary people. In actuality, it disregards the individual's body fat percentage and musculature.

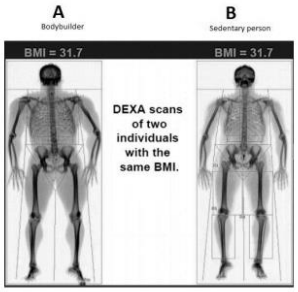


Figure 1 Different people with the same BMI.

	A	B
Muscle Mass	88.7 kg	69.5 Kg
Fat Mass	**13.8 kg**	**25.8 Kg**
Bone Mass	3.8 kg	2.8 Kg
Body Fat	13%	26.3 %
Total Weight	**106.3 kg**	**98.1 Kg**
Height	1.83 m	1.76 m

Table 2 Data of subjects A and B

As you can see in Figure 1 and Table 2, despite subject B's greater weight and lesser fat mass than person A's, both have the same BMI (31.7), indicating that both are suffering from obesity (De Lorenzo et al. 2001).

Tests to diagnose obesity could be:

- Waist circumference, Sagittal Diameter and Waist-To-Hip Ratio. They are measurements for estimating the amount of fat mass deposited under the skin and inside the abdominal cavity;

- Skinfolder Caliper which measures only the fat under the skin;

- Water Displacement Tests – Fat floats. This test consists in submerging a person in the water and calculating the volume of the displaced water from the weight of the displaced water;

- Electrical Measurements that calculate the percentage of body fat by measuring the different electrical characteristics of fat and other body tissues;

- Blood test. This is the most common test recommended by physicians. Thanks to it, it is possible to know how much fat there is in the blood and if a person suffers from disorders, such as thyroid disorder;

- Plicometry is a technique that, through a device called plicometer, evaluates the thickness of cutaneous plicae or folds (Rona et al. 2006). It is based on the relationship between the subcutaneous adipose tissue and thin body mass;

- Densitometry, which is another technique that observes how thin tissues absorb, determined electromagnetic waves in comparison with fat tissues;

Causes Obesity & Overweight

Several factors can play a role in gaining and retaining excess weight. These include diet, lack of exercise, environmental factors, and genetics. Some of these factors are discussed briefly in the following section.

- Food and Activity

People gain weight when they eat more calories than they burn through activity. This imbalance is the greatest contributor to weight gain.

- Environment

The world around us influences our ability to maintain a healthy weight. For example:

- Not having area parks, sidewalks, and affordable gyms makes it hard for people to be physically active.
- Oversized food portions increase Americans' calorie intake, making even more physical activity necessary to maintain a healthy weight.
- Some people don't have access to supermarkets that sell affordable healthy foods, such as fresh fruits and vegetables.
- Food advertising encourages people to buy unhealthy foods, such as high-fat snacks and sugary drinks.

- Genetics

Research shows that genetics plays a role in obesity. Genes can directly cause obesity in such disorders as Prader-Willi syndrome. Genes also may contribute to a person's susceptibility to weight gain. Scientists believe that genes may increase a person's likelihood of having obesity but that outside factors, such as an abundant food supply or little physical activity, also may be required for a person to have excess weight.

- Health Conditions and Medications

Some hormone problems may cause overweight and obesity, such as underactive thyroid, Cushing syndrome and polycystic ovary syndrome.Certain medicines also may cause weight gain, including some corticosteroids, antidepressants, and seizure medicines.

- Stress, Emotional Factors, and Poor Sleep

Some people eat more than usual when they are bored, angry, upset, or stressed.Studies also have found that the less people sleep, the more likely they are to have overweight or obesity. This is partly because hormones that are released during sleep help control appetite and the body's use of energy.

1.1 Background :

Obesity is a very real and worldwide concern, as it affects and influences millions worldwide, with at least 300 million clinically diagnosed as obese. It is a power player in contributing to chronic conditions and causing disability (Falentin, 2010). Worldwide obesity has more than doubled since 1980 (World Health Organization [WHO], 2016). The Centers for Disease Control and Prevention [CDC], (2015) reported that in the United States alone the prevalence of obesity was 36.5% among adults during the period of 2011-2014, more than one-third of adults and 17% of youth in that period. Healthcare costs related to obesity are estimated to be at $147 billion (CDC, 2015).

Florida's obesity rate is currently 26.8%, having increased from its 18.4% rate in 2000 (State of Obesity, 2016). The prevalence of obesity in a primary care setting is 35% of adults having a body mass index (BMI) $\geq 30 kg/m^2$, whereas the prevalence of obesity in Europe is estimated at 17.2 % of the overall population (Lenoir & Ritz, 2015). The prevalence of obesityin the adult population in Canada is no different with a rate of one in every four adults or about

6.3 million people, were obese in 2011-2012 (Navaneelan & Janz, 2014).

This evidence-based project was inspired by a primary care clinical practice in a southernstate in the United States (US). According to the primary care physician (personal communication, January 12, 2017), about half of his patient population has been diagnosed with obesity. In this clinic, the rate of comorbidities associated with obesity is also high in the patientpopulation. In fact, the rate of co-morbidities is higher in this state compared to other states, ranking 13^{th} in diabetes and hypertension (State of Obesity, 2016). The significance obesity holds is high not only because of the disorder itself but also due to the nature of its negative health effects.

1.2 Statement of the Problem :

Obesity is a chronic condition that causes the individual to accumulate and carry fat exceeding 20% of the recommended weight (DeAngelo et al., 2016). Due to an unequal relationship between caloric intake and expenditure, obesity presents itself as an intricate and compounded condition in those who are affected by it. Obesity is a multifactorial clinical problem. The onset of obesity and

its noted and unprecedented impact on social and economic levels has resulted in the need for uniform national recommendations to be created to effectivelymanage it.

Obesity is undeniably a cause of great concern in the Western world due to its influence on morbidity, mortality, and quality of life. Obesity should be faced with a critical mindset as current trends only point to its continued upward trend. According to national statistics from 2007 to 2008, over one-third of Americans across all socio-economic statuses and races were classified as obese (Ogden et al., 2015). Even though the number of patients diagnosed with obesity has risen over the years, weight counseling has been offered less, declining from 7.8% from 1995 to 1996 to 6.2% from 2007 to 2008 (Kraschnewski et al., 2013). Therefore, the purpose of this chapter is to discuss the prevalence of the identified clinical problem, obesity due to a lack of knowledge and self-awareness in patients, and to stress the need to combat this prevalence.

1.3 Objectives of the study:

The specific objectives of this study were the following:

i. To determine the difference in the prevalence of overweight and obesity among respondents between urban and semi-urban settings of Delhi-NCR;
ii. To identify lifestyles that cause overweight and obesity among adults in urban as well as semi-urban settings;
iii. To assess health and social problems that overweight as well as obesity conditions impact upon adults; and
iv. To examine general perception towards obesity and its associated issues and health awareness amongst adults.
v. To study the day-to-day eating habits and lifestyle of adults working as professionals, students, homemakers, businesspeople, etc.
vi. To identify the causes of overweight and obesity by assessing lifestyle behaviours that subject adults to overweight and obesity.

1.4 Significance of the study:

i. This study sought to establish the status of overweight and obesity among adults in Delhi-NCR and its districts.
ii. Findings from this study would be helpful in raising awareness among the respondents about the impacts that overweight and obesity have on individuals' health and social and academic welfare.
iii. The study findings would enhance respondents' plans for effective use of leisure time at work and home by putting great emphasis on sports as well as physical activities. In due regards, they would be able to expend extra energy that could otherwise be stored in their bodies and cause overweight as well as obesity.

iv. The study also aimed at providing information that can be useful in developing ways to avoid heart diseases, diabetes, blood pressure, and respiratory disorders that are derivatives of overweight and obesity.

v. In another vein, control of problems resulting from being overweight and obese will be a way forward to reduce absenteeism in offices and homes (Sharkey, 1997).

vi. Thus, understanding the causes of overweight and obesity will make preventive measures easier and hence help in minimizing the extent of obesity and increasing health awareness.

Chapter 2

LITERATURE REVIEW

2.1 Review of the literature

Obesity is a major health concern in the United States (US) because it reduces a person's well-being, a fact attested to by the Centers for Disease Control and Prevention [CDC] (2015). The rising prevalence rate and healthcare implications of obesity affect not only the individual's health emotionally and physically but also the nation's health. Diagnosing and treating obesity early is directly proportional to the rate of weight loss; the earlier it is detected the higher the rateof weight loss. However, the main cause for resistance to treatment is the struggle to motivate patients to successfully manage their weight. The healthcare provider can be influential in identifying risks that motivate patients to lose weight and develop healthier lifestyles and habits (Post et al., 2015). The task then is to motivate patients to lose weight and give them the tools tosucceed, not only to lose weight but to also maintain a healthy weight for a lifetime.

Education is a powerful tool for the healthcare provider to influence the lifestyle choices and habits of their patients, and therefore address obesity (Ogden, Lamb, Carroll, & Flegai, 2015). An educational intervention could potentially increase patient knowledge about obesity and its harmful health effects, ultimately leading to a decrease in their weight. A literature review was necessary to explore studies that examined weight loss strategies and approaches, using established criteria to create the most effective approach for weight loss. The results would serve as the foundation for an evidence-based practice (EBP) change project to address weight management in a primary care setting. The purpose of this paper was to describe the literature review process and findings to address the significant concern of obesity in the primarycare setting.

2.2 Literature Review Findings

The majority of evidence found related to obesity used one or all of the measures of BMI (Body Mass Index), WT (Weight), and/or WC (Weight Circumference).

- The interventions were assessed through the literature review to determine which provided the best evidence for the projected change project. The review identified multiple interventions: group education interventions to support and maintain behavioral change (Aveyard et al., 2016; Greer &Hill, 2011), increases in exercise and other physical modifications that impacted obesity (Neidrick et al., 2012), and written dietary interventions (Mohammad et al., 2013).

- Other interventions included the use of a telemedicine-guided weight management program (Batsis et al., 2017), bariatric surgery (Livington (2012), and pharmacotherapy (Kim et. al., 2006). Weight loss interventions were often combined to create more effective ones. It wasfound that a combined approach using education and behavioral modifications was more effective in creating change than one strategy alone (Volger et al., 2013; Annesi & Whitaker, 2012; Neidrick, Fick, &Loeb, 2012; Whitmore, et al., 2010). The project implementer planned to use a combinational approach as it was found to be more effective

in increasing weight loss. A longitudinal, randomized controlled multisite trial was performed by Volger et al. (2013) in a primary care setting that resulted in significant weight loss with corresponding improvements in eating restraint and energy expenditure, a strong predictor of long-term weight loss. Study participants (N=390) were assigned to one of three groups. The control group received traditional education on the effects and need for diet and exercise, as well as regularlyscheduled visits to the PCP. The two experimental groups (groups 2 and 3) received: 10-15 minutes of education every two weeks over the effects and need for diet and exercise, specific exercise instructions and recommendations, a tailored/specific prescribed diet, and a pedometer. Group 3 also received pharmacotherapy to increase weight loss. Group 3 produced a significantly greater weight loss (p=.003) compared with the other two groups (Volger et al., 2013).

- Tsai et al. (2015) conducted a randomized clinical trial of a weight loss maintenance program in a primary care population (N=106) with the use of provider recommendations in personal counseling and portion control weight loss options. Participants were monitored twice-monthly with in-person visits for weight loss maintenance as well as telephone calls between visits or to receive materials by mail. The outcomes were measured by monitoring their weight weekly with significant weight loss and weight maintenance results at the end of twelve months,$p \leq .01$. The study also indicated a significant decrease in cardiovascular risk factors, blood pressure, low density lipids (LDL) and glucose, $p = .025$. The intervention group also had improvements in mood and in health-related quality of life and achieved a 12.9% reduction in monthly medication costs.

- A parallel, two-arm, randomized trial performed by Aveyard et al. (2016) demonstrated that physician-delivered education interventions, made with the patient and his/her behavioral pattern in mind, were acceptable to the patient population and effective in weight loss. Out of a convenient sample size of 1,882 participants, 942 were enrolled in the intervention group and theremainder were in the control group. By implementing a 12-month physician- directed weight loss intervention with the help of a structured education program (12 sessions of 1 hour each, once per week) focusing on diet, exercise, and behavioral modification, a mean weight change of 2.43 kg ± 6·49 (SD) was achieved in the intervention group, in comparison with the control group (who received traditional care). This led to an adjusted difference of 1.43 kg (95% confidence interval [CI] (0.89, 1.97) in weight loss. The physician-directed intervention wasreported to be appropriate and helpful by the participants.

- A similar meta-analysis investigation, on nineteen studies was completed by Brauer et al. (2016). The authors reviewed established recommendations for reducing weight gain and the useof behavioral and pharmacologic interventions to aid obese and overweight patients in primary care settings. The review emphasized the effectiveness of a physician-directed combinational therapy in contrast to a single therapy. The findings indicated that participants who received the combinational therapy in a primary care setting with the use

of educational counseling lost an average of 3.1 kg more than participants in the control group, who only received one form of intervention. Total cholesterol, low density-lipoprotein (LDL) cholesterol, fasting glucose, and blood pressure were the secondary outcomes measured as a direct result of weight loss. The results showed that the intervention groups had lowered BMI scores, lost 10% more body weight, and had a significantly greater reduction in levels of measured secondary outcomes (lower cholesterol, fasting glucose and blood pressures). One of the most significant results indicated that the incidence of diabetes was 4% lower in the experimental group, 95% CI [24, 42] due to the more intensive lifestyle changes.

- Mohammad et al. (2013) explored education on lifestyle modification and self-control of eating with written diet instructions, encouraging high fibre diet, and changing participant lifestyle activities to include 30 to 45 minutes of physical activity for three to five times a week.The study consisted of 140 individuals who were seen at two-week intervals, and taught intensive lifestyle modifications. In the first three months, 78% of the participants lost over 5% of their weight with a mean weight and BMI loss of 7.6 ± .8kg and 2.4 ± 0.3kg/m², respectively.The subjects who did not lose 5% of their initial body weight after 3 months were assigned to receive 120 milligrams orlistat three times daily for three months, in addition to counseling sections. The mean weight and BMI of the participants were 78.6 ± 10.7 kg and 30 ± 0.2 kg/m²,respectively.

- A randomized study was completed by Wadden, Berkowitz, Womble, Sarwer and Phelan (2015), to evaluate the effectiveness of the use of a combinational therapy (sibutramine and group sections of life-style modification) in contrast to group sections of life-style modificationsalone or sibutramine therapy alone as a successful weight loss therapy in primary care patients. There were 224 obese adults who received either: 15 milligrams of sibutramine per day alone, given by a primary care provider in eight visits of ten to fifteen minutes; individual lifestyle- modification counseling sessions delivered in 30 group sections; sibutramine and 30 sessions of lifestyle modification counseling; or sibutramine and brief lifestyle-modification counseling sessions delivered by a primary care provider in eight visits of ten to fifteen minutes each. All subjects were prescribed a diet of 1,200 kcal per day and the same exercise regimen. At the end of one year, subjects who received combined therapy lost a mean weight of 12.1± 9.8 kg whereas those who received sibutramine alone lost only 5.0±7.4kg, and those who received lifestyle modification alone lost 6.7± 7.9kg respectively. This study indicated that the best weight-loss results were obtained when medication was used as supplementary support to a comprehensive program of diet and behavior therapy.

- A similar study utilizing pharmacotherapy conducted by Kim et al. (2006), pointed to pharmacotherapy as providing change in the participants' weight. In this study, a group that received the drug Phentermine achieved more significant weight lossthan the placebo group weight, 6.7 ± 2.5 kg, $p < .001$.

Chapter 3

RESEARCH METHODOLOGY

3.1 Research Design

For this study, a qualitative as well as quantitative approach was followed. This research method is descriptive research which is defined as a method used to describe systematically the existing phenomena under the study. The research methodology used to solve the main problem included a literature study, secondary data, and primary data.

In order to collect primary data, a survey was conducted in which a questionnaire was developed using Google form and circulated through social media.

3.2 Sample Data

The population for the present study includes respondents from different regions of Delhi-NCR working as professionals, employees, homemakers, businesspeople, or students. The questionnaire played a major role in data collection and data sampling which were used for the research. A questionnaire is defined as a list of planned, written questions about a particular topic, with space provided for the responses to each question (Padua, 2001). A structured questionnaire with 19 questions was distributed among 100 participants majorly belonging to Delhi NCR.

3.3 Duration of the study

Survey responses were collected within a time period of two weeks whereas the data collected from secondary sources took about one month. The secondary data was collected from various websites and scholars.

3.4 Source of the data

This study mainly depends on the primary data i.e responses collected from the survey. The relevant and required data were collected from textbooks, websites, and National and International articles.

3.5 Measurements of the Data

The questionnaire comprises 19 questions out of which 4 were related to the personal details of the respondents. 13 questions included both types of descriptive and MCQ-based questions related to the study. The questionnaire consists of 2 questions measured on a 5-point Likert scale with the anchoring points ranging from first for strongly agree to last strongly disagree.

3.6 Tools & Techniques

The present study is an analytical study. For the analysis of data in the form of various qualitative and quantitative responses, statistical tools like MS Excel and Pie Charts have been employed.

Chapter 4

DATA REPRESENTATION AND ANALYSIS

4.1 Survey Analysis

- A Google form was circulated among citizens of Delhi-NCR across social media platforms for the collection of primary data.
- The data has been collected through 100 potential respondents.
- The respondents consist of both males and females belonging to different age groups and different occupations.
- The first part of the questionnaire deals with basic information about the respondent, the second part of the questionnaire consists of questions related to health awareness, risks and lifestyle of the respondents.

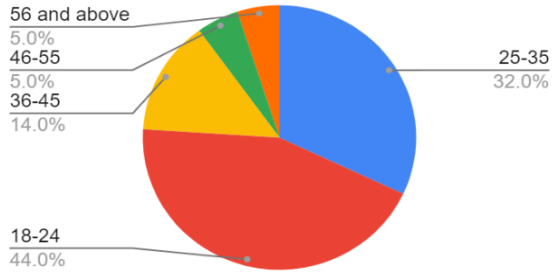
4.2 Analysis of Responses

Q1. The first question was the *Name* of the respondent hence it has been excluded from the analysis part.

Q2. The second question was *Gender* of the respondent

It has been found that the majority of the respondents belonged to females at 51% whereas male respondents stood at 49% which means out of 100 respondents 51 were females and 49 were males.

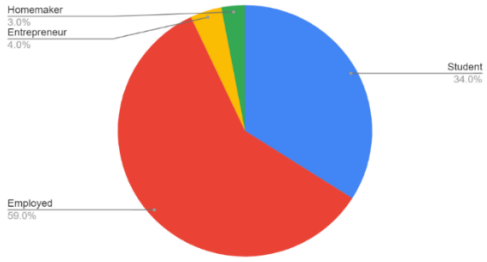
Q3. The third question asked about the *age* of the respondents.



Out of 100 respondents, the majority i.e 44 respondents belonged to adults/teenagers/ youngsters belonging to the age group between 18-24. The second-highest category was for adults belonging

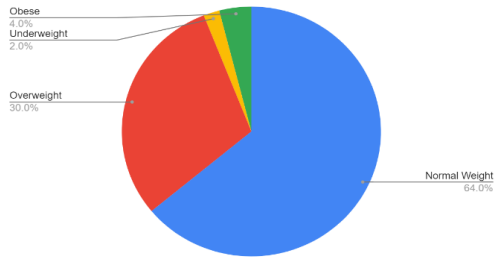
to the 25-35 age group with 32 respondents. 14 respondents belonged to the 36-45 years of age group whereas 10 respondents belonged to the 46-55 and 56 and above age group brackets, 5 in each group.

Q4. The fourth question asked about the *status* of the respondents.



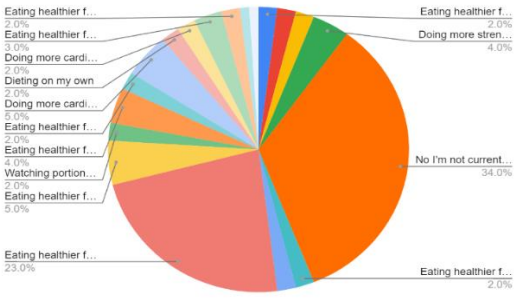
Most of the respondents i.e 59 were employed while 34 respondents were categorized as students, 4 as entrepreneurs while only 3 were homemakers.

Q5. How would you categorize yourself from the following?



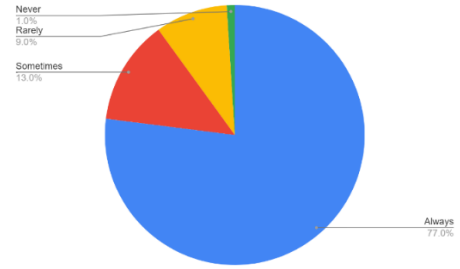
64 respondents believed they have normal weight, 30 of them categorized themselves as overweight while 2% believed they fall under the underweight category, and only 4 out of 100 believed they are obese.

Q6. Are you currently doing anything to improve your health or lose weight? (Check all that apply)



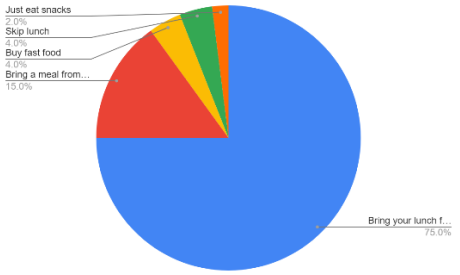
This was a checkbox question in which respondents were allowed to select multiple answers. 34 respondents checked 'No I'm not currently doing anything' while others selected a combination of different choices.

Q7. How often do you eat breakfast?



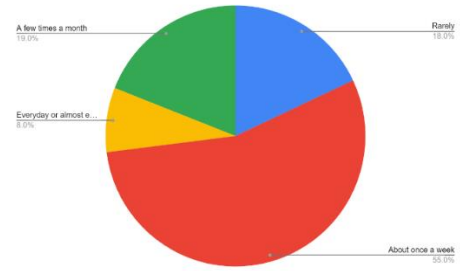
Out of all the respondents who were surveyed, 77 never skip their breakfast while 1 respondent mentioned he/she never eats breakfast. 13 mentioned they sometimes have it while 9% opted for rarely.

Q8. When at college or work; you usually:



75% of the respondents take their lunch along with them to college or work followed by 15 respondents who bring a meal from the cafeteria. 4% buy fast food and 4% prefer to skip lunch while 2% just eat snacks like wafers, biscuits, chocolates etc.

Q9. How often do you eat fast food (e.g. Burgers; pizza; Fries; etc.)?

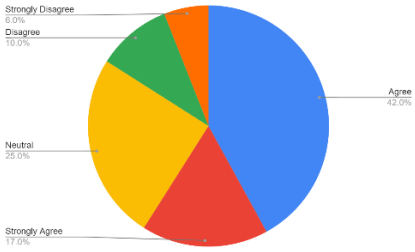


More than half of the respondents (55) eat fast food once a week followed by 19 respondents who consume fast food a few times a month while 18 eat rarely and lastly, 8 of them eat fast food daily or almost every day.

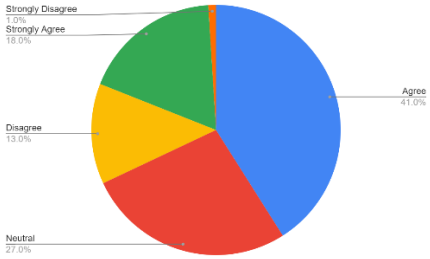
Q10. When you eat out; what influences your decision to eat out?

This was a Likert scale question; it has 5 parts and each part has a 5-point Likert scale with the anchoring points ranging from first for strongly agree to last strongly disagree.

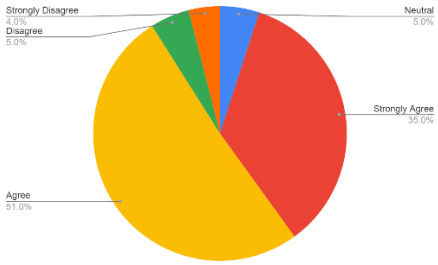
a) It's convenient for me



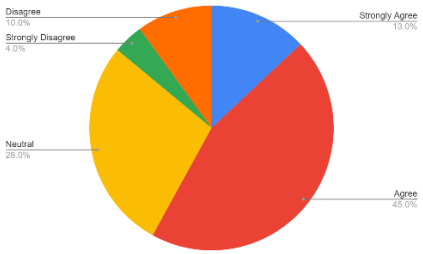
b) It is tastier than homemade food



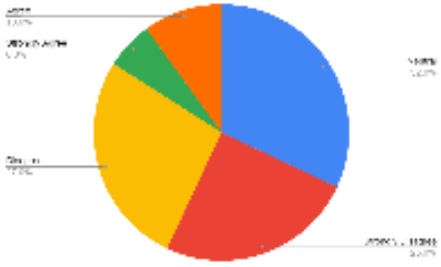
c) To hang out with friends at cafes/restaurants



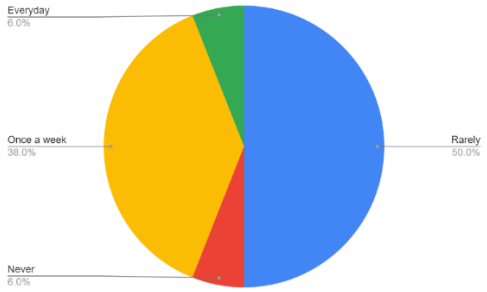
d) Unavailability of homecooked food/Shortage of time to prepare food on my own



e) I don't eat out

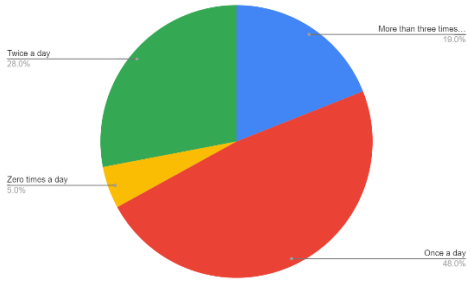


Q11. How often do you buy the following? (sweetened coffee drinks; milkshakes; energy drinks; regular soda; diet soda; etc.)



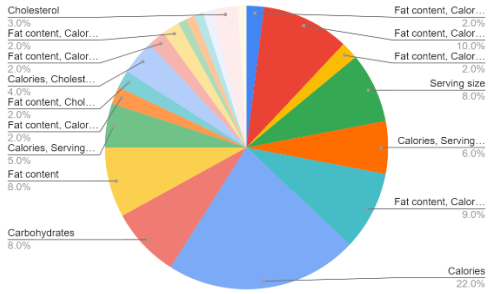
50% of the respondents rarely buy the items given in the bracket while 38 of the respondents buy them once a week. 6 respondents buy them daily while 6 never buy them.

Q12. How often do you usually eat fruits and vegetables?



The majority of the respondents (48) eat fruits once a day while the minority (5) do not eat fruits at all. 28 respondents eat fruits twice a day while 19% eat more than thrice.

Q13. What is most important to you when it comes to picking healthy foods? (check all that apply)

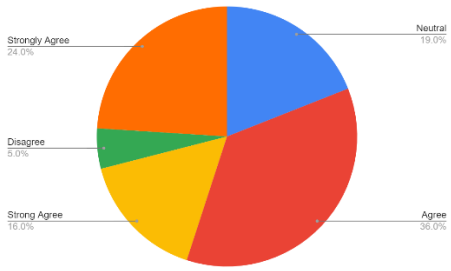


This was a checkbox question in which respondents were allowed to select multiple answers. 22 respondents selected only 'Calories', 8 respondents selected only 'Carbohydrates' while the other 8 adults only look for 'fat content' while picking healthy foods.

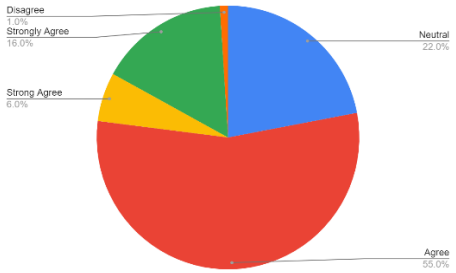
Q14. When picking foods or snacks what influences your decision?

This was a Likert scale question; it has 4 parts and each part has a 5-point Likert scale with the anchoring points ranging from first for strongly agree to last strongly disagree.

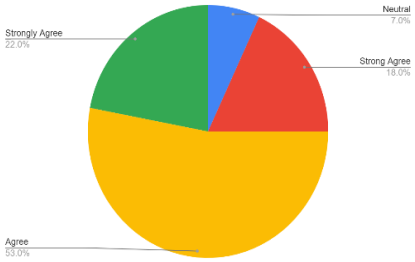
a) How healthy it is



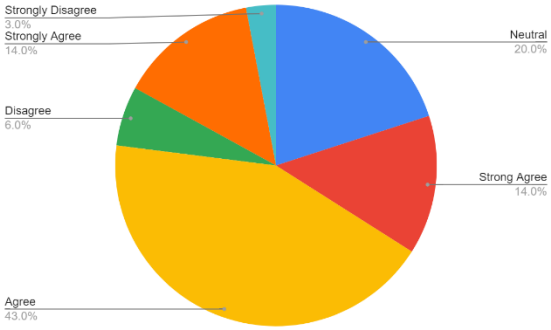
b) How much it costs



c) How it tastes

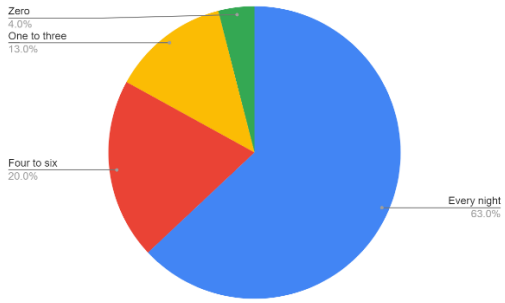


d) How convenient it is (e.g. I can throw its waste in my backpack; I can pick it up on the go; etc.)

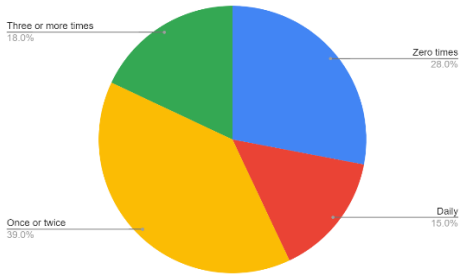


Q15. How many nights a week; on average; do you eat dinner at home or have home-cooked food?

Most of the respondents with a score of 63 have dinner every night at their home or have home-cooked food followed by 20 respondents who have so 4-6 times a week while 13 respondents have 1-3 times- whereas 4 respondents do not have either home-cooked food or have dinner at home.

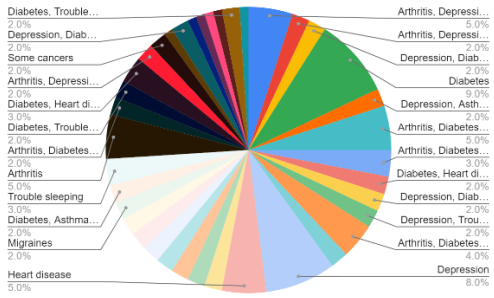


Q16. How often do you exercise each week?



39 respondents exercise once or twice a week while 28 respondents do not exercise at all. 18 respondents exercise thrice or more than that whereas 15 do exercise daily.

Q17. Which of the following health problems do you think are linked to being overweight or obese? (Check all that apply)

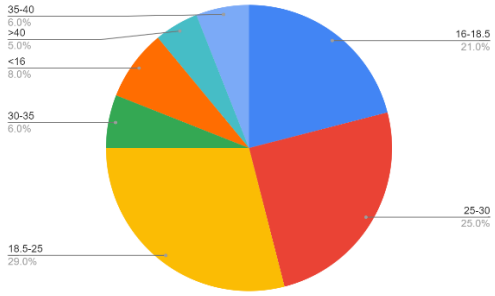


This was a checkbox question in which respondents were allowed to select multiple answers. The respondents selected several combinations of different options.

Q18. Are you currently dealing with any medical condition that may lead to weight gain? If Yes, kindly mention else you may skip this question.

This was a descriptive question, responses of the respondents varied differently hence they were not included in the research.

Q19. What is your Body Mass Index?



This was the most important part of the questionnaire since it deals with the actual condition of the respondents according to their BMI. 29% of the respondents are underweight out of which 8 are extremely thin since their BMI falls below 16. Followed by another slot of 29 respondents who have normal weight and are healthy with a BMI ranging between 18.5 to 25. 25 respondents have BMI between 25-30 which indicates being overweight followed by 6 adults that have BMI between 30-35 are categorized under obesity I followed by another 6 Adults that have a BMI between 35-40 fall under obesity II. 5 adults that have BMI more than 40 fall under the III and last category of obesity.

4.3 Discussion

Obesity is defined by the WHO as “abnormal or excessive fat accumulation that may impair health”. It is a gateway to many serious diseases, including diabetes, cancer, cardiovascular disorders and joint problems. In our study, participants lack awareness about the measurement of obesity, various treatments are given to obese patients and dietary foods to be taken. However, participants were aware that obesity can reduce the life expectancy of the individual and might cause several diseases.

Respondents are aware of the fact that being overweight or obese may lead to harmful consequences but still, many of them do not follow a healthy lifestyle.

Chapter 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

1. Although prevention and reduction of overweight and obesity ultimately depend on individual lifestyle changes, healthcare professionals should play a greater role in motivating and educating about the consequences of obesity as the majority of the participants were still lacking in various aspects of obesity.
2. Adults who are sedentary run the risk of becoming obese and developing chronic conditions like cancer, hypertension, hypercholesterolemia, coronary heart disease, and musculoskeletal disorders (Finucane et al.; Orzano and Scott 2004; Raiola et al. 2015).
3. Additionally, some groups of people are more prone to obesity, including Black African and Pakistani women as well as Black Caribbean men and women (Orzano AJ, Scott JG 2004). The Body Mass Index is the most helpful tool for diagnosing obesity out of all the available ones.
4. The issue of weight increase may be resolved with exercise training, a healthy diet, and an effective healthcare system (Altavilla et al., 2014; Guetano et al., 2015). To make a significant improvement, it is crucial to combine the aforementioned proposals (Hamilton et al. 2007). The government is crucial in enforcing new lifestyle models that require individuals to spend more time outdoors, engage in physical activity, and consume more fruits and vegetables than fatty, salty foods (Kotz CM 2006).
5. Additionally, the endocannabinoid system represents a new pharmacological target for the treatment of obesity in terms of pharmacological therapy. The endocannabinoid system, which is well known for its contributions to some mental processes like relaxation, relief from pain and anxiety, and the beginning of sedation, has recently been reported to play a crucial role in regulating appetite and metabolism to maintain energy balance, leading to the acceptance that the endocannabinoid system is closely related to obesity (Hu Zhu and Huang 2009).
6. However, governments should prioritise improving other societal sectors and providing the best possible living and health circumstances for people before spending money on health care.
7. To effectively combat obesity on a worldwide basis, better diets and higher levels of physical exercise are required. Population-based techniques are efficient because they have the ability to change the distribution of risk variables across the entire population in a positive way. Changes in policy, in particular, have the power to enhance the physical and social surroundings, resulting in long-term gains in public health and quality of life. Such initiatives required multifaceted solutions, from major legislative shifts to small-scale behavioural adjustments at the individual level. To monitor and assess the programmes, as well as to maintain awareness among the general public and within governments, ongoing surveillance of obesity and national health outcomes is also required.

5.2 Recommendations

You can take action to avoid unhealthful weight increase and associated health issues whether you are already obese, at danger of becoming so, or at a healthy weight. The same techniques used to decrease weight can also be used to avoid weight gain.

1. Daily exercise: The American College of Sports Medicine advises that in order to avoid weight gain, you should engage in 150 to 300 minutes of moderate-intensity activity each week. Exercises with a moderate level of intensity include swimming and quick walking.

2. Keeping a nutritious, well-balanced diet. This can be done by emphasizing low-calorie, nutrient-dense foods such as fruits, vegetables, and whole grains while avoiding items high in saturated fat, sugar, and alcohol. It's crucial to make meal selections that support a healthy weight and good health.

3. Constantly keeping a close eye on your diet and beverage intake.

4. Making healthier food and drink choices, such as whole grains, fruits, vegetables, healthy fats, and sources of protein. Limiting unhealthy foods (red meat, processed meat, potatoes, refined grains, and sweets) and liquids (sugary drinks) raising the level of exercise, limiting one's exposure to screens, television, and other "sit time" improving sleep and reducing stress.

5. Encouraging children and youth to be physically active involves providing them with places where they can safely walk, bike, run, skate, play games, or engage in other activities that expend energy. But practices that guide the development of streets and neighbourhoods often place the needs of motorized vehicles over the needs of pedestrians and bicyclists. Local governments should find ways to increase opportunities for physical activity in their communities by examining zoning ordinances and priorities for capital investment.

6. Parents (defined broadly to include primary caregivers) have a profound influence on their children by fostering certain values and attitudes, by rewarding or reinforcing specific behaviours, and by serving as role models. A child's health and well-being are thus enhanced by a home environment with engaged and skillful parenting that models, values, and encourages healthy eating habits and a physically active lifestyle. Economic and time constraints, as well as the stresses and challenges of daily living, may make healthful eating and increased physical activity a difficult reality on a day-to-day basis for many families.

7. Parents play a fundamental role as household policymakers. They make daily decisions on recreational opportunities, food availability at home, and children's allowances; they determine the setting for foods eaten in the home; and they implement countless other rules and policies that influence the extent to which various members of the family engage in healthful eating and physical activity. Older children and youth, meanwhile, have responsibilities to be aware of their own eating habits and activity patterns and to engage in health-promoting behaviours.

8. adults should participate in health awareness and healthcare campaigns and programs and encourage their children also.

9. Eat fewer calories. You and your doctor should discuss how many calories per day you should try to eat. The average goal is 1,200 to 1,500 calories per day for women, and 1,500 to 1,800 calories per day for men. Your goal is to burn more calories than you eat – that's the only way to safely and effectively lose weight naturally.

10. Base your meals on fruits, vegetables, and whole grains. Fresh fruits and vegetables are low in fat and calories, and contain lots of nutrients. Opt for fresh or frozen over canned – canned fruits and veggies can contain lots of salt and additives. Make the bulk of your meals with whole grains – choose whole wheat bread, rice, pasta, oats, and quinoa.

- Avoid white bread and other refined sugars.
- Eat a variety of vegetables – dark leafy greens, red and yellow veggies, peas and beans, and starches. Aim to eat 5-9 servings of fruits and vegetables daily.
- Cut out junk food. Junk food like chips, cookies, soda, and other pre-packaged items from the snack aisle contain lots of fat and sugar and quickly add to your calorie count. Limit these items in your diet as much as possible. Try to replace sugary, high-fat desserts with fresh fruit or popsicles; snack on vegetables, hummus, or nuts rather than salty snack foods.

Chapter 6

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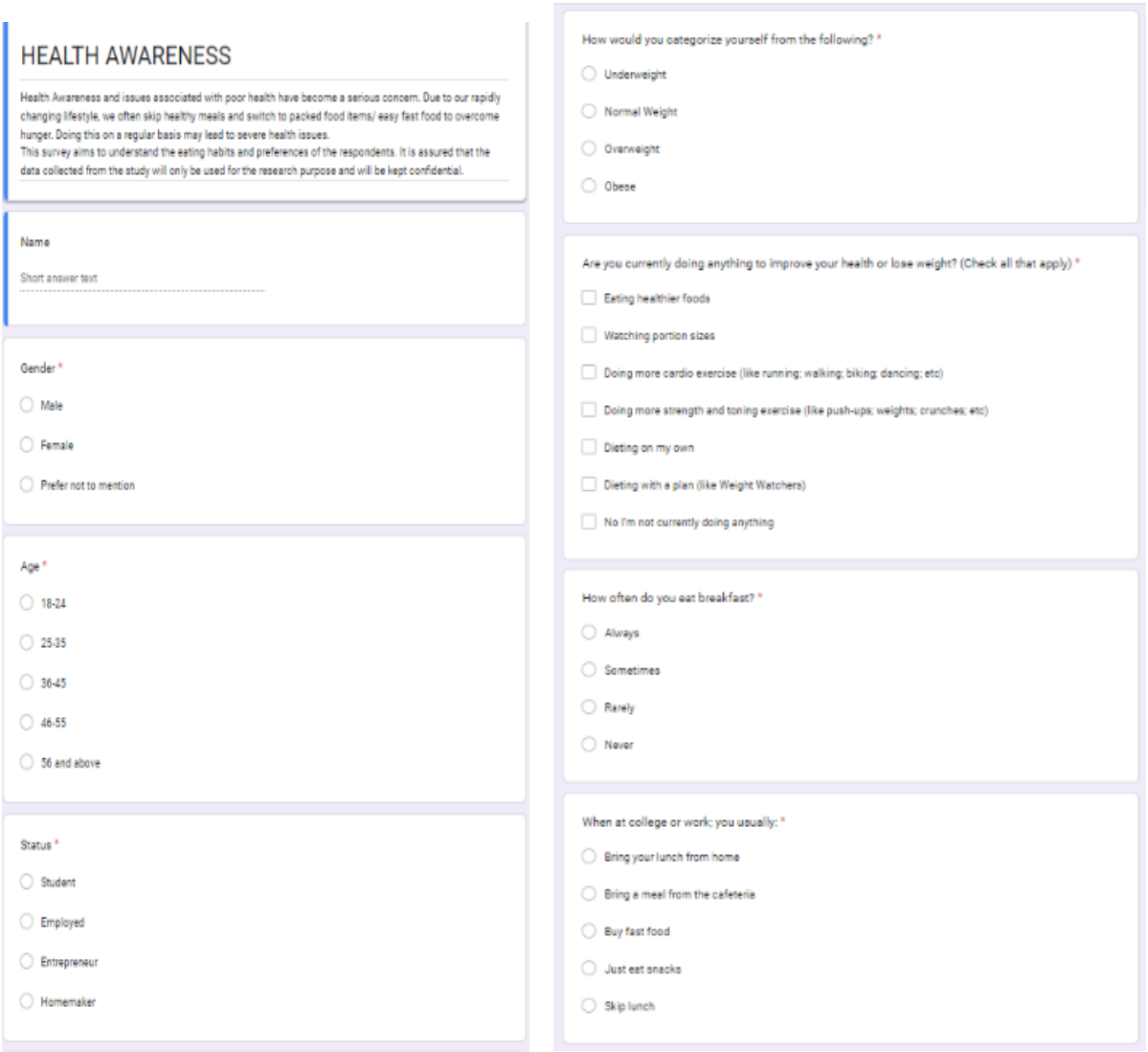
Chapter 7

ANNEXURE

7.1 Questionnaire



HEALTH AWARENESS

Health Awareness and issues associated with poor health have become a serious concern. Due to our rapidly changing lifestyle, we often skip healthy meals and switch to packed food items/ easy fast food to overcome hunger. Doing this on a regular basis may lead to severe health issues.
This survey aims to understand the eating habits and preferences of the respondents. It is assured that the data collected from the study will only be used for the research purpose and will be kept confidential.

Name

Short answer text

Gender *

- Male
- Female
- Prefer not to mention

Age *

- 18-24
- 25-35
- 36-45
- 46-55
- 56 and above

Status *

- Student
- Employed
- Entrepreneur
- Homemaker

How would you categorize yourself from the following? *

- Underweight
- Normal Weight
- Overweight
- Obese

Are you currently doing anything to improve your health or lose weight? (Check all that apply) *

- Eating healthier foods
- Watching portion sizes
- Doing more cardio exercise (like running; walking; biking; dancing; etc)
- Doing more strength and toning exercise (like push-ups; weights; crunches; etc)
- Dieting on my own
- Dieting with a plan (like Weight Watchers)
- No I'm not currently doing anything

How often do you eat breakfast? *

- Always
- Sometimes
- Rarely
- Never

When at college or work; you usually: *

- Bring your lunch from home
- Bring a meal from the cafeteria
- Buy fast food
- Just eat snacks
- Skip lunch

How often do you eat fast food (e.g. Burgers; pizza; Fries; etc.)? *

- Everyday or almost every day
- About once a week
- A few times a month
- Rarely
- Never

What is most important to you when it comes to picking healthy foods? *

- Fat content
- Calories
- Serving size
- Carbohydrates
- Sodium
- Cholesterol

When you eat out; what influences your decision to eat out? *

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagr...
It's convenient ...					
It is tastier tha...					
To hangout wit...					
Unavailability o...					
I don't eat out					

When picking foods or snacks what influences your decision? *

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagr...
How healthy it is					
How much it c...					
How it tastes					
How convenien...					

How often do you buy the following? (sweetened coffee drinks; milkshakes; energy drinks; regular soda; diet soda; etc.) *

- Everyday
- Once a week
- Rarely
- Never

How many nights a week; on average; do you eat dinner at home or have home-cooked food? *

- Zero
- One to three
- Four to six
- Every night

How often do you usually eat fruits and vegetables? *

- More than three times a day
- Twice a day
- Once a day
- Zero times a day

How often do you exercise each week? *

- Zero times
- Once or twice
- Three or more times
- Daily

Which of the following health problems do you think are linked to being overweight or obese? * (Check all that apply)

- Arthritis
- Depression
- Diabetes
- Asthma
- Trouble sleeping
- Heart disease
- Some cancers
- Migraines

Are you currently dealing with any medical condition that may lead to weight gain? If Yes, kindly mention else you may skip this question.

Short answer text

What is your Body Mass Index? *

Imperial System:

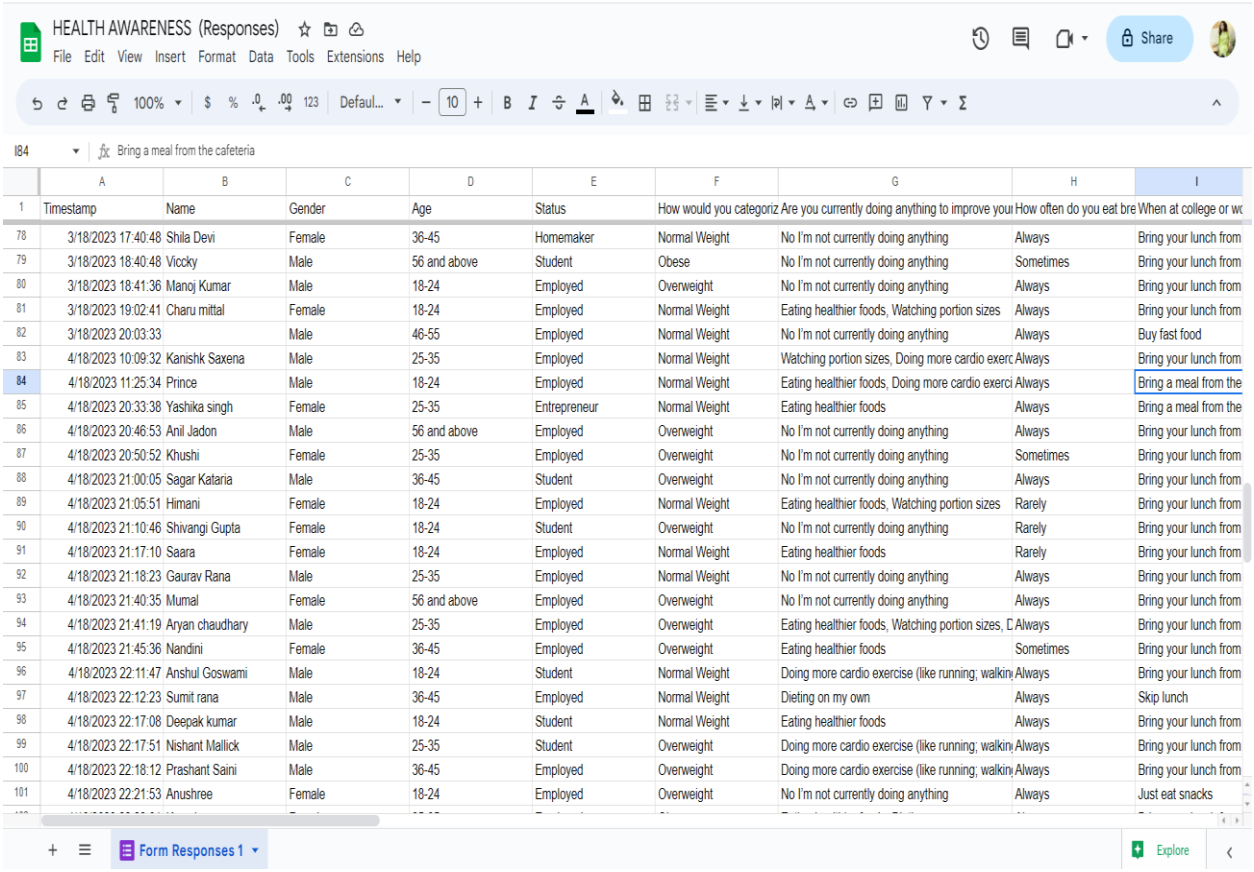
$$BMI = 705 \times \frac{\text{Weight (in pounds)}}{\text{Height}^2 \text{ (in inches)}}$$

Metric System:

$$BMI = \frac{\text{Weight (in kilograms)}}{\text{Height}^2 \text{ (in meters)}}$$

- <16
- 16-18.5
- 18.5-25
- 25-30
- 30-35
- 35-40
- >40

7.2 Survey Responses



HEALTH AWARENESS (Responses)

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I84 | Bring a meal from the cafeteria

	A	B	C	D	E	F	G	H	I
1	Timestamp	Name	Gender	Age	Status	How would you categoriz	Are you currently doing anything to improve you	How often do you eat bre	When at college or wo
78	3/18/2023 17:40:48	Shila Devi	Female	36-45	Homemaker	Normal Weight	No I'm not currently doing anything	Always	Bring your lunch from
79	3/18/2023 18:40:48	Viccky	Male	56 and above	Student	Obese	No I'm not currently doing anything	Sometimes	Bring your lunch from
80	3/18/2023 18:41:36	Manoj Kumar	Male	18-24	Employed	Overweight	No I'm not currently doing anything	Always	Bring your lunch from
81	3/18/2023 19:02:41	Charu mittal	Female	18-24	Employed	Normal Weight	Eating healthier foods, Watching portion sizes	Always	Bring your lunch from
82	3/18/2023 20:03:33		Male	46-55	Employed	Normal Weight	No I'm not currently doing anything	Always	Buy fast food
83	4/18/2023 10:09:32	Kanishk Saxena	Male	25-35	Employed	Normal Weight	Watching portion sizes, Doing more cardio exerc	Always	Bring your lunch from
84	4/18/2023 11:25:34	Prince	Male	18-24	Employed	Normal Weight	Eating healthier foods, Doing more cardio exerci	Always	Bring a meal from the
85	4/18/2023 20:33:38	Yashika singh	Female	25-35	Entrepreneur	Normal Weight	Eating healthier foods	Always	Bring a meal from the
86	4/18/2023 20:46:53	Anil Jadon	Male	56 and above	Employed	Overweight	No I'm not currently doing anything	Always	Bring your lunch from
87	4/18/2023 20:50:52	Khushi	Female	25-35	Employed	Overweight	No I'm not currently doing anything	Sometimes	Bring your lunch from
88	4/18/2023 21:00:05	Sagar Kataria	Male	36-45	Student	Overweight	No I'm not currently doing anything	Always	Bring your lunch from
89	4/18/2023 21:05:51	Himani	Female	18-24	Employed	Normal Weight	Eating healthier foods, Watching portion sizes	Rarely	Bring your lunch from
90	4/18/2023 21:10:46	Shivangi Gupta	Female	18-24	Student	Overweight	No I'm not currently doing anything	Rarely	Bring your lunch from
91	4/18/2023 21:17:10	Saara	Female	18-24	Employed	Normal Weight	Eating healthier foods	Rarely	Bring your lunch from
92	4/18/2023 21:18:23	Gaurav Rana	Male	25-35	Employed	Normal Weight	No I'm not currently doing anything	Always	Bring your lunch from
93	4/18/2023 21:40:35	Mumal	Female	56 and above	Employed	Overweight	No I'm not currently doing anything	Always	Bring your lunch from
94	4/18/2023 21:41:19	Aryan chaudhary	Male	25-35	Employed	Overweight	Eating healthier foods, Watching portion sizes, D	Always	Bring your lunch from
95	4/18/2023 21:45:36	Nandini	Female	36-45	Employed	Overweight	Eating healthier foods	Sometimes	Bring your lunch from
96	4/18/2023 22:11:47	Anshul Goswami	Male	18-24	Student	Normal Weight	Doing more cardio exercise (like running; walkin	Always	Bring your lunch from
97	4/18/2023 22:12:23	Sumit rana	Male	36-45	Employed	Normal Weight	Dieting on my own	Always	Skip lunch
98	4/18/2023 22:17:08	Deepak kumar	Male	18-24	Student	Normal Weight	Eating healthier foods	Always	Bring your lunch from
99	4/18/2023 22:17:51	Nishant Mallick	Male	25-35	Student	Overweight	Doing more cardio exercise (like running; walkin	Always	Bring your lunch from
100	4/18/2023 22:18:12	Prashant Saini	Male	36-45	Employed	Overweight	Doing more cardio exercise (like running; walkin	Always	Bring your lunch from
101	4/18/2023 22:21:53	Anushree	Female	18-24	Employed	Overweight	No I'm not currently doing anything	Always	Just eat snacks

Form Responses 1

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