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# Exploring the Food Security and Dietary Diversity Situation: A Comparative Analysis between Bangladeshi Immigrants Currently Residing in Lund, Sweden and Their Previous Residence in Bangladesh.

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# ABSTRACT

The purpose of this study was to compare the food security and dietary diversity status of Bangladeshi immigrants living in Sweden to their position in Bangladesh. Structured surveys were used to collect data from 15 Bangladeshi immigrants, which included demographic information as well as indices of food security and dietary diversity. Food security was assessed using the Household Food Insecurity Access Scale (HFIAS), while dietary variety was examined using the Household Dietary variety Score (HDDS).

The descriptive analysis of the study revealed that the mean HDDS score for participants residing in Bangladesh was slightly higher than their mean HDDS scores in Sweden. This shows that Bangladeshi immigrants in Sweden can maintain the same level of nutritional diversity as they had in Bangladesh. However, participants in Sweden had higher mean HFIAS ratings than those in Bangladesh, indicating a higher incidence of food insecurity among Bangladeshi immigrants in Sweden.

The study used the social ecological model, which takes into account individual, interpersonal, communal, and societal aspects, to investigate the causes contributing to food insecurity among Bangladeshi immigrants in Sweden. Language hurdles, cultural differences, socioeconomic issues, religious restrictions, and the food environment were identified as factors influencing food diversity and food poverty in a thematic analysis of interview data.

The study's conclusions have significant policy consequences. Policymakers can design targeted interventions and policies to reduce food insecurity among Bangladeshi immigrants in Sweden by identifying the variables that contribute to it. Improving linguistic support, overcoming cultural obstacles, resolving socioeconomic issues, offering culturally acceptable food selections, and improving the entire food environment are some examples. Ultimately, the goal is to improve Bangladeshi immigrants' food security and dietary diversity status in Sweden, as well as to boost their overall health and well-being.

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## List of Abbreviations

- SDGs: Sustainable Development Goals
- FAO: Food and Agriculture Organization
- IFAD: International Fund for Agricultural Development
- UNICEF: United Nations Children's Fund
- WFP: World Food Program
- WHO: World Health Organization
- n.d.: No date (used for a publication without a specified date)
- HDDS: Household Dietary Diversity Score
- HFIAS: Household Food Insecurity Access Scale
- SCB: Statistics Sweden
- IOM: International Organization for Migration

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# CHAPTER ONE

## 1. Introduction

Food security and dietary diversity are two important aspects of nutrition that have significant implications for health and well-being (Bellon & Ntandou-Bouzitou, 2016). According to the World Food Program (2020), In the mission of achieving Sustainable Development Goals (SDGs), food security is one of the vital points, without which SDG,s cannot be achieved. For ending hunger, reducing malnutrition, and promoting health and well-being ensuring food security is a must ("SDG Goal 2: Zero Hunger," n.d.). Food insecurity is not the issue of any single country, rather almost 820 million people from the entire world are being suffering from this issue, only in 2018 (FAO, IFAD, UNICEF, WFP, & WHO, 2019). Particularly the immigrants are more vulnerable toward food insecurity (International Organization for Migration, n.d.). As a Result, Bangladeshi immigrants currently residing in Sweden, are facing the similar situation, in terms of food security. (Ahmed & Rahman, 2020). Even though, Sweden is a high-income country with a well-developed welfare system, not all group of people are equally secured in terms of food (Nordic Council of Ministers, 2018). The lack of access to culturally appropriate foods, limited economic resources, and language barriers are some of the factors that may contribute to food insecurity among immigrants in Sweden (Nordic Council of Ministers, 2018).

Food security is defined as “a situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 1996). On the other hand, food insecurity refers to the limited or uncertain access to adequate food due to various factors such as poverty, inequality, and social exclusion (Alaimo et al., 1998). Due to lack of economic resources, insufficient social resources, not having accessibility in culturally appropriate food most immigrants are being at the risk of food insecurity (Nord, 2007). A person should take a diet which is diverse as the essential nutrients and micronutrients can

be found in not in any one type of food, rather a variety of food is necessary for maintaining a good health and for avoiding many diseases (FAO & FHI 360, 2016). Moving to a new country is not easy, and it can impact the dietary habits of the people who are moving to a new country. (Ahrén-Moonga & Hörnell, 2017). This may lead to changes in dietary habits and food choices, which can have implications for the health of immigrants (Drewnowski, 2005). The social ecological theory, which has been used as a theoretical framework in this study will better explain the factors that can contribute to this insecurity (Bronfenbrenner, 1979).

Despite the growing number of Bangladeshi immigrants in Sweden, there is a lack of research on the food security and dietary diversity status of this population group. Therefore, this study aims to conduct a comparative analysis of the food security and dietary diversity of Bangladeshi immigrants currently residing in Sweden with the dietary diversity when they were living in Bangladesh. For serving that purpose a section of this study will describe the findings of this study on the food diversity and food security of Bangladeshi immigrants living in Lund, Sweden. As the sample size is small it will only give an overview of the situation of food security and food diversity of the entire community. It includes a summary of the demographic characteristics of the 15 participants, as well as their Household Dietary Diversity Score (HDDS) and Household Food Insecurity Access Scale (HFIAS) scores before and after their migration to Sweden (Kennedy, et al.2011) To provide a comprehensive perspective of the data, descriptive statistics such as Mean, Range, and Standard Deviation will be displayed (Creswell, 2014). In addition, the frequency distribution of the four associated scores will be displayed to further illustrate the data trend and direction of change. A scientific test will also be introduced to compare the mean HDDS and HFIAS scores.

## 1.1 Research Problem

Not having enough information about the immigrant Bangladeshi people food security and dietary situation, residing in Lund, Sweden can make it less clear

about their nutritional well-being and the variables that contribute to their food situation (Blakely, et al. 2011). Also, Food insecurity and a lack of nutritional diversity have serious health consequences. Malnutrition, vitamin shortages, and poor physical and mental health consequences can all result from food insecurity (FAO, 2018). Individual productivity and general well-being might be hampered by a lack of access to sufficient and nutritious food (FAO, 2018). Obesity, diabetes, and cardiovascular disease can be the consequence of not having enough diverse food (FAO, 2016). This can also have serious social and societal consequences among Bangladeshi immigrants in Sweden (FAO, 2016). A cycle of poverty and inequality, especially among marginalized immigrant populations can be produced by this situation as Malnutrition and ill health can reduce production, raise healthcare expenses, and place a strain on social assistance systems (FAO, 2016). Even the immigrants can suffer from overweight and obesity as it is led by poor food choices, as these people must go through cultural adaptation, food availability, and affordability etc. issues, their dietary patterns and food choices are often impacted (Lee et al., 2017; Tuomisto & Edvardsson, 2019).

## 1.2 Purpose and significance of this study

This study is significant because, it can be used as an exploring agent of how migration can have an impact of the food security and dietary diversity situation of Bangladeshi immigrants living in Sweden compared to when they were living in Bangladesh. Factors such as food availability, affordability, and accessibility can be understood by this study. Bangladeshi immigrants often face many difficulties regarding food, it's not easy for them to maintain the same pattern of food habit or finding the traditional food in a foreign country, so this study will help to identify those challenges, faced by the immigrants (Ahmed & Rahman, 2020). According to the socio-ecological model proposed by Bronfenbrenner (1979), health behaviors and outcomes are shaped by multiple levels of influence, including individual, interpersonal, community, and structural factors. Understanding the factors that contribute to food insecurity among Bangladeshi immigrants in Sweden is significant because it can help identify the barriers that prevent

immigrants from accessing healthy and culturally appropriate food. The study can help policymakers and service providers to develop effective strategies to improve food security and promote healthy eating habits among immigrant populations. The study can also help create awareness among the broader public about the challenges faced by immigrant communities in maintaining their food traditions and dietary practices. Overall, the study can contribute to promoting social inclusion and equitable access to food among immigrant populations.

## 1.3Research Aim\Questions

This study aims to compare the food security and dietary diversity status of Bangladeshi immigrants living in Sweden with the status when they were living in Bangladesh. Specifically comparing their current situation with the situation, they had when they were living in Bangladesh. The study also aims to identify and evaluate the factors that contribute to the food insecurity issue and explore potential solutions to improve the situation.

- What is the food security and dietary diversity situation of Bangladeshi immigrants living in Lund, Sweden compared to when they were living in Bangladesh?
- What are the factors that shape Bangladeshi immigrants' food environments and dietary situation?

## 1.4 Background of the study

Bangladesh is a developing country with significant challenges related to food security and nutrition (Ahmed et al., 2020). Bangladesh has been working toward poverty reduction and food security for several years, the situation is better than before but not all group of people are getting the same benefits, the condition of some group of people is remaining the same UNICEF, 2021). The country has a population over 160 million people, under nutrition, malnutrition and food insecurity is a common problem in Bangladesh (World Bank, 2021). Bangladeshi immigrants residing in other countries also face challenges related to food security

and dietary diversity, which can impact their health and well-being (Islam et al., 2021). The immigrants who are residing in other countries can have difficulty to even accessing nutritional or diverse food (Hossain et al., 2017).

Sweden is a popular destination for Bangladeshi immigrants, with over 7,500 Bangladeshis living in Sweden as of 2021 (SCB, 2021). There is not much information about the food security and dietary status of those immigrants who are residing in Sweden both as citizens and non-citizens. (Hossain et al., 2017; Lee et al., 2017; Tuomisto & Edvardsson, 2019). Understanding these factors is crucial for addressing food security and dietary diversity challenges faced by Bangladeshi immigrants in Sweden. This is an important research gap, that needs to be addressed because for maintaining a healthy life, the nutrition intake in daily life is crucial, which can be ensured by the food security and dietary diversity (FAO, 2018; WHO, 2021). This study is crucial as Understanding the food habits, preferences, and access to food of Bangladeshi immigrants in Sweden is crucial for addressing these challenges and promoting food security and dietary diversity among this population.

**Food security status in Bangladesh**

Income inequality and social inequities are some of the factors lead to food availability and dietary diversity gaps in Bangladesh (Biswas et al., 2019). Because of improved market infrastructure, urban locations may have greater access to a wider range of foods, but rural areas may have availability and affordability constraints (Rahman, 2018). In this country Food choices and consumption patterns are also influenced by socio-cultural behaviors, religious beliefs, and nutritional preferences (Islam et al., 2018).

**Migration and food security**

Migration is an important issue that effects people's food security and dietary diversity (Smith et al., 2019). A migrant is someone who moves from their home nation to another country or region for a variety of reasons, such as improved economic opportunities, escaping conflict or persecution, or reuniting with family

members (International Organization for Migration [IOM], 2021). A considerable proportion of Bangladeshi migrants in Sweden had poor educational attainment levels, with the majority having just attended basic or secondary school (Islam, 2021). This shows that educational gaps among Bangladeshi migrants in Sweden may exist.

# CHAPTER TWO

## 2. Theoretical framework

### 2.1 Social ecological theory

Social ecological theory, proposed by Bronfenbrenner (1979), provides a thorough framework for studying human growth and behavior. According to the author Individuals are not independent entities but rather exist inside complex systems of interactions and relationships with their environments. The theory, according to Bronfenbrenner (1979), emphasizes the dynamic interplay between individuals and their social and physical environments, acknowledging that development is influenced by several levels of ecological systems. The concept of the individual integrated among many interrelated systems is central to social ecology theory. The macrosystem, exosystem, mesosystem, microsystem, and individual levels are among them (Bronfenbrenner, 1979). The macrosystem represents the larger cultural and socioeconomic influences that influence people' growth, such as cultural values, beliefs, and customs. Economic systems, political structures, and historical circumstances all impact people's experiences and chances (Bronfenbrenner, 1979)

The term "exosystem" refers to external environments that have an indirect impact on the development of persons. Institutions, organizations, and systems are examples of contexts in which individuals may not directly engage but nevertheless have an impact (McLeroy et al., 1988). Extended family networks, mass media, and the school system are examples of exosystems (ibid).

The mesosystem investigates the links and interactions between several microsystems in a person's life. It emphasizes on how diverse environments, such as family, peers, school, and religious institutions, influence individuals' development (Bronfenbrenner, 1979). The mesosystem highlights that the effects of these several contexts are interrelated and shape an individual's experiences and development (Bronfenbrenner, 1979).

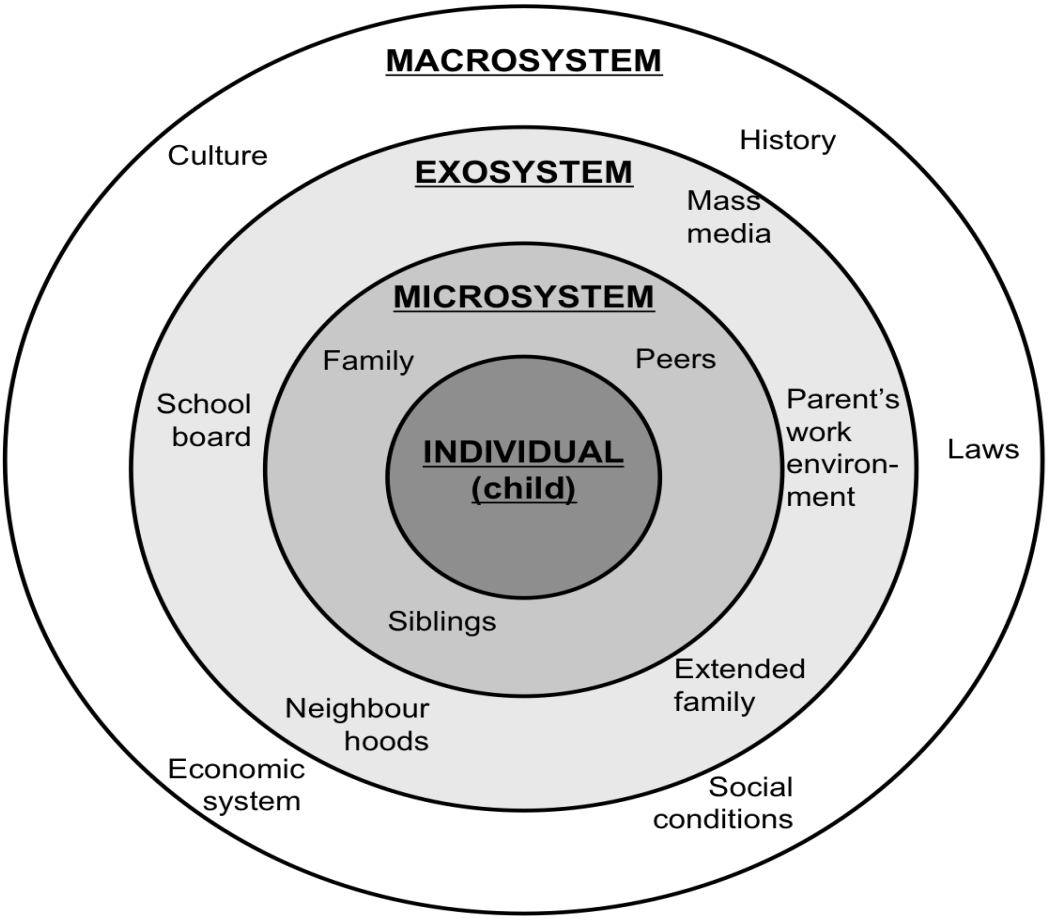
The microsystem refers to the immediate social contexts in which people interact on a regular basis. This level encompasses the family, peers, school, neighborhood, and other proximal environments that have a direct influence on the development of individuals (Bronfenbrenner, 1979; McLeroy et al., 1988). Individuals' most immediate and direct experiences, interactions, and support networks are provided by these microsystems (ibid).

Finally, the individual level represents the individual's characteristics, traits, and personal attributes. It consists of an individual's beliefs, values, skills, abilities, and distinctive features that determine their behaviors and interactions within ecological systems (Bronfenbrenner, 1979; McLeroy et al., 1988).

### 2.2 Social ecological theory in the context of Bangladesh and Sweden

The social ecology theory has been used in studies undertaken in Bangladesh and Sweden to investigate various aspects of human development and behavior. For example, Kabir et al. (2017) investigated the impact of social ecological factors on child malnutrition in rural Bangladesh. The study discovered that child malnutrition was caused by causes at numerous levels, including individual, family, neighborhood, and social issues (Kabir et al. 2017) Another study discovered that characteristics at several ecological levels, such as individual, interpersonal, and environmental factors, were related to levels of physical activity (Eriksson et al. 2018).

**Figure: Bronfenbrenner (1979) Social-Ecological Model of Human Development**




Source: Bronfenbrenner (1979) Social-Ecological Model of Human Development

**2.3 The various fields in which social ecological theory has been applied.**

Public health, criminology, and education are some of the fields where social ecological theory has been applied. to better understand the complex interactions between individuals and their environment (Sallis, et al., 2015). Individual, interpersonal, community, and structural factors are some of the components that influence the health behavior of an individual. This theory has also been used to develop interventions that target multiple levels of influence to promote behavior change and improve outcomes (Sallis, et al., 2015).

## Public health

The socio-ecological model emphasizes on the multiple nature of health behaviors and outcomes, which explains that individual, interpersonal, community, and structural factors (Glanz, et al., 2008). Public health is one of the fields in which social ecological model has been used (ibid). A person's individual individual behavior or the environ factors can never solely explain the health issues, as these are the interconnected factors, hence this model can better explain health issues. (Glanz, et al., 2008). Personal beliefs, attitudes, and behaviors can impact health outcomes are some of the factors that can have an impact on an individual (ibid). Interpersonal factors, such as family and social networks, can also influence health behaviors by providing support or hindering healthy practices (Glanz, et al., 2008). It is also interconnected in the community level, health behaviors and outcomes can be impacted by environmental factors such as access to healthy food, the kind of recreational facilities they have and also if the surrounding is violent. (ibid). Policies and laws which are related to healthcare, education system and employment condition can also impact on health behavior and outcomes (Glanz, et al., 2008).

## Workplace Intervention Development

socio-ecological model can be applied in the development and evaluation of workplace interventions to promote physical activity and healthy eating (Kachan et al., 2017). Some interventions can be designed to identify the hindrance's that a person can face in workplace, by considering the interconnectedness of those factors that are affecting (Kachan et al., 2017). Socio-ecological model has been used for promoting physical activity and healthy eating (ibid). What kind of strategies will bring the maximum amount of benefit in terms of the development it can be guided by the socio-ecological model, for example, taking effective policies, education, introducing skill building projects and environmental change (Kachan et al., 2017).

**Childhood Obesity Prevention**

Childhood obesity is a major issue that can be a product of some interconnected factors , Such as individual, interpersonal, community, and structural, socio-ecological model provides a useful framework to understand and identify those complex factors , that can impact a child's health behaviors. (Fahim et al., 2016)

**Individuals and their contexts**

This approach acknowledges the multiple levels of influence that shape individuals' behaviors and emphasizes the simultaneous addressing of these levels in public health interventions (Glanz et al., 2015). health is influenced by a complex interplay of factors at the individual, interpersonal, organizational, community, and policy levels Rooted in social ecology theory, the socio-ecological model emphasizes that, (Glanz et al., 2015).

Over the last two decades, numerous studies have investigated the use of the socio-ecological model in health promotion interventions, with specific goals of reducing tobacco use, increasing physical activity, improving nutrition, and preventing chronic diseases (Smith et al., 2019; Johnson & Brown, 2020). The socio-ecological model's continuous relevance and value in directing public health practice and intervention development has been recognized (Brown et al., 2018; Adams & White, 2021).

**2.4 Social ecological theory aims to investigate the food security situation of Bangladeshi immigrants residing in Sweden, as well as their food habits and diversity.**

The social ecological theory can be a useful framework for understanding the complex interplay of factors that contribute to food insecurity among Bangladeshi immigrants in Sweden, as well as their dietary diversity and food habits (Bronfenbrenner 1979) According to this theory, health behaviors and outcomes are shaped by multiple levels of influence, including.

- individual,

- interpersonal,
- community, and
- structural factors.

**Individual factors**

Age, gender, education is some of the demographic factors and some other factors like employment status of a person and health condition etc. may impact the food security and dietary diversity situation among Bangladeshi immigrants in Lund, Sweden. (Turner et al., 2020). For example, if immigrants face challenges in finding employment or have lower levels of education, it may affect their ability to afford and access diverse and nutritious foods, as a result it can lead toward food insecurity (Food and Agriculture Organization of the United Nations 2020)

**Interpersonal factors**

Social support networks, cultural norms, and family dynamics may also influence food security and dietary diversity among Bangladeshi immigrants (Turner et al., 2020). For instance, social support from family and community members may play a role in providing access to food resources and influencing food habits (Hamelin et al.,2002)

**Community factors**

Factors such as neighborhood characteristics, availability of ethnic food markets, and cultural adaptation may impact food security and dietary diversity among Bangladeshi immigrants (Turner et al., 2020). For example, living in a neighborhood with limited access to affordable and culturally appropriate foods may contribute to food insecurity among immigrants (Turner et al., 2020).

**Structural factors**

Broader societal factors such as immigration policies, discrimination, and economic disparities may also play a role in shaping the food security status and dietary diversity of Bangladeshi immigrants in Sweden (Turner et al., 2020). For

instance, discriminatory practices or policies that limit immigrants' access to social services or employment opportunities may impact their ability to achieve food security (Bloemraad et al., 2008)

### 2.5 The Use of Social Ecological Theory in this study

The theoretical framework of social ecological theory influenced and guided the design and approach of the study in numerous ways in the analysis part. To begin, the study used multiple levels of influence, as proposed by social ecological theory, to investigate the factors influencing food security and dietary diversity among Bangladeshi immigrants in Sweden (Bronfenbrenner 1979).

The study evaluated cultural norms and economic differences between Bangladesh and Sweden at the macrosystem level, which may influence food security situation and dietary diversity behaviors (Bronfenbrenner 1979). This affected the research questions for data collection, as well as the emphasis on comparing the food security and dietary diversity situation of immigrants in both nations.

The exosystem level was addressed by looking at institutional issues like government policies and social support networks that can have an impact on food security (Bronfenbrenner 1979). This influenced the investigation of factors influencing food insecurity among Bangladeshi immigrants in Sweden. The interactions between family, community, and social networks were used to encompass the mesosystem level. This level influenced the choice of questions about social networks, cultural practices, and social norms that may affect food security and dietary diversity.

The immediate social context, including household characteristics, income, and access to local food markets, was considered at the microsystem level (Turner et al., 2020). This influenced the questions chosen for household dietary diversity and food insecurity access (ibid).

Furthermore, the individual level was considered by investigating individual characteristics, beliefs, and knowledge about food and nutrition (Turner et al.,

2020). This influenced the questioning of individual experiences and behaviors in the context of food security and dietary diversity (ibid)

The data gathering procedure was also influenced by social ecology theory. The structured questionnaire, which included demographic information, the Household Dietary Diversity Score (HDDS), and the Household Food Insecurity Access Scale (HFIAS), enabled data collection at various levels (Kennedy et al., 2011) The questionnaire's questions were aimed to collect data on cultural practices, social networks, economic circumstances, and individual experiences.

The descriptive analytic approach was used throughout the data analysis to compare the mean HDDS and HFIAS scores of the immigrants in Sweden with their scores when they lived in Bangladesh (Creswell, 2013) By evaluating the macro, exo, meso, micro, and individual levels of effect on food security and dietary diversity, our research aligned with social ecological theory.

A factor identification technique was also employed to identify and investigate the factors that influence dietary diversity and food insecurity among Bangladeshi immigrants in Sweden (Guest et al., 2012) This method enabled the discovery of themes linked to language obstacles, cultural differences, socioeconomic circumstances, religious restraints, and the food environment, all of which corresponded to the levels of influence described by social ecological theory.

The study's findings were analyzed considering social ecological theory, emphasizing the connectivity and complexity of factors impacting food security and dietary diversity (Bronfenbrenner 1979). Based on the findings and the social ecological perspective, various solutions were given for the highlighted themes in relation to the theoretical framework.

# CHAPTER THREE

## 3. Literature review

### 3.1 Nutritional status and dietary intake of Bangladeshi immigrants in London, United Kingdom.

Bangladeshi immigrants in the United Kingdom, particularly in London, have poor nutritional status and dietary intake (Ahmed et al. 2017). 100 Bangladeshi adults living in Tower Hamlets in East London were surveyed by Ahmed et al. 2017. The study found a high prevalence of overweight and obesity among the participants and identified factors such as lack of physical activity and high intake of fast food and sugary drinks that may contribute to the high prevalence of obesity in this population. (Ahmed et al. 2017). In another study it has been found that older Bangladeshi people are more prone to malnutrition in UK. limited dietary diversity, inadequate food intake, and social isolation are some of the factors that are contributing to the problem (Ferdous et al. 2020)

### 3.2 Food insecurity among Bangladeshi immigrants in Italy

Due to financial constraints and limited access to healthy food options a considerable portion of Bangladeshi immigrants in Italy experienced food insecurity (Hossain et al. 2018). Majority of the respondents, about 64% of the respondents experienced food insecurity, of which 18% were classified as severely food insecure (Hossain et al. 2018). The most common reason for food insecurity was financial constraints, as migrants have to leave behind their jobs, also because of limited access to healthy food options (Hossain et al. 2018). More studies have done on Bangladeshi immigrants in Italy it was found that in a more recent study by Islam et al. (2020), the dietary intake of Bangladeshi immigrants in Italy was not sufficient. in terms of energy, protein, fat, and fiber. The prevalence of overweight and obesity was high among Bangladeshi immigrants in Italy, particularly among women. This was attributed to changes in dietary habits and reduced physical activity levels (Khatun et al. 2021).

### 3.3 Food and nutrition security status of Bangladeshi migrant workers in Malaysia, Haiti and Dominic republic and China.

food and nutrition security of Bangladeshi migrant workers in Malaysia was influenced by several factors, including limited access to nutritious food, low wages, long working hours, and inadequate living conditions (Rahman et al. 2019).It has also been found that most Bangladeshi migrant workers in Malaysia were not aware of their rights to food and nutrition security, that contributed more in their condition of being vulnerable toward food insecurity and also their access to health care services was limited (Islam and Khan 2018). similarly In Haiti and Dominic Republic migrant workers the food insecurity was high (Carballo et al. 2019). Hunger was also an issue, with more than half of the participants reporting that they had experienced hunger in the past month. low wages, poor living conditions, limited access to health care services, and discrimination are some of the factors contributing to food insecurity (Carballo et al. 2019). Similar factors have found within the migrant workers in China, finding that these workers faced challenges such as low wages, limited access to nutritious food, and inadequate living conditions (Lu et al. 2019).

### 3.4 Food insecurity among Bangladeshi immigrants in America

In Bangladeshi immigrants in New York City more than half of the participants were food insecure (Kibria and Khan 2019). The study identified several factors contributing to food insecurity among Bangladeshi immigrants, including low wages, lack of access to healthy food options, and limited knowledge of nutrition (Kibria and Khan 2019). People who were non-citizens were more likely to suffer from food insecurity than non-immigrants several factors were identified for contributing to food insecurity among immigrant households (Lora et al. 2018).. Limited English proficiency, lack of access to public assistance programs, and limited job opportunities are some of the factors contributing to the insecurity regarding (Lora et al. 2018). Similarly, among Latino immigrants in the United States food insecurity was associated with poor dietary quality, including low consumption of fruits and vegetables and high consumption of sugar-sweetened

beverages (Sussner et al. 2018). low wages, lack of access to healthy food options, and limited knowledge of nutrition are the factors that were contributing to food insecurity among Latino immigrants (Sussner et al. 2018).

### 3.5 Food insecurity in Bangladeshi people

In rural households in Madhupur Upazila, a sub-district in Bangladesh food insecurity was prevalent among the households in the area, with more than half of the households being food insecure (Rahman et al. 2017). Both social and economic factors were associated with food insecurity. Income, education, and occupation were significantly associated with food insecurity and poor dietary diversity as these factors are very important to impact accessibility of healthy food of a person (Rahman et al. 2017) similarly in another study which is a review of 20 studies and found that the overall prevalence of food insecurity in Bangladesh was 31.5%. low income, low education levels, and households with female-headed or larger households are some of the common factors contributing to food insecurity (Uddin et al. 2017).

### 3.6 Dietary patterns of Bangladeshi immigrants in Australia

Bangladeshi immigrants in Australia faced several challenges in maintaining their traditional dietary patterns due to several reasons, including a lack of access to traditional ingredients, limited cooking facilities, and time constraints due to work and family commitments (Fozdar et al. 2014). A high consumption of rice, lentils, vegetables, and fish in their diet has found within these people (Fozdar et al. 2014). 409 Bangladeshi adults living in Melbourne, Australia were surveyed, the study found that the participants reported consuming a diet high in rice, lentils, vegetables, and fish (Haque et el. 2019). The study also identified two distinct dietary patterns among the participants: a "traditional" pattern characterized by high consumption of rice, lentils, and vegetables, and a "modern" pattern characterized by high consumption of meat, processed foods, and sugary drinks. In both cases the diet was not healthy enough (Haque et el. 2019).

# CHAPTER FOUR

## 4. Methodology

Research methodology is a logical, systematic, and structured approach, which is used to investigate a particular research problem or question (Creswell, 2014). It describes how and from where data will be collected, how it will be presented and analyzed. Various methods and techniques are involved in a successful research methodology. These methods and techniques are used to collect, present, analyze and interpret data. A well-designed and well-presented research methodology provides a framework for the systematic investigation of a research question. The effectiveness and efficiency of a good study, depends on a well-maintained methodology. Thus, the research become able to produce reliable and generalized results at the end (Creswell, 2014).

## 4.1 Data Resource:

This study used a mixed-methods approach, integrating both qualitative and quantitative data analysis methodologies (Smith & Johnson, 2018). This study's primary data source is semi-structured interviews with 15 Bangladeshi immigrants living in Lund, Sweden. The interviews were conducted face-to-face by the researcher alone, who is a native Bengali speaker and from Bangladesh, and the responses were directly recorded on paper. The researcher contacted possible participants using personal networks, community centers, and social media sites. The interviews lasted 45 minutes to an hour and were conducted in a private location where the participants felt at ease. Following the interviews, the researcher transcribed and translated the data from Bengali to English. The transcribed data from the interviews were subjected to descriptive and thematic analysis (Thomas, 2017).

Overall, the primary data acquired from the interviews provides insights on the food security and diversity situation among Bangladeshi immigrants in Sweden. While the sample size was limited to 15, the study used internationally trialed and

tested tools such as the Household Dietary Diversity Score (HDDS) and Household Food Insecurity Access Scale (HFIAS) questionnaire (Khan, 2020) to provide a comprehensive understanding of the participants' food security and diversity status before and after migration to Sweden (Rahman & Ali, 2016).

## 4.2 Population and Sampling:

This study's target group was Bangladeshi immigrants living in Lund, Sweden. According to the Swedish Migration Agency, there were an estimated 12,500 Bangladeshi immigrants in Sweden as of 2020 (Swedish Migration Agency, 2021), but the exact number of Bangladeshi immigrants in Lund is unknown. Purposive sampling was used to choose participants for this study. Purposive sampling is a non-probability sampling strategy that allows the researcher to pick participants based on specified criteria relevant to the study issue (Palinkas et al., 2015). Participants were chosen for this study based on their Bangladeshi ancestry and residence in Lund, Sweden. The study's inclusion criteria were Bangladeshi ethnicity, residency in Lund, and the ability to speak in Bengali or English. Participants who did not match these requirements were excluded. While the sample size is small and limited to the Lund area, it provides insights into the experiences of Bangladeshi immigrants in the region.

## 4.3 Research Design:

The design of this study is a mixed-methods design that combines both qualitative and quantitative research methods (Creswell, 2014). Here, the quantitative approach was used to assess the food diversity as well as food security status of Bangladeshi immigrants living in Lund, Sweden. To achieve this purpose this research has administered the Household Dietary Diversity Score (HDDS) and the Household Food Insecurity Access Scale (HFIAS) questionnaires (Khan, 2020). The qualitative approach involved semi-structured interviews with open-ended and yes/no questions in the questionnaire and studying of some secondary studies. Thus, this thesis has been able to gain a deeper understanding of the cultural and social factors that impact the food choices and dietary habits of these 15

Bangladeshi immigrants in Lund, Sweden. To identify common themes and patterns in the qualitative data, thematic analysis was used (Braun and Clarke 2006)

## 4.4 Data collection technique:

In this study, data was collected using a mixed-methods design consisting of both quantitative and qualitative methods (Creswell, 2014). The quantitative approach used the Household Dietary Diversity Score (HDDS) and the Household Food Insecurity Access Scale (HFIAS) questionnaires to assess the food diversity and food security status of 15 Bangladeshi immigrants currently residing in Lund, Sweden (Khan, 2020). A semi-structured questionnaire was used, which had two parts. The first part consisted of structured questions with multiple choice answers, which were further divided into demographic, HDDS, and HFIAS parts. Each participant completed the demographic section and answered all the HDDS and HFIAS questions. The responses were then evaluated, calculated, and analyzed.

For the qualitative approach, semi-structured interviews were conducted with the same 15 Bangladeshi immigrants using a questionnaire consisting of open-ended and yes/no questions. The interviews were recorded with permission and later translated into English for analysis. Thematic analysis was used to identify common themes and patterns in the participants' responses, which provided a deeper understanding of the cultural and social factors that impact the food choices and dietary habits of Bangladeshi immigrants in Lund, Sweden. Semi-structured interviews were chosen as they allow for more flexible conversations, where participants can express their thoughts and feelings freely on the topic under investigation (Braun & Clarke, 2013). This approach provides rich and detailed information about participants, their experiences, and perspectives compared to structured interview (Bloor et al., 2001).

## 4.5 Data analysis:

The data analysis section is a critical part of any research, which explains how collected data will be processed and interpreted to answer the research questions (Miles & Huberman, 1994). In this study, data was analyzed using both quantitative and qualitative approaches. Descriptive analysis was used to determine the mean HDDS and HFIAS scores, and thematic analysis was used to identify common themes and patterns in the participants' responses. The resulting themes related to food diversity and food security issues were presented in the data presentation and analysis chapter. The findings from the descriptive and thematic analyses were synthesized to provide a comprehensive overview of the food security and food diversity status of Bangladeshi immigrants living in Lund, Sweden.

## 4.6 Strengths and Limitations:

In any study or thesis, it is crucial to evaluate both the strengths and limitations of the research design, data collection, and analysis techniques used in methodology part of the study.

### 4.6.1 Strengths:

**Mixed-methods approach:**

The combination of qualitative and quantitative approaches has provided a more complete picture of the experiences and perspectives of the participants. Moreover, it has given significant statistical information on their food security and diversity status (Creswell, 2014).

**Comparison of HDDS and HFIAS scores:**

Comparison of HDDS and HFIAS scores of the participants before and after migration provided such a valuable insight into the impact of immigration on food security and diversity. This comparison certainly allowed for a better

understanding of how the experiences of immigration may have impacted the food security and diversity status of these participants (Swindale & Bilinsky, 2006).

**In-depth analysis:**

Though the sample size of 15 participants was relatively small, it allowed for a more in-depth and nuanced analysis of the data (Mason, 2010).

### 4.6.2 Limitations:

**Self-reported measures:**

The use of self-reported measures, such as the HDDS and HFIAS, may have originated bias and inaccuracies in the data. Also, participants may have provided responses, which they believed were socially desirable or that they thought the researcher wanted to hear (Wolfe & Frith, 2015).

**Limited generalizability:**

In a way, this study only focused on Bangladeshi immigrants living in Sweden, mainly in Lund city. This limits the generalizability of the findings to other immigrant communities or geographic locations. (Creswell, 2014).

**Recall bias:**

The participants had to remember their food security and diversity status before migration is associated with the recall bias. This may have impacted the accuracy of the data of this research. (Sudman & Bradburn, 1982).

**Small sample size:**

The small sample size is a limitation of this study. According to Salkind (2010), a limited sample size can diminish the study's generalizability and representativeness.

**Not Using professional translator:**

The majority of the participants were not fluent in English. As a result, the interviews were done in their preferred languages, English and Bangla. However, the translations of the Bangla sections were completed without the assistance of a professional translator. Although it is possible that some nuances and intricacies of the language were lost during the translation process of some interviews (Ghauri & Grnhaug, 2010).

# CHAPTER FIVE

## 5. Findings and Results

## 5.1 Data Presentation:

This section includes a summary of the demographic characteristics of the 15 participants, as well as their Household Dietary Diversity Score (HDDS) and Household Food Insecurity Access Scale (HFIAS) scores before and after their migration to Sweden (Khan, M. N. 2020). To provide a comprehensive perspective of the data, descriptive statistics such as Mean, Range, and Standard Deviation will be displayed (Creswell, 2014). In addition, the frequency distribution of the four associated scores will be displayed to further illustrate the data trend and direction of change. A scientific test will also be introduced to compare the mean HDDS and HFIAS scores. Furthermore, this part will focus on a number of topics connected to the factors that influence food diversity and food security. Overall, the aim of this section is to present the facts in a clear and succinct manner to aid in the interpretation of the results and to allow readers to draw their own conclusions (Creswell, 2014).

## Data Presentation of Survey Analysis

The results of a survey of 15 Bangladeshi immigrants living in Lund, Sweden, will be presented and described in this section.

### 5.1.1 Demographic Data/ Personal Information of the Participants

The demographic information shown in table 1 pertains to 15 Bangladeshi immigrants who currently reside in Lund, Sweden. Gender, age, marital status, number of family members, level of education, employment status, sector of labor, and place of residence in Bangladesh are all included in the statistics. Seven of the fifteen participants were male, while eight were female, accounting for 46.7% and 53.3% of the overall sample, respectively. 40% of those polled were single, 26.7% were married, 20% were divorced, and 13.3% were widowed. The average family size was 1.67, with a standard deviation of 0.724. The minimum and maximum

number of family members was one. In terms of education, 73.3% of participants held a Bachelor's degree, 20% had attended college, and 6.7% had graduated from high school. In terms of employment situation, 8 of the 15 interviewees worked part-time (53.3%) and 4 worked full-time (26.7%). Two of the individuals were self-employed, while one was unemployed. In terms of industry, the majority of participants (46.7%) worked in restaurants, followed by 13.3% in education and 13.3% in retail and sales. Two (13.3%) people worked in healthcare and social services, while one worked in cleaning and domestic support. One of the participants was unemployed. In Bangladesh, 73.3% of the participants previously resided in a metropolis, 13.3% in a large town, and 13.3% in a small town. The 15 participants were all now residing in Lund, Sweden.

**Table 1: Personal Information of the Participants**

| Participant Number | Gender | Age (Year) | Marital Status | Number of Family Members | Level of Education | Employment Status | Sector of Work | Residence Place in Bangladesh |
|---|---|---|---|---|---|---|---|---|
| 01 | Female | <30 | Married | 3-4 | College | Part-time | Restaurant | City |
| 02 | Male | >30 | Divorced | 1-2 | Bachelor degree | Full-time | Education | City |
| 03 | Female | <30 | Married | 3-4 | Bachelor degree | Unemployed | | Large town |
| 04 | Male | >30 | Widowed | 1-2 | Bachelor degree | Full-time | Retain & Sales | City |
| 05 | Female | <30 | Divorced | 1-2 | Bachelor degree | Part-time | Restaurant | Small town |
| 06 | Male | >30 | Married | 3-4 | Bachelor degree | Full-time | Restaurant | City |
| 07 | Female | <30 | Single | 1-2 | Bachelor degree | Part-time | Education | City |
| 08 | Female | >30 | Widowed | 1-2 | College | Self-employed | Health care | City |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 09 | Male | >20 | Single | 1-2 | High School | Part-time | Cleaning | Large town |
| 10 | Male | >20 | Single | 5-6 | Bachelor degree | Part-time | Restaurant | Large town |
| 11 | Male | >30 | Divorced | 3-4 | Technical training | Self-employed | Social services | Small town |
| 12 | Male | >20 | Single | 3-4 | Bachelor degree | Part-time | Restaurant | Large town |
| 13 | Female | >20 | Single | 5-6 | Bachelor degree | Part-time | Restaurant | City |
| 14 | Female | <30 | Married | 1-2 | Bachelor degree | Full-time | Retail & Sales | City |
| 15 | Female | >20 | Single | 3-4 | High school | Part-time | Restaurant | City |
| Total Number of Participants = 15 | | | | | | | | |

Source: Field Survey, 2023

### 5.1.2 Household Dietary Diversity (HDDS) and Food Insecurity Access Scores (HFIAS)

Table 2 shows the results of 15 Bangladeshi immigrants' household dietary diversity (HDDS) and food insecurity access scores (HFIAS) before and after migration. The HDDS assesses the diversity of foods consumed by the household, whereas the HFIAS assesses food access and the severity of food insecurity. The table shows the individual scores of each participant before and after migration, as well as the mean and standard deviation of the group's HDDS and HFIAS values. Before migration, the mean HDDS score was 8.07, and it dropped significantly to 7.87 after migration. Before migration, the average HFIAS score was 18.33, and it increased to 20.33 after migration. The table also reveals some heterogeneity in individual scores before and after migration, showing that the influence of migration on HDDS and HFIAS scores was not the same for all participants. For example, participant number 4 had an increase in HDDS score after relocation, whereas participant number 12 had a decrease in HDDS score after migration.

Similarly, participant number 5 exhibited an increase in HFIAS score after relocation, whereas participant number 4 showed a drop in HFIAS score after migration. It is vital to highlight that the participants' demographic data, such as marital status, employment status, education level, and place of living in Bangladesh, may have an impact on their HDDS and HFIAS scores. For example, participants who were married or employed may have had better mental health and less food insecurity than those who were single or unemployed. Therefore, it is important to consider these factors when interpreting the findings of the study.

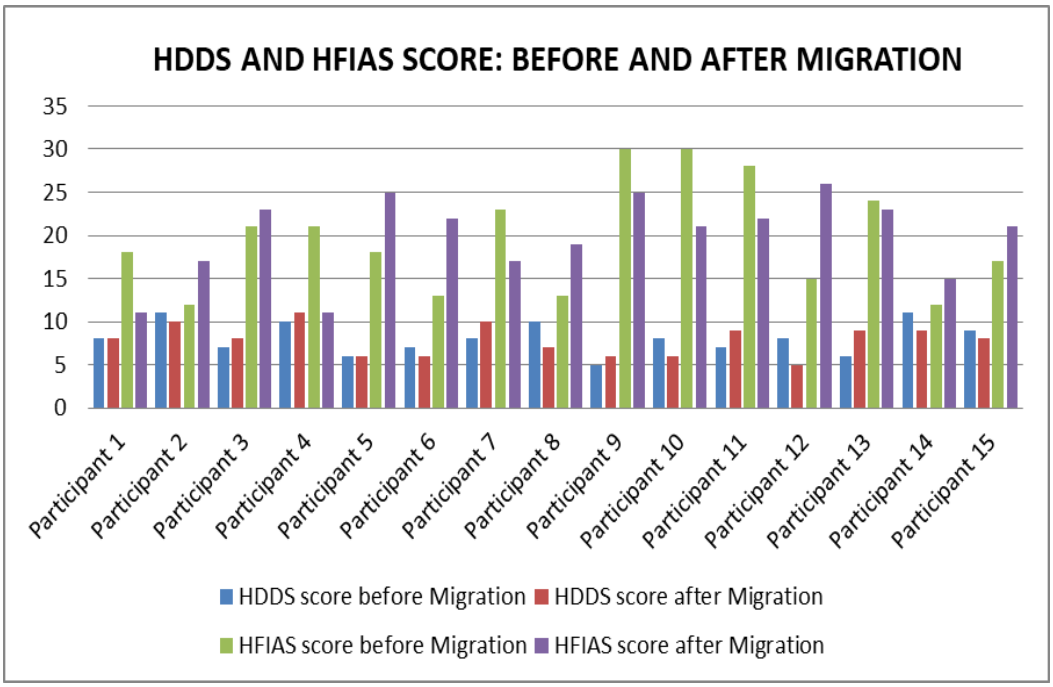
**Table 2: Household Dietary Diversity (HDDS) and Food Insecurity Access Scores (HFIAS)**

| Participant Number | HDDS Before Migration | HDDS After Migration | HFIAS Before Migration | HFIAS After Migration |
|---|---|---|---|---|
| 01 | 08 | 08 | 11 | 18 |
| 02 | 11 | 10 | 12 | 17 |
| 03 | 07 | 08 | 21 | 23 |
| 04 | 10 | 11 | 21 | 11 |
| 05 | 06 | 06 | 18 | 25 |
| 06 | 07 | 06 | 13 | 22 |
| 07 | 08 | 10 | 23 | 17 |
| 08 | 10 | 07 | 13 | 19 |
| 09 | 05 | 06 | 30 | 25 |
| 10 | 08 | 06 | 17 | 21 |
| 11 | 07 | 09 | 28 | 22 |
| 12 | 08 | 05 | 15 | 26 |
| 13 | 06 | 09 | 24 | 23 |
| 14 | 11 | 09 | 12 | 15 |
| 15 | 09 | 08 | 17 | 21 |
| Mean | 8.07 | 7.87 | 18.33 | 20.33 |

| | | | | |
|---|---|---|---|---|
| Standard Deviation | 1.831 | 1.807 | 5.996 | 4.152 |

Source: Field Survey, 2023

**Diagram 1: Visual Representation of HDDS and HFIAS scores of Bangladeshi Immigrants**




Source: Data Table 2

## 5.1.3 Frequency Distribution of HDDS and HFIAS Scores

In the context of this study, frequency tables were utilized to depict the distribution of scores for the Household Dietary Diversity (HDDS) and Food Insecurity Access Scores (HFIAS) before and after migration. Four unique tables have been presented, one for each score. The tables summarize the number of participants and the frequency of scores for each category. The significance of these tables is that they provide a visual picture of the distribution of HDDS and HFIAS scores before and after migration to Sweden. It enables researchers to spot any patterns or trends. It enables researchers to find any patterns or trends in the data and establish which scores are most prevalent among participants. This information can be utilized to

derive conclusions about the participants' overall health and well-being prior to their move.

**Frequency Distribution for HDDS before Migrate to Sweden**

Table 3 shows the frequency distribution of HDDS scores prior to migration to Sweden. It displays the number of participants who scored in each category as well as the percentage of participants in each category. The "Valid Percent" column excludes any missing or invalid replies and displays the proportion of participants who supplied a valid response in each category. The "Cumulative Percent" column displays the percentage of participants who scored at or below a specific category. The table shows that the most common score was 8, with four people scoring in this category, followed by 7 with three participants, then 6 and 10 with two participants each. The least common scores were 5 and 9, with only 1 participant scoring in each category. The total number of participants who provided valid responses was 15.

**Table 3: Frequency Distribution for HDDS before Migrate to Sweden**

| HDDS Scores | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 5 | 1 | 6.7 | 6.7 | 6.7 |
| | 6 | 2 | 13.3 | 13.3 | 20.0 |
| | 7 | 3 | 20.0 | 20.0 | 40.0 |
| | 8 | 4 | 26.7 | 26.7 | 66.7 |
| | 9 | 1 | 6.7 | 6.7 | 73.3 |
| | 10 | 2 | 13.3 | 13.3 | 86.7 |
| | 11 | 2 | 13.3 | 13.3 | 100.0 |
| | Total | 15 | 100.0 | 100.0 | |

Source: Field Survey, 2023

**Frequency Distribution for HDDS after Migrate in Sweden**

The frequency distribution of the HDDS scores following immigration to Sweden is displayed in Table 4. It shows the proportion of participants in each category as well as the number of participants that received a score in that category. The

percentage of participants who supplied valid responses in each category is shown in the "Valid Percent" column, which excludes any incorrect or missing responses. The percentage of participants who scored in that category or lower is displayed in the "Cumulative Percent" column. According to the table, 4 out of the participants received a 6, followed by 8 and 9 with 3 each. Only one participant received a score in each of the least frequent categories, 5, and 11, respectively. The total number of participants who provided valid responses was 15.

**Table 4: Frequency Distribution for HDDS after Migrate in Sweden**

| HDDS Scores | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 5 | 1 | 6.7 | 6.7 | 6.7 |
| | 6 | 4 | 26.7 | 26.7 | 33.3 |
| | 7 | 1 | 6.7 | 6.7 | 40.0 |
| | 8 | 3 | 20.0 | 20.0 | 60.0 |
| | 9 | 3 | 20.0 | 20.0 | 80.0 |
| | 10 | 2 | 13.3 | 13.3 | 93.3 |
| | 11 | 1 | 6.7 | 6.7 | 100.0 |
| | Total | 15 | 100.0 | 100.0 | |

Source: Field Survey, 2023

**Frequency Distribution for HFIAS before Migrate to Sweden**

The HFIAS scores for the individuals are presented in Table 5 along with their frequency distribution. Along with the proportion of participants that each category reflects, the table displays the number of participants who scored in each category. The percentage of participants who gave a valid response in each category is shown in the "Valid Percent" column, which eliminates any missing or invalid responses. The percentage of participants who scored in a particular category or lower is shown in the "Cumulative Percent" column. According to the table, the most typical scores were 12, followed by 13, with two individuals scoring in each category. 17 and 21 also had two participants apiece. With only one person rating

in each category, the least frequent scores were 11, 15, 18, 23, 24, and 30. The total number of participants who provided valid responses was 15.

**Table 5: Frequency Distribution for HFIAS before Migrate to Sweden**

| HFIAS Score | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 11 | 1 | 6.7 | 6.7 | 6.7 |
| | 12 | 2 | 13.3 | 13.3 | 20.0 |
| | 13 | 2 | 13.3 | 13.3 | 33.3 |
| | 15 | 1 | 6.7 | 6.7 | 40.0 |
| | 17 | 2 | 13.3 | 13.3 | 53.3 |
| | 18 | 1 | 6.7 | 6.7 | 60.0 |
| | 21 | 2 | 13.3 | 13.3 | 73.3 |
| | 23 | 1 | 6.7 | 6.7 | 80.0 |
| | 24 | 1 | 6.7 | 6.7 | 86.7 |
| | 28 | 1 | 6.7 | 6.7 | 93.3 |
| | 30 | 1 | 6.7 | 6.7 | 100.0 |
| | Total | 15 | 100.0 | 100.0 | |

Source: Field Survey, 2023

**Frequency Distribution for HFIAS after Migrate in Sweden**

Table 6 shows the frequency distribution of HFIAS scores after migration to Sweden. It displays the number of participants who scored in each category as well as the percentage of participants in each category. The "Valid Percent" column excludes any missing or invalid replies and displays the proportion of participants who supplied a valid response in each category. The "Cumulative Percent" column displays the percentage of participants who scored at or below a specific category. The table shows that the most common scores were 17 and 21, with two participants in each group, followed by 15, 19, 22, 23, 25, and 26, with one participant in each category. The least common scores were 11, 18, and 30, with only 1 participant scoring in each category. The total number of participants who provided valid responses was 15.

**Table 6: Frequency Distribution for HFIAS after Migrate in Sweden**

| HFIAS scores | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|
| 11 | 1 | 6.7 | 6.7 | 6.7 |
| 15 | 1 | 6.7 | 6.7 | 13.3 |
| 17 | 2 | 13.3 | 13.3 | 26.7 |
| 18 | 1 | 6.7 | 6.7 | 33.3 |
| 19 | 1 | 6.7 | 6.7 | 40.0 |
| Valid | 2 | 13.3 | 13.3 | 53.3 |
| 21 | 2 | 13.3 | 13.3 | 66.7 |
| 22 | 2 | 13.3 | 13.3 | 80 |
| 23 | 2 | 13.3 | 13.3 | 93.3 |
| 25 | 1 | 6.7 | 6.7 | 100.0 |
| 26 | 15 | 100.0 | 100.0 | |
| Total | | | | |

Source: Field Survey, 2023

### 5.1.4 HDDS and HFIAS Scores Before and After Migration (Mean, Range, Standard Deviation)

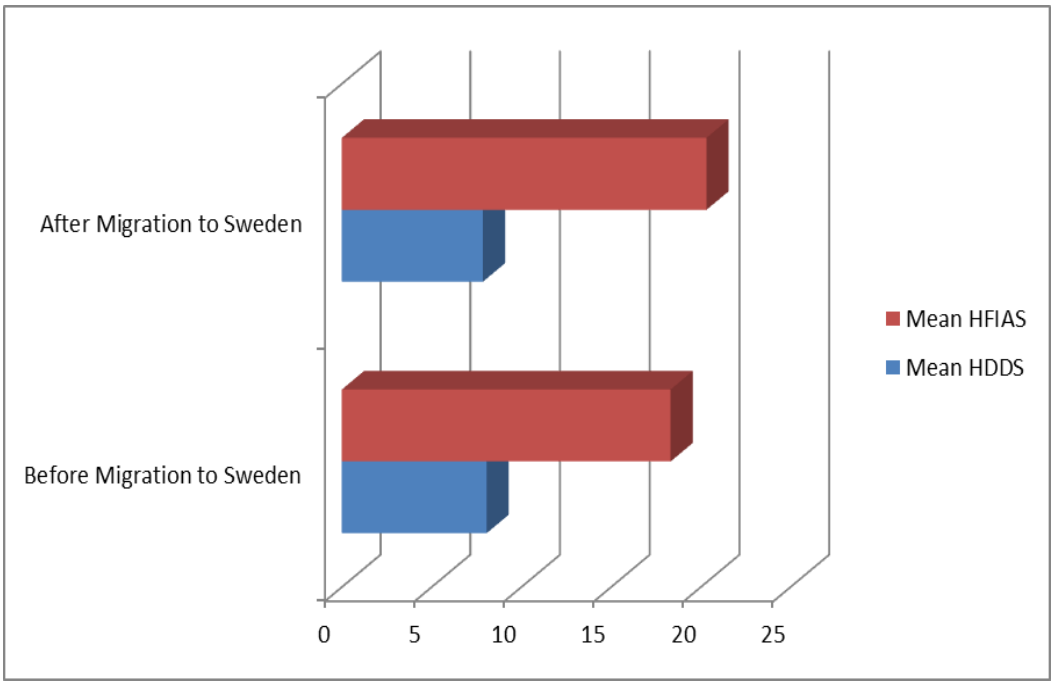
Table 7 displays descriptive statistics for HDDS and HFIAS scores before and after migration, including mean, range, and standard deviation. Before migration, households had a moderate level of dietary diversity mean , HDDS: 8.07 with some variability ,range: 0-5. Food insecurity was significant ,mean HFIAS: 18.33 with a wide range ,0-19. After migration, there was a slight decline in dietary diversity mean HDDS: 7.87 while variability remained similar. Food insecurity worsened slightly mean HFIAS: 20.33 with a narrower range 0-15, indicating a more concentrated distribution. The standard deviations 1.831 before migration, 1.807 after migration for HDDS; 5.996 before migration, 4.152 after migration for HFIAS suggested moderate to substantial variations in scores. These findings highlight the impact of migration on dietary diversity and food insecurity, emphasizing the need for targeted interventions to support migrant populations.

**Table 7: HDDS and HFIAS Scores Before and After Migration (Mean, Range, Standard Deviation)**

| Scores | Mean | Range | Standard Deviation |
|---|---|---|---|
| HDDS before migration | 8.07 | 05 | 1.831 |
| HDDS after migration | 7.87 | 05 | 1.807 |
| HFIAS before migration | 18.33 | 19 | 5.996 |
| HFIAS after migration | 20.33 | 15 | 4.152 |

Source: Field Survey, 2023

**Diagram 2: Visual Representation of Mean HDDS and HFIAS scores**




Source: Data Table 7

## 5.2 The Comparison of HDDS and HFIAS Scores Before and After Migration.

### 5.2.1 T-Test

The paired samples t-test is a statistical test used to evaluate whether there is a significant difference between the means of two related groups of data (Derrick, 2013). T-test is utilized in this study to compare the mean HDDS and HFIAS scores before and after migration. The paired samples t-test is suited for this study because it allows users to compare the mean scores of the same subjects before and after migration. The paired sample correlation is a statistical analysis that measures the association between two variables that are measured twice for each individual (Field, 2013). In this study, paired sample correlations were employed to assess the association between HDDS and HFIAS scores before and after migration.

**Paired Samples Correlations between HDDS and HFIAS Scores (Before and After Migration)**

Table number 8 provides the results of paired sample correlations between two sets of variables: Pair 1: HDDS scores before and after migration; Pair 2: HFIAS scores before and after migration. The sample size (N) for the first pair is 15, and the correlation coefficient is 0.478 with a significance level (Sig.) of 0.072. The correlation is positive, showing that there is a moderate association between HDDS scores before and after migration, such that those with higher scores before migration likely to have higher scores after migration as well. However, the p-value (0.072) is bigger than 0.05, indicating that the connection is not statistically significant at the 95% confidence level. The sample size (N) for the second pair is also 15, and the correlation coefficient is 0.288, with a significance level (Sig.) of 0.298. The correlation is positive, showing that the HFIAS scores before and after migration have a weak link. The p-value (0.298) is, however, substantially greater than 0.05, indicating that the association is not statistically significant at the 95% confidence level.

**Table 8: Paired Samples Correlations between HDDS and HFIAS Scores**

| Variables | | Number of participants | Co-relation | Significance |
|---|---|---|---|---|
| Pair 1 | HDDS before & after migration | 15 | 0.478 | 0.072 |
| Pair 2 | HFIAS before & after migration | 15 | 0.288 | 0.298 |

Source: Field Survey. 2023

**Paired Sample Test between HDDS and HFIAS Scores (Before and After Migration)**

The table shows the results of a paired samples test, which evaluates the differences between two related variables for the same group of individuals. Pair 1 compares HDDS (Household Dietary Diversity Score) before and after migration, while Pair 2 compares HFIAS (Household Food Insecurity Access Scale) before and after migration. The mean difference between HDDS scores before and after migration for Pair 1 was 0.20, with a standard deviation of 1.859. The standard error of the mean was 0.480, indicating that the mean difference was not substantially different from zero. The 95% confidence interval for the difference varied from -0.830 to 1.230. With 14 degrees of freedom, the t-value was 0.417 and the p-value was 0.683, showing that the difference in HDDS scores before and after migration was not statistically significant. The mean difference in HFIAS scores before and after migration for Pair 2 was -2.000, with a standard deviation of 6.234. The mean difference was not substantially different from zero, according to the standard error of the mean of 1.609. The difference's 95% confidence interval ranged from -5.452 to 1.452. With 14 degrees of freedom, the t-value was -1.243 and the p-value was 0.234, showing that the difference in HFIAS scores before and after migration was not statistically significant.

**Table 9: Paired Sample Test between HDDS and HFIAS Scores**

| Variables | | Paired Differences | | | | | t | Df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| | | Mean | Std. Deviation | Std. Error Mean | 95% confidence interval of the difference | | | | |
| | | | | | Lower | Upper | | | |
| Pair 1 | HDDS before & after migration | 0.200 | 1.859 | 0.480 | -0.830 | 1.230 | 0.417 | 14 | 0.683 |
| Pair 2 | HFIAS before and after migration | -2.000 | 6.234 | 1.609 | -5.452 | 1.452 | -1.243 | 14 | 0.234 |

Source: Field Survey, 2023

### 5.3 Exploring Factors Affecting Food diversity and security among Bangladeshi Immigrants in Lund, Sweden

The purpose of this section is to investigate the factors that influence dietary diversity and security among Bangladeshi immigrants in Lund, Sweden. 15 participants were interviewed using a semi-structured questionnaire, and their replies were analyzed using a theme analysis approach. The goal of this study is to

uncover common themes and elements that may influence Bangladeshi immigrants' food choices and access in Lund, Sweden. The study's findings can provide insight into the experiences of Bangladeshi immigrants in terms of food security and diversity, as well as suggest policies and initiatives that can better meet their nutritional needs.

In social science research, thematic analysis is a popular method for interpreting qualitative data (Braun & Clarke, 2006). Thematic analysis was used to examine data acquired from Bangladeshi immigrants in Lund, Sweden, for this study. The data was categorized into topics, sub-themes, and participant quotations, allowing the researchers to discover and investigate aspects influencing dietary diversity and security among participants. Using this method, the researchers were able to acquire a better understanding of the participants' experiences and perceptions on food access and diversity in their new home nation. The resulting topics and sub-themes highlight the economic, cultural, social, and environmental aspects that influence Bangladeshi immigrants' food access and diversity in Lund, Sweden.

Here are the general steps that this study followed, or thematic analysis of the data recorded from 15 participants:

- Transcribing the data: The data collected from the participants' responses was transcribed by manually recording their answers on paper.
- Familiarizing with the data: To become familiar with the data, the responses were read through multiple times to gain a better understanding of the data.
- Generate initial codes: To generate initial codes, after familiarizing with the data, the responses were read through again and relevant words or phrases were highlighted or underlined. These words or phrases were chosen based on their significance, repetition, or ability to convey a key concept or idea.
- Organizing codes into themes: The initial codes were grouped into themes, which are categories that group similar codes together. This involved identifying similarities and differences across the codes and coming up with themes that captured the essence of what the participants were saying.

- Reviewing of the themes: The themes and codes were reviewed and refined to ensure they accurately represented the data. This step involved revising or refining themes to ensure they accurately reflected the data.
- Defining and naming themes: Once the themes were identified, they were defined and named in a way that captured the essence of what the participants were saying. The definitions and names could be simple and straightforward, or they could be more abstract and conceptual.
- Interpreting the findings: Finally, the findings were interpreted in light of the research question or objective. This involved summarizing the key findings and highlighting any insights or implications that emerged from the analysis.

### 5.3.1 Economic Factors:

The economic obstacles that Bangladeshi immigrants confront in Lund, Sweden, appeared as a key subject in this study's data analysis. Several sub-themes were identified within this issue that contributes to the difficulties of finding and affording healthy food. Low income, occupational position, and budgetary restraints were among these causes.

**Low income:**

Participants frequently reported that their low-paid jobs made it difficult for them to afford healthy food. One participant explained, "My salary is very low, and I have to support my family. I can't afford to buy fresh fruits and vegetables regularly. It's cheaper to buy fast food or processed foods." Another participant shared, "I work long hours, but my income is still low. I have to prioritize rent and bills over food. It's a struggle to make ends meet every month." This point emphasizes the link between income and food choices, revealing the economic barriers to accessing healthy food.

**Employment status:**

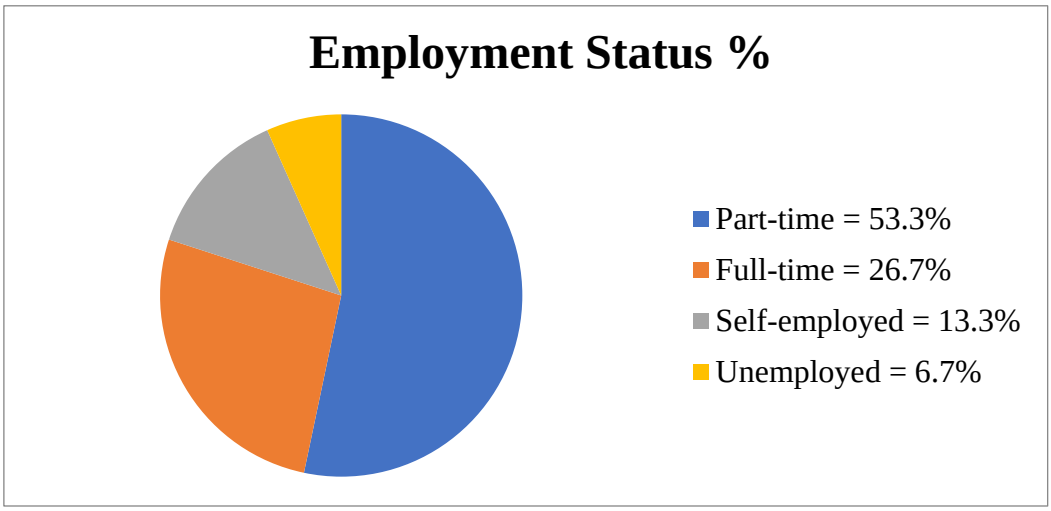
Participants also reported struggling to find full-time work, often being underemployed. One participant stated, "I have a master's degree, but I can only find part-time work in a restaurant. It's not enough to pay for my rent, bills, and food." Another participant shared, "I have to work multiple part-time jobs to make ends meet. This leaves me with little time or energy to prepare healthy meals." This point highlights the impact of employment status on financial stability and the ability to afford healthy food.

**Financial constraints:**

High expenses, such as rent and bills, were identified as significant barriers to accessing healthy foods. One participant stated, "I have to pay a lot of money for rent and electricity. I don't have much left for food, so I have to buy cheaper options." Another participant shared, "I have to prioritize paying off my debt over buying healthy food. It's a difficult choice, but I have no other option at the moment." This sub-theme emphasizes the financial burden faced by many Bangladeshi immigrants in Lund and their limited ability to prioritize healthy food within their budget.

Overall, the sub-themes of low income, employment status, and financial constraints combine to create significant economic challenges that impact the ability of Bangladeshi immigrants in Lund to access and afford healthy food.

**Diagram 3: Breaking down of Employment Status of the participants.**




Source: Qualitative data of Interview

The work status of the 15 immigrants illustrates the economic element influencing their food security. More than half of the participants (53.3%) were working part-time, indicating poor income and financial insecurity. Only a quarter of the participants (26.7%) worked full-time, which could add to financial limits on their capacity to acquire healthful food. The self-employed (13.3%) may have greater control over their income, but it can also be unreliable and unpredictable. One participant was unemployed, underscoring the enormous financial difficulties to acquiring healthful food. Overall, the job status of the participants is closely related to the economic aspect that influences their food security. Low-wage jobs, underemployment, and unemployment all lead to financial insecurity and the inability to prioritize healthy meals within their budget.

### 5.3.2 Cultural Factors:

Immigrant's food choices and eating habits are heavily influenced by cultural variables. Bangladeshi immigrants in Lund suffer several cultural hurdles that have an impact on their food security. The cultural component yielded three sub-themes: dietary choices, food behaviors, and religious views.

### Dietary Preferences

Few of the participants remarked about missing the taste and variety of cuisine they used to eat in Bangladesh. "My friend, I miss the authentic taste of Bangladeshi spices in my food, spices are expensive here," one participant said. Another participant stated, "I miss our spicy and delicious traditional food, Swedish food isn't really working for me." This sub-theme emphasizes the importance of flavor and cultural familiarity in food choices, as well as the difficulties of adjusting to a new eating environment.

### Food Habits

Some participants reported avoiding wasting food, even if it was expired or ruined. "In Bangladesh, we don't waste food because we know its value," one participant explained. In Sweden, I still do this and occasionally consume outdated food." "In our culture, it's considered disrespectful to waste food," said another attendee. So, rather than putting away food that has gone bad, I occasionally consume it." This sub-theme emphasizes the cultural influence on food choices and the importance of food safety and nutrition education.

### Religious Beliefs

Several interviewees reported religious-based food restrictions, such as halal or vegetarianism. "I only eat halal meat, which is not always available here," one participant said. It's difficult to find halal meat or vegetarian options." "I have to follow certain dietary restrictions due to my religion, I can't help it," stated another attendee. This sub-theme emphasizes the impact of religious beliefs on food choices and the importance of having access to culturally acceptable food options.

### 5.3.3 Social Factors:

Social factors, such as an individual's ability to obtain and purchase nutritious food, can have a significant impact on their food security. Social isolation and

discrimination are two sub-themes that emerged from the thematic analysis of social aspects.

**Language Barrier**

."I find it difficult to ask for help at the grocery store because I don't speak the language fluently," one participant said. This quotation emphasizes how language limitations can cause feelings of isolation and make it difficult for people to access food resources. Another participant noted, "I had trouble understanding food labels in the supermarket, and I ended up buying food that I couldn't eat because it contained ingredients that I'm allergic to." This quotation exemplifies how language difficulties can cause uncertainty and misunderstandings about food ingredients, potentially leading to food insecurity and health issues.

**Social Isolation**

Social isolation can have a negative impact on a person's mental and physical health, as well as their food security. One participant stated, "I don't have many friends or family here, so I feel lonely and sometimes skip meals." This sub-theme emphasizes the significance of social support and how a lack of it can contribute to food insecurity.

**Discrimination**

"I have faced discrimination in the job market," one participant said, "which has affected my financial situation and ability to buy food." This statement of participant number 7 indicates job market discrimination such as fewer job possibilities, lower earnings, and a lack of resources, contribute to food insecurity.

**5.3.4 Environmental Factors:**

Environmental factors like limited access to grocery stores and marketplaces, low food quality, and food waste also seem to have a substantial impact on an immigrant's food security in Sweden.

**Food Availability and Accessibility**

For Bangladeshi immigrants in Sweden, limited access to food stores and markets that sell economical and fresh vegetables can be a big difficulty. "The nearest grocery store which is also the cheapest is far away from my home, and transportation is expensive," one participant said. It's difficult to find in the super shops, all the ingredients that we need to prepare our traditional dishes." This sub-theme emphasizes the significance of having access to grocery stores that cater to a wide range of ethnic demands.

**Food Quality**

Bangladeshi immigrants in Sweden may be concerned about the quality of food offered in stores. "Some of the food sold in the supermarkets here doesn't taste fresh, and it's not the same taste and quality we're used to back home," one participant said. Poor food quality can cause health issues, and it can be difficult for immigrants to find culturally appropriate food options that match their dietary demands.

**Food Waste**

"I frequently see a lot of food being thrown away in restaurants," one participant said, "and it's frustrating when we're struggling to make ends meet." Food waste can raise food prices and diminish the availability of nutritious food, making it more difficult for Bangladeshi immigrants in Sweden to find healthy and culturally appropriate food options.

## 5.4 Key Findings

### 5.4.2 Key Findings from the descriptive analysis part:

1. No statistically significant Decreased or increase in HDDS or HFIAS before or after Migration: The study revealed that before migration, households had a moderate level of dietary diversity, HDDS score was

8.07. After migration it was 7.87. Before migration HFIAS score was 18.33 and after migration it was 20.33.

2. No statistically significant correlation found for HDDS and HFIAS scores before and after migration: Despite the increase in HDDS after migration, our analysis did not identify a statistically significant correlation between HDDS scores before and after migration. Similarly, there was no statistically significant link between HFIAS ratings before and after migration. This shows that, while migration may have an impact on food diversity and insecurity, other variables may also be important.
3. Participants experienced varying levels of food diversity and insecurity before and after migration: According to our findings, participants had various levels of food diversity and insecurity both before and after migration. The most common HDDS score before to migration was 8, whereas the most common HFIAS scores were 12 and 13. The most common HDDS score after migration was 6, while the most common HFIAS scores were 17 and 21. These findings show the necessity for personalized interventions to address individual migrants' food security requirements.
4. There is high variability in the HDDS and HFIAS scores: The standard deviation for HDDS scores before and after migration, as well as the standard deviation for HFIAS scores before and after migration, revealed a high degree of variability in the participants' food diversity and insecurity. This implies that initiatives to improve food security outcomes for migrant communities should take this heterogeneity into account and target the most vulnerable.

### 5.4.2 Key Findings from the thematic analysis part:

As part of the study, a thematic analysis was carried out to uncover themes and patterns connected to the participants' experiences and perceptions of food security and dietary diversity before and after migration.

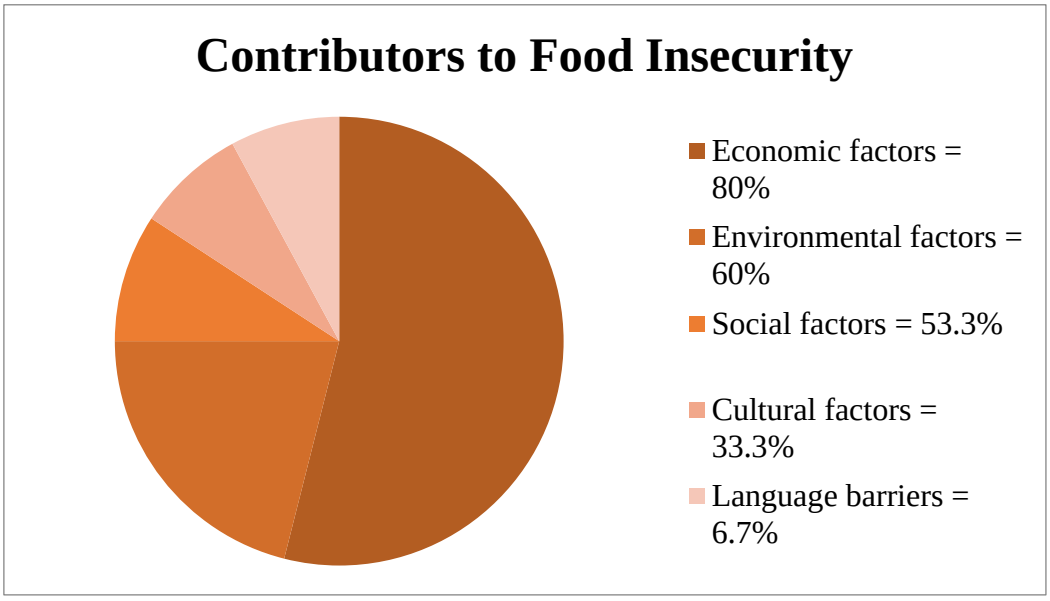
- Employment, income, and affordability appear to play an important impact in food security. Because the cost of living in Sweden is rather high, many immigrants struggle to acquire fresh and nutritious food. Immigrants are likely to have difficulty finding job for a variety of reasons, including language barriers, a lack of work experience in Sweden, and prejudice. This makes it much more difficult for them to meet their basic needs, such as food (Wamala et al., 2007).
- Social isolation can limit access to social support networks and resources, making it difficult to receive appropriate and nutritious diet. Discrimination can also have an impact on employment and income, making it more difficult to buy healthy dietary selections. Thus, Participants highlighted the importance of social support and access to resources (Wamala et al., 2007).
- Food waste has been implicated as a contributor to food insecurity, as it can add to the already-expensive expenditures for families struggling to make ends meet. As a result, boosting access to fresh and healthy food options, as well as reducing food waste, may help Bangladeshi immigrants in Sweden improve their food security (Zhang et al., 2019).
- Cultural factors such as food preferences and dietary habits were also identified as important considerations. Participants expressed a desire to maintain their traditional food practices while also adapting to the food culture in Sweden.
- Language barriers can also be a significant obstacle to food security, with some participants expressing difficulties in understanding food labels and communicating with grocery store staff.

**Visual Representation: Contributors to Food Insecurity of Immigrants Community**

The pie chart of Diagram 2, shows that economic factors are the largest contributor to food insecurity among Bangladeshi immigrants living in Sweden, representing 80% of (12 participants out of 15) the total factors identified. Environmental

factors and social factors follow closely behind, representing 60% (9 participants out of 15) and 53.3% (8 participants out of 15) respectively. Cultural factors represent 33.3% (5 participants out of 15) and language barriers are the smallest contributor at 6.7% (01 participant out of 15). So, it seems that the biggest contributor towards food insecurity of Bangladeshi immigrants in Sweden is the "Economic Factor".

**Diagram 4: Contributors to Food Insecurity of Immigrants Community**




Source: Qualitative data of Interview

Overall, primary findings of the thematic analysis show the multifaceted character of food security and dietary variation among Bangladeshi immigrants in Sweden. The study found that economic factors such as employment, income, and affordability play a significant effect in determining participants' food security status. Social, environmental, cultural, and linguistic aspects all contribute to participants' experiences and perceptions of food security and dietary diversity.

# CHAPTER SIX

## Discussion

The interpretation of the study's findings and results is highlighted in the discussion chapter of a research paper. It not only encompasses key findings but also their interpretation within the existing literature, as well as draws conclusions based on

the findings. Moreover, this chapter evaluated the limitations of the study and offers guidelines for future research (Smith & Johnson, 2010).

**Summarization of the Key Findings:**

The main purpose of this research is to compare the food security and dietary diversity status of Bangladeshi immigrants living in Sweden with their status when they used to live in Bangladesh. This study also aimed to recognize and interpret the key factors that contribute to the food insecurity issues, as well as to suggest potential solutions to improve the situation. After running a systematic descriptive analysis, it seems that there is no significant change in the household dietary diversity score (HDDS) of the participants after migration to Lund. However, a slight change in food security condition was observed as measured by the Household Food Insecurity Access Scale (HFIAS), though the change is not significant enough to address. Moreover, there was also no statistically significant correlation found for HDDS and HFIAS scores before and after migration, which means that other variables may also be important.

Though there weren't any alarming change in the food diversity or food insecurity rate, there were noticeable variability in the collected data. The range, variability and changing direction of data suggests that there are some factors, contributing to some sort of food insecurity or affects food security status. This includes- economic factors such as employment and income, social factors such as social isolation and discrimination; environmental factors such as food availability and quality; cultural factors such as food preferences and dietary habits, and finally language barriers.

**Comparison of Findings with Existing Literature**

It is crucial to note that the small sample size of this study limits the generalization of the primary findings to all Bangladeshi immigrants in Sweden. The study, however, adds to the current literature on food security and dietary diversity among immigrant groups by providing useful insights into the food security and dietary

diversity status of Bangladeshi immigrants in Sweden. Several studies have looked into the food security and dietary diversity of immigrant groups in various countries, including Sweden. As a result, a comparison of the findings from prior studies with the findings of the current research can help to justify the researcher's efforts.

In the context of food diversity, the current research has found that there is no significant change in the household dietary diversity score (HDDS) of Bangladeshi immigrants after migration to Sweden. This result is in contrast to the study, conducted by Ahmed et al. (2017). In his study, it was found that there is a poor nutritional status and dietary intake situation is prominent among Bangladeshi immigrants in London, United Kingdom.

This research also identified several factors that may contribute to food insecurity among Bangladeshi immigrants, including economic factors such as employment and income, social factors such as social isolation and discrimination, environmental factors such as food availability and quality, cultural factors such as food preferences and dietary habits, and language barriers. These findings are consistent with the current study.

Though the outcomes of this study indicate that there is no significant change in the HDDS of Bangladeshi immigrants following migration to Sweden, there was a modest shift in the food security status as measured by the HFIAS. This study's finding is fairly similar to a previous study by Hossain et al. (2018). According to the survey, a substantial proportion of Bangladeshi immigrants in Italy faced food insecurity due to budgetary restrictions and restricted access to nutritious food options.

This study has shown that there is some variability in the data that indicates potential factors affecting food security status of Bangladeshi immigrants living in Lund, Sweden. Factors like economic, social, environmental, cultural, and language-related issues were identified contributors to food insecurity in

immigrant community. Similarly, in a study, conducted in rural households of Madhupur Upazila, a sub-district in Bangladesh; it was found that the prevalence of food insecurity is high among those poor households. More than half of the households were food insecure. The study also claimed that food insecurity is significantly associated with lower dietary diversity scores and is influenced by social and economic factors like income, education, and occupation (Rahman et al. 2017).

Another study was conducted on Bangladeshi migrant workers in Malaysia by Islam and Khan (2018). In the study the researchers found that limited access to healthy food, low salary, long working hours, poor living conditions and lack of awareness of their rights to food are all the contributing factors to food insecurity. In contrast, the present study on Bangladeshi immigrants in Lund did not find significant changes in dietary diversity after migration, though it has noted variability in the data that suggests the presence of other factors affecting food security.

In a recent study, Carballo et al. (2019) examined that food and nutrition security of Bangladeshi migrant workers in Haiti and the Dominican Republic, faced similar challenges to those in Malaysia, including low wages, poor living conditions and limited access to healthcare services. However, the researchers recommended policy measures to improve food security by promoting community programs, improving living conditions and increasing access to healthcare services. These findings of the research are quite alike to the factors identified in the present study.

Overall, this study discovered that there was no significant change in the household dietary diversity score (HDDS) after migration to Sweden, however there was a little shift in food security status as judged by the Household Food Insecurity Access Scale (HFIAS). Economic, social, environmental, cultural, and linguistic challenges were recognized as major drivers to food insecurity among Bangladeshi immigrants, which is consistent with earlier study on immigrant communities. The

study indicates that there is a need for initiatives aimed at improving food security outcomes for migrant groups.

# CHAPTER SEVEN

## 7.Recommendations and conclusion

### 7.1 Recommendations:

Enhancing food literacy through community-based nutrition education programs, cooking classes, and peer-led initiatives can improve the knowledge and skills of

Bangladeshi immigrants in Lund in terms of healthy eating practices and available food resources (CDC, 2023). Secondly, Policymakers in Lund should address the advice to increase availability to culturally acceptable food items for Bangladeshi immigrants with an understanding of the issue's intricacies and sensitivities. This involves the need for more robust data and research (Kollmuss and Agyeman, 2002). They should also implement income support programs such as social welfare, housing support, and employment services to increase the financial stability of Bangladeshi immigrants in Lund ("Arbetsförmedlingen," n.d.).

### 7.2 Conclusion:

In conclusion, this study aimed to evaluate the food diversity and food security situation of Bangladeshi immigrants living in Lund, Sweden, through a comparative analysis. The study found that while the food diversity status of Bangladeshi immigrants in Lund is similar to that when they were in Bangladesh, their food insecurity condition is quite high in comparison to before their migration. It also identified various factors influencing their food habits and preferences, such as cultural background, language barriers, income level, and access to food resources. Based on the study's findings, several interventions were recommended, including increasing access to culturally appropriate food items, providing food literacy through community-based nutrition education programs, enhancing income support. However, it is important to note that this study has some limitations, such as a relatively small sample size and the use of self-reported data that may be subject to response bias. The implications of this study are significant for policymakers, stakeholders, and governments seeking to improve the food security and dietary diversity of immigrant populations. By implementing the recommended solutions and addressing the limitations of this study, policymakers and stakeholders can work towards achieving food security and dietary diversity for Bangladeshi immigrants in Lund as well as beyond.

## Interview Questions

**Part 1**

**Demographic/Introductory part**

1. What is your gender? A. Male B. Female C. Non-binary D. Prefer not to say.
2. What is your marital status? A. Married B. Single C. Divorced D. Widowed
3. What is your position within the household? A. Head of household B. Spouse/partner of head of household C. Child of head of household D. Other
4. What is the size of your family? A. 1-2 B. 3-4 C. 5-6 D. 7 or more
5. What is your level of education? A. Less than high school B. High school diploma or equivalent C. Some college or technical training D. Bachelor's degree or higher
6. What is your current employment status?

A. Employed full-time B. Employed part-time C. Self-employed D. Unemployed E. Unpaid work within the home F. Other

7. If you have employment, what is your position or sector of work?

A. Restaurant, bar, tourism B. Cleaning or domestic support C. Health care and social services D. Retail and sales E. Education

8. Place of residence in Sweden rural or urban?

A. Village B. Small town C. Large town D. City

9. Place of residence when you were in Bangladesh?

A. Village B. Small town C. Large town D. City

**Part 2**

**HOUSEHOLD DIETARY DIVERSITY SCORE (HDDS)**

| Types of food | Yes | No |
|---|---|---|
| a. Any bread, rice noodles, biscuits, bans, porridge or any other foods made from millet, sorghum, maize, rice, wheat (such as kalo, atapa, posho or bushera)? | | |

| | | |
|---|---|---|
| b. Any potatoes, yams, manioc, cassava or any other foods made from roots or tubers? | | |
| c. Any vegetables? | | |
| d. Any fruits? | | |
| e. Any beef, pork, lamb, goat, rabbit, wild game, chicken, duck, other birds, liver, kidney, heart, or other organ meats? | | |
| f. Any eggs? | | |
| g. Any fresh or dried fish or shellfish? | | |
| h. Any foods made from beans, peas, lentils, or nuts? | | |
| i. Any cheese, yoghurt, milk or other milk products? | | |
| j. Any foods made with oil, fat, or butter? | | |
| k. Any sugar or honey? | | |
| l. Any other foods, such as condiments, coffee, tea? | | |

**Part 3**

**HOUSEHOLD FOOD INSECURITY ACCESS SCALE (HFIAS)**

| Household Food Insecurity Access Scale | No (Answer to | Rarely (once | Sometimes (3 to 10 times) | Often (more than |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| (HFIAS) for last four weeks | question is 'No') | or twice) | | 10 times |
| a. In the past four weeks, did you worry that your household would not have enough food? | 1 | 2 | 3 | 4 |
| b. In the past four weeks were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? | 1 | 2 | 3 | 4 |
| c. In the past four weeks did you or any household member have to eat a limited variety of foods due to a lack of resources? | 1 | 2 | 3 | 4 |
| d. In the past four weeks, did you or any | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? | | | | |
| e. In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food? | 1 | 2 | 3 | 4 |
| f. In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food? | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| g. In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food? | 1 | 2 | 3 | 4 |
| h. In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food? | 1 | 2 | 3 | 4 |
| i. In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food? | 1 | 2 | 3 | 4 |

| | | | | |
|---|---|---|---|---|
| j. In the past four weeks, did you or any household member eat a cooked meal less than once a day? | 1 | 2 | 3 | 4 |

**Part 4**

**Food Security and Diversity part: (For Bangladeshi Immigrants living in Sweden)**

1. Have you developed any informal support systems to help you access food, such as sharing food with friends or family members? A. Yes B. No C. Not sure
2. How often do you try new types of food? A. Always B. Often C. Sometimes D. Rarely E. Never
3. How often do you eat food from your home country? A. Always B. Often C. Sometimes D. Rarely E. Never
4. Have you noticed any differences in the types of food that are available or preferred in Sweden compared to your home country? A. Yes B. No C. Not sure
5. Have you adapted your cooking or eating habits since moving to Sweden? A. Yes B. No C. Not sure
6. How have you adapted your cooking or eating habits since moving to Sweden?
7. Do you feel that your access to a diverse range of foods has changed since moving to Sweden? A. Yes B. No C. Not sure
8. How has your access to a diverse range of foods changed since moving to Sweden?

9. Have you ever had to choose between paying for food and other basic needs, such as rent or utilities? a) Yes b) No
10. Can you please share how often you have had to choose between paying for food and other basic needs such as rent or utilities as well as what were the reasons behind it?
11. Have you or anyone in your household experienced job loss or income reduction in the past year? a) Yes b) No c) Not applicable
12. How frequently has anyone in your household encountered job loss or a decrease in income over the previous year?
13. Have you noticed any differences in food prices or availability where you live in Sweden compared to where you lived in Bangladesh? a) Yes, there are significant differences b) Yes, but the differences are minor c) No, there are no differences
14. Are there any specific cultural or religious dietary restrictions that you follow, which make it difficult to access certain types of food in Sweden? a) Yes b) No c) Not applicable
15. Can you explain if there are any cultural or religious dietary restrictions that you follow, which make it difficult for you to access certain types of food in Sweden?
16. Have you found it challenging to find ingredients for traditional Bangladeshi dishes in Sweden? a) Yes, frequently b) Occasionally c) No, not at all
17. Have you had to adapt your cultural or religious dietary practices since moving to Sweden? a) Yes, significantly b) Somewhat c) No, not at all.
18. What are some challenges you face in accessing and purchasing healthy food in Sweden?
19. What are some strategies you use to make sure you have enough food for your family?
20. Have you noticed any differences in the availability and quality of food in different areas of Sweden?

21. How do you incorporate your cultural food traditions into your diet in Sweden?
22. What do you think could be done to improve the food security and dietary diversity of immigrant communities in Sweden?
23. Could you elaborate on the ways in which you have had to adapt your cultural or religious dietary practices since moving to Sweden?
24. Do you feel that there are any specific policies or practices that could be implemented to better support Bangladeshi immigrant households in Sweden with regards to accessing food? A. Yes B. No C. Not sure
25. Please explain what specific policies or practices you think could be implemented to better support Bangladeshi immigrant households in Sweden with regards to accessing food?

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