NUTRITIONAL AND MICRONUTRIENT STATUS OF FEMALE WORKERS IN GARMENTS FACTORY IN SAVAR, DHAKA

BY

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Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment of B.Sc. in Nutrition and Food Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY

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APPROVAL

This thesis titled on "**Nutritional and Micronutrient Status of Female Workers in Garments Factory in Savar, Dhaka**", submitted by **Nasrin Akter (ID: 193-34-1015)** to the Department of, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Science in Nutrition and Food Engineering and approval as to its style and contents.

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DECLARATION

I hereby certify that, with the exception of equations and sources, this paper is all my own work. This thesis work is ready for submission as part of the **B.Sc. in Nutrition & Food Engineering** degree program. I further declare that it has not already been submitted for another degree at Daffodil International University.

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LETTER OF TRANSMITTAL

Date: 21/05/2024

Dr. Nizam Uddin

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Subject: Submission of Thesis report

Dear Sir,

I would like to take this opportunity to thank you for your guidance and assistance during the course of this report. This report could not have been completed without your help. I would also like to thank the following individuals for their assistance in completing my project report. In order to make my report as analytical and credible as possible, I gathered what I think to be the most essential material. I have made every effort to meet the report's objectives, and I trust that my efforts will be fruitful. I am confident that the practical information and experience gained during report writing will be beneficial to me in my future professional life. I would like to apologize for any errors that may have occurred in the report despite my best efforts. I would be grateful if you could share your thoughts and opinions on the report.

Consequently, I am submitting this report for your review and feedback. Your nice suggestions will motivate me to do better preparation in the future.

Sincerely Yours,

_____

Nasrin Akter

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Department of Nutrition and Food Engineering

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LETTER OF AUTHORIZATION

Date: 21/05/2024

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Subject: An announcement regarding the validity of the Thesis Report.

Dear Sir,

This is my truthful declaration that the "Thesis report" that I have prepared is not a copy of any Project report previously made by any other student. I also express my forthright confirmation in support to the fact that the said project report has neither been used before to fulfill my other courses related nor it will be submitted to any other person in future. I made it based on my experience that I acquired from my study and work related to the project such as literature review, experimental design, data collection and analysis.

Faithfully Yours,

_____

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First and foremost, I would like to thank my creator, Almighty Allah, for providing me with the strength and chance to successfully complete the report on time. I want to convey my profound appreciation to my thesis advisor, **Mr. Juwel Rana**, **Assistant Professor**, Department of Nutrition and Food Engineering, Daffodil International University, for her unwavering supervision and assistance throughout my thesis work and report preparation. At the same time, I'd like to thank my **Dr. Nizam Uddin, Associate Professor and Head** of Daffodil International University, for his unwavering support throughout my project effort. My heartfelt gratitude and heartfelt thanks go to **Dr. Md. Bellal Hossain, Dean (In-Charge) & Professor** of the Faculty of Health and Life Sciences, for his kind collaboration during my research term, and especially for his generous acceptance of my report. Finally, I would like to thank all of the other NFE Faculty members for their tremendous assistance during my study time, as well as my seniors, juniors, and all of my classmates for their assistance, advice, recommendations, and inspirations.

ABSTRACT

Background: There have been raised worries about the nutritional condition of Savar garment workers for several years, yet there is still a lack of sufficient data available. The study aims to investigate the nutritional and micronutrient levels of female employees in a garment factory in Savar, Dhaka, and determine the potential connection between body mass index and micronutrient status. Approach: A survey was carried out on 400 female employees at a clothing factory in Savar using cross-sectional method. Anthropometric measurements were conducted alongside micronutrient consumption analysis (energy, water, protein, carbohydrate, VitA, VitB1, VitB2, VitB6, potassium, magnessium, calcium, phosphorus, iron and zinc) etc. Associations were evaluated using bivariate correlations. Findings: In total, 31.4% of employees were considered to be underweight, 26.9% were diagnosed with anemia, 22.1% were found to have iron deficiency, and 46.5% were discovered to have low iron reserves. There was no evidence found of inadequate levels of vitamin A or B12. There was a slight association between body mass index and serum ferritin levels (inversely) as well as serum retinol-binding protein levels (directly). Research on skinny and non-skinny employees found variations in iron deficiency and iron deficiency anemia, with a higher prevalence among the non-skinny individuals. Conclusions: There was a high rate of underweight, anemia, and low iron status. Young, nulliparous female textile workers in Savar could potentially face a greater risk of nutritional deficiencies. It is necessary to develop tactics to enhance their nutritional, micronutrient, and health conditions. Low levels of iron seem to play a role in the high occurrence of anemia. Both underweight and non-underweight individuals were impacted by low levels of hemoglobin and iron deficiency. Although body mass index was inversely related with iron reserves, genuine variations in iron status between underweight and non-underweight participants could not be substantiated.

Keyword: Nutrition, Micronutrient, Female, Workers, Garments Factory

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CHAPTER-1

INTRODUCTION

1.1 General Topic & Background

Micronutrients are essential for the correct growth and development of the human body, and their shortage has a negative impact on health, contributing to poor productivity and a vicious cycle of malnutrition, underdevelopment, and poverty. Micronutrient deficiency is a public health issue that affects more than one-quarter of the world's population. Several programs have been implemented in Bangladesh over the years to improve the people's nutrition and health condition; yet, a considerable section of the population is still impacted by micronutrient deficiencies.

Anaemia, the most frequent form of micronutrient insufficiency, affects over half of all preschool children and women, although vitamin A deficiency and iodine-deficiency diseases (IDD) have improved over time.This study focuses on the present state of micronutrients (anaemia, vitamin A, iodine, vitaminB, folate, ferritin, zinc, copper, and vitamin C) status in the country, taking into account national surveys as well as recent research (Gonmei et al. 2018) . Since the 1980s, data from nationally representative and selected small surveys that reported on the status of at least one micronutrient in children and/or women have been studied. National policy papers and reports on existing initiatives were examined. A large number of non-pregnant and non- lactating women (57%) and I (42%), whereas one-quarter of women suffer from anemia, vitamin B12, and vitamin D (21%) shortages. Anaemia affects over half of all pregnant and breastfeeding women. Some of the primary causes related to high levels of deficiencies are inadequate food, poor hygiene, illness, and infestation (Ahmed et al. 2016) .

Anemia is the most common nutritional condition worldwide, and inadequate nutrition is the primary cause. Iron deficiency alone accounts for around half of all anemia cases, while other dietary deficiencies may also occur.Anemia increases the risk of death, particularly in vulnerable groups, as well as unfavorable pregnancy outcomes, poor cognitive development, higher health-care expenses, and poorer labor productivity (Abioye, et al. 2022) . Vitamin A is a fat-soluble vitamin found in a variety of foods. Vitamin A is required for healthy eyesight, the immune system, reproduction, and growth and development. Vitamin A also aids in the healthy functioning of the heart, lungs,

and other organs (Sommer et al. 2012). Iodine can be found in many different types of foods as a mineral. The body needs iodine to make thyroid hormones. Thyroid hormones control the metabolism of the body and numerous important functions. The body relies on thyroid hormones for proper bone and brain development during pregnancy and infancy, as well (Sommer et al. 2012).

1.2 Problem Statement

i. Assess micronutrient intake and control in a female laborer in Savar.
ii. Identify mechanisms and factors, including socioeconomic, affecting micronutrient status.
iii. Provide interventions and interpretations for improving health in Savar's garment industry for female workers.

1.3 Research Objective

i. Assess the dietary patterns of female workers in garments factories in Savar.
ii. Evaluate the micronutrient intake and status of these workers.
iii. Identify potential factors influencing nutritional and micronutrient status, such as socioeconomic factors and working conditions.
iv. Provide recommendations for interventions and policies to improve the nutritional well being of female workers in Savar's garment industry.

CHAPTER 2

LITERATURE REVIEW

According to the study carried out by Makurat et al., (2016) on Nutritional and micronutrient provision for women workers in a garment factory in Cambodia. The "Dataset" used in the study is the baseline data from the LUPROGAR study, which includes information on the impact of daily lunch provision on the nutritional status of female garment workers in Cambodia, collected using an explorative approach and analyzed using SPSS software.The methodology involved a cross-sectional survey of 223 female workers who have never given birth and are not currently pregnant at a clothing factory in Phnom Penh. Anthropometric measurements and blood samples were collected to evaluate hemoglobin, iron, vitamin A, vitamin B12, and inflammation levels in young and nulliparous female garment workers in Cambodia had a higher prevalence of underweight, anemia, and poor iron, indicating a higher risk for nutritional deficiencies (Makurat et al., 2016).

According to the study carried out by Akter (2019) on Bangladeshi women employed in the garment industry's health and nutrition. The dataset used in the study is comprised of interviews with 200 female workers in the garment sector of Bangladesh.The main findings of the majority of female workers in the garment sector suffer from various health issues including bone problems, abortion complexity, dermatitis, back pain, eye strain, malnutrition, respiratory problems, hepatitis, gastric pain, fatigue, fever, abdomen pain, common cold, and helminthiasis (Akter 2019).

According to Khan et al., (2005) on Adolescent female factory workers' nutritional intake, physical condition, and eating habits in metropolitan Bangladesh. The dataset used in the study includes 1211 postmenarchial girls aged 14-19 years from seventeen readymade garment industries in urban Bangladesh. The 24-hour recall method was used to evaluate the nutritional intake data, and a 7-day food frequency questionnaire was used to gather dietary pattern data from a subsample of 509 girls (Khan et al., 2005).

According to the study carried out by Kabir et al., (2010) on The JPMA of Bangladesh's urban adolescent college females' dietary patterns, nutritional status, anemia, and anemia-related knowledge. The dataset used in the study consists of information collected from 65 adolescent girls aged 15-19 years from the Home Economics college of Dhaka. The main findings of the study are the poor dietary habits, high prevalence of undernutrition, and

considerable proportion suffering from anaemia with a lack of awareness about sources of iron-rich foods (Kabir et al., 2010).

According to Otunchieva et al., (2022) on Women of reproductive age's diet quality in low-income environments: a cross-sectional study conducted in Kyrgyzstan. The dataset used in the study includes data collected from women of reproductive age in Kyrgyzstan, encompassing information on BMI, dietary diversity scores, nutrient adequacy ratios, and household characteristics such as the presence of cropland and farm animals. The methodology involved a cross-sectional study design, a survey with pre- coded and open-ended questions, anthropometric measurements for BMI calculation, nutrient adequacy ratio calculation using RDIs from Russia and Germany, and statistical analysis using the R language (Otunchieva et al., 2022).

According to research conducted by Huq et al., (2014) on Health, safety, and hygiene behaviors at work among Bangladeshi women employees. The dataset is a cross-sectional survey conducted using a well-designed semi-structured questionnaire to observe working conditions, safety facilities and hygiene practices among 384 female workers in various baking industries located in Dhaka and Tangail regions of Bangladesh. The main findings include poor working conditions and hygiene maintenance, high prevalence of Chronic Energy Deficiencies (CED) among workers, and the need for improved occupational hygiene, safety practices, and adoption of food safety tools (Huq et al., 2014).

According to research conducted by Hossain et al., (2019) on Evaluation of the efficacy effect of workplace nutrition programs on the anemia status of female employees in Bangladesh's ready- to-wear industry. Quantitative and qualitative data collected from 1310 female RMG workers who were not pregnant from four factories in Bangladesh. The study utilized a quasi-experimental mixed method design, including baseline and endline surveys to assess the effects of intervention packages on reducing anemia. Data entry and validation were performed using Microsoft Access, statistical analyses were performed with the use of SPSS software. The participants all responded to the survey. The evaluation findings carry important messages for policymakers, donors, factory owners, and female garment workers in Bangladesh regarding the advantages of nutrition programs in garment factories. The research shows that implementing a variety of interventions over a substantial period can successfully decrease anemia in non-pregnant female RMG factory workers (Hossain et al., 2019).

According to the study carried out by Afolabi et al., (2015) on Nutrient consumption and nutritional status of the old in low income districts of southwest, Nigeria. The dataset used in the study consists of 140 apparently healthy elderly subjects aged 58-99 years residing in low income urban and rural areas of southwest Nigeria. The methodology used in the study involved a cross-sectional design, multistage sampling technique, data collection using a structured questionnaire for socio-economic characteristics, dietary intake, and anthropometric data, as well as statistical analysis using the SPSS software. Inadequate intake of protein and some micronutrients, high prevalence of overweight coexisting with underweight, mid upper arm circumference is a better index for assessment of under-nutrition among the elderly and is influenced strongly by their protein and energy intake (Afolabi et al., 2015).

According to the research conducted by Islam et al., (2004) on Bangladeshi women's nutritional status: comparing the energy consumption and nutritional status of affluent urban and rural populations. The dataset includes measurements of body weight, height, biceps and triceps skinfolds, BMI, total body fat (TBF), fat-free mass (FFM), body fat percentage (BF%), and energy intake (EI) for the different subgroups within the two socio-economic groups.The methodology involved a cross-sectional study in two locations in Bangladesh, measurement of anthropometric characteristics using standard procedures, estimation of energy intake using a three-day dietary record, and calculation of body composition using skinfold measurements and basal metabolic rates using FAO/WHO/UNU equations (Islam et al., 2004).

According to Hossain et al., (2017) on The socioeconomic position, eating habits, and nutritional state of the female employees of Moulvibazar District's Fulchara Tea Garden. Bangladesh. The dataset used in the study is a descriptivestudy with a cross-sectional design, conducted among 96 purposively selected female workers who had experienced at least one pregnancy in Fulchara tea garden at Sreemangal, Moulavibazar, Bangladesh. The data was analyzed using SPSS 18. The main findings of the study include the high illiteracy rate and low income among female tea garden workers, a significant proportion of underweight women with limited meat intake, poor Sanitation practices, and a high percentage of women having to do heavy work during pregnancy anddelivering at home (Hossain et al., 2017).

CHAPTER: 3

METHODS AND MATERIALS

3.1 Sample Size

$$n = \text{N x } \frac{\frac{Z^2 \times p \times (1-p)}{e^2}}{\left[\text{N - 1 + } \frac{Z^2 \times p \times (1-p)}{e^2}\right]}$$

Z = The critical value of the normal distribution at the necessary confidence level,

p = Sample proportion,

e = Margin of error

N = Population size,

The sample size was calculated using the method described below. The population here exceeds 20,000 people.

Population Size (N) = 20,000

Critical Value (95% confidence level) (Z) = 1.96

Margin of Error (e) = 0.05

Sample Proportion (uncertain) (p) = 0.5

Now Calculate Sample Size =

$$\frac{\{\ (20{,}000)(1.96\text{^}2)(0.5)(1-0.5)\ /\ (0.05\text{^}2)\ \}}{\{\ (20{,}000)-1+((1.96\text{^}2)(0.5)(1-0.5)\ /\ (0.05\text{^}2)\ \}}$$

$$= 377$$

The standard number was 377 if the population size is 20,000, but I collected 400 data because I had more samples.

3.2 Study Site and Area

The data collected from all the garment workers are located in Kumkumari Bazar, Kaghan Bazar, Charabag etc. There are no good hospital facilities in the garment area to provide healthcare facilities. Moreover, there is no breakfast and lunch provided in the garments.

3.3 Conceptual Framework

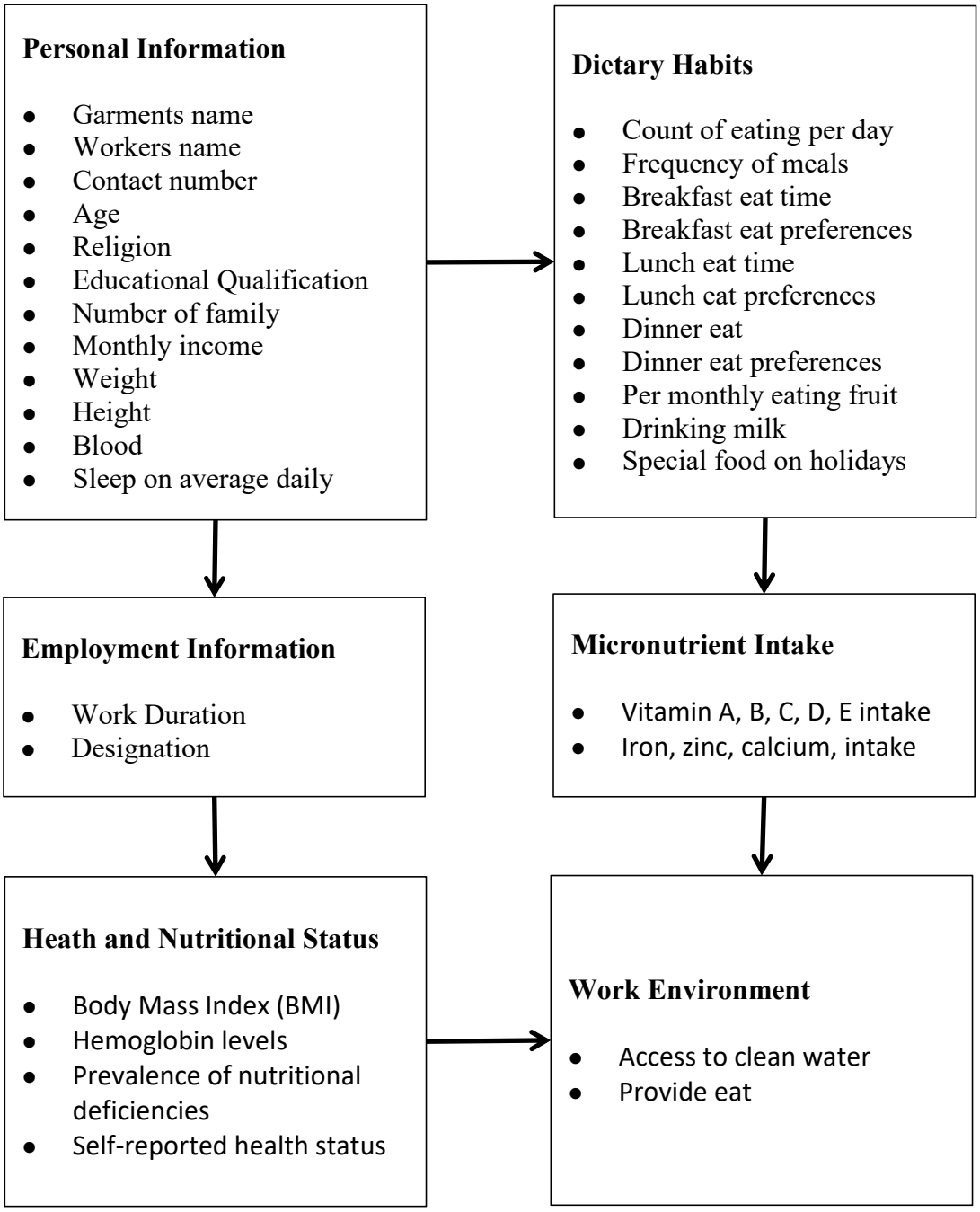


Figure-1: Figure on Conceptual framework

3.4 Survey Design

Given the purpose of this study, questionnaire development is an essential component of any survey. Six sets of 38 questions on personal information, employment information, dietary habits, micronutrient intake, health and nutritional status, and work environment were administered. Initially, 14 questions based on Savar women workers' personal information and 2 questions based on their employment information were collected via interview. Twelve questions were added to reflect the specific objective (IV) of this study, in accordance with FAO's standard guidelines for determining dietary diversity. Considering basic health and nutritional knowledge, 5 questions were collected from Savar women workers to determine whether they are getting adequate nutrition for their low income and having regular periods. Furthermore, two questions were collected based on micronutrient intake, such as vitamin, mineral, and so on. Supplements were taken. Furthermore, more information was gathered by asking three questions about their working environment.

3.5 Survey Implementation

The survey completion process involved meticulous steps to ensure accuracy and reliability. After creating a comprehensive set of 38 questions using Google Forms, a thorough review was conducted to identify and rectify any potential errors. Once it was confirmed that the form was functioning seamlessly, the survey was executed through a hands-on approach. Each question was meticulously transcribed onto paper, and the information was gathered through interviews with workers in the garment industry located at Savar. To enhance the dataset and capture a more holistic understanding, additional efforts were made to collect information by visiting the homes of the garment workers. This approach aimed to provide a more nuanced perspective on the respondents' habits and lifestyles, adding depth to the survey findings. The diligent combination of in-person interviews and home visits reflects the dedication and hard work invested in the data collection process. The outcome of this extensive effort resulted in the acquisition of 400 data points within the span of one month. This achievement not only underscores the commitment to the research but also emphasizes the richness and diversity of the gathered data. The hands-on approach taken in this survey contributes to the robustness of the findings, enhancing the overall quality and reliability of the research outcomes.

Flowchart on Survey implementation

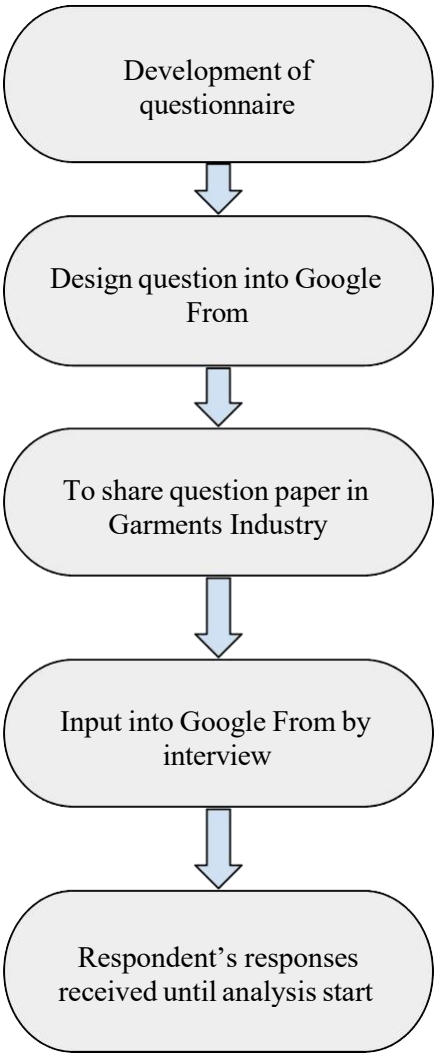


Figure-2: Figure on Survey Implementation

3.6 Analysis:

After receiving all responses from the Google form. It's been downloaded as a spreadsheet. Following that, all data is transferred to Microsoft Excel for final data analysis. For calculating BMI and BMR, use the following formulas:

The Mifflin-St Jeor Equation for Women calculates BMR as 10x weight + 6.25x height - 5x age - 161, while the BMI formula is weight (kg) / [height (m)]2. If the respondent's BMI is less than 18.5 kg/m2, they are considered underweight. If the range is between 18.5 and 24.9kg/m2 for a normal healthy weight. Respondents with a BMI between 25 and 29.9 kg/m2 are considered overweight. Obese respondents have a body mass index of 30 to 39.9kg/m2.(Mara S. Georges et al., 2011). After calculating BMR, multiply it by their own activity level to determine their calorie requirements. Activity level is a numerical value used in the Harris Benedict Formula. Calorie calculation for sedentary active individuals is BMR x 1.375, while for light active individuals, BMR x Calorie calculation for moderate activity is 1.375 x 1.55, while for every activity it is BMR x 1.725. (Mara S. Georges et al, 2011.). When analyzing general knowledge questions, assign 15 marks to each question and use frequency to determine respondents' score levels. The frequency level has four steps (0-5, 6-10, and 11-15). After scoring, calculate the average score. As the female workers did not know their BMI and caloric requirement, a mean distribution was used to calculate BMI and caloric requirement based on their subjective responses. Analysis of dietary diversity level have to consider only female respondents because in this study follow the FAO individually dietary diversity guideline. Survey data reveal that the analysis of average dietary diversity score; it has out of 9 scores and can be divided into three parts Lowest dietary diversity ≤ 3, Medium dietary diversity 4-5, High dietary diversity ≥ 6 in this score indicate how healthy Savar female garments industry. At the same time analyze the percentage of micronutrient intake among the respondents.

Flowchart on Analysis:

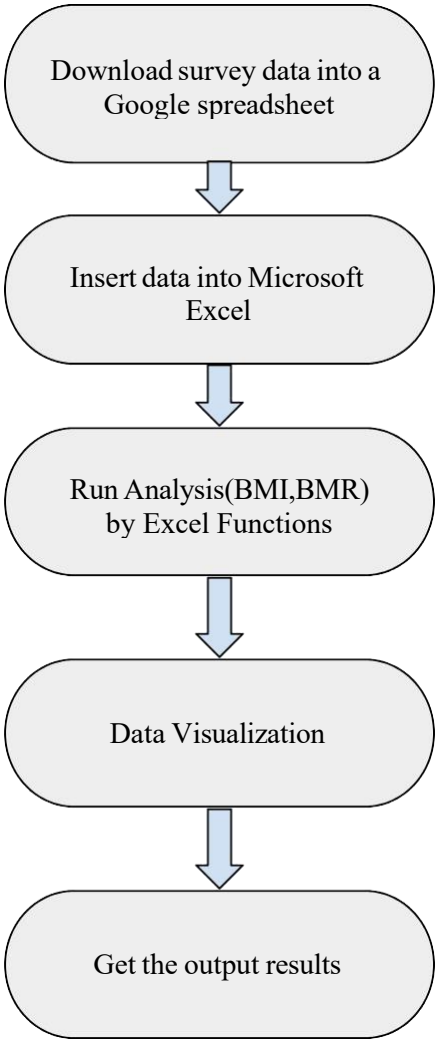


Figure-3: Figure on Analysis

3.7 Managing data and conducting statistical analysis:

In this study, management and handling of information statistical analyses were carried out using Microsoft Excel and SPSS, indicating a comprehensive approach to handling and processing information. The distribution normality of the data was assessed using the Shapiro-Wilk test, ensuring the validity of subsequent statistical analyses. Descriptive statistics were examined for continuous variables such as background characteristics, nutrition, and micronutrient status represented using the median and interquartile range (IQR) due to their skewed distribution. Continuous variables such as background characteristics, nutrition, and micronutrient status were expressed as median and IQR, providing a robust summary of the central tendency and

variability in the data. To enhance the clarity of categorical variables, frequency and percentage were employed as expressive measures. The study also delved into the exploration of relationships by correlating numerical variables with their respective BMI, BMR, and micronutrient betas. Furthermore, a comprehensive statistical analysis was conducted to rigorously examine the variables. This meticulous approach ensures a thorough investigation of the associations and dependencies within the dataset. By employing a combination of robust statistical methods and software tools, the study adhered to best practices in data analysis, contributing to the reliability and validity of the research findings.

CHAPTER 4

RESULTS AN DISCUSSION

4.1 Duration of Employment In The Garments Industry

In Savar, a region with a diverse array of garment industries, a substantial number of women workers follow a structured daily routine. Commencing their workday at 8:30 am, these employees report to the garment factories and subsequently engage in their assigned tasks. A crucial part of their day is the designated mealtime from 1 pm to 2 pm, providing the workers with an opportunity to consume food brought from their homes. Following this midday break, they promptly return to their workstations, contributing to the operations of the garment industry. As the workday progresses, a work break is observed around 8:00 pm for some workers, while others may experience their break slightly later at 8:30 pm or 9:00 pm. This structured schedule underscores the significance of regular breaks, ensuring that the female garment workers in Savar maintain a balanced work routine and have dedicated times for nourishment and rest.

4.2 Job Roles

Roles in Savar's garment industry include Sewing Machine Operator responsible for garment assembly, Quality Inspector ensuring high standards, Finishing Operator managing final touches, Embroidery Operator adding decorative elements, Packaging Operator handling product packaging, Cutting Master overseeing fabric cutting, Cleaner Man maintaining cleanliness, and Helper Man providing support in various tasks.

4.3 Datasets

The data collection process for the study titled "Nutrition and micronutrient levels of female employees in a clothing factory in Savar, Dhaka" involved a systematic and structured approach to gather relevant information. To obtain a comprehensive understanding of the nutritional and micronutrient status of female workers, various data sources and collection methods were employed. First, recruitment of participants began within selected garment factories in Savar, Dhaka. Informed consent procedures were followed, ensuring that participants understood the nature and purpose of the study before agreeing to participate. Subsequently, demographic data, including personal data, employment data, dietary habits, micronutrient intake, health and nutritional status, and work environment, were collected to

provide context for the nutrition assessment. Anthropometric measurements, such as height, weight, and body mass index (BMI), Basal metabolic rate (BMR) and Micronutrient intake were obtained to assess the overall nutritional status of the participants. Dietary intake was evaluated through food frequency questionnaires or dietary recall methods, capturing information on daily nutritional habits and dietary patterns. Micronutrient levels were assessed through blood tests or other relevant biomarkers to provide insights into specific nutrient statuses. Additionally, structured interviews or surveys may have been conducted to gather information on lifestyle factors, including physical activity levels and health-related behaviors. The data collection process likely adhered to ethical standards, maintaining participant confidentiality and privacy throughout.Overall, the data collection for this study aimed to paint a comprehensive picture of the nutritional and micronutrient status of female workers in a garments factory in Savar, Dhaka, by employing a combination of anthropometric measurements, dietary assessments, and biochemical analyses. This meticulous approach ensures the reliability and validity of the findings, contributing valuable insights to the field of nutrition and workplace health.

4.4 Income level

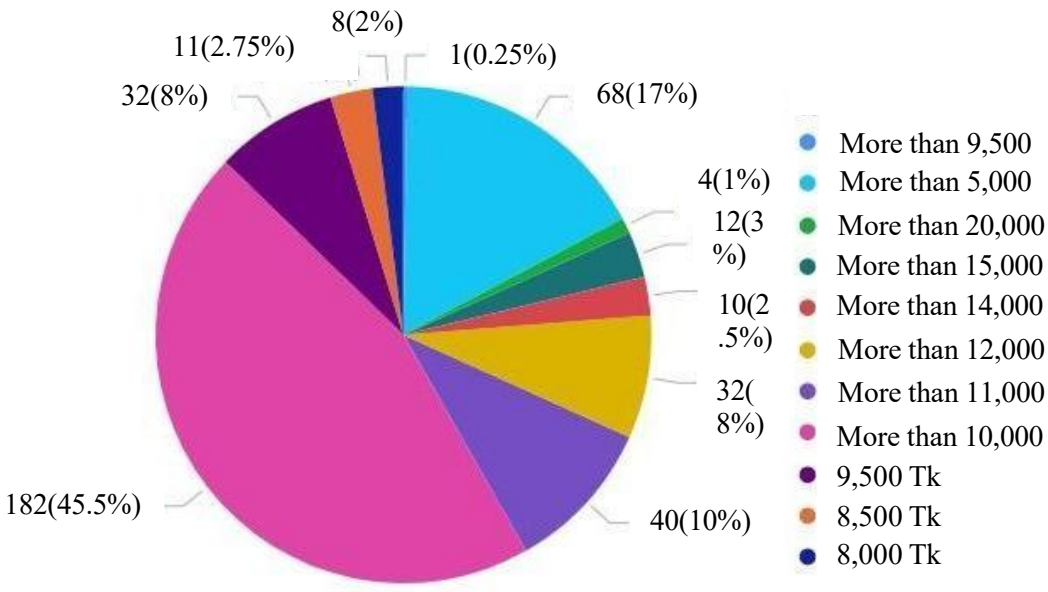


Figure-4: Monthly income level of female garments workers.

The monthly salary distribution among women garment workers in Savar highlights a concerning disparity, making it challenging for them to sustain their families. A detailed analysis of the provided pie chart reveals that out of a total of 400 employees, a significant

proportion faces economic hardship, earning less than optimal wages. Specifically, 182 employees, constituting 45.5%, receive a monthly salary exceeding 10,000 thousand rupees. Moreover, 68 workers, accounting for 17%, earn above 5,000 thousand taka, while 40 employees, equivalent to 10%, receive a salary surpassing 11,000 thousand taka. Interestingly, the data indicates that 8% of the workers, totaling 32 individuals, earn either 9,500 rupees or more than 12,000 thousand taka, suggesting a relatively narrow band of middle-income earners.The salary range between 10,000 and 13,000 thousand rupees emerges as the most common, with the maximum salary falling within this bracket. However, there is a noteworthy mention of a small segment, approximately 2%, who earn 14,000 taka or more. This minority at the higher end of the salary spectrum may signify a potential need for further investigation into factors influencing such discrepancies.

4.5 Age Distribution Frequency

The distribution of age frequencies among female garment workers in Savar is illustrated in **Figure-5**. Notably, the age group with the highest representation is 22-28 years, encompassing 154 individuals, constituting 38.5% of the total garment workers surveyed. This demographic holds the majority share, signifying a substantial presence of young female workers in the Savar garment industry. Following closely is the age range of 15-21 years, with 149 workers, comprising 37.2% of the workforce. The 29-35 age group is the next significant segment, comprising 71 individuals, contributing to 17.8% of the total workforce. Interestingly, the age categories of 43-49 years and 36-42 years have lower participation rates in the female garment workforce in Savar. Specifically, the 43-49 age group comprises only 1% of the workers, amounting to 4 individuals, suggesting a minimal presence in this age bracket. Similarly, the 36-42 age range encompasses 22 individuals, constituting 5.5% of the female workforce, indicating a relatively lower representation compared to the younger age groups. This distribution underscores the concentration of female garment workers in the younger age brackets, particularly within the 22-28 and 15-21-year age ranges, while also highlighting a lower prevalence in the older age categories of 43-49 and 36-42 years.

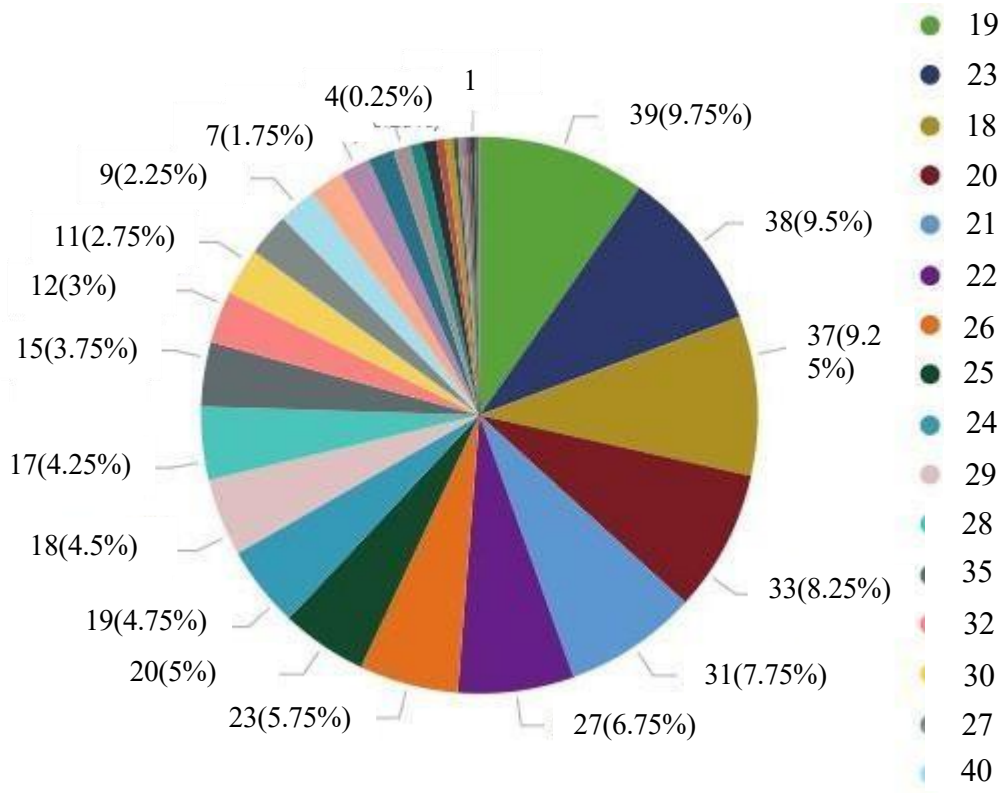


Figure-5: Frequency distribution of Age

4.6 Frequency Distribution of Marital Status

The frequency distribution of marital status among women workers in Savar's garment industry is depicted in **Figure-6**. Notably, a significant majority of the respondents, accounting for 79.3% of the total datasets (317 out of 400 individuals), are married. This highlights a predominant presence of married women in the workforce, constituting a substantial portion of the surveyed population. In contrast, unmarried women workers constitute 17.3% of the respondents, with a count of 69 individuals. The data also reveals a relatively lower percentage of divorced women workers, comprising 3% of the total, amounting to 12 individuals. The smallest category in terms of marital status is widows, constituting only 0.4% of the surveyed population. This distribution sheds light on the diverse marital statuses within the female garment workforce in Savar, emphasizing the majority representation of married women and providing insights into the comparatively lower prevalence of unmarried, divorced, and widowed individuals in this occupational setting.

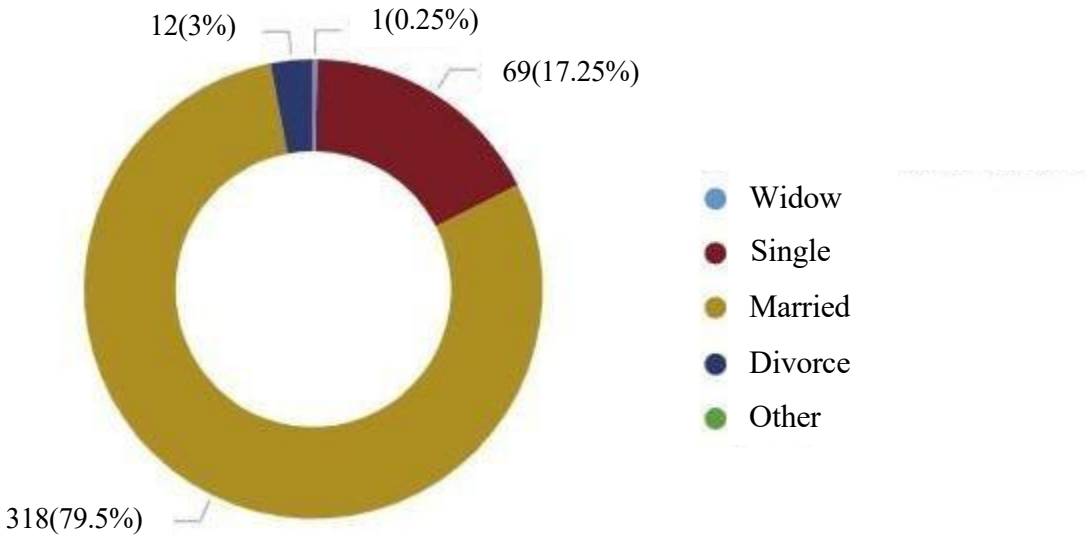


Figure-6: Frequency distribution of marital status

4.7 Distribution of Religion Frequency

The frequency distribution of religious affiliation among female garment workers in Savar is elucidated in **Figure-7**. Among the respondents, a substantial majority, comprising 88.75% of the total surveyed population, identify with the Islamic faith. This accounts for a significant portion of the female garment workforce in Savar, with 355 individuals adhering to Islam. Following this, the Hindu religious group represents the second-largest category, encompassing 43 individuals, constituting 10.75% of the workforce. Notably, Savar has a minimal representation of Christian and Buddhist workers, both sharing the same frequency with 1 individual each, making up a mere 0.25% of the total garment workforce. This distribution underscores the religious diversity among female garment workers in Savar, with Islam being the predominant affiliation. The lower percentages of Hindu, Christian, and Buddhist workers indicate a comparatively smaller presence of individuals from these religious groups in the garment industry in this particular region. The data provides insights into the religious composition of the workforce, emphasizing the majority of Islamic workers and the minimal representation of other religious affiliations in the Savar garment sector.

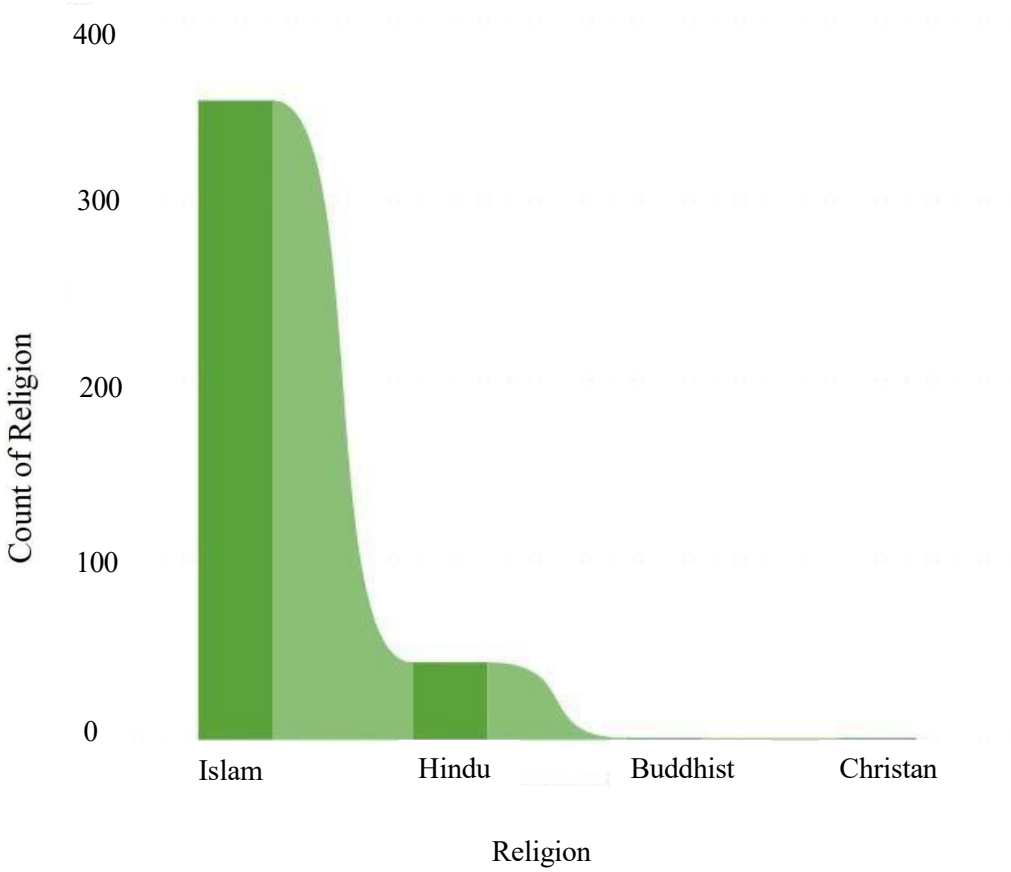


Figure-7: Frequency distribution of religion

4.8 Frequency Distribution of Blood Group

Frequency distribution of blood groups in Savar female garments are shown in figure-5. Among the respondents, the blood group percent of B positive blood garments female workers. The number of female workers in the blood group B positive is 123 which is more than other blood groups. That is 30.75% garments workers of this blood group work more in Savar. Then the number of female workers in the blood group A positive is 102 which is 25.5%. The number of workers in the blood group O positive is 88 which is 22%. AB positive blood group is 7% which out of 400 data 28 female workers are AB positive blood group. Moreover, B negative is less than AB positive which is 26 i.e. 6.5%. The number of O negative blood workers is 17 which is 4.25% in percentage terms. Savar has the least number of females i.e. AB negative which is 4 or 1% of workers employed in garments and A negative is 12 which is 3% of female workers.

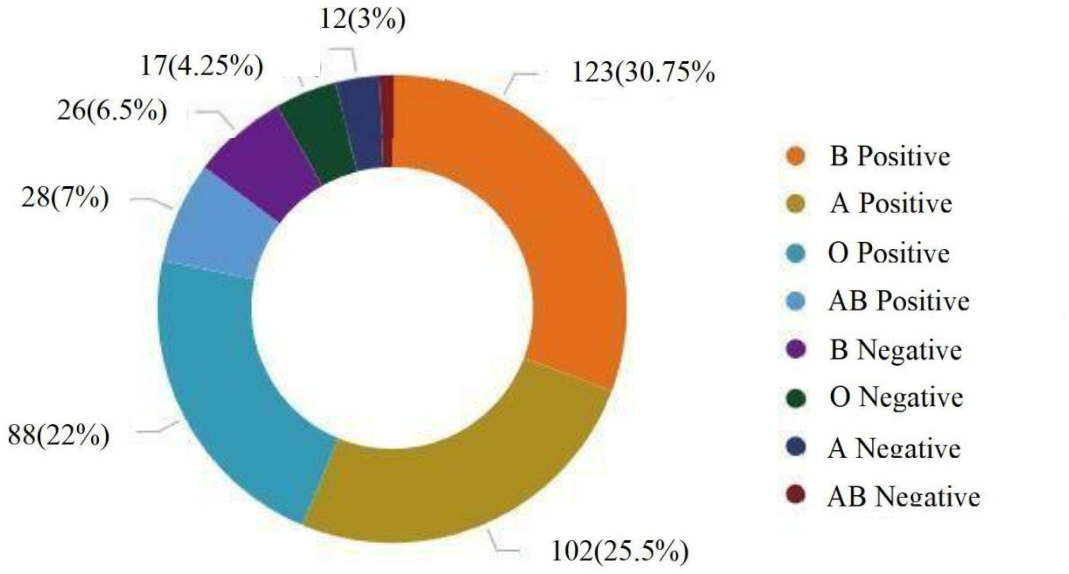


Figure-8: Frequency distribution of blood group

4.9 Distribution of the frequency of different sleeping statuses

The frequency distribution of sleep patterns among female garment workers in Savar is illustrated in **Figure-9**, providing valuable insights into their varying sleep durations. Notably, a significant proportion of respondents, comprising 40% of the surveyed population, reported sleeping for 3-4 hours daily. This indicates a prevalent trend of shorter sleep durations among a substantial number of female garment workers in Savar, with 160 individuals falling into this category. In contrast, the number of workers sleeping 5-6 hours is slightly lower, totaling 124 individuals, suggesting that a portion of the workforce experiences a slightly longer sleep duration compared to the 3-4 hour range.Further analysis reveals that 15% of the respondents, amounting to 60 individuals, reported sleeping for 6-7 hours daily. This indicates a smaller but notable segment of the workforce maintaining a moderate sleep duration. On the other hand, the number of workers reporting 7-8 hours of sleep is considerably less, with only 13 individuals, constituting 3.25% of the total surveyed population. This suggests a minority of workers in Savar achieve a more optimal sleep duration within the recommended range.Lastly, the data indicates that 10.74% of the respondents, comprising 43 individuals, reported sleeping for 2-3 hours daily. This highlights another segment of the workforce

experiencing a particularly short duration of sleep. In summary, the distribution of sleep patterns among female garment workers in Savar reveals variations in sleep durations, with a substantial percentage reporting shorter sleep periods, and a smaller but noteworthy proportion achieving more moderate or optimal sleep durations.

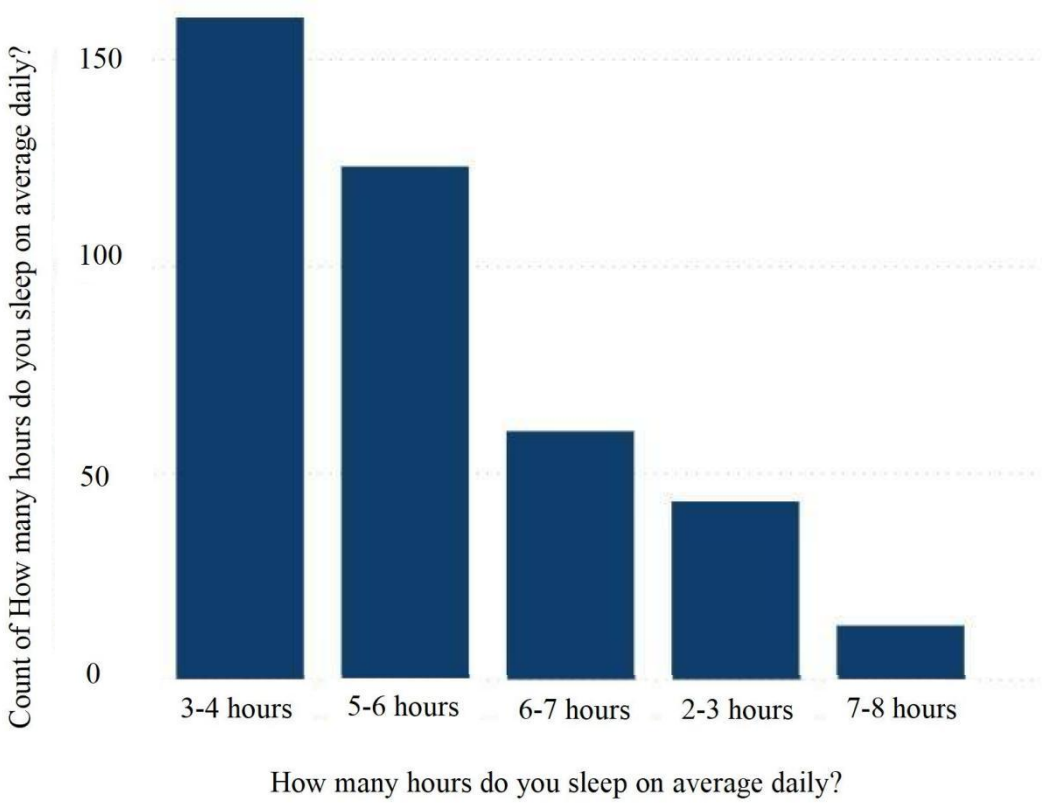


Figure-9: Frequency distribution of sleeping status

4.10 Distribution of how often weights are seen in a dataset.

The frequency distribution of weight among female garment workers in Savar is elucidated in **Figure-10**, offering a comprehensive overview of the workforce's weight distribution. Notably, the largest segment of respondents falls within the 41-46 weight range, constituting a substantial 35.5% of the surveyed population. This signifies a notable concentration of workers with weights in this range, amounting to 142 individuals. Following closely, the 47-52 weight group represents 29.5% of the female workforce, tota 70 18 individuals. These two weight categories combined underscore the significant proportion of garment workers in Savar within the mid-range weight spectrum.Further analysis reveals that the 53-58 weight range encompasses 14.2% of the workforce, with 57 individuals falling into this category. The 35-40 weight range represents 9.2% of the surveyed population, consisting of 37 workers. Conversely, the 59-64 and 65-70 weight ranges are the least represented, comprisin 82% (33

individuals) and 3.2% (13 individuals) of the workforce, respectively. These statistics provide a detailed and nuanced perspective on the weight distribution of female garment workers in Savar, shedding light on the prevalence of workers within specific weight ranges and offering valuable insights for understanding the physical c haracteristics of the workforce in this industry.

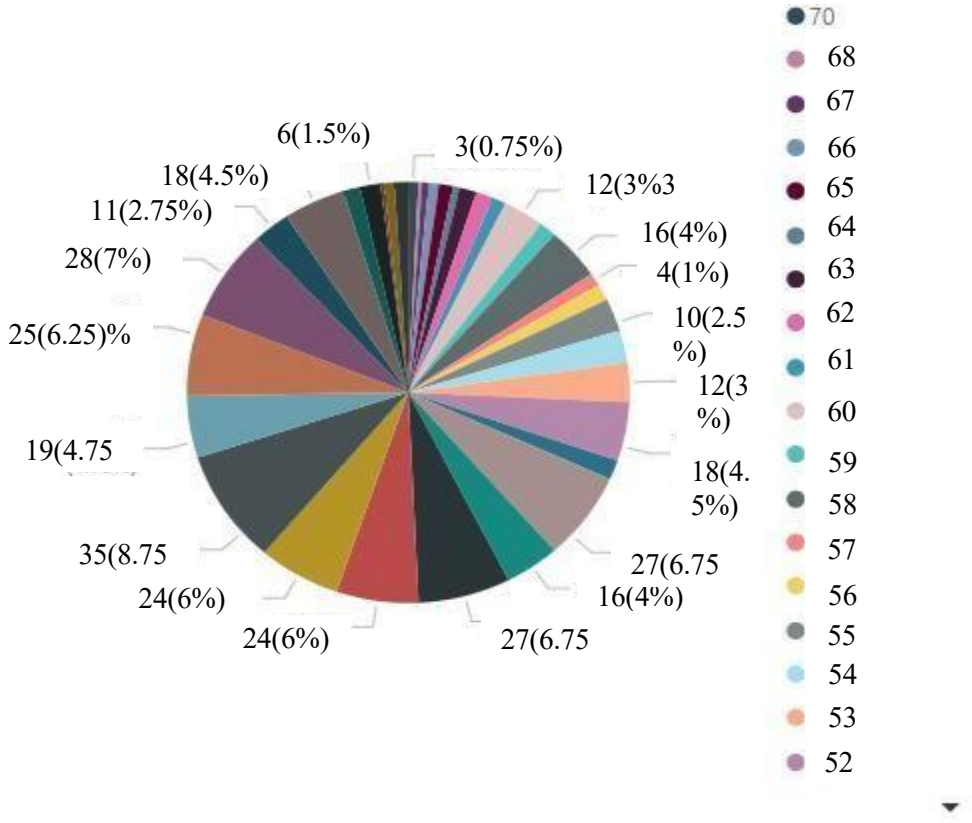


Figure-10: Frequency distribution of weight

4.11 Frequency Distribution of Height

The frequency distribution of height among female garment workers in Savar is elucidated in **Figure11**, providing valuable insights into the workforce's height distribution. Notably, the predominant segment of respondents falls within the 152-164.99cm height range, constituting a substantial 78% of the surveyed population. This highlights a significant concentration of female workers within this particular height bracket in Savar, with 312 individuals falling into this category. This prevalence suggests a notable uniformity in height among a considerable majority of garment workers in the region. In contrast, the 139-151.99cm height group accounts for 16.8% of the workforce, representing a smaller yet significant proportion, with 67 individuals falling into this category. The 165-177.99cm height range encompasses a modest 4.8% of the surveyed population, with 19 workers falling within this segment.

Conversely, the 178 cm and above height category is the least represented, with only 2 workers, making up 0.4% of the employed garment workforce in Savar. These statistics underscore the diversity in height among female garment workers in Savar, with the majority falling within a specific height range, while smaller proportions represent shorter and taller height categories.

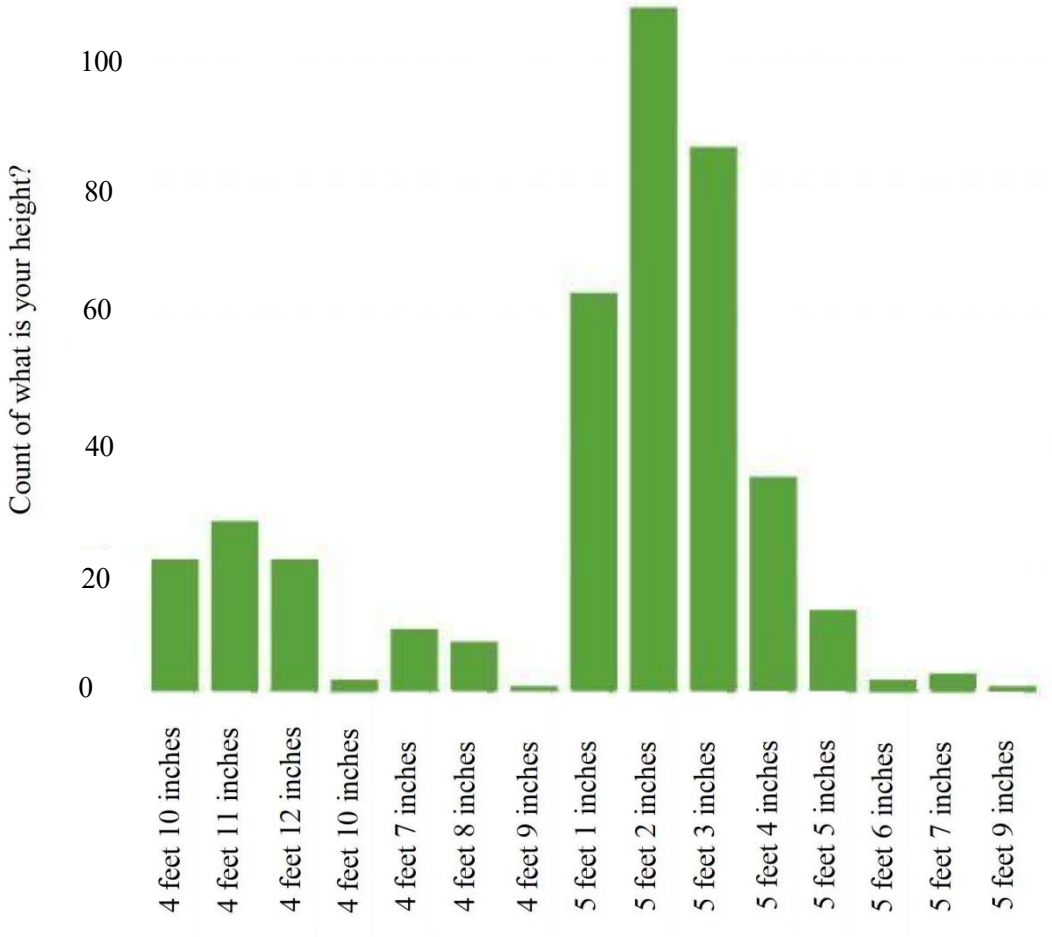
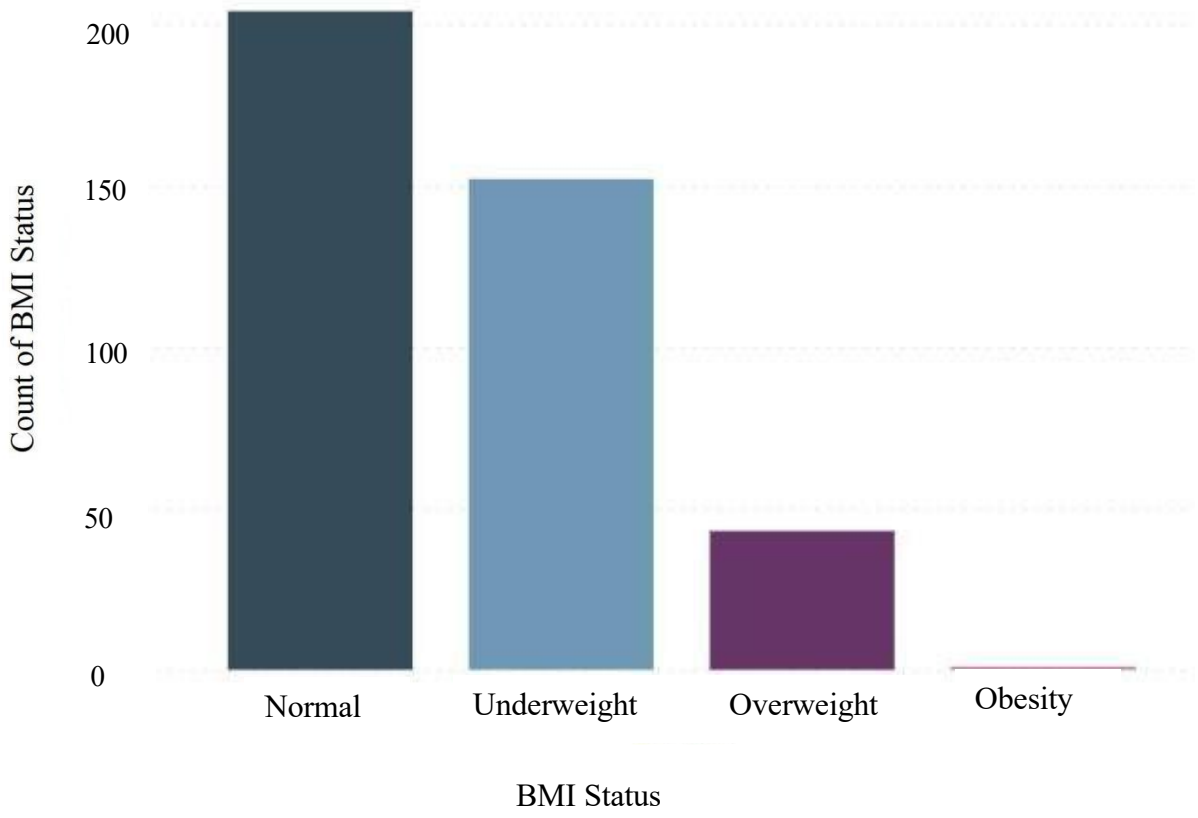


Figure-11: Frequency distribution of height

4.12 Frequency Distribution of BMI



Fiqure-12: Frequency of Distribution BMI

4.13 Nutritional Status Tools

NutriSurvey program is a commercial German software (EBISpro)**.** Nutritional status and Micronutrient status analysis has been done with this software.

4.14 Assessment for the Nutritional Status of Adolescent Girls (15-18 years)

15	2,333.68
17	2,308.94
18	2,298.92

Analysis of the food record			
Food	Amount	Energy	Carbohydr.
Rice hulled cooked	450 g	464.9 kcal	92.2 g
Mixed vegetables fresh cooked	50 g	16.8 kcal	2.4 g
Biscuits	50 g	249.3 kcal	29.8 g
Tea black with milk (beverage)	200 g	4.8 kcal	0.3 g
Wholemeal bread	80 g	150.3 kcal	30.1 g
Fried Egg (R)	120 g	303.7 kcal	0.7 g
Fishes cooked	60 g	57.6 kcal	0.0 g
Chicken	80 g	205.4 kcal	0.0 g
Lentils (R)	50 g	28.9 kcal	3.3 g
Vegetarian fries dehydrated	30 g	89.4 kcal	15.1 g
Potato mash ®	80 g	66.4 kcal	9.0 g
Meal abalysis: Energy 1591.0 kcal (100%), Carbohydrate 182.8 g (100%)			

The nutritional status of female workers aged 15-18 years in the garment industry, with a focus on Savar, has been examined based on their age, height, and weight data obtained from the dataset. The analysis reveals specific caloric requirements for different age groups within this demographic. For instance, 15-year-old female workers who engage in six days of work per week have an average caloric requirement of 2333.68 kcal. Similarly, 17-year-olds require an average of 2308.94 kcal, and 18-year-olds need 2298.92 kcal on a daily basis. Despite these calculated energy needs, a closer look at their dietary habits, comprising Rice (hulled and cooked), Mixed vegetables (fresh and cooked), Biscuits, Tea (black with milk), Wholemeal bread, Fried egg, Fish (cooked), Chicken, Lentils, Vegetarian fries (dehydrated), and Potato mash, reveals a lower-than-recommended energy intake. The overall energy

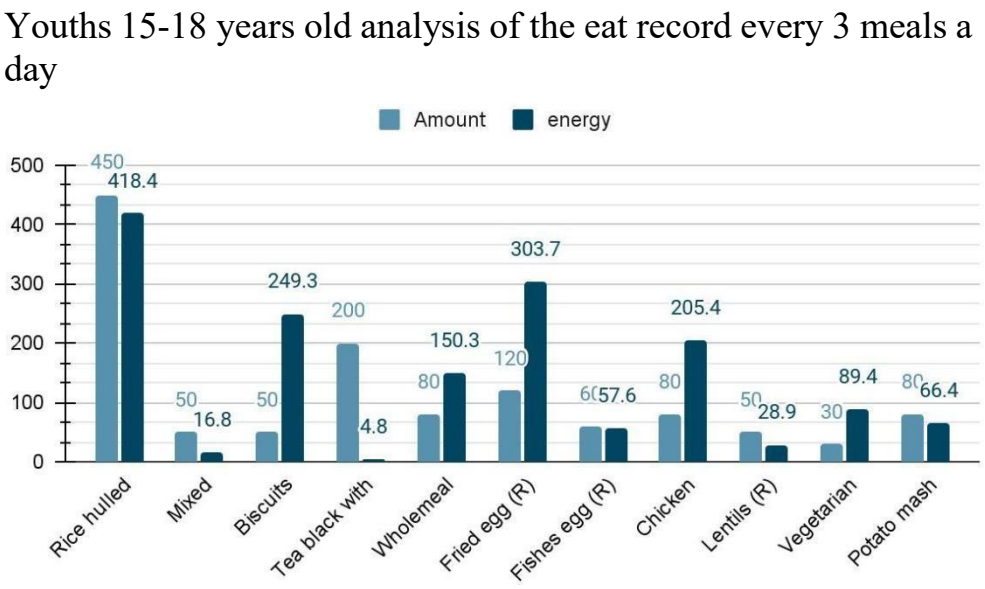
intake from these food items is measured at 1591.0 kcal, with a carbohydrate intake of 182.8g. Below is their nutritional food gap calculation:

$$\frac{2333.68 + 2308.94 + 2298.92}{3}$$

$$= 2313.847 \text{ kcal}$$

Total gap calories for 15-18 years old = (2313.847 - 1591.0) kcal, = 722.847 kcal.

This analysis underscores a potential gap in the nutritional intake of these young female workers, which may be attributed to the demanding nature of their work. It is imperative to address this nutritional shortfall to safeguard the health and well-being of these workers. Implementing measures to enhance the nutritional content of their meals, ensuring a balance of essential nutrients, could contribute to improved overall health and performance. Additionally, there is a need for educational initiatives to raise awareness about proper nutrition and promote healthier eating habits among these workers, thereby supporting their long-term well-being in the challenging work environment.



4.15 Assessment for the Nutritional Status of Adolescent Girls (19-24 years):

19	2,294.79
20	2,287.84
21	2,270.01

22	2,249.26
23	2,268.60
24	2,261.65

Analysis of the food record			
Food	Amount	Energy	Carbohydr.
Rice hulled cooked	500 g	464.9 kcal	102.4 g
Mixed vegetables fresh cooked	70 g	23.6 kcal	3.3 g
Biscuits	50 g	249.3 kcal	29.8 g
Tea black with milk (beverage)	200 g	4.8 kcal	0.3 g
Wholemeal bread	80 g	150.3 kcal	30.1 g
Fried Egg (R)	120 g	303.7 kcal	0.7 g
Fishes cooked	60 g	57.6 kcal	0.0 g
Chicken	80 g	205.4 kcal	0.0 g
Lentils (R)	70 g	40.4 kcal	4.6 g
Vegetarian fries dehydrated	40 g	119.2 kcal	20.1 g
Potato mash ®	100 g	83.0 kcal	11.3 g
Meal abalysis: Energy 1702.2 kcal (100%), Carbohydrate 202.6 g (100%)			

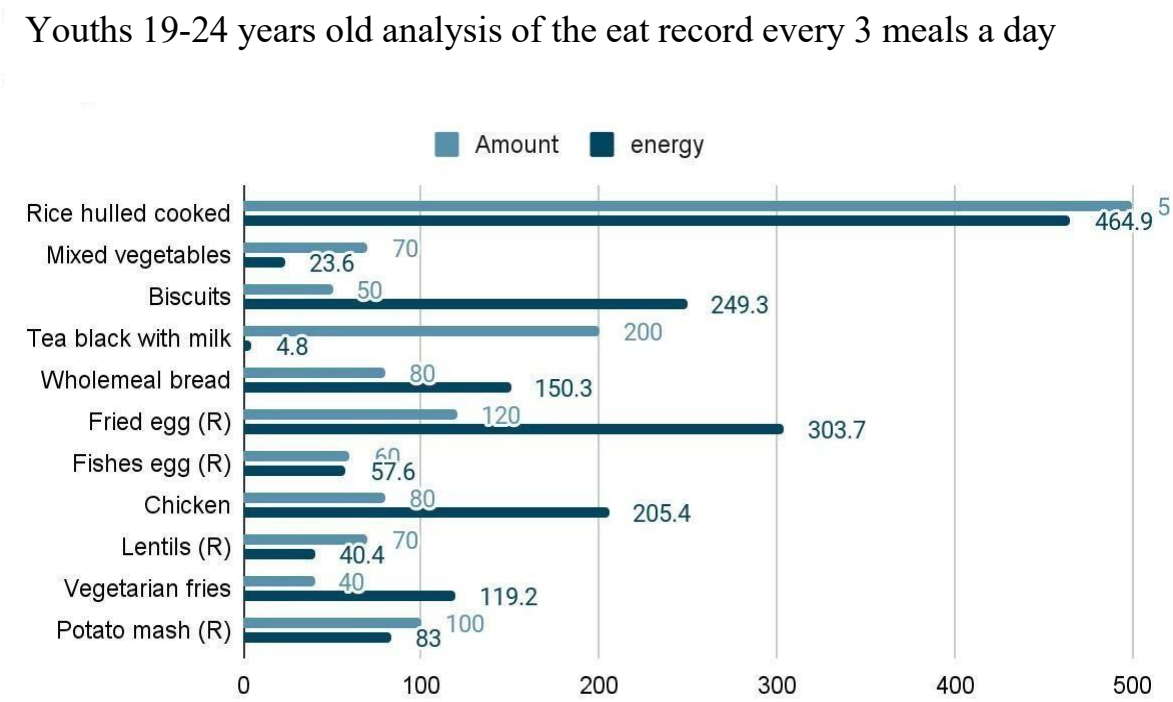
The nutritional status of female workers aged 19-24 years in the garment industry, particularly in Savar, has been assessed based on their age, height, and weight data from the dataset. The analysis reveals variations in the average daily caloric intake for different age groups. For instance, 19-year-old women who work six days a week have an average caloric requirement of 2294.79 kcal, while 20-year-olds need 2287.84 kcal, and 21-year-olds require 2270.01 kcal. The pattern continues with 22-year-olds needing 2249.26 kcal, 23-year-olds requiring 2268.60 kcal, and 24-year-olds having an average caloric requirement of 2261.65 kcal. However, despite these calculated caloric needs, an examination of their actual dietary habits reveals that workers are falling short of the recommended intake. The main components of their diet include Rice (hulled and cooked), Mixed vegetables (fresh and cooked), Biscuits, Tea (black with milk), Wholemeal bread, Fried egg, Fish (cooked), Chicken, Lentils, Vegetarian fries (dehydrated), and Potato mash. The overall energy intake from these dietary components is measured at 1702.2 kcal, with a carbohydrate intake of 202.6g. Below is their nutritional food gap calculation:

$$\frac{2{,}294.79 + 2{,}287.84 + 2{,}270.01 + 2{,}249.26 + 2{,}268.60 + 2{,}261.65}{6}$$

$$= 2272.025 \text{ kcal}$$

Total gap calories for 19-24 years old = (2272.025 -1702.2) kcal, = 569.825 kcal.

This analysis suggests that the workers are not receiving the necessary caloric intake to sustain their energy levels, likely due to the demanding nature of their work. It is crucial to address this nutritional gap to ensure the well-being and productivity of these female workers. Implementing strategies to enhance their dietary intake, such as providing more balanced and energy-dense meals, could contribute to improving their overall health and performance on the job. Additionally, raising awareness about proper nutrition and promoting healthy eating habits among these workers may be essential for maintaining their long-term well-being in the challenging work environment.



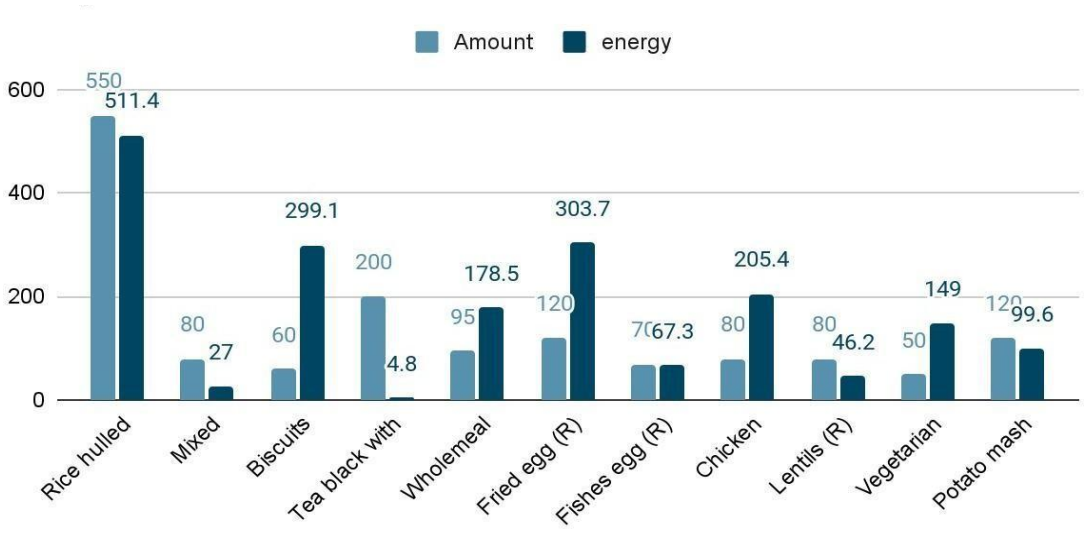
4.16 Assessment for the Nutritional Status of Adolescent Girls (25-50 years):

Age	Energy (Kcal)	Age	Energy (Kcal)
25	2,246.39	36	2,089.29
26	2,258.08	37	1,964.84
27	2,264.82	38	2,143.52

28	2,208.67	39	2,000.70
29	2,181.12	40	2,110.21
30	2,205.92	41	2,325.84
31	2,263.26	42	1,993.34
32	2,146.39	43	1,840.86
33	2,311.27	45	1,886.70
34	2,125.21	46	1,973.27
35	2,180.65		

Analysis of the food record			
Food	Amount	Energy	Carbohydr.
Rice hulled cooked	550 g	511.4 kcal	112.7 g
Mixed vegetables fresh cooked	80 g	27.0 kcal	3.8 g
Biscuits	60 g	299.1 kcal	35.7 g
Tea black with milk (beverage)	200 g	4.8 kcal	0.3 g
Wholemeal bread	95 g	178.5 kcal	35.1 g
Fried Egg (R)	120 g	303.7 kcal	0.7 g
Fishes cooked	70 g	67.3 kcal	0.0 g
Chicken	80 g	205.4 kcal	0.0 g
Lentils (R)	80 g	46.2 kcal	5.3 g
Vegetarian fries dehydrated	50 g	149.0 kcal	25.2 g
Potato mash ®	120 g	99.6 kcal	13.6 g
Meal analysis: Energy 1891.9 kcal (100%), Carbohydrate 232.9 g (100%)			

Youths 25-50 years old analysis of the eat record every 3 meals a day



The nutritional status analysis of female workers aged 25-50 years in Savar reveals interesting insights into their calorie requirements and dietary habits. The data indicates a variation in the average calorie needs across different age groups. For instance, the average calorie intake for 25-year-old women working 6 days a week is reported as 2,246.39 kcal, while the average for 26-year-olds is 2,258.08 kcal, and 27-year-olds require 2,264.82 kcal on average. The trend continues with fluctuations in calorie needs for subsequent age groups. Concerningly, the examination of their actual dietary intake, which includes items like rice, mixed vegetables, biscuits, tea, wholemeal bread, fried egg, fishes, chicken, lentils, and dehydrated vegetarian fries, reveals that workers aged 19-24 years are consuming only 1891.9 kcal and 232.9g of carbohydrates. This suggests a potential gap between their energy expenditure due to work and their actual calorie intake, raising concerns about inadequate nutrition.It's essential to address this discrepancy to ensure the well-being and productivity of the workers. Employers and health authorities may consider implementing nutritional education programs, providing access to a variety of nutritious food options, or even offering on-site meals to help meet the energy demands of these hardworking individuals. Regular health check-ups and consultations with nutritionists could also contribute to maintaining the overall health and performance of the female workers in the garment industry in Savar.

4.17 Exploring Micronutrient Intake Patterns in Adolescent Women (15-18 years)

The analysis conducted through the Nutri Survey 2007 software reveals important insights into the dietary habits and nutritional intake of female workers aged 15–18 years. The data

indicates that, on average, these women consumed 1591.0 kcal along with various micronutrients derived from their daily food intake. However, despite this, it becomes evident that their nutritional intake falls short of the demands placed on their bodies, particularly considering the fact that they engage in work activities six out of seven days a week.The detailed breakdown of their diet reveals notable deficiencies in key components such as meat, sugars, and overall caloric intake. The women's daily consumption includes 67.9g of protein, 64.2g of fat, and 182.8g of carbohydrates. While these values provide a snapshot of their macronutrient intake, it is crucial to recognize that their demanding work schedule necessitates a higher energy expenditure. Consequently, the observed gaps in their dietary profile, such as the limited intake of meat and sugars, contribute to an insufficient overall calorie and micronutrient intake.To address this nutritional imbalance, it is recommended that female workers aged 15–18 years increase their consumption of non-vegetarian carbohydrate-rich foods. This adjustment in their diet can help bridge the gap in calorie and micronutrient intake, supporting their energy needs and overall well-being. By incorporating a more diverse range of foods, especially those rich in proteins, sugars, and essential vitamins and minerals, these women can better meet the demands of their physically demanding work routine and promote optimal health. It is essential for them to prioritize a well-rounded diet that aligns with the increased energy expenditure associated with their active lifestyle, ensuring they receive the necessary nutrients for growth, development, and sustained energy levels.

Result			
Nutrient Content	Analysed value	Recommended value/day	Percentage fulfillment.
Energy	1591.0 kacl	2036.3 kcal	78%
Water	899.4 g	2800.0 g	32%
Protein	67.7 g(17%)	60.1 g(12%)	113%
Fat	64.2 g(36%)	69.1 g(<30%)	93%
Carbohydrate	182.8 g(47%)	290.7 g(>55%)	63%
Dietary fiber	17.0 g	30.0 g	57%
Alcohol	0.4 g	-	-
PUFA	9.1 g	10.0 g	91%
Cholesterol	607.1 g	-	-
Vit. A	731.2 ug	900.0 ug	81%
Carotene	1.4 mg	-	-
Vit. E (eq.)	5.5 mg	12.0 mg	46%
Vit. B1	0.5 mg	1.0 mg	53%
Vit. B2	0.8 mg	1.2 mg	63%
Vit. B6	1.1 mg	1.2 mg	95%
Tot. Fol.acid	184.1 mg	400.0 ug	46%
Vit. C	26.5 mg	100.0 mg	26%
Sodium	2733.6 mg	2000.0 mg	137%
Potassium	1507.4 mg	3500.mg	43%
Calcium	217.6 mg	1200.0 mg	18%
Magnesium	272.4 mg	350.0 mg	78%
Phosphorus	1089.3 mg	1250.0 mg	87%
Iron	9.3 mg	15.0 mg	62%

4.18 Exploring Micronutrient Intake Patterns in Adolescent Women (19-24 years)

The Nutri Survey 2007 software has provided valuable insights into the dietary patterns and micronutrient intake of female workers aged 19–24 years. According to the analysis, these women consume an average of 1702.2 kcal, accompanied by various essential nutrients obtained from their daily food intake. Notable components include 72.2g of protein, 65.7g of fat, and 20.6g of carbohydrates. Additionally, the micronutrient profile encompasses vitamins such as Vit. A, E, B1, B2, B6, C, as well as minerals like sodium, potassium, calcium, magnesium, phosphorus, and iron.However, despite this nutritional information, it is evident that the dietary needs of these female workers are not fully met, particularly when considering their demanding work schedule of six out of seven days a week. The reported average of 987 kcal, along with the accompanying micronutrient intake, falls short of the energy expenditure required by their active lifestyle. This discrepancy may result in insufficient levels of essential elements, such as meat and sugars, in their diet.To address

these nutritional gaps, it is recommended that female workers aged 19–24 years increase their calorie and micronutrient intake by incorporating more non-vegetarian carbohydrate-rich foods into their diet. This adjustment aims to better align their nutritional intake with the energy demands imposed by their work routine. By prioritizing a diverse range of foods, especially those rich in proteins, carbohydrates, and essential vitamins and minerals, these women can enhance their overall well-being and sustain the energy levels required for their physically demanding occupations. Encouraging a balanced and nutrient-dense diet will contribute to improved health outcomes, ensuring these individuals receive the necessary nutrients for optimal growth, development, and sustained energy throughout their workweek.

Result			
Nutrient Content	Analysed value	Recommended value/day	Percentage fulfillment.
Energy	1702.0 kacl	2036.3 kcal	84%
Water	987.7 g	2700.0 g	37%
Protein	72.2 g(17%)	60.1 g(12%)	120%
Fat	65.7 g(36%)	69.1 g(<30%)	95%
Carbohydrate	202.6 g(47%)	290.7 g(>55%)	70%
Dietary fiber	19.6 g	30.0 g	65%
Alcohol	0.4 g	-	-
PUFA	9.5 g	10.0 g	95%
Cholesterol	608.5 g	-	-
Vit. A	844.5 ug	800.0 ug	106%
Carotene	1.9 mg	-	-
Vit. E (eq.)	6.1 mg	12.0 mg	51%
Vit. B1	0.6 mg	1.0 mg	61%
Vit. B2	0.8 mg	1.2 mg	67%
Vit. B6	1.3 mg	1.2 mg	106%
Tot. Fol.acid	203.5 mg	400.0 ug	51%
Vit. C	35.7 mg	100.0 mg	36%
Sodium	2991.8 mg	2000.0 mg	150%
Potassium	1703.7 mg	3500.mg	49%
Calcium	243.0 mg	1200.0 mg	24%
Magnesium	304.9 mg	310.0 mg	98%
Phosphorus	1176.9 mg	700.0 mg	168%
Iron	10.4 mg	15.0 mg	69%

4.19 Exploring Micronutrient Intake Patterns in Adolescent Women (25-50 years)

The utilization of the Nutri Survey 2007 software has allowed for a comprehensive analysis of the dietary habits and micronutrient intake of female workers aged 25–50 years. The data reveals that these women have an average energy intake of 1891.9 kcal, derived from a diverse array of macronutrients and micronutrients present in their daily food consumption. Notable components include 79.8g of protein, 69.6g of fat, and 232.9g of carbohydrates. The micronutrient profile encompasses essential vitamins such as Vitamin A, E, B1, B2, B6, C, as well as vital minerals including sodium, potassium, calcium, magnesium, phosphorus, and iron.Despite this seemingly robust dietary intake, it is evident that female workers aged 25–50 years may face nutritional challenges, especially considering their demanding work schedule of six out of seven days a week. The reported average energy intake of 1891.9 kcal, along with the accompanying micronutrient levels, may fall short of meeting the energy demands associated with their active lifestyle. This gap in nutritional adequacy could contribute to insufficient levels of key elements such as meat and sugars in their diet.To address these potential deficiencies, it is recommended that female workers in this age group increase their overall calorie and micronutrient intake by incorporating more non-vegetarian carbohydrate-rich foods into their diet. This adjustmentaims to better align their nutritional intake with the increased energy expenditure demanded by their work routine. By diversifying their food choices and focusing on sources rich in proteins, carbohydrates, and essential vitamins and minerals, these women can optimize their overall health and sustain the energy levels necessary for their physically demanding occupations. Encouraging a balanced and nutrient-dense diet will contribute to improved well-being, ensuring that these individuals receive the necessary nutrients for optimal health, vitality, and sustained productivity throughout their workweek.

Result			
Nutrient Content	Analysed value	Recommended value/day	Percentage fulfillment.
Energy	1891.9 kacl	2036.3 kcal	93%
Water	1074.4 g	2700.0 g	40%
Protein	79.8 g(17%)	60.1 g(12%)	133%
Fat	69.6 g(33%)	69.1 g(<30%)	101%
Carbohydrate	232.9 g(50%)	290.7 g(>55%)	80%
Dietary fiber	23.3 g	30.0 g	78%
Alcohol	0.4 g	-	-
PUFA	10.1 g	10.0 g	101%
Cholesterol	631.0 mg	-	-
Vit. A	936.6 ug	800.0 ug	117%
Carotene	2.2 mg	-	-
Vit. E (eq.)	6.7 mg	12.0 mg	56%
Vit. B1	0.7 mg	1.0 mg	70%
Vit. B2	0.9 mg	1.2 mg	74%
Vit. B6	1.4 mg	1.2 mg	119%
Tot. Fol.acid	227.1 ug	400.0 ug	57%
Vit. C	41.5 mg	100.0 mg	42%
Sodium	3288.5 mg	2000.0 mg	164%
Potassium	1952.3 mg	3500.mg	56%
Calcium	271.2 mg	1200.0 mg	27%
Magnesium	346.8 mg	310.0 mg	112%
Phosphorus	1318.8 mg	700.0 mg	188%
Iron	11.8 mg	15.0 mg	79%

4.20 Participants Characteristics

The descriptive characteristics of the 400 participants, as presented in Tables-1 and Tables-2 based on questionnaire results, provide valuable insights into the age distribution of the study population. The mean age is reported as 24.77 years, reflecting the average age of the participants. The median age, which represents the middle point of the age distribution, is noted as 23 years. The standard deviation, a measure of the dispersion of age values around the mean, is calculated to be 6.131 years, indicating the degree of variability in the age data.The age range, defined as the difference between the maximum and minimum age values, range 31 years, with the maximum reported age being 46 years and the minimum age recorded at 15 years. This broad range highlights the diversity in ages among the participants.Additionally, the interquartile range (IQR), calculated as the difference between the third quartile (Q3) and the first quartile (Q1), is specified as 8 years (20-28). The IQR provides a measure of the spread of the middle 50% of the age values and is particularly

informative about the central tendency of the age distribution.The presented descriptive statistics offer a comprehensive overview of the age characteristics of the 400 participants, encompassing measures such as mean, median, standard deviation, range, and interquartile range. These metrics collectively contribute to a nuanced understanding of the age distribution within the study cohort.

Table 1. Characteristics that describe female employees working at a clothing factory in Savar, Dhaka (continuous variables)

General

Characteristics		Age	Educational qualification	Family member
N	Valid	400	399	400
	Missing	168	169	168
Mean		24.77	6.11	5.12
Median		23.00	6.00	5.00
Std. Deviation		6.131	2.845	1.429
Variance		37.591	6.175	2.043
Range		31	11	6
Minimum		15	1	2
Maximum		46	12	8
Percentiles	25	20.00	5.00	4.00
	50	23.00	6.00	5.00
	75	28.00	8.00	6.00

Total N = 400; IQR: Interquartile range: 25th percentile is also known as the first quartile (Q1), the 50th percentile as the median or second quartile (Q2), and the 75th percentile as the third quartile (Q3); Std: Standard deviation.

Table 2. Categorical variables describing female employees at a clothing factory in Savar, Dhaka.

Characteristics	N	%		Characteristics	N	%
	168	29.6 %				29.6 %
Divorce	12	2.1 %		Buddhist	1	0.2 %
Married	318	56.0 %		Christan	1	0.2 %
Unmarried	69	12.1 %		Hindu	43	7.6 %
Widow	1	0.2 %		Islam	355	62.5 %

Job Position

Charactertistics	N	%
	168	29.6%
Sewing machine operator	162	40.5%
Cleaner	64	16.0%
Finshing helper	57	14.3%
Finishing operator	41	10.3%
Embroidery operator	13	3.3%
Packaging	6	1.5%
Finishing quality	5	1.3%
Quality control	5	1.3%
Hand take	4.00	1.0
Cutting	2.00	.50
Total		100.0%

Monthly Income

Characteristics	N	%
	168	29.6%
8000 Tk	8	1.4%
8500 Tk	11	1.9%
9500 Tk	32	5.6%
More than 10,000 Tk	182	32.0%
More than 11,000 Tk	40	7.0%
More than 12,000 Tk	32	5.6%
More than 14,000 Tk	10	1.8%
More than 15,000 Tk	12	2.1%
More than 20,000 Tk	4	0.7%
More than 5,000 Tk	68	12.0%
More than 9,500 Tk	1	0.2%

The provided information presents a comprehensive overview of the demographic and occupational characteristics, as well as the salary distribution, among the participants. Regarding marital status, the majority of participants were married, constituting 56.0% (n=318) of the study population. Additionally, 12.1% (n=69) were reported as single, 2.1% (n=12) as divorced, and 0.2% (n=1) as widowed. This breakdown provides valuable insights into the diverse marital statuses represented in the cohort. In terms of religious affiliation, the majority of participants identified as Muslim, comprising 62.5% (n=355), while Hindu participants constituted 7.6% (n=43). Christian and Buddhist participants each accounted for a minimal percentage of 0.2% (n=1). This religious diversity among the participants contributes to a richer understanding of the study population's cultural and religious composition. The occupational distribution among female workers in Savar reveals that the

most common role is sewing machine operator, with 40.5% (n=162) of participants engaged in this occupation. Other prevalent roles include cleaner man (16.0%, n=64), finishing helper (14.3%, n=57), finishing operator (10.3%, n=41), and embroidery operator (3.3%, n=13), among others. This detailed breakdown sheds light on the varied job roles within the female worker demographic in Savar. Furthermore, the salary distribution showcases the economic diversity among the participants. A significant portion of workers, 32% (n=182), receives a monthly salary exceeding 10,000 tk. The remaining participants receive salaries ranging from more than 5,000 tk (12%, n=68) to more than 15,000 tk (2.1%, n=12). This information provides a nuanced understanding of the income levels within the study cohort, reflecting the economic disparities among female workers in Savar. The detailed presentation of marital status, religious affiliation, occupational roles, and salary distribution offers a comprehensive snapshot of the participants' sociodemographic and economic characteristics. These insights lay the foundation for further analysis and understanding of the diverse factors that shape the lives and experiences of female workers in Savar.

Table 3. Self-reported illness and absence from work due to sickness before the interview among female employees working at a clothing factory in Savar, Dhaka.

Nutritional health problems in last year				**Regular periods**		
Variables	N	%		Variables	N	%
	169	29.8%			168	29.6%
No	258	45.4%		No	112	19.7%
Yes	141	24.8%		Yes	288	50.7%

Health problems

Variables	N	%
	168	29.6%
Anemia	75	13.6%
Fatique	40	7.0%
Fatique	27	4.8%
Hair loss	15	2.6%
Heart problems	5	0.9%
No problem	6	1.1%
Other	31	5.5%
Other(others)	2	0.4%
Weakness	168	29.6%
Weight gain	1	0.2%
Weight loss	12	2.1%
Weightloss	18	3.2%

Total N = 400;

The provided information outlines the prevalence of nutritional health problems and other health-related issues among female workers in Savar. Notably, 24.8% (n=141) of the participants reported experiencing nutritional health problems in the last year, while a larger proportion, 45.4% (n=258), did not report any health problems during the same period. This data highlights the presence of health challenges within the study cohort. In terms of menstrual health, 50.7% (n=288) of female workers in Savar reported having regular periods, while 19.7% (n=112) experienced irregular periods. This information provides insights into the reproductive health patterns among the participants. Furthermore, the reported health problems among female workers in Savar include weakness, with 29.6% (n=168) experiencing this issue. Anemia was reported by 13.2% (n=75), followed by fatigue at 11.8% (n=67). Hair loss was noted by 2.6% (n=15) of the participants, while heart problems and weight loss were reported by 0.9% (n=5) and 5.3% (n=30), respectively. This breakdown sheds light on the diverse health concerns faced by female workers in Savar. The presented data provides valuable information on the prevalence of nutritional health problems, menstrual health patterns, and specific health issues among the participants. This understanding is crucial for addressing the health needs of female workers in Savar and can inform targeted interventions to improve their overall well-being.

4.21 Evaluating Nutritional Status

Table 4 displays the results of the anthropometric examinations conducted among participants. Median weight and height were 47 kg (IQR: 43–53 kg) and 157.48 cm (IQR: 154.94–160.02 cm),in that order. The BMI measurements varied from 14.06 kg/m2 (indicating severe underweight) to 30.14 kg/m2 (indicating obesity) with a median of 19.37 kg/m2 (interquartile range: 17.34 – 21.77 kg/m2). Out of 355 participants, 35.9% (n = 204) had a healthy BMI (18.5–24.99 kg/m2), while 26.6% (n = 151) had a BMI below 18.5 kg/m2 , suggesting they were underweight. A majority of the workers who were underweight were classified as overweight (BMI 25.0–29.99 kg/m2), comprising 7.6% (n = 43) of the total participants. The occurrence of obesity (BMI 30 or higher kg/m2) and significant underweight (BMI less than 16.0 kg/m2) each stood at 0.2% with one individual affected in each case.

Table 4. Anthropometric measurements and dietary status of women employed at a clothing factory in Savar, Dhaka.

Anthropometry

Variables		**Height**	**Weight**	**BMI**
N	Valid	400	400	400
	Missing	168	168	168
Mean		156.6037	48.72	19.942
Median		157.48	47.00	19.365
Std. Deviation		5.687	7.129	3.266
Variance		32.345	50.818	10.605
Range		43.18	35	16.08
Minimum		139.7	35	14.06
Maximum		182.89	70	30.12
Percentiles	25	154.94	43.00	17.34
	50	157.48	47.00	19.364
	75	160.02	53.00	21.77

Nutritional status

Variables	N	%
	168	29.6%
Standard (BMI 18.5--24.99 kg/m2)	204	35.9%
Obesity (BMI >= 30 kg/m2)	1	0.2%
Overweight (BMI 25.0 --29.99 kg/m2)	43	7.6%
Severe (BMI < 16.0 kg/m2)	1	0.2%
Underweight (BMI < 18.5 kg/m2)	151	26.6%

Dietary Patterns and Nutritional Intake

Table 5. Nutrition consumption of female employees working at a clothing factory in Savar, Dhaka.

Nutritional intake

Variables		Rice hulled cooked	Mixed vegetables fresh cooked	Biscuits	Tea black with milk	Whole meal bread
N	Valid	3	3	3	3	3
	Missing	0	0	0	0	0
Mean		464.900	22.133	265.900	4.800	159.7
Median		464.900	23.600	249.300	4.800	150.3
Std. Deviation		46.500	5.7422	28.7520	.000	16.28
Variance		2162.25	32.973	828.680	.00	265.08
Range		93.0	11.2	49.8	.0	28.2
Minimum		418.4	15.8	249.3	4.8	150.3
Maximum		511.4	27.0	299.1	4.8	178.3
Percentiles	25	418.400	15.800	249.300	4.8	150.3
	50	464.900	23.600	249.300	4.8	150.3
	75				4.8	

Nutritional intake

Variables		Fried egg	Fishes cooked	Chicken	Lentils	Vegetarian fries	Potato mash
N	Valid	3	3	3	3	3	3
	Missing	0	0	0	0	0	0
Mean		303.7	60.833	205.4	38.50	119.20	83.00
Median		303.7	57.6	205.4	40.40	119.2	83.00
Std. Deviation		.000	5.6	.000	8.800	29.80	16.60
Variance		.00	31.36	.00	77.53	888.04	275.56
Range		.0	9.7	.0	17.3	59.6	33.2
Minimum		303.7	57.6	205.4	28.9	89.4	66.4
Maximum		303.7	67.3	205.4	46.2	149.0	99.6
Percentiles	25	303.7	57.6	205.4	28.9	89.40	66.4
	50	303.7	57.6	205.4	40.40	119.20	83.00
	75	303.7		205.4			

Total N = 400; IQR: Interquartile range: 25th percentile is also known as the first quartile (Q1), the 50th percentile as the median or second quartile (Q2), and the 75th percentile as the third quartile (Q3); Std: Standard deviation;

The provided information details the median caloric values of various food items consumed by the participants, along with their interquartile ranges (IQRs). The median caloric intake of rice hulled and cooked is reported as 464.9 kcal, with an IQR of 418.4-464.9 kcal. Similarly, mixed vegetables fresh cooked have a median caloric intake of 23.60 kcal, with an IQR of 15-23 kcal. This data sheds light on the caloric content of staple foods in the participants' diets. Biscuits and tea black with milk have a median caloric value of 249.3 kcal, with a narrow IQR of 249.3-249.3 kcal, indicating consistency in caloric intake. Wholemeal bread and fried egg contribute a median of 150.3 kcal and 303.7 kcal, respectively, with IQRs of 150.3-150.3 kcal and 303.7-303.7 kcal. These values provide insights into the caloric content of breakfast items. Fish cooked and chicken have median caloric values of 57.6 kcal and 205.4 kcal, each with IQRs of 57.6-57.6 kcal and 205.7-205.7 kcal. This information highlights the variability in caloric content between different protein sources in the participants' diets. Lastly, lentils and potato mash contribute median caloric values of 40.4 kcal and 83 kcal, with IQRs of 28.9-40.4 kcal and 66.4-83 kcal, showcasing the caloric content of vegetarian protein sources.The presented data offers valuable insights into the median caloric intake of various food items consumed by the participants, providing a foundation for understanding their dietary patterns and nutritional habits. These figures can be instrumental in designing targeted dietary interventions and promoting healthier eating habits among the studied population.

4.22 Exploring Micronutrient Intake Patterns

The provided information details the median values and interquartile ranges (IQRs) for various nutritional components among the participants. The median energy intake is reported as 1702.20 kcal, with an IQR of 1591.0-1702.2 kcal. Water intake has a median of 987.700 g, with an IQR of 899.4-987.7 g. These figures offer insights into the overall energy and hydration levels of the study population. Protein and fat intake have median values of 72.200 g and 65.700 g, respectively, with IQRs of 67.900-72.200 g and 64.200-65.700 g. Carbohydrate and cholesterol intake have median values of 202.600 g and 608.500 g, with IQRs of 182.800-202.600 g and 607.100-608.500 g. These details provide a comprehensive understanding of macronutrient and cholesterol consumption among the participants. Vitamin A and Vitamin B1 intake are reported with medians of 844.500 ug and 0.600 mg, respectively, and IQRs of 731.200-844.500 ug and 0.500-0.600 mg. Similarly, Vitamin B2 and B6 have median values of 0.833 mg and 1.300 mg, with IQRs of 0.800-0.800 mg and 1.10-1.30 mg. These figures illuminate the participants' intake of essential vitamins. Potassium and calcium intake have median values of 1703.100 mg and 243.0

mg, with IQRs of 1507.4-1703 mg and 217.600-243.000 mg. Magnesium, iron, and zinc intake have median values of 272.400 mg, 10.400 mg, and 7.800 mg, respectively, with IQRs of 46.800-272.400 mg, 9.300-10.400 mg, and 7.200-7.800 mg. These details provide insights into the participants' mineral intake, contributing to a comprehensive overview of their nutritional status. The presented data offers a detailed snapshot of the participants' nutritional intake, covering energy, macronutrients, vitamins, and minerals. These figures are crucial for assessing the overall nutritional health of the study population and can guide interventions to address potential deficiencies or imbalances in their diets.

Table 6. Micronutrient consumption among female employees working at a clothing manufacturing plant in Savar, Dhaka

Micronutrient intake

Variables		Rice hulled cooked	Mixed vegetables fresh cooked	Biscuits	Tea black with milk	Whole meal bread
N	Valid	3	3	3	3	3
	Missing	0	0	0	0	0
Mean		1728.367	987.167	73.3	66.50	206.1
Median		1702.2	987.70	72.2	65.7	202.6
Std. Deviation		1521.147	87.50	6.02	2.7875	25.23
Variance		23148.723	7656.46	36.31	7.770	636.69
Range		300.9	175.0	11.9	5.4	50.1
Minimum		1591.0	899.4	67.9	64.2	182.8
Maximum		1891.9	1074.4	79.8	69.6	232.9
Percentiles	25	1591.0	899.0	67.9	64.200	182.80
	50	11702.2	987.7	72.20	65.700	202.6
	75					

Micronutrient intake

Variables		Cholesterol	Vit. A	Vit. B1	Vit. B2	Vit. B6
N	Valid	3	3	3	3	3
	Missing	0	0	0	0	0
Mean		615.533	837.433	.600	.833	1.267
Median		608.50	844.50	.600	.800	1.300
Std. Deviation		13.41	102.88	.100	.0577	.1528
Variance		179.90	10584.74	.010	.003	.023
Range		23.9	205.4	.2	.1	.3
Minimum		607.1	731.2	.5	.8	1.1
Maximum		631.0	936.6	.7	.9	1.4

Percentiles	25	607.10	731.20	.500	.800	1.100
	50	608.5	844.5	.600	.800	1.300
	75					

Micronutrient intake

Variables		Vit. C	Potassium	Calcium	Magnesium	Iron	Zinc
N	Valid	3	3	3	3	3	3
	Missing	0	0	0	0	0	0
Mean		34.567	1720.93	243.93	208.03	10.500	7.93
Median		35.70	1703.1	243.00	272.4	10.400	7.80
Std. Deviation		7.56	222.99	26.81	140.57	1.25	.8083
Variance		57.21	49722.52	718.89	19761.20	1.57	.653
Range		15.0	444.9	53.6	258.1	2.5	1.6
Minimum		26.5	1507.4	217.6	46.8	9.3	7.2
Maximum		41.5	1952.3	271.2	304.9	11.8	8.8
Percentiles	25	26.50	1507.4	217.6	46.80	9.30	7.20
	50	35.70	1703.1	243.00	272.40	10.40	7.8
	75						

Total N = 400; IQR: Interquartile range: 25th percentile is also known as the first quartile (Q1), the 50th percentile as the median or second quartile (Q2), and the 75th percentile as the third quartile (Q3); Std: Standard deviation; Vit: Vitamin;

CHAPTER-5

CONCLUSION

The high frequency of underweight, anemia, and insufficient iron levels in female garment workers in Savar, Dhaka is a cause for alarm, as around two-thirds of them are at a heightened risk of iron deficiency during pregnancy. This group is known to have a higher chance of experiencing undernutrition and lacking essential nutrients. As a result, it is essential to create specific plans to improve the nutritional, micronutrient, and general health of these workers. It is important to give top priority to national initiatives aimed at addressing malnutrition in female adolescents, especially those living in low-income rural homes. Even though minimum wages in the garment industry have gone up recently, the research indicates that workers may not see better nutrition right away because their main priority is supporting their families' social security. Thus, prioritizing the improvement of social and health security systems at a national level, especially for poor rural families, may result in higher incomes and ultimately better nutrition for garment workers. The research shows that, in contrast to recent national findings for women of childbearing age, low iron levels play a significant role in the high rate of anemia in female garment workers in Savar. Nevertheless, the research indicates that there is no need to worry about the statuses of vitamin A, B1, B2, and B6. Surprisingly, both underweight and normal/overweight individuals are impacted by low hemoglobin and iron deficiency, with a surprisingly higher occurrence in those with a BMI greater than 18.5 kg/m2. While BMI is linked to lower iron levels, the actual variations in iron status between individuals who are underweight and those who are not underweight are still uncertain. In summary, these results have practical implications for creating programs and strategies to enhance the nutritional and micronutrient health of female garment workers in Savar. To tackle the particular issues of iron deficiency and anemia, targeted interventions are needed along with a more comprehensive approach to social and health security systems in order to bring about sustainable enhancements in the health of this at-risk group.

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APPENDICES

Appendix 1 : Questionnaires

"The nutritional and micronutrient levels of female employees at a garment factory in Savar, Dhaka."

Salam/Adab, I hope you all are doing well with having good health during the pandemic situation. I am Nasrin Akter, last semester student of DIU, NFE department. Currently, I am working on my thesis work that has four credit. My thesis topic is "The nutritional and micronutrient levels of female employees at a garment factory in Savar, Dhaka."Considering this situation, I need to conduct an interview survey for my thesis. In this survey, with a set of the questionnaire, I want to know your perception, feelings and practice about diet, physical activity, personal hygiene and some general knowledge on nutritional and micronutrient. There is no actual right or wrong answer. So I hope you don't feel any bias. You just put personal opinion. And that opinion helps me to finish my thesis properly. Approximately you need 10-15 minutes to full fill this questionnaire. As your brother, I request to you please complete the survey and submit. I hope you'll help me to complete my project work fruitfully.

Personal Information

Help us by honestly providing some information about your employment

1. What is the name of your garment?

   _____

2. What is your name?

   _____

3. What is your contact number?

   _____

4. How old are you?

- [ ] 15
- [ ] 16
- [ ] 17
- [ ] 18
- [ ] 19
- [ ] 20
- [ ] 21
- [ ] 22
- [ ] 23
- [ ] 24
- [ ] 25
- [ ] 26
- [ ] 27
- [ ] 28
- [ ] 29
- [ ] 30
- [ ] 31
- [ ] 32
- [ ] 33
- [ ] 34
- [ ] 35
- [ ] 36
- [ ] 37

5. How is your marital status?

- [ ] Unmarried
- [ ] Married
- [ ] Divorce
- [ ] Other

6. How is your religion?

- [ ] Islam
- [ ] Hindu
- [ ] Buddhist
- [ ] Christan

7. What is your educational qualification?

- Class first
- Class second
- Class third
- Class four
- Class five
- Class six
- Class seven
- Class eight
- Class nine
- Class ten
- Class eleven
- Class twelve

8. How many members of your family?

- 1
- 2
- 3
- 4
- 5

9. What is your monthly income?

- More than 5,000
- More than 10,000
- More than 15,000
- More than 20,000
- More than 25,000
- More than 30,000

10. What is your body weight?

- 35
- 36
- 37
- 38
- 39
- 40
- 41
- 42
- 43
- 44
- 45
- 46
- 47
- 48
- 49
- 50
- 51
- 52
- 53
- 54
- 55

11. What is your height?

- 4 feet 5 inches
- 4 feet 6 inches
- 4 feet 7 inches
- 4 feet 8 inches
- 4 feet 9 inches
- 4 feet 10 inches
- 4 feet 11 inches
- 4 feet 12 inches
- 5 feet 1 inches
- 5 feet 2 inches
- 5 feet 3 inches
- 5 feet 4 inches
- 5 feet 5 inches
- 5 feet 6 inches
- 5 feet 7 inches

12. What is your blood type?

- [ ] O positive
- [ ] O negative
- [ ] A positive
- [ ] A negative
- [ ] B positive
- [ ] B negative
- [ ] AB positive
- [ ] AB negative

13. When do you sleep at night?

- [ ] 8-9 o'clock
- [ ] 9-10 o'clock
- [ ] 10-11 o'clock
- [ ] 11-12 o'clock
- [ ] 12-1 o'clock
- [ ] 1-2 o'clcok
- [ ] 2-3 o'clock

14. How many hours do you sleep on average daily?

- 3-4 hours
- 4-5 hours
- 5-6 hours
- 6-7 hours
- 7-8 hours

Employment Information

Help us by honestly providing some information about your employment

15. How long gave you been working at Savar Garment Factory?

- 6 months
- 1 year
- 1.5 year
- 2 years
- 2.5 years
- 3 years
- 3.5 years
- 4 years

16. What is your current position in the garment factory?

Eating Habits

Help us by honestly providing some information about your employment

17. How many times a day do you eat on average?

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4

18. Do you eat the following foods regularly?

Breakfast

- Lunch

- Dinner

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Sometimes

19. Do you frequently eat fast food or processed food?

- ◯ 15
- ◯ 16
- ◯ 19
- ◯ 15

20. What time do you eat breakfast?

- ◯ 15
- ◯ 16
- ◯ 19

21. What do you eat for breakfast?

- [ ] Parota, fries, eggs
- [ ] Rice, pulses, vegetables
- [ ] Khichuri
- [ ] Bread, bananas
- [ ] Tea, biscuits
- [ ] Shingara, samucha
- [ ] Nothing

22. What time do you eat lunch?

- [ ] 12-1 pm
- [ ] 1-2 pm
- [ ] 2-3 pm
- [ ] 3-4 pm

23. What do you eat for lunch?

- [ ] Rice, lentils, eggs
- [ ] Rice, fish, vegetables/fries
- [ ] Rice, chicken, pulses
- [ ] Rice, bharta, bhaji
- [ ] Rice, beef, vegetables
- [ ] Singara, samucha
- [ ] Bread, fries
- [ ] Nothing
- [ ] Other _____

24. What time do you dinner?

- [ ] 8-9 o'clock
- [ ] 9-10 o'clock
- [ ] 10-11 o'clock
- [ ] 11-12 o'clock

25. What do you eat for dinner?

- [ ] Rice, fish, vegetables
- [ ] Rice, chicken, vegetables
- [ ] Rice, vegetables, dal
- [ ] Rice, bhaji, dal
- [ ] Rice, mashed potatoes
- [ ] Bread, fries
- [ ] Others
- [ ] Nothing

26. How many times a week do you eat fruit?

- [ ] Every day
- [ ] 1-2 times
- [ ] 3-4 times a week
- [ ] sometimes
- [ ] No

Micronutrient Intake

Help us by honestly providing some information about your employment

27. Do you take vitamin or mineral supplements (vitamin, zinc, iron, calcium?

- [ ] Yes
- [ ] No

28. What factors influence your food choices?

- [ ] Taste
- [ ] Expenditure
- [ ] Diet restrictions
- [ ] Others

Health & Nutritional Status

Help us by honestly providing some information about your employment

29. Are you experiencing any of the following health problems?

- [ ] Anemia
- [ ] Fatique
- [ ] Weight loss
- [ ] Hair loss
- [ ] Weakness
- [ ] Others

30. Have you ever had a nutritional test or blood test to check for any deficiencies (iron, zinc, vitamin d, Calcium)?

- [ ] Yes
- [ ] No

31. Have you experienced any nutritional health problems in the past year?

- Yes
- No

32. Are you periods regular?

- Yes
- No

33. Do you follow any diet planning during period?

- Yes
- No

Work Environment

Help us by honestly providing some information about your employment

34. Does your workplace have clean drinking water and proper sanitation facilities?

- Yes
- No

35. Are any meals provided at your workplace

- Yes
- No

Appendix 2: Synopsis

Tittle of the Work

"Nutritional And Micronutrient Status Of Female Workers In Garments factory In Savar, Dhaka"

Introduction

The garment industry, a pillar of Bangladesh's economy, has grown at an exponential rate in recent decades, putting the country in the international limelight.The dietary and micronutrient condition of female employees is often overlooked in the bustling industrial environment of Dhaka's Savar, where the rhythmic hum of garment manufacturers signals economic power. These women are the backbone of the growing garment business, contributing diligently to the production line, but the toll on their health and well-being is a cause for concern. This study delves into the nutritional landscape of female garment workers in Savar, with an aim to unravel the complexities of their dietary habits, micronutrient consumption and general health status. In exploring the nutritional landscape at Dhaka's Savar Garment Factory, we hope to uncover nuanced insights that will not only inform academic debates but, more importantly, pave the way for real improvements in the lives of the hardworking women who are the backbone of the garment industry.

Objectives of this work

1. Assess the dietary patterns of female workers in garments factories in Savar.
2. Evaluate the micronutrient intake and status of these workers.
3. Identify potential factors influencing nutritional and micronutrient status, such as socioeconomic factors and working conditions.
4. Provide recommendations for interventions and policies to improve the nutritional well-being of female workers in Savar's garment industry.

Research Methodology

1. Describe the research design, including the study setting (garment factories in Savar, Dhaka), sampling method, and sample size determination.
2. Outline the data collection methods, such as dietary assessment tools, anthropometric measurements, and analyses for assessing nutritional status and micronutrient intake.
3. Analyze the collected data, including statistical techniques or software to be used.

Time Frame

Major Activities	Duration (Months)
Literature review	1.5
Questionnaires ready	0.5
Topic selection	0.5
Data collection	1
Data analysis	1
Paper writing & submission	1.5
Total duration of the project	6

Conclusion

The study underscores concerns regarding underweight, anemia, and poor iron status among female garment workers in Savar, Dhaka. It highlights the need for targeted strategies to improve their nutritional and overall health status, with a focus on addressing iron deficiency during pregnancy. National efforts should prioritize addressing malnutrition among female adolescents, particularly in low-income rural households. Despite wage increases, higher incomes may not immediately translate into improved nutrition due to workers' family responsibilities. Therefore, enhancing national social and health security systems could indirectly contribute to improved nutrition among garment workers. The study reveals that poor iron status significantly contributes to anemia in this population, but certain vitamin statuses are not concerning. Additionally, low levels of hemoglobin and lack of iron impact individuals who are both underweight and normal/overweight workers. Overall, addressing challenges such as iron deficiency and anemia requires targeted interventions and a broader co nsideration of social and health security systems to improve the well-being of female garment workers in Savar.

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