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SURVEY ON CONSUMER AWARENESS OF NUTRITION, FOOD SAFETY AND HYGIENE

FINAL REPORT

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Survey on Consumer Awareness of Nutrition, Food Safety and Hygiene (2020-21)

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Executive summary

This study aims to gauge the general population's knowledge of basic nutrition, food safety, and hygiene in rural urban and slum areas of Bangladesh. It is expected to serve as a baseline that will be used in the future to assess any changes. The specific objectives of the study are to:

a. Assess the knowledge of basic nutrition, cooking best practices, food safety and hygiene principles of a sample of the country that will be representative of different:
   -Divisions of the country as well as nationally
   -Age groups and stages of the life cycle
   -Gender, male and female
   -Socio economic groups
b. Compare knowledge levels to a simple assessment of people's dietary practices, nutritional behavior and status, and overall health.
c. Identify factors associated with different levels of knowledge and awareness.

Methodology

A cross-sectional study design was followed to conduct the study. To obtain nationally representative information on issues related to basic nutrition, food safety and hygiene related knowledge, a survey was conducted in both urban and rural areas of all eight divisions of the country. Data was collected from four types of consumers, namely, purchasers, cooks, adolescents and caregivers from 5,000 households from across the country, of which 3,989 were rural and urban respondents and 1,011 were respondents from slums.

Results

Basic nutrition knowledge: Overall, one-third of the respondents living in rural and urban areas and two-fifths in slums had a low basic nutrition knowledge. Specifically, they had:

I. Absence of knowledge on foods rich in vitamin A and Iron.
II. Lack of knowledge on adverse health effects of trans-fatty acid, such as, cardiovascular disease risk.
III. Low knowledge on adverse health effects of unfavorable nutrition behavior (e.g. eating salty/savory foods—puri, singara, crisps and chips, chanachur, etc; sweet foods/sugary foods; sugar sweetened beverages).
IV. Lack of knowledge about adequate dietary diversity from consuming a variety of foods and well-balanced diet.
V. The lowest knowledge of basic nutrition and adverse health effects of unfavorable nutrition behavior compared to other types of consumers in the case of adolescents living in urban areas. .

Cooking best practices: Overall, 43 percent of cooks living in rural-urban and slum areas had low knowledge on cooking best practices. Specifically,

I. Most of the cooks (74.5 percent) did not mention that vegetables need to be cleaned before cooking.
II. Fifty seven percent of cooks did not know how many times cooked food is safe to reheat before consumption.

Food safety and hygiene knowledge: Overall, one-third of cooks had low food safety and hygiene knowledge. Specifically, the problems and issues were:

I. Lack of knowledge about the sources of possible cross-contamination in the household to protect potential food safety and hygiene hazards and risk.
II. Low personal hygiene and inadequate handwashing practices at critical times during food preparation and before eating.
III. Lack of knowledge and understanding regarding the concepts of "food safety" and "food hygiene"

IV. Low knowledge on the need to avoid keeping cooked foods at ambient temperature for prolonged periods and to reheat leftover food properly before eating and feeding to infants.
V. Low knowledge of practices of water purification before drinking in rural households.
VI. Due to public health messaging regarding the Covid-19 pandemic, the handwashing practice with soap increased by one-fifth and is expected to continue at this level after the crisis is over.
VII. Low access to pipe water—an option in high demand, for increasing water access for drinking, and for washing fresh fruit and vegetables before preparation and eating, mainly in the rural households.

Having no formal education, belonging to the low wealth category, having inadequate dietary diversity, being underweight or obese, and having somewhat or bad health condition were identified as significant predictors/indicators of low levels of knowledge and awareness. There were also geographical differences with those in Barisal faring worse in terms of knowledge and awareness while those in Khulna division has worse knowledge of cooking best practices, and those in Rangpur had low food safety and hygiene knowledge.

Implications for Policy

- This household survey has identified a need to raise awareness of basic nutrition, cooking best practices and food safety and hygiene, and to improve the knowledge, attitudes and practices (KAP) of consumers at household level. To this effect, it is suggested to promote effective awareness campaigns to:
  i. Increase knowledge on foods rich in vitamin A and Iron;
  ii. Increase knowledge on adverse health effects of trans-fatty acid, such as, cardiovascular disease risk;
  iii. Increase knowledge on adverse health effects of unfavorable nutrition behavior (those who eat salty/savory foods—puri, singara, crisps and chips, chanachur, etc; sweet foods/sugary foods; sugar sweetened beverages).
  iv. Popularize the adoption of balanced diets and quality eating behavior for a healthy life. Special attention should be given to nutritionally vulnerable people being underweight, somewhat or bad health condition and adolescent girls.
  v. Promote effective training to those purchasing food for the household regarding dietary diversity and healthy diet and develop network among purchaser, producers, and relevant departments to obtain necessary support for ensuring availability of diversified food items at household/community level.
  vi. Popularize the importance of soap and water for cleaning and safety and ensure that these are available at all times close to food preparation and feeding areas.
  vii. Inform of the dangers of unhygienic food handling, preparation, safe storage, reheating of foods where necessary, and distribution and demonstration of appropriate practices is essential.
  viii. Improve hygiene knowledge through Behavior Change Communication (BCC) followed by community–based monitoring through public and private sector partnerships to check whether environmental sanitation and hygiene practices are maintained properly in the household to protect potential food safety and hygiene hazards and risk.
- Nutrition training, BCC for enhanced knowledge of safe handling, processing and storing of foods and improved consumption need to be scaled up.
- Food safety priority issues should be clearly defined, developed and incorporated into the health education curriculum of current school textbooks.
- Food safety and hygiene surveillance systems to monitor and evaluate progress overtime and inform policy need to be developed.

Accordingly, it is recommended that a communication strategy be developed with information, education and communication (IEC) materials and tools aimed at addressing the identified high-risk food safety and hygiene behaviors. Specifically:

- Primary target audience should be the general population, however, special attention should be given to persons involved in purchasing food, cooking, adolescents and caregivers having no formal education, belonging to low socio-economic categories, having inadequate dietary diversity, having unfavorable nutritional behavior, being underweight or obese and having overall health condition as somewhat or bad.
- Key messages should be culturally appropriate, clear, simple and practical, and easy to understand by people with low education and literacy skills.
- Communication channels and selection of the appropriate communication media for a BCC campaign should be planned in consultation with key stakeholders, including BFSA, BNCC, JICA, SUN Movement, Bureau of Health Education, Directorate General of Health Services, Institute of Public Health, and the Department of Mass Communication. Strategies may include but not be limited to:
  - € Production of relevant basic nutrition, food safety and hygiene information/educational print materials for distribution to households in rural and slum areas. This may include booklets, leaflet, flip charts, posters and billboards;
  - € Grassroots informal meetings with the person involved in cooking/mothers and mothers-in-laws involving interpersonal communication supported by community health workers and community leaders; and
  - € National coverage/reach using mass media, including Government and private television and radio channels, with information spots and practical demonstration on environmental sanitation, potential sources of contamination and risk for food safety and hygiene in the household, safe food handling and preparation practices. Short documentary film and video can be used to communicate more effectively with illiterate groups.
  - € Rural Community **Radio Krishi**, which is the only government community radio, and was established by Agricultural Information Service, can be engaged to disseminate key messages for improving knowledge of basic nutrition, diversified food items and healthy diet, and preventive aspects of food safety and hygiene among community people including farmers.

    Field level workers of the Ministry of Agriculture, Ministry of Fisheries and Livestock, Ministry of Food, Ministry of Health and Family Welfare (MoHFW) and relevant NGOs working at community level can be engaged on improving knowledge of basic nutrition, diversified food items and healthy diet, and preventive aspects of food safety and hygiene through training, and to communicate this during community sessions. The Community Clinics offers another opportunity to address food safety and hygiene through training of health workers. All medical service centres including should offer food safety and hygiene education to clients.

Chapter 1
Introduction

Research background

Achieving adequate nutrition and food security for everyone, the right foods must be available, and people must be able to physically and financially access to these foods. Although Bangladesh has made remarkable improvements in the areas of food availability[1] and access[2], the progress in food utilization[3] and nutrition, the third dimension of food security is still lagging behind (FPMU, 2020). Nonetheless, the country's population consumes much more rice per capita than recommended dietary guidelines. However, feeding and hygiene practices are often inadequate (Rabbi and Dey, 2013; Mahmud, 2016; Manikam et al., 2017; MICS, 2019), with catastrophic consequences for small children's nutritional status and growth.

There is an inextricable link between nutrition, safety of food, and security of food (World Health Organization, 2020a). Unsafe food triggers a vicious cycle of foodborne diseases, especially affecting vulnerable consumers such as elderly, sick, young children, and infants. It is therefore important to create awareness among people about basic nutrition, that includes knowledge regarding sources of nutrients, everyday food choices, dietary recommendations, diet-disease relationship and so on (Yahia et al., 2016). Food safety is a public health priority being fundamental for the economic and social well-being of the people. To ensure safe food, WHO has identified and recommended five key measures, viz. keeping clean, separating raw and cooked food, cooking thoroughly, keeping food at safe temperatures, and using safe water and raw materials (World Health Organization, 2006; Fontannaz-Aujoulat et al., 2019). Adopting certain essential practices during cooking such as washing hands properly before handling food, preparing items with the cooking materials on a clean surface, using separate cutting boards for different items of food, keeping vegetables away from meat, cleaning cooking utensils after they come into contact with raw meat, are some of the examples that may help to ensure food safety (Dudeja and Singh, 2017). The escalating number of episodes related to food-borne illnesses and food poisoning demand a better call for improved food handling practices (Gupta et al., 2016). Therefore, the knowledge, attitude, and practices (KAP) of food handlers are of prime importance (Cheng et al., 2017; Nkhebenyane and Lues, 2020). The evaluation of KAP is the first step to understand the food handler's point of view (Zanin et al., 2017). Sun et al., (2016) found that gender, grade, education level and field of specialization were correlated with food safety knowledge scores.

It is necessary to explore how knowledge on food safety and hygiene influences nutritional behaviour. Nutritional behavior is “the sum of all planned, spontaneous, or habitual actions of individuals or social groups to procure, prepare, and consume food as well as those actions related to storage and clearance. In this context, the term ‘nutritional behavior’ also refers to the influencing factors as well as the health, environmental, social, and economic implications along the entire food product ranging from producer to consumer” (Zander and Köhler, 2009; Hummel and Hoffmann, 2016; Rüter, 2019). Poor knowledge on food safety and hygiene may result in poor food utilization that affects nutritional status, resulting from the relationship between nutrient intake and requirements and from the body's ability to digest, absorb and use these nutrients (FAO, 2007). A

[1] Food availability refers to the physical presence of sufficient quantities of appropriate food at various levels from household to national level, be it from own production or through markets (FAO, 2006).

[2] Food access refers to the ability to obtain an appropriate and nutritious diet and is in particular linked to resources at the household level (Begum et al., 2013).

[3] Food utilization refers to the proper use of food, which includes proper food processing and storage practices, adequate knowledge of nutrition and child care practices and, their application, and adequate health and sanitation services (USAID, 1992).

comparison of people's food safety and hygiene related knowledge with a simple assessment of their overall health is necessary.

Studies in Bangladesh have shown that introduction of inadequate complementary food (CF) for children in resource-poor settings can result in diets that are not only nutritionally inadequate but also microbiologically unsafe, leading to possible multiple nutrient deficiencies and higher exposure to food borne pathogens associated with a higher incidence of diarrhoea (Islam et al., 2012). Young children are often infected by intestinal pathogens through food contamination that impacts their health and nutritional status Owino et al., 2016; Mostafa et al.,2018). Proper attention needs to be paid to consumers especially the infants' mother and caregivers to identify their feeding behavior as well as foods consumed for ensuring healthy growth of the young children.

Diarrhoea and other water related infectious disease occurring in rural areas of Bangladesh stem from a lack of awareness about cleanliness including hygiene, low-cost infrastructure including tubewells, and low-quality latrines (Dey et al., 2015). It is very important to get insights on people's knowledge on issues like these that critically impinge on food safety and hygiene. Proper handwashing with soap and water before eating, after defecation, proper management of child faeces, and periodic monitoring for adopting hygiene behavior including cleanliness of latrine, can prevent under-five children diarrhoea in households (Dey et al., 2019). In fact, WHO (2020b) has declared that proper hygiene practices including handwashing frequently with soap and water is one of the most effective options to protect against infectious diseases including COVID-19.

The hygiene and safety aspects of street foods are a challenge and also important, particularly when they contribute substantially to food security and nutrition of urban consumers. A study on street foods consumed in Dhaka city found medium to high coliform counts in commonly sold street foods. (Khairuzzaman et al., (2014); Faruque et al., 2010). Consumers bear the consequences of eating such foods, often ignoring the aspects of hygiene and sanitation . It is essential to assess the perception and knowledge among consumers about street foods as well as junk foods, and their probable health impacts.

A cross-sectional study conducted among university students in Noakhali region of Bangladesh identified their lack of knowledge about nutrition, healthy diets and the harmful effects of obesity (Karmakar et al., 2016). Another study examined the differentials in nutritional status and dietary intake and related knowledge among 4,993 unmarried adolescent girls aged 13-18 years in 708 clusters in rural Bangladesh and identified overall low dietary knowledge (Alam et al., 2010). A number of other studies carried out in Bangladesh to assess the impact of interventions on knowledge of basic nutrition, IYCF, adolescent nutrition, food preparation, hygiene etc. also point to inadequate knowledge (Khan et al., 2017; Hoddinott et al., 2018). A study carried out by FAO in collaboration with ICDDR,B identified food safety lessons learned and provided recommendations for interventions of food safety in Bangladesh (Add Ref). However, no nationwide survey has been carried out in the country to identify the consumer's knowledge of nutrition, food safety and hygiene. Further, no study has focused extensively on assessing people's knowledge and practices on safe handling of food which is essential to reduce contamination. People's knowledge on some neglected but important hygiene issues are also still largely unexplored. Hence, a nationally representative survey covering all these issues is required to develop a full-fledged strategy to ensure proper knowledge of nutrition and hygiene. It will work as a baseline of nutrition and food safety knowledge across different populations in Bangladesh.

Objectives of the study*:*

The objectives of the research project are to:

d. Assess the knowledge of basic nutrition, best practices in cooking, food safety and hygiene principles of a sample population of the country that will be representative of different:
    -Divisions of the country as well as nationally
    -Age groups and stages of the lifecycle

-Gender, male and female
-Socio economic groups

e. Compare knowledge levels to a simple assessment of people's dietary practices, nutritional behavior and status, and overall health.
f. Identify factors associated with different levels of knowledge and awareness.

Chapter 2
Literature review

2.1 Food safety and nutrition in Bangladesh

Food safety and nutrition are inextricably linked, particularly in places where food supplies are unstable (WHO, 2021). When food becomes scarce, aspects of hygiene, safety and nutrition are often ignored as people shift to less nutritious diets and may consume more 'unsafe foods'and chemical, microbiological, zoonotic, and other hazards pose a health risk. Unsafe food, whether arising from poor quality supply or inadequate treatment and preparation, increases the risk of foodborne infections such as diarrhoea.

Since independence, Bangladesh has made significant progress in increasing domestic production of food; this has to a large extent helped in overcoming insufficient national food availability. Nutrition, food safety and quality were largely ignored but have now attained highest importance and the Government of Bangladesh is firmly committed to the progressive realization of the right to safe food.

2.2 Consumer behavior

Consumer behavior entails all activities associated with the purchase, use and disposal of goods, services, time, and ideas including a consumer's emotional, mental and behavioral responses that precede or follow these activities. It is valuable to study consumer buying behavior, buying motives and habits so as to create marketing strategies to respond to the needs of consumers. Ajagbe et al. (2015) opined that many factors influence consumer decision making, some of which are: stimulus-response , buyers' decision-making process, buyers' characteristics, perception value, and marketing mix centering on promotional activities. There are also determining factors like demographics (i.e. age, gender and income), perception value (brand awareness, brand association and brand loyalty), perceived quality and sales promotion, and some others (convenience to buy, taste flavors, price and packaging) that have significant influence on consumer's understanding and buying behavior (Oke et al., 2016; Muchru et al., 2018).

2.3 Consumer awareness of nutrition, food safety and hygiene

Consumer awareness is one of the most important steps towards understanding and reducing the adulteration of foods. The price, availability, variety, and attractiveness of consumer products have increased with rise in people's incomes in Bangladesh. Low-income groups who are less educated, appear to lack awareness of their rights and accountabilities, and have less knowledge about the risks of adulterated food (Arefin et al., 2020). A number of studies have identified lack of people's knowledge about basic nutrition, healthy diet, food safety and hygiene, Infant and Young Child Feeding (IYCF), and the harmful effect of obesity (Alam et al., 2010; Roy, 2011; Hackett et al., 2015; Hassan et al., 2017; Kabir et al., 2013; Karmakar et al., 2016; Saha et al., 2011; Uddin et al., 2008).

Nutrition and food safety may be affected by abusive use of agrochemicals and pesticides on crops, which can be minimized if people have proper knowledge of the health consequences of such malpractices (Dey, 2010). Studies in similar settings have identified knowledge gaps regarding hygiene issues like faeces of young children being regarded as less harmful than adults by mothers/caregivers which results in unsafe disposal of child faeces (Brown et al., 2013; Islam et al., 2018). Unhygienic household surroundings and dirty children's toys have been found to be responsible for recurring rotavirus infection among children resulting in poor nutritional outcomes (Junaid et al., 2011).

Many diseases occurring in rural areas of Bangladesh stem from a lack of awareness about cleanliness including hygiene, low-cost WASH infrastructure, and low-quality latrines (Dey et al., 2015). Dey et al. (2019) suggest need for uptake strategies that go beyond merely increasing access to improved latrine and improved drinking water, such as imposing fines and eliciting shame and disgust as motivation to mitigate unhealthy and unhygienic practices. They identify Behavior Change Communication (BCC) for improving hygiene knowledge followed by community–based monitoring for hygiene practices at household level as one of the effective approaches for improving handwashing practices followed by reducing risk of infectious diseases of children in rural areas of Bangladesh.

Food safety is a public health priority and is fundamental for the economic and social well-being of the people. Food safety deals with safeguarding the food supply chain from the introduction, growth, or survival of hazardous microbial and chemical agents (Radovanovic, 2011; Uyttendaele et al., 2016). A systematic literature review of 81 full-text articles identified microbial and chemical contamination of foods, food adulteration, misuse of food additives, mislabeling, and foods past their use-by dates as food safety-related public health risks in the food market (Gizaw, 2019). WHO has identified five keys for ensuring safe food: keeping clean, separating raw and cooked food, cooking thoroughly, keeping food at safe temperatures, and using safe water and raw materials (World Health Organization, 2006).
There is limited published data on the temporal trends, magnitude of food adulteration and on consumers' knowledge, attitude, and practices (KAP) regarding food adulteration in Bangladesh. KAP involves a range of beliefs about the causes of disease and exacerbating factors, identification of symptoms, and available methods of treatment and consequences (Szymona-Pałkowska et al., 2016).

2.4 COVID-19 pandemic and hygiene behaviour

The national representative survey 'Bangladesh National Hygiene Baseline Survey-2014' reported that 40percent of households had handwashing facilities with water and soap available for post-defecation use (Alam et al., 2017). The first action recommended by WHO and other related bodies for individuals to protect themselves and others from COVID-19 was washing hands frequently with water and soap or using hand-sanitizing gel (World Health Organization, 2020b, UNICEF, 2020). A recent nationwide study based on the two national representative publicly available datasets (MICS 2019, and confirmed cases of COVID-19) found that the overall prevalence of households handwashing practices was 56.3percent, and the prevalence significantly varied across the socio-economic status of the household and COVID-19 prevalence (Ahmed and Yunus, 2020). The study suggested a gradual increasing trend of COVID-19 cases in areas where household handwashing practice is low. The northern part of Bangladesh had the highest handwashing practice and had been less affected by COVID-19 cases. However, central Bangladesh was the hardest hit by COVID-19 cases, and it had around 50% handwashing practice coverage.

2.5 Policy gap

There is no nationwide survey in Bangladesh till date to identify people's knowledge of nutrition and food hygiene basics at consumer level (Roy 2011; FAO, 2020 and references therein). Besides, no study has focused on assessing people's knowledge on safe handling of food which is essential to reduce contamination. Hence, a nationally representative survey covering all types of consumers in various demography of Bangladesh is required to formulate proper guideline that can positively influence the KAP of the consumers for ensuring not only nutritional value of the food they consume but also its safety and hygiene status. It will work as a baseline of nutrition and food safety knowledge across different population segments in Bangladesh and allow the government and other stakeholders to develop a coordinated approach to address knowledge gaps and monitor progress over time.

Chapter 3
Methodology

3.1 Study design and settings

To get the nationally representative prevalence of basic nutrition, food safety and hygiene related knowledge, the survey was conducted in both urban and rural areas of all eight divisions of Bangladesh, following a cross-sectional study design.

3.1.1 Sampling frame for rural-urban areas

The sampling frame used for the "Survey on consumer awareness of nutrition, food safety and hygiene" was the complete list of enumeration areas (EA) covering the entire country prepared by the Multiple Indicator Cluster Survey (MICS) 2019 of the People's Republic of Bangladesh; which established 3220 EAs covering on average 113 households. The sampling frame and a sketch map that delineates the EA geographic boundaries are available for each EA (UNICEF, 2019, accessed on 7 March 2021).

3.1.2 Sample size calculation (to get estimates by division)

The following formula adopted by the Bangladesh MICS was used to estimate the required sample size (UNICEF, 2019):

—

Where

- n is the required sample size, expressed as number of households
- z is the two sided z-value at (1-α)% level of confidence
- r is the predicted or anticipated value of specific indicator, expressed in the form of a proportion
- deff is the design effect for the indicator when cluster random sampling is implemented, generally estimated from a previous survey or experience
- e is the margin of error to be tolerated at the (1-α)% level of confidence
- pb is the proportion of the total population upon which the indicator r, is based
- AveSize is the average household size (number of persons per household)
- RR is the predicted response rate

For the calculation of sample size, the formula adopted by the MICS was used. The sample size was calculated for each domain (eight-division with urban-rural classification). Considering 95% level of confidence, 0.5 predicted value of the indicator, 2.5 design effect, 5% error margin, 0.47 proportion of respondents of the total female population, 4.6 average household size and 90% response rate estimated sample size for each domain is 250. The sample size was doubled to compensate for the design effect. Primary respondents were the persons involved in food purchasing, cooking, adolescents and caregivers responsible for child (<5 age) caring in the household.

3.1.3 Sample allocation in the rural-urban areas

Since each division was divided into the rural and urban domain, 240 to 820 samples were collected from each division as shown in Table 1. Total sample size was 4000 households from across the 8 divisions. We collected 73% of the data from rural areas and 27% from urban areas (slum and non-slum). Each division was divided into two sampling strata, rural and urban areas. Samples of EAs were selected independently in each stratum in two stages.

In the first stage, 200 PSUs (clusters) were selected using the systematic random sampling procedure and independent allocation in each sampling stratum using MICS datasets. In the second stage of selection, a fixed number of 20 households per cluster were selected with an equal probability systematic selection from the newly created household listing. For, rural areas we selected sample mouzas from each domain and then selected households from each mouza. For urban areas, we

selected wards from each domain and then selected the households from each ward. A detail of selected clusters in rural and urban areas is in Annexure 1.

Table 1: Distribution of sample cluster (PSU) and sample households from each division by urban and rural

Division	Sample cluster (PSU)			Sample households		
	Urban	**Rural**	**Total**	**Urban**	**Rural**	**Total**
Barisal	5	14	19	100	280	380
Chattogram	9	26	35	180	520	700
Dhaka	11	30*	41	220	589	809
Khulna	8	23	31	160	460	620
Mymensingh	3	9	12	60	180	240
Rajshahi	7	18	25	140	360	500
Rangpur	7	18	25	140	360	500
Sylhet	3	9	12	60	180	240
Total	**53**	**147**	**200**	**1060**	**2940**	**3989**

* 11 interviews were taken less due to drop out of one Enumerator

3.2 Sampling frame and sample size calculation for slum areas

The sampling frame involved drawing 50 enumeration areas (EAs) where samples were drawn in two stages. The primary stratification was based on the grouping of EAs by division (Dhaka+Mymensingh and others divisions) as shown in Table 2. The second stratification was based on geographic locations within each primary stratum. To get estimates from the slum areas, an adequate number of respondents from slum were included. Considering the high level of inter-cluster correlation for slum areas, 20 households from each slum were selected. So, the total number of selected households from the whole slum was (20*50=1000) 1000. The number of households from slums were selected based on the "Census of Slum areas and Floating population 2014". There are a total of 9113 slums at the division level. Then we selected 50 slums based on the probability proportional to size sampling procedure ($n_1 = (N_1/N)*n$).

Where

n_1 = required slum size at each division

N_1 = total number of slums in each division

N =total number of slums in Bangladesh

n= required slums need to be sampled for our study

Then the households were selected by using the systematic random sampling procedure. This sample size of 50 EAs (i.e. 1000 households) was large enough to provide estimates of census coverage at the national level. Details of selected clusters in slum areas are shown in Annexure 2.

Table 2: Distribution of sampling households in slums by divisions

Division	Slum Census 2014		Sampling households
	Number	Selected Slum by using PPS sampling	
Dhaka+Mymensingh	4761	25**	511
Others (Chattogram, Barisal, Khulna, Rajshahi, Rangpur, Sylhet)	4352	25	500
Total	**9113**	**50**	**1011**

** 11 more interviews were taken in order to full fill the total sample size

3.3 Data collection

The data collection started on October 1, 2020 and was completed on November 30, 2020. Data was collected by Field Research Assistants (FRA) using a pre-tested standard structured questionnaire through face-to-face interviews with respondents in his/her household and entered electronically in Kobo Collect, an Android-based open-source mobile platform software. 24 FRA and 6 Field supervisors were recruited and provided with rigorous hands-on training on the questionnaire for 4 days before sending them out to the field for data collection. The trainings covered topics relevant to the objectives of the research, research methodology, data collection procedure, how to maintain confidentiality of the participants, taking consent and respecting respondent's decision of participating or not participating in the research etc. The supervisors checked for consistency of data and ensure quality Six data collection teams, each consisting of one Supervisor and 5 FRAs worked in the field.

Since the survey was conducted during the Covid-19 pandemic, for safety and security, masks, goggles, hand sanitizers etc. were provided to FRAs, supervisors and research personnel to ensure their safety and security as per the protocols set forth by JPGSPH. As there was restriction of movement of FRAs, it was difficult to collect data particularly in the urban areas of the study sites. The Covid-19 pandemic had meant that limited access was available to households in urban slums and other areas. This meant that the FRAs had to search for more households in adjacent areas to get the required number of respondents.

3.3.1 Data quality control and management

A multilayer monitoring system was employed to maintain the quality of data. The field supervisors were responsible for the daily monitoring of fieldwork. They performed tasks such as spot checking, thorough checking of the filled questionnaire in the tablets, back checking and provided necessary feedback to their respective teams working in the field. Each supervisor observed at least one household interview by each FRA of his/her team each day. Field supervisors randomly revisited selected sub-samples (around 5%) of interviewed households within 48 hours of the initial visit by the FRAs to check whether the selected households were visited, eligible respondents were properly identified and interviewed or not. Each day, the filled-in questionnaires were first cross-checked by team members, and then finally thoroughly checked by the field supervisor. Discrepancies in any information were corrected through re-interviewing the respondents by the interviewers or field supervisors. In addition, Senior Field Coordinators visited each data collection team at random, at least once every fortnight to ensure adherence to the questionnaire protocols in the field. They observed conduct of interviews, provided guidance if any issue arose and contributed to maintaining data quality. The statistician, positioned in Dhaka, downloaded the daily uploaded data from the server, and performed analyses to identify any discrepancies in the collected data. Inconsistencies, if any, were reviewed by the principal investigator, co-investigators, and other researchers to identify possible reasons, and directions were provided to address them.

3.4 Key factors and measuring indicators

The key factors and measuring indicators are summarized in Table 3.

Table 3: List of key factors and indicators

Objectives	Key factors	Indicators
Respondent screening & survey information	Survey basic information, Responsibility related to food at HH level	● Survey information ● Decision about food purchasing, expenditure on food ● Involvement in food preparation, cooking & serving ● Involvement with child feeding and care ● Having adolescent girl/boys in the household
Household information	Socio-economic information	● Demography ● Economic ● Basic HH sanitation etc. ● Livestock ownership
Objectives 1 & 2: (a)	Basic nutrition and dietary knowledge plus practices	● Diet during different stages of lifecycle such as first 1000 days, adolescence, pregnancy, and old age . ● Child feeding (pre lacteal, breast feeding, exclusive breast feeding, dietary diversity, minimum meal frequency etc.) practice and knowledge ● Knowledge about recommended dietary allowance ● Food source of different nutrients ● Nutrient deficiency disorders ● Prevention and control of malnutrition ● Knowledge regarding different forms of malnutrition i.e. wasting, stunting, obesity etc. ● ●
	Junk/ processed/ manufactured/ ready to eat foods for example savory crispy and fried foods, sweet snacks and sugar sweetened beverages	● Perception about junk food, processed food, manufactured foods ● Reasons for foods considered as junk ● Importance/harmful impact on health ● Food marketing related issues (omega 3, vitamin A or D etc. rich foods) ● Factors considered during buying/eating
	Consumer behavior	● Perception value (brand awareness, brand association and brand loyalty), perceived quality and sales promotion ● Convenience to buy, taste flavours, price and packaging
Objective 1 & 2: (b)	Cooking practice and knowledge	● Food handling hygiene ● Cooking area free of Insects/pests/animals ● Use of clean utensils ● Use of salt and oil ● Knowledge about the adverse effect of trans fat
Objective 1 & 2: (c)	Food safety and hygiene knowledge and practice	● Cleanliness ● Separate storage of raw and cooked food ● Cooking time ● Food preservation temperature

		● Reheat time for cooked food ● Safe water usage ● Safe raw materials usage ● Covering cooked food to protect from contamination by flies. ● Knowledge on environmental sanitation ● Hand hygiene before eating and after defecation ● Knowledge on possible sources of microbial contamination ● Awareness about food adulteration
Objective 2:	Nutritional behaviour and status	● Food frequency ● Dietary diversity ● Consumption of food from specific food group
	Diet and nutrition related conditions, illness/morbidity Overall health	● Body weight perception ● Diseases/illnesses ● Perception about physical activity ● General Health Rating Index (o) based on different indicators of perceived health status (Scale range: 0-100)
Objective 3:	Factors associated with different levels of knowledge and awareness	● Divisions of the country ● Wealth Index ● Education level ● Age group ● Area of residence ● Nutritional behavior ● Nutritional status ● Overall health

3.5 Analysis plan

3.5.1 Statistical analysis

Descriptive statistical analysis was done using frequency tables and was visualized with graphs and figures. Inferential analysis was done using chi square test of independence and regression analysis. To ensure the actual representation of the survey results at national level, sampling weights were used in the analysis. Multinomial logistic regression is used to explain the relationship between one nominal dependent variable and independent variables, and to identify predictors. At first, we identified the variables which were statistically significant with outcome and then considered the identified variables for the model (Das & Gulshan, 2017). We conducted analysis of data of rural/urban and slum areas separately to prevent any multicollinearity problem. Accordingly, no multicollinearity was found in our model.

3.6 Operational definitions of variables and measuring technique

3.6.1 Wealth Index

The wealth index has been calculated based on the methodology used discussed in Fry et al., (2014). We have considered the area of homestead and cultivable land owned by the household, number of rooms in the house, assets of households (like TV, refrigerator, radio, etc.), cooking fuel, materials of walls and roofs, materials of floor, drinking water source, and toilet facility. At first, we divided each variable into different categories based on the methodology of the given reference. After that, principal component analysis (PCA) was run to find out the weight of each corresponding variable.

Then we calculated the predicted value of PCA model. The whole sample was then divided into 5 equal parts from lowest to highest.

3.6.2 Scoring technique for measuring nutrition-related knowledge

The main outcome variable in this study is the consumer's knowledge of basic nutrition, food safety and hygiene. The scoring system, described in Marías and Glasauer (2014) was used to assess the overall knowledge of the respondents. For each dichotomous question, score 1 was given if respondent's answer was right. Questions having multiple right answers were scored between 0 and 1 based on number of right answers given, with each right answer carrying equal fractional score value (i.e. if a question has 5 right answers, the respondent got score 0.2 for each right answer). The total knowledge score was calculated by combining scores of all questions. Based on the total score, the whole sample was divided into three tertiles. We have considered that the respondents belonging to first tertile have "Low level of Knowledge", while respondents of second tertile and the top tertile have "Moderate level of Knowledge" and "High level of knowledge" respectively (Bonaccio et al., 2013). Knowledge of basic nutrition was measured in terms of knowledge on diets during different stages of lifecycle (such as first 1000 days, adolescence, pregnancy), child feeding (prelacteal, breastfeeding, exclusive breastfeeding, dietary diversity, minimum meal frequency etc.), recommended dietary allowance, food source of different nutrients, nutrient deficiency disorders, prevention and control of malnutrition, requirement of different food items in recommended diet etc. (Yahia et al., 2016).

3.6.4 Cooking practice related knowledge

Knowledge on washing hands properly before handling food;; keeping vegetables away from meat and using separate cutting boards, cleaning cooking utensils after they come into contact with raw meat were some of the indicators used as measures of cooking practice related knowledge, following (Dudeja and Singh, 2017).

3.6.5 Food safety and hygiene

Food safety and hygiene related knowledge was assessed based on a set of questionnaires evaluating respondent's knowledge of cooking time, food preservation temperatures, reheating time for cooked food, safe water usage, covering cooked food to protect from flies, hand washing and hygiene before eating and after defecation, possible sources of microbial contamination, awareness about food adulteration and safe food storage (Sun et al., 2016; FAO, 2017; World Health Organization (WHO, 2020).

3.6.6 Nutritional behaviour

The prevalence of selected eating behaviors (favorable: consuming breakfast, fruit, vegetables, milk and milk beverages, whole grain bread and fish; adverse: regular consumption of sweets, sugared soft drinks and fast-foods) are some major indicators to measure nutritional behavior (Fry et al., 2014). A respondent was considered having favorable nutritional behavior if he or she ate starchy staples/grains or dark green leafy vegetables or red/orange/ yellow vegetables or red/orange/ yellow fruits or vitamin C rich fruits or vitamin C rich vegetables or other vegetables or fruits at least one in the last 24 hours. A respondent was considered as having unfavorable nutritional behavior if he or she ate savory and fried snacks or sweets or sugar sweetened drinks or commercial soft drinks at least once in the last 24 hours or other beverages and foods at least once in last 7 days.

3.6.7 Dietary diversity

Dietary diversity is a qualitative measure of food consumption that reflects household access to a variety of foods and is also a proxy for nutrient adequacy of the diet of individuals. The dietary diversity scores consist of a simple count of food groups (Annex-Table A5) that a household or an individual has consumed over the preceding 24 hours (FAO, 2013; FAO, 2021). Improving young

children's diets during the complementary feeding period was measured as per guidance by UNICEF (2020).

3.6.8 Nutritional status

Nutritional status of respondents was measured in terms of their height and weight and calculation of Body Mass Index (BMI). this has been extensively used in similar studies in the past (Bhattacharya et al., 2019; Nowak-Szczepanska et al., 2019).

3.6.9 Overall health

The Minimum European Health Module (MEHM) consisting of 3 questions concerning 3 health domains: self-perceived health, chronic conditions and long-term activity limitation was adopted to assess the overall health of the respondents (Cox et al., 2009).

3.6.10 Bias correction on handwashing behaviour due to public health messaging related to Covid-19 to understand actual hygiene behavior

It is possible that the intensive public health messaging around COVID-19 on handwashing with soap and water carried out just before the household survey may have affected some outcomes, mainly handwashing knowledge and practice at critical times as well as food safety and handling measures like washing vegetables and fruits thoroughly with running water.

To address this, , a bias correction matrix (Table 4) was included which asked the respondents how they wash their hands in specific times, was it their initial practice before the pandemic, was it developed due to public health messaging on COVID-19 and whether they would continue the practice once the pandemic was over.

Table 4: A matrix of bias correction

Indicators	Were these their usual practice before the pandemic?		Are these practices developed among them due to public health messaging on COVID-19?		Whether the current practices will persist after COVID-19?		Actual practice,
1	2		3		4		5
Examples	Yes	No	Yes	No	Yes	No	
Hygiene practice e.g. Is it necessary to wash hands in a day? If Yes, when do you wash your hands and how?							If answers of column 2, 4 is Yes and column 3 is No, the practice isn't influenced by COVID-19

Chapter 4
Results and Discussion

4.1 Demographic characteristics of respondents

Status of respondents of each category according to different background characteristics is shown in Table 5. The total number of respondents notably, food purchasers, cooks, caregivers, and adolescents are 5000, 5000, 581, and 2473, respectively. Most of the respondents were from the age group 30-39 years in case of food purchasers and cooks. More than half (66.9%) of caregivers were from the age group 20-29. As expected in the context of Bangladesh, almost all cooks and caregivers were female while almost two thirds of those purchasing food in the household were male. Among the adolescents interviewed, 57% were female. The total number of respondents in rural- urban non-slum areas, and urban slum areas were 3989 and 1011, respectively, in both rural-urban non-slum and slum areas. Caregiver respondents in rural-urban and slum were 481 and 100, respectively. Likewise, the total number of respondents from adolescents (10-19) in rural-urban (non-slum) and slum areas were 2044 and 429, respectively. Most of the respondents in all categories were from Dhaka division. A majority of respondents among cooks, caregivers and adolescents had secondary education. But in case of food purchasers most of them had only primary education.

Table 5: Status of respondents in each category according to different background characteristics

Background characteristics	Food purchasers N=5000	Cooks N=5000	Caregivers N=581	Adolescents N=2473
			%	
Age				
10-19	3.5	5.0	5.9	100.0
20-29	17.5	29.2	67.0	
30-39	28.6	32.5	22.9	
40-49	23.5	20.5	3.4	
50-59	14.9	9.4	0.3	
60+	12.0	3.4	0.5	
Sex				
Male	62.0	0.7	1.2	43.4
Female	38.0	99.3	98.8	56.6
Area				
Rural	58.4	58.4	65.1	63.2
Urban	21.4	21.4	17.7	19.5
Slum	20.2	20.2	17.2	17.4
Division				
Barisal	9.2	9.2	10.0	12.2
Chittagong	18.4	18.4	16.9	15.2
Dhaka	22.8	22.8	22.4	21.8
Khulna	14.5	14.5	19.5	18.0
Mymensingh	11.2	11.2	11.7	10.6
Rajshahi	10.4	10.4	7.4	8.7
Rangpur	7.2	7.2	4.8	7.2
Sylhet	6.4	6.4	7.4	6.3
Level of Education				
No education	28.7	25.4	7.5	1.9
Primary	33.6	32.9	32.4	38.6
Secondary	29.9	35.8	51.6	57.3
Higher secondary+	7.8	5.9	8.5	2.2

4.2 Basic nutrition related knowledge of consumers

Percentage distribution of the answers of the basic nutrition knowledge related questions for food purchasers living in rural and urban areas are shown in Table 6. Majority of the respondents were able to correctly answer most of the basic nutrition knowledge related questions, either partially or fully. However, substantially high proportions (over two-thirds) of respondents had no knowledge of energy rich food (such as, Fish/Meat/Egg/Pulses/Nuts; Milk and milk products), foods rich in vitamin A and Iron and the adverse health impacts of trans-fatty acid in both rural-urban and slum areas.

Table 6: Percentage distribution of answers of basic nutrition knowledge of consumers

SL No	Basic nutrition knowledge related questions	Overall			Food purchasers			Cooks			Adolescents		
		FC	PC	IC	FC	PC	IC	FC	PC	IC	FC	PC	IC
		%			%			%			%		
1	What do you know about trans-fatty acid?	4.3	28.5	67.2	2.1	33.8	64.1	6.3	27.0	66.7	4.4	24.8	70.8
2	Which foods are rich in vitamin A?	3.4	36.3	62.7	3.7	42.5	61.2	5.6	33.6	60.7	0.8	32.9	66.3
3	Which foods are rich in Iron?	29.1	8.9	62.0	40.4	0.0	59.6	40.8	0.0	59.2	6.2	26.6	67.2
4	What are energy rich foods for the body?	12.1	25.7	62.2	1.3	38.9	59.8	1.3	38.1	60.6	33.8	0.0	66.2
5	Which types of foods you consider as unhealthy food and why?	0.0	95.9	95.9	0.0	99.9	0.1	0.0	99.9	0.1	0.0	87.9	12.1
6	What will happen if we consume unhealthy foods (harmful impact on health)?	0.0	95.8	95.8	0.0	99.9	0.1	0.0	99.9	0.0	0.0	87.7	12.3
7	Foods from which food group(s) need to be included in a balance diet?	0.2	94.5	94.5	0.1	98.5	1.4	0.2	98.6	1.2	0.2	86.3	13.5
8	What physical problems will arise if balanced foods/ balanced diet are not taken?	11.4	79.7	79.7	11.0	84.2	4.8	12.2	83.9	3.9	11.1	71.0	17.9
9	How should a pregnant woman eat in comparison with a non-pregnant woman to provide good nutrition to her baby and help him grow?	0.2	86.1	86.1	0.2	95.7	4.1	0.3	98.3	1.4	0.1	64.2	35.7
10	How should a lactating woman eat in comparison with a non-lactating woman to be healthy and produce more breast milk?	0.1	86.4	86.4	0.0	96.1	3.9	0.1	98.8	1.0	0.1	64.4	35.5
11	Overall, what are the features of a healthy diet? (dietary guideline based)	0.0	89.4	89.4	0.0	93.5	6.5	0.0	94.9	5.0	0.0	79.7	20.4
12	What are body building foods?	63.4	27.1	63.4	66.1	28.6	5.3	66.9	27.0	6.0	57.1	25.7	17.2
13	Which foods are rich in vitamin C?	64.0	0.0	64.0	63.4	0.0	36.6	64.7	0.0	35.3	64.0	0.0	36.0
14	Which foods you consider as unhealthy food?	44.0	56.0	44.0	54.8	45.1	0.1	37.2	62.8	0.0	39.9	60.1	0.0
15	What are body protective foods?	44.9	36.5	44.9	47.3	38.1	14.6	46.1	39.1	14.7	41.2	32.2	26.6

FC: Fully correct; PC: Partially correct; IC: Incorrect

4.2.1Knowledge level of basic nutrition

The percentage distribution of low, medium, and high knowledge level of basic nutrition among consumers from rural, urban and slum areas are presented in Table 7. Overall, one-third, one-fifth and two-fifths of the respondents in rural, urbanslum area, respectively had low nutrition knowledge. According to the results, it was found that half of the adolescent respondents in urban slum area had the lowest knowledge of basic nutrition compared to other types of consumers.

Table 7: Knowledge level of basic nutrition

Area	**Overall**			Purchaser			Cook			adolescents			Caregiver		
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
		%							%						
Rural	35.0	34.1	31.0	36.9	33.5	29.5	35.5	31.2	33.3	34.1	32.2	33.7	33.3	39.4	27.3
Urban	26.2	38.3	35.6	24.0	33.4	42.6	22.5	39.0	38.5	25.2	38.1	36.8	33.0	42.7	24.3
Slum	41.1	31.3	27.6	33.3	33.5	33.1	39.0	34.0	27.0	52.0	25.0	23.0	39.9	32.8	27.2

L-Low; M-Medium; H-High

4.2.2 Status of basic nutrition knowledge level of consumers according to their role in the household

Table 8 shows the level of basic nutrition knowledge among the surveyed consumers according to different background characteristics. According to the results, it was found that low knowledge levels were significantly higher among respondents from Sylhet followed by those from Barisal Division. Older people had relatively lower level of basic nutrition knowledge.

About 36.64% of food purchasers, 57.0% of cooks and 50% of adolescents who were between 50-60 years or above ages had low basic nutrition knowledge. Furthermore, low knowledge level was more prevalent among male consumers compared to their female counterparts (36.9% vs. 25.2%; 35.7 % vs. 31.5%; 36.6% vs. 28.4% and 60.0% vs. 33.0% in case of food purchaser, cooks, adolescents and caregivers, respectively), among respondents from rural areas compared to their urban counterparts, and among people belonging to lowest and low wealth index compared to those from households of highest and high wealth index. Furthermore, significantly higher proportion of persons having no formal education and those that did not complete primary level education had low knowledge of basic nutrition compared to others. High basic nutrition knowledge level was comparatively higher among purchasers from Dhaka (38.9%), followed by respondents from Rangpur (36.2%) and Barisal (35.6%) division compared to Sylhet for example. Urban food purchasers had significantly more knowledge compared to their rural counterparts (42.6% vs. 29.6%), and females more than males (39.0% vs. 30.5%). Younger respondents tended to be more knowledgeable while wealth was also positively associated with levels of knowledge. This is also the case for education with stark contrasts: 13.5% had a high knowledge among those with no education compared to 66.4% for those with at least higher education.

High basic nutrition knowledge level was comparatively higher among cooks from Barisal (46.9%) and Dhaka (42.7%) and Rajshahi (33.4%) divisions. High knowledge level was more prevalent among urban cooks compared to their rural counterparts (38.5% vs. 33.3%), and among cooks who were females compared to males (34.8% vs. 17.9%). Significantly higher proportion of cooks from high (44.7%) and highest (48.8%) wealth categories had high knowledge level compared to cooks from low (34.1%) and lowest (46.7%) wealth categories. Additionally, high knowledge scores were higher among cooks who had passed at least higher secondary level (69.7%) or secondary level (43.8%) of education. High basic nutrition knowledge level was comparatively higher among adolescents from Rangpur (44.9%), Barisal (40.3%) and Chattogram division. High knowledge level was more prevalent

among urban adolescents compared to their rural counterparts (36.8% vs. 33.7%), and among adolescent girls compared to boys (37.0% vs. 31.2%). Significantly higher proportion of adolescents from households belonging to highest and high wealth index categories belonged to high knowledge level category, compared to adolescents from lowest and low wealthy households. Additionally, high knowledge scores were higher among adolescents who have passed at least higher secondary level (55.1%) or secondary level (42.7%) of education.

Table 8: Status of basic nutrition knowledge levels of food purchasers according to role in the household

Background characteristics	Basic nutrition knowledge of consumers living in the rural-urban area								
	Food purchasers			Cooks			Adolescents		
	Low	High	p-value	Low	High	p-value	Low	High	p-value
	%			%			%		
Age groups									
10-19	27.3	39.6	<0.001	29.6	38.5	<0.001			
20-29	25.0	39.4		27.2	38.8				
30-39	30.4	37.6		29.6	37.3				
40-49	33.2	29.4		34.6	32.3				
50-59	36.6	30.1		42.4	22.8				
60+	19.3	9.8		57.0	14.8				
Sex									
Male	36.9	30.5	<0.001	35.7	17.9	0.199	36.6	31.2	< 0.001
Female	25.2	39.0		31.9	34.8		28.4	37.0	
Residence									
Urban	24.0	42.6	<0.001	22.5	38.5	<0.001	25.2	36.8	0.001
Rural	36.9	29.6		35.5	33.3		34.1	33.7	
Division									
Barisal	37.5	35.6	<0.001	34.4	46.9	<0.001	36.1	40.3	< 0.001
Chattogram	32.6	29.0		33.3	29.5		34.4	27.5	
Dhaka	30.9	38.8		28.9	42.7		33.8	41.4	
Khulna	31.3	29.9		30.4	31.5		34.0	29.6	
Mymensingh	33.3	28.4		28.3	29.2		26.2	40.0	
Rajshahi	36.4	35.2		41.4	33.4		33.3	25.6	
Rangpur	29.2	36.2		23.5	30.9		12.7	44.9	
Sylhet	46.1	24.8		41.1	30.2		47.3	22.9	
Wealth index									
Lowest	47.8	21.0	<0.001	46.7	21.2	<0.001	37.9	28.8	0.001
Low	38.1	25.7		34.1	31.8		34.3	32.2	
Middle	32.9	29.8		32.6	33.3		32.0	34.9	
High	22.7	45.0		21.1	44.7		27.0	38.0	
Highest	19.0	51.2		18.7	48.8		24.6	42.4	
Level of Education									
No education	55.4	13.1	<0.001	55.5	13.7	<0.001	80.0	0.0	< 0.001
Primary	37.7	27.8		34.4	29.1		44.3	20.5	
Secondary	20.3	45.0		22.8	43.8		24.0	42.7	
Higher secondary+	6.9	66.4		5.5	69.7		20.4	55.1	
N	3989			3989			2473		

In the slum area, it was found that knowledge level was similar across both Dhaka and Mymensingh and other divisions. Furthermore, low knowledge level was more prevalent among male food purchasers compared to their female counterparts (36.7% vs. 31.7%), and among people belonging to lowest and low wealth index compared to those from households of highest and high wealth index. Furthermore, significantly higher proportion of people having no formal education and those who haven't completed primary level education had low knowledge of basic nutrition compared to others. High knowledge level was more prevalent among females compared to males (35.5% vs. 28.4%). Significantly higher proportion of people from highest and high wealthy household who were responsible for purchasing in households belonged to high knowledge level category, compared to those from lowest and low wealth index. Additionally, high knowledge scores were higher among purchasers who have passed at least higher secondary level (80.9%) or secondary level (40.2%) of education.

It must be emphasized that nutrition knowledge is an important target, and has the potential to improve consumer's dietary habits and lifestyle while reducing incidences of obesity-related non-communicable diseases throughout the lifespan of an individual.

Status of food safety and hygiene knowledge

Awareness of food safety and hygiene among rural and urban cooks is shown in Table 9. Most of the cooks could give correct answers to most of the questions with some partial exceptions. Majority of the respondents were aware that hands should be properly cleaned before cooking, washed before having food, there should be separate storage of raw and cooked food, the cooking utensils should be properly cleaned. Most of the cooks could only partially mention about different times for washing times with soap (99.9%), how they ensure safety of cooked food, what are the sources of disease transmission (98.5%), and how can they prevent food from becoming contaminated during preparation (82.1%). However, majority of the cooks had no knowledge on food storage that it should never be stored near chemicals and cleaning supplies (52.2%), and how many times the foods could be reheated (57.6%) .

Table 9: Food-safety and hygiene knowledge of cooks based on selected questions

Questions	Food-safety and hygiene knowledge of cooks		
	Fully correct	**Partially correct**	**Incorrect**
		%	
At what times do you feel you should wash your hands with soap?	0.0	99.9	0.1
Do you know food should never be stored near chemicals or cleaning supplies?	47.8	0.0	52.2
Do you think that the hand should be properly cleaned before cooking?	96.1	0.0	3.9
Is there any need to wash hand before having food?	95.5	0.0	4.5
Do you know it is necessary to do separate storage of raw and cooked food?	81.7	0.0	18.3
How can we ensure safety of cooked food ?	0.1	99.9	0.1
Is there any need to clean enough the cooking utensils?	97.7	0.0	2.3
What are the sources where disease can be transmitted overall? Such as uncleaned toilet, flies, open feces, polluted hand, polluted	0.7	98.5	0.8

pond nearby house, polluted surroundings nearby household, etc.			
How many times you can reheat a cooked food?	42.3	0.0	57.7
How can we prevent food from becoming contaminated during preparation?	0.1	82.2	17.7
N	3989		

In the slum areas, most of the cooks could give correct answers to nearly all of the questions. Respondents could name whether hands should be washed properly, need to wash hand before having food, knowledge of storing raw and cooked food separately and the need to clean the cooking utensils properly. Some of the interviewed slum cooks could not name the procedure of reheating cooked foods properly.

Handwashing behavior

Table 10 represents the prevalence of handwashing with soap at critical times among the of the surveyed households in rural and urban areas. It also shows the percentage of respondents of whom handwashing with soap was usual practice before the pandemic, the proportion of respondents among whom using soap was developed due to public health messaging on COVID-19 and percentage of them who feel that this practice will persist even after the pandemic. About 96.5% of the respondents reported that they wash their hands with soap before eating, of whom 80.9% said it was their usual practice even before the pandemic. Of the 18.8% women who started the practice following public health messaging on COVID-19, about 99.7% reported that they would continue the practice after the pandemic as well. Almost all the women (97.6%) claimed that they use soap for washing hands after defecation, of which 92.6% said that they used to do so before the pandemic as well. Only 7.1% of respondents reported that they developed the practice during the pandemic and almost all (99.6%) insisted that they would continue it even beyond the pandemic period. The practice of handwashing with soap before feeding the baby was reported by 42.0% women. However, 29.7% reported that the public health messaging during COVID-19 motivated them to adopt such a practice. All of them claimed that they would continue their newly developed practice beyond the pandemic period. About 50.5% of women reported that they wash their hands with soap after handling child faeces, of whom 18.7% insisted that this practice was developed due to intense public health messaging on handwashing during the pandemic time. Almost all the women of this group (93.1%) reported that they would continue the practice even after the pandemic ended. Nearly half (49.7%) of the women reported that they wash their hands with soap before they cook, and 81.1% of them said that it was their usual practice. Of the 13.7% respondents who started this practice during the pandemic, almost all (98.1%) insisted that they will continue to do so even after the pandemic . Of the 45.7% of women who reported washing hands with soap after coming home from outside, more than half of them (54.3%) started doing so during the pandemic by getting motivated by the public health messaging on COVID-19. About 98.6% of this group reported that they believe that this practice will persist after the pandemic too.

Table 10: Handwashing behavior before, during and after (perceived) COVID-19 (Bias correction) (Rural-urban)

Questions	% of respondents reporting washing/sanitizing hands with soap	% of respondents of whom it was their usual practice	% of respondents who reported it was developed due to public	% of respondents among whom this practice is newly developed

		before the pandemic	health messaging on covid-19	reporting that it will persist after the pandemic
	%	%	%	%
Washing hands with soap before eating	96.5	80.9	18.8	99.7
Washing hands with soap after using latrine	97.6	92.6	7.1	99.6
Washing hands with soap before feeding the baby	42.0	76.7	29.7	100.0
Washing hands with soap after cleaning baby's faeces	50.5	86.8	13.7	93.1
Washing hands with soap before cooking	49.7	81.1	18.7	98.1
Washing hands with soap after coming home from outside	45.7	44.3	54.3	98.6
N		3989		

The practice of handwashing with soap at critical times among the main female members of the surveyed households in slum areas is shown in Table 11. About 96.6% of the respondents reported that they wash their hands with soap before eating, 73.5% respondents said that it was their usual practice before the pandemic. Of the 26.1% who developed this practice following public health messaging on COVID-19, all said they would continue the practice after the pandemic as well. Almost all the interviewed women (97.2%) claimed that they use soap for washing hands after defecation, of whom about 90.4% told that they used to do so before the pandemic as well. Only 9.6% of respondents reported that such practice was developed during the pandemic, of whom almost all (97.9%) insisted that they will continue to do this even beyond the pandemic . Prevalence of handwashing with soap before feeding the baby was 65.0%. However, 30.8% of them reported that the public health messaging during the pandemic motivated them to adopt such practice and that that they would continue it beyond the pandemic. About two-third (65%) of women reported that they wash their hands with soap after handling child faeces, of whom about 20.7% said that this practice was developed due to intense public health messaging on handwashing during the pandemic time and that they would continue the practice even after the pandemic ends. More than one-third (35.3%) of the interviewed women reported that they wash their hands with soap before cooking, of whom majority (79.0%) said that it was their usual practice. Of the 20.2% respondents who started this practice during the pandemic, all insisted that they will continue the practice even after the pandemic ended. Of the 46.0% of women who reported washing hands with soap after coming home from outside, more than two-third of them (70.1%) started doing so during the pandemic by getting motivated by the public health messaging on COVID-19. About 99.4% of this group reported that they believe that this practice will persist after the pandemic too.

Table 11: Handwashing behavior before, during and after (perceived) COVID-19 (Bias correction) (Slum Areas)

Questions	% of respondents reporting washing/sanitizing hands with soap	% of respondents practicing from before the pandemic	% of respondents who reported practicing after public health messaging on covid-19	% of newly practicing respondents reporting that they will continue
	%	%	%	%
Washing hands with soap before eating	96.6	73.5	26.1	100.0
Washing hands with soap after using latrine	97.2	90.4	9.6	97.9
Washing hands with soap before feeding the baby	65.0	74.3	30.8	100.0
Washing hands with soap after cleaning baby's faeces	65.0	82.9	20.7	100.0
Washing hands with soap before cooking	35.3	79.0	20.2	100.0
Washing hands with soap after coming home from outside	46.0	28.2	70.1	99.4
N	1011			

Food safety and hygiene knowledge

Overall, 35.0%, 34.0% and 31.0% of cooks in rural-urban and 32.0%, 30.0%, and 38.0% of cooks in slum areas, had low, medium, and high knowledge level respectively of food safety and hygiene (Fig. 1)

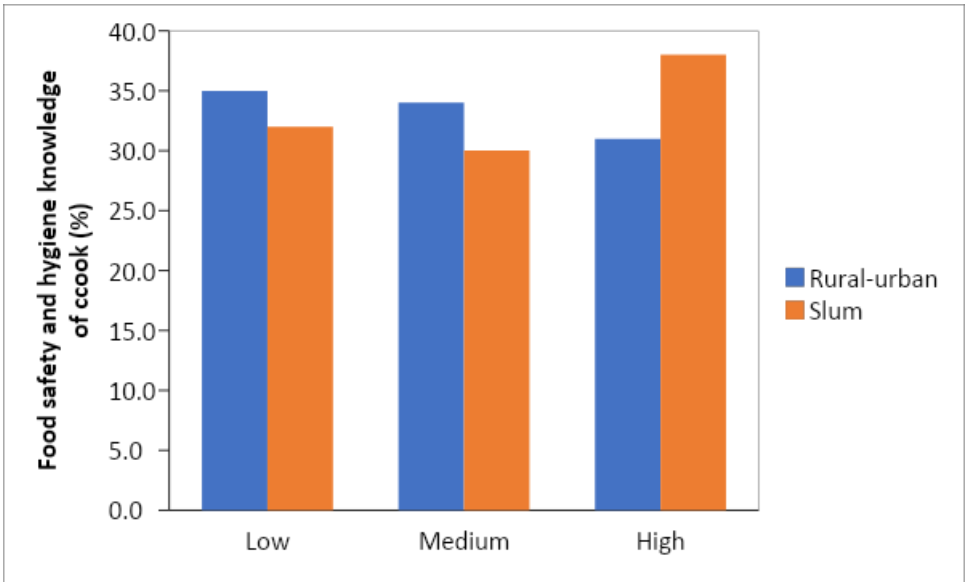

Figure 1: Overall percentage of food safety and hygiene knowledge level

Cooking best practices knowledge

Table 12 shows the knowledge prevalence of cooking best practices among cooks in rural and urban areas and knowledge of basic nutrition questions. Most of the cooks could give correct answers to most of the questions. Majority of the respondents could name procedures for cooking best practices such as not discarding of gruel (75.0%), not discarding water of boiled vegetables (84.1%), putting lid on pot while cooking vegetables and leafy vegetables (78.5%), right time to eat foods (97.8%), need to keep food covered after cooking (78.0%) and type of salt to use in household (96.3%). Unfortunately, most of the cooks could not mention that vegetables needed to be cleaned before cooking.

Table 12: Cooking best practices knowledge of cook based on some selected questions

Question	Cooking best practices knowledge of cook		
	Fully correct	Partially correct	Incorrect
	%		
Should gruel be discarded during rice cooking?	75.1	0.0	24.9
How should vegetables be cleaned before cooking?	24.6	0.0	74.5
On boiling the vegetables and leafy vegetables in water, should one discard water?	84.2	0.0	15.8
Is it right to put lid on the pot while cooking vegetables and leafy vegetables?	78.5	0.0	21.5

After cooking what is the right time to eat food?	97.9	0.0	2.1
Is there any need to keep the food covered after cooking?	78.1	0.0	21.9
Is it right to eat stale food or uncovered food?	0.0	90.8	9.2
What type of salt one should use in her/his household?	96.3	0.0	3.7
N		3989	

Cooking best practice knowledge of cooks

Overall, 44.0%, 42.0% and 14.0% of cooks in rural-urban area and 41.6%, 50.1% and 8.3% of cooks in slum area, had low, medium, and high knowledge respectively on cooking best practices (Figure 2)

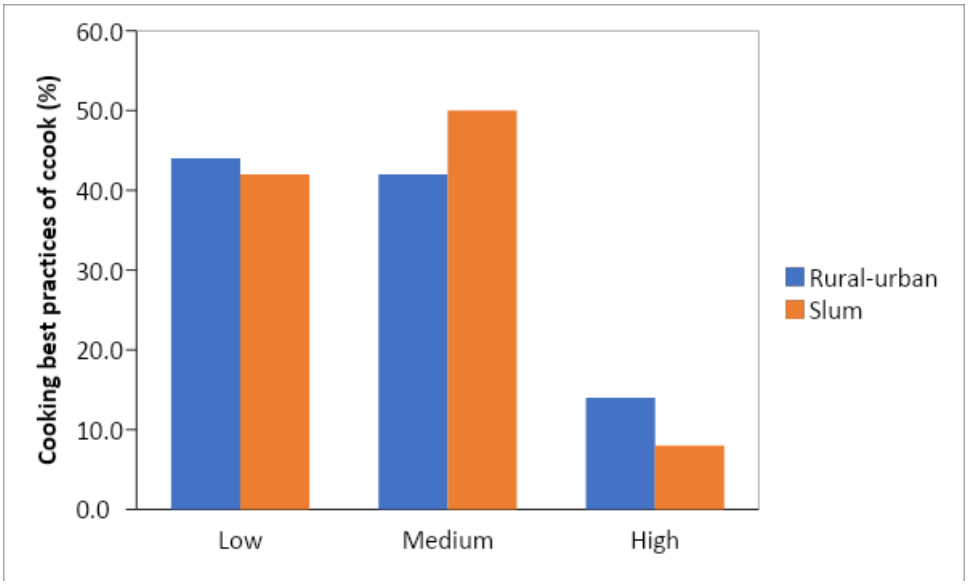

Figure 2: Overall percentage of cooking best practices knowledge level of cook

Food safety and hygiene knowledge

Table 13 shows the food safety and hygiene knowledge among the surveyed cooks according to different background characteristics. Overall, 35%, 34% and 31% of cooks had low, medium and high knowledge respectively (Figure 5.2). It was found that low knowledge level was significantly higher among cooks from Rangpur division (55.2%), followed by cooks from Khulna and Mymensingh. Furthermore, low knowledge level was more prevalent among males compared to females (50.0% vs. 34.95%), among rural cooks than their urban counterparts (36.54% vs. 30.96%), and among cooks belonging to lowest and low wealth categories households compared to cooks from the highest and high households categories. Also a higher proportion of cooks having no formal education and those who haven't completed primary level had low knowledge of basic nutrition compared to others. High knowledge on food safety and hygiene knowledge level was comparatively higher among cooks from Chattogram (56.5%), Dhaka (30.4%) and Sylhet (40.3%) divisions. High knowledge level was more prevalent among urban cooks compared to their rural counterparts (37.7% vs. 29.2%), and among female cooks compared to boys (31.5% vs. 21.4%). Significantly higher proportion of cooks from highest and high wealth index households belonged to high knowledge level category, compared to cooks from lowest and low wealth index households. Additionally, cooks who had passed at least higher secondary level (55.1%) or secondary level (42.7%) of education scored higher.

Table 13: Percentage distribution of food safety and hygiene knowledge of cook according to different background characteristics

Background characteristics	Food safety and hygiene knowledge levels of cook			
	Low	Medium	High	
	%			p-value
Age groups				
10-19	30.2	32.4	37.4	
20-29	33.3	33.2	33.5	
30-39	36.2	32.6	31.2	<0.001
40-49	36.2	33.1	30.7	
50-59	37.0	38.1	24.9	
60+	32.8	35.9	31.3	
Sex				
Male	50.0	28.6	21.4	0.299
Female	34.9	33.5	31.5	
Residence				
Urban	30.9	31.3	37.7	
Rural	36.5	34.3	29.2	<0.001
Division				
Barisal	33.9	38.6	27.5	
Chattogram	16.4	27.1	56.5	
Dhaka	27.8	41.8	30.4	<0.001
Khulna	51.9	24.8	23.2	
Mymensingh	34.6	39.6	25.8	
Rajshahi	34.2	38.8	27.0	
Rangpur	55.2	26.5	18.3	
Sylhet	31.4	37.6	31.0	
Wealth index				
Lowest	45.1	33.4	21.4	
Low	36.1	35.3	28.6	<0.001

Middle	35.6	33.2	31.2	
High	31.6	33.6	34.8	
Highest	22.7	31.5	45.8	
Level of Education				
No education	43.2	32.9	23.9	
Primary	36.1	35.9	27.9	<0.001
Secondary	31.9	31.3	36.8	
Higher secondary+	21.2	35.8	43.1	
Overall	1398	1336	1255	

In the slum area, overall, 32%, 30% and 38% of cooks had low, medium and high knowledge, respectively (Table A13). No significant difference in knowledge levels were observed according to sex. Proportion of cooks having low knowledge level was significantly higher among cooks living in other divisions compared to those living in slums of Dhaka and Mymensigh compared to slum dwelling cooks from other divisions (33.5% vs. 30.4%). Comparatively a higher proportion of cooks from lowest wealth quintile (65.1%) households had low knowledge of basic nutrition in comparison to those from the highest and high wealth category. Low knowledge level was also more prevalent among cooks without any formal education (37.5%). High basic nutrition knowledge level was higher among cooks living in slums of other divisions (34.6%) in comparison to Dhaka and Mymensingh 40.9%) and the difference was significant.

Cooking best practices knowledge

Table 14 shows the distribution of cooking best practices knowledge among cooks according to different background characteristics. It was found that low knowledge level was significantly higher among cooks from Khulna division (56.3%), followed by cooks from Barisal and Rangpur. Furthermore, low knowledge level was more prevalent among males compared to females (60.7% vs. 44.1%) and among cooks belonging to poorest and poor households compared to cooks from richest and richer households. Furthermore, significantly higher proportion of cooks having no formal education and those who haven't completed primary level had low knowledge of best cooking practices compared to others. The cooking best practices knowledge of cooks was comparatively higher among cooks from Sylhet (26.4%), Mymensingh (24.2%) and Khulna (20.8%) divisions. High knowledge level of best cooking practices was more prevalent among urban cooks compared to their rural counterparts (14.5% vs. 11.3%), and among cooks females compared to males (13.7% vs.7.1%) even though the percentages are low in expectation of the desired knowledge. Significantly higher proportion of cooks from highest and high households had high knowledge levels, compared to cooks from lowest and low wealth categories households. Additionally, high knowledge scores were higher among cooks who have passed at least higher secondary level (18.6%) or secondary level (15.3%) of education.

Table 14: Percentage distribution of cooking best practices knowledge of cook according to different background characteristics

Background characteristics	Cooking best practices knowledge levels of cook			
	Low	Medium	High	p-value
	%			
Age groups				
10-19	44.7	43.6	11.7	
20-29	42.2	41.7	16.1	
30-39	43.6	41.5	14.9	0.017
40-49	46.1	42.8	11.0	
50-59	47.5	41.8	10.7	
60+	46.1	46.9	7.0	
Sex				
Male	60.7	32.1	7.1	0.336
Female	44.1	42.2	13.7	
Residence				
Urban	44.8	40.6	14.5	0.001
Rural	42.4	46.3	11.3	
Division				
Barisal	54.4	34.7	10.8	
Chattogram	49.4	41.4	9.2	
Dhaka	40.5	48.3	11.2	<0.001
Khulna	56.3	22.9	20.8	
Mymensingh	36.8	39.2	24.2	
Rajshahi	19.2	71.8	9.0	
Rangpur	50.2	39.2	10.6	
Sylhet	41.1	32.6	26.4	
Wealth index				
Lowest	46.1	38.8	15.2	
Low	49.1	39.2	11.7	0.001
Middle	42.8	41.9	15.2	
High	41.8	45.1	13.1	
Highest	39.1	47.8	13.1	
Level of Education				
No education	52.1	38.6	9.3	
Primary	45.6	42.2	12.3	
Secondary	40.8	43.9	15.3	<0.001
Higher secondary+	37.2	44.2	18.6	
Overall	1763	1680	546	

In the slum area, overall, 41.6%, 50.1% and 8.3% of cooks had low, medium and high knowledge, respectively. No significant difference in knowledge levels were observed according to sex. Proportion of cooks having low knowledge level was significantly higher among cooks living in slums of other divisions compared to slum dwelling cooks than those of Dhaka and Mymensingh (46.2% vs.

36.3%) and their difference was significant. Also those living in slums also had low high basic nutrition knowledge. Comparatively a higher proportion of cooks from low (53.9%) and lowest (46.5%) households had low knowledge of basic nutrition.

Rural and urban area

The percentage distribution of answers given by the rural and urban caregiver to the child feeding related knowledge questions is presented in Table 15. Most of the caregiver could give fully correct answers to most of the questions. However, some of the questions, such as, "how often should a baby breastfeed?", "How long after birth should a baby start breastfeeding?" and "Do you think that infants less than 6 months of age should be given water if the weather is very hot?", respectively could not give answer correctly over 42%, 35.3% and 34.5%. Most of the caregivers could give partially correct answer (77%) and over 20% couldn't give correct answer to the question "'if a mother thinks her baby is not getting enough breast milk, what should she do?'

Table 15: Prevalence of child feeding (IYCF) knowledge of caregiver according to selected some questions

Question	Fully Correct	Partially correct	Incorrect
		%	
How often should a baby breastfeed?	58.0	0.0	42.0
How long after birth should a baby start breastfeeding?	64.7	0.0	35.3
Do you think that infants less than 6 months of age should be given water if the weather is very hot?	65.5	0.0	34.5
If a mother thinks her baby is not getting enough breast milk, what should she do?	1.7	76.9	20.8
Do you think that child should breast fed after birth?	99.8	0.0	0.2
What should a mother do with the "first milk" or colostrum?	97.3	0.0	2.3
How often should a baby breastfeed?	58.0	0.0	42.0
What are the food items a mother should give her child during 0-6 months?	90.0	0.0	10.0
Up to what age the child should breastfed?	84.4	0.0	15.6
Should the child fed other foods just after three days of birth?	89.6	0.0	10.4
N		481	

In the slum area, most of the caregiver could give fully correct answers to most of the questions. However, some of the questions, such as, "how often should a baby breastfeed?", "How long after birth should a baby start breastfeeding?" and "Do you think that infants less than 6 months of age should be given water if the weather is very hot?", respectively could not give answer correctly over 48.0%, 36.0% and 46.0%. Most of the caregiver could give partially correct answer (73%) and over 27% couldn't give correct answer on the questions "'if a mother thinks her baby is not getting enough breast milk, what should she do?'

Infant and Young Child Feeding (IYCF) knowledge of caregiver

Overall, 33%, 40% and 27% of caregiver in rural-urban and 39.9%, 32.8% and 27.2% caregiver in slum area, respectively had low, medium and high knowledge level on IYCF practices (Figure 3).

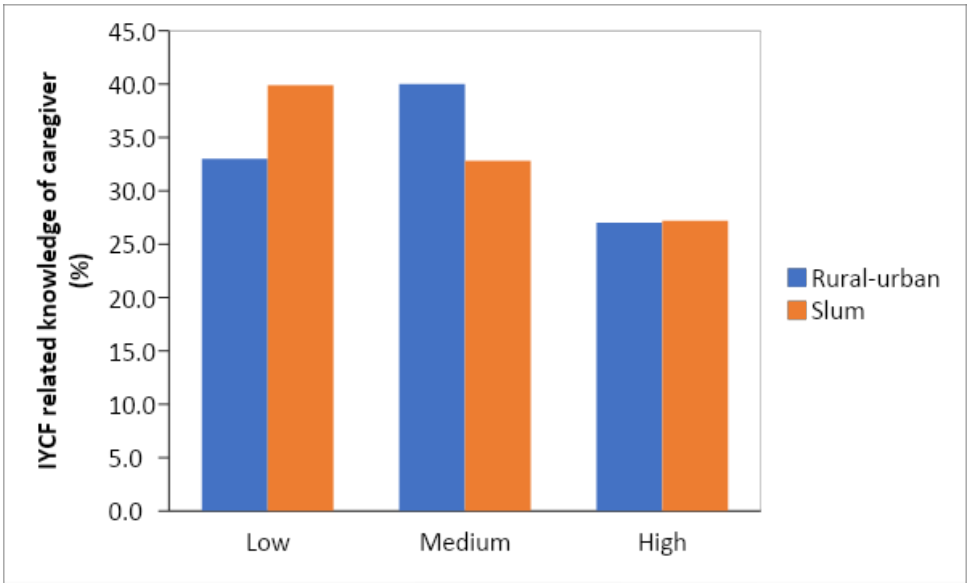

Figure 3: Overall distribution of infant and young child feeding (IYCF) knowledge of caregiver in urban-rural and slum areas

Status of Infant and Young Child Feeding (IYCF) related knowledge of caregiver according to different background characteristics

According to the results, it was found low IYCF knowledge among caregiver from Rajshahi division (48.7%), followed Barisal and Chattogram divisions. A study conducted in rural areas in Rajshahi district showed that the knowledge and practices on exclusive breastfeeding (EBF) were only 34.5% and 27.9%, respectively among mothers which was much lower as compared to other division (Rana et al., 2020) and consistent with our findings of lower knowledge level in Rajshahi division. It was found that caregiver of Chattogram had higher knowledge level on child feeding related knowledge. As previous studies showed that children under-2 with Dhaka and Chattogram was less likely to be stunted as compared to other regions (Das and Gulshan, 2017; Saha et al., 2019) which might be the consequences of higher knowledge level of child feeding related knowledge level of caregivers. Urbanizations, more mass media communications, more schooling children, more nutritional messaging etc. were the reasons for increasing the child feeding (IYCF) related knowledge level among caregiver in Chattogram and Dhaka (Guldan et al., 1993; Mashreky et al., 2015; Nisbett et al., 2017; Raju et al., 2019).

Percentage distribution of different food items used in dietary diversity and IYCF

Percentage distribution of different food item used in dietary diversity and nutritional behavior of the IYCF from rural-urban and slum areas are presented in Table 16. Higher percentage level of inadequate dietary diversity and favorable nutritional behavior was found among IYCF in the rural-urban and slum areas.

Table 16: Dietary diversity with 8 food groups and IYCF for 6-23 months infants

	Rural-urban	Slum
Food groups	**%**	
Breast milk	87.9	89.0
Grains, white roots and tubers, and plantains	88.4	90.0
Legumes and nuts (Pulses-beans, peas, lentils, seeds)	45.9	46.0
Dairy (Milk and milk products)	23.1	11.0
Flesh foods (meat, fish, poultry and liver/organ meats)	44.3	39.0
Eggs	40.9	28.0
Vitamin A-rich fruits and vegetables (Dark green leafy vegetables)	33.3	27.0
Other vitamin A-rich fruits and vegetables, Other vegetables and fruits	33.5	30.0
Dietary diversity		
Inadequately dietary diversity (<5 food items)	59.3	69.0
Adequate dietary diversity (≥5 food items)	40.7	31.0
Nutritional Behavior		
Favorable Nutritional behavior	50.2	55.6
Unfavorable Nutritional behavior	49.7	44.4
N	481	100

In case of slum areas, over half and two-thirds of respondents living in rural-urban and slum areas, respectively showed unfavorable nutritional behavior and inadequately diversified diet in last 24 hours prior to the interview, where unhealthy behavior showed predominant in slum areas..

Comparative knowledge levels based on simple assessment of people's dietary practices, nutritional behavior and status, and overall health of consumers

Table A17 shows the knowledge levels of consumers at household level according to their dietary practices, nutritional status and behavior and overall health. According to the findings, it was found that consumer having inadequate dietary diversity practices, underweight or obesity as nutrition status and bad or somewhat as perceived health conditions were significantly associated with low nutrition knowledge level. It was found that most of the adolescents (96.1%) with obesity had low basic nutrition knowledge, and the difference was significant. It was also observed that high knowledge level was comparatively higher among those who reported their health as very good and good. No significant difference in knowledge levels was observed according to presence or absence of long-time illness. Significant difference in knowledge levels was observed in case of cooks with limitations of work because of lots of problems.

In the slum area, according to the findings, it was found that over half of the consumer with bad or somewhat health conditions had low nutrition knowledge, and the difference significant. Over one-third of cook with inadequate dietary diversity practices and over two-fifths of cooks having somewhat or bad perceived health condition had low nutrition knowledge level and the difference was significant. It was found that all adolescents having obesity had low nutrition knowledge level and the difference was significant. No significant difference in knowledge levels was observed according to presence or absence of long-time illness and activity limitations.

Table 17: Comparative knowledge levels based on simple assessment of people's dietary practices, nutritional behavior and status, and overall health of consumers (Rural-urban area)

Variables	Food purchasers				Cooks				Adolescents			
	L	M	H		L	M	H		L	M	H	
	%			p-value	%			p-value	%			p-value
Dietary practices												
Inadequate dietary diversity (<5 food groups)	33.9	35.3	30.8	0.001	32.8	34.9	32.2	0.001	37.1	31.3	31.6	<0.001
Adequate dietary diversity (≥5 food groups)	32.9	31.1	35.9		30.9	31.2	37.9		23.1	37.5	39.4	
Nutritional behavior (NB)												
Favorable nutritional behavior	31.9	33.9	34.1	0.3	40.6	31.9	27.5	<0.001	23.9	40.0	36.2	0.4
Unfavorable nutritional behavior	34.5	33.2	32.3		27.2	34.7	38.7		22.4	37.6	40.0	
Nutritional Status (BMI)												
Normal weight	33.7	35.4	30.9		33.4	34.0	32.6		12.0	39.3	48.8	
Underweight	52.5	26.6	20.9	<0.001	41.8	29.7	28.5	<0.001	31.9	37.3	30.9	<0.001
Overweight	24.3	32.3	43.4		27.1	33.3	39.5		6.0	40.3	53.7	
Obese	26.9	29.7	43.4		23.8	33.5	42.7		96.1	1.2	2.7	
Overall Health												
Very Good	29.1	34.2	36.7	<0.001	21.8	38.3	39.9	<0.001	30.7	34.7	34.7	0.1
Good	36.2	32.5	31.3		32.0	31.3	36.7		34.0	30.9	35.0	
Somewhat	46.2	31.8	22.0		38.1	33.5	28.4		35.5	29.8	34.8	
Bad	65.2	18.8	15.9		58.3	28.7	12.9		56.7	26.7	16.7	
Very Bad	50.0	50.0	0.0		0.0	60.0	40.0		0.0	0.0	0.0	
Long time illness												
Yes	35.8	32.4	31.8	0.8	30.8	32.7	36.5	0.6	30.6	31.2	38.2	0.5
No	37.3	32.5	30.2		32.2	33.4	34.4		34.4	31.6	34.1	
Limitations in work												
Lot of problems	36.1	31.9	31.9	0.9	31.6	40.8	27.5	0.001	26.5	44.1	29.4	0.2
Sometimes	39.1	30.0	30.9		37.5	28.9	33.6		28.2	31.3	40.5	

No	36.9	32.9	30.2		31.2	33.8	35.0		34.8	31.3	33.9

L-Low; M-Medium; H-High

Comparing the food safety and hygiene knowledge levels to a simple assessment of people's dietary practices, nutritional behavior and status, and overall health of cook

Table 18 compares the food safety and hygiene knowledge levels to a simple assessment of people's dietary practices, nutritional behavior and status, and overall health of cook. According to the findings, it was found that cooks (41%) having underweight nutrition status and very bad perceived health condition had low nutrition level and a significant difference in knowledge levels of cooks was observed based on nutritional behaviors and overall health of the cooks. It was observed that cooks having very good or good perceived health condition had high food safety and hygiene knowledge and the difference was significant.

In the slum area, according to the findings, cooks having somewhat or bad perceived health condition had low nutrition knowledge and a significant difference (<0.01) in knowledge levels was observed.No significant difference in food safety and hygiene knowledge levels of cook was found with dietary practices, nutritional behavior and status. It was also observed that cooks with very good perceived health condition had high food safety and hygiene knowledge and the difference was significant.

Table 18: Food safety and hygiene knowledge levels compared to a simple assessment of people's dietary practices, nutritional behavior and status, and overall health of cook

Variables	Food safety and hygiene knowledge levels							
	Rural-urban				Slum area			
	Low	Medium	High		Low	Medium	High	
	%			p-value	%			p-value
Dietary practices								
Inadequately dietary diversity (<5 food groups)	34.7	34.2	31.1	0.549	31.5	26.2	42.3	0.52
Adequately diversity (≥5 food groups)	35.5	32.6	32		3.1	37.5	29.4	
Nutritional behavior (NB)								
Favorable nutritional behavior	38.4	33.7	27.9	<0.001	38.6	26.6	34.9	0.043
Unfavorable nutritional behavior	33.2	33.4	33.5		30.0	31.2	38.8	
Nutritional status (BMI)								
Normal	35	33.2	31.8	<0.004	33.9	28.4	37.7	0.331
Underweight	**41.6**	34.2	24.3		32.3	28.1	39.6	
Overweight	32.5	35.0	32.6		30.2	34.7	35.1	
Obese	34.5	29.5	35.9		25.3	28.7	46.0	
Overall health								

Very Good	41.7	29.8	**28.6**		29.9	32.5	**37.7**	
Good	34.8	37.1	28.1	<0.001	41.3	29.1	29.6	0.013
Somewhat	41.5	30.8	27.7		**56.3**	30	13.8	
Bad	27.5	47.8	24.6		45.5	18.2	36.4	
Very Bad	**50.0**	50.0	0		0	0	0	
Long time illness								
Yes	30.4	34.1	35.5	<0.001	40.5	18.9	40.5	0.14
No	38.8	34.2	27		42.5	30.9	26.6	
Limitations in work								
Lot of problems	37.5	36.1	26.4		50.0	10.0	40.0	
Sometimes	37.6	30.3	32.1	0.396	46.7	20.0	33.3	0.448
No	37.8	34.7	27.5		41.7	31.2	27.2	
N	3989					1011		

Comparison of cooking best practices knowledge levels of cooks according to a simple assessment of their dietary practices, nutritional behavior and status, and overall health

Table 19 compares the cooking best practices knowledge levels of cooks according to a simple assessment of their dietary practices, nutritional behavior and status, and overall health of people living in rural-urban and slum areas. According to the findings, it was observed that no significant difference in cooking best practices knowledge among cooks having dietary practices, nutritional behavior and status among cooks living in rural-urban areas. It was observed that cooks with somewhat or bad condition had low cooking best practices knowledge and the difference was significant. No significant difference was observed between longtime illness and activity limitations with cooking best practices knowledge levels.

In the slum area, it was observed that no significant difference in cooking best practices knowledge among cooks having various nutritional status, nutritional behavior and overall health. A significant difference was observed among cooks with adequate dietary diversity and high cooking best practices knowledge level. No significant difference was observed between longtime illness and activity limitations with cooking best practices knowledge levels.

Table 19: Comparison of cooking best practices knowledge levels to a simple assessment of people's dietary practices, nutritional behavior and status, and overall health of cooks

Variables	Cooking best practices knowledge levels							
	Rural-urban				Slum area			
	Low	Medium	High		Low	Medium	High	
	%			p-value	%			p-value
Dietary practices								
Inadequately dietary diversity (0-4 groups)	43.8	42.8	13.4	0.626	39.6	54.1	6.3	<0.001
Adequately diversity (>=5 groups)	44.7	41.3	14		45.5	42.4	12.1	
Nutritional behavior (NB)								
Favorable NB	43.6	42.9	13.6	0.772	40.3	52.3	7.5	0.694
Unfavorable NB	44.6	41.7	13.7		42.1	49.4	8.6	
Nutritional status (BMI)								
Underweight	47.4	40.2	12.4	0.109	38.5	56.3	5.2	0.548
Normal weight	43.2	41.8	15.1		41.8	49.6	8.6	
Overweight	44.8	43.8	11.4		43.7	48.9	7.5	
Obese	45.2	41.3	13.5		37.9	49.4	12.6	
Overall health								
Very Good	47.4	47.6	5	<0.001	46.8	50.7	2.6	0.113
Good	43.2	40	16.8		51.5	38.8	9.7	
Somewhat	47.7	34.1	18.2		52.5	32.5	15	
Bad	46.4	40.6	13		54.6	36.4	9.1	
Very Bad	0	100	0		0	0	0	
Long time illness								
Yes	38.7	46.1	15.2	0.03	46	40.5	13.5	0.617
No	46.2	40.1	13.8		51.4	39.8	8.9	
Limitations in work								
Lot of problems	44.4	41.7	13.9	0.667	30	70	0	0.291

Sometimes	44.6	43.7	11.7	53.3	33.3	13.3
No	45.4	40.4	14.3	51.2	39.5	9.3
N	3989			1011		

Factors associated with basic nutrition knowledge levels of persons involved in purchasing food using multinomial logistic regression model

To identify factors associated with basic nutrition knowledge of persons involved in purchasing food in rural-urban and slum areas, multivariate logistic regression analysis was conducted. It was found that persons involved in purchasing food having no formal education, belonging to low wealth categories, having inadequate dietary diversity, being underweight or obese and having overall health as somewhat or bad and place of residence as Barisal division were identified as significant predictors/indicators of low levels of basic knowledge and awareness.

Table 20 depicts the factors associated with different basic nutrition knowledge levels of persons responsible for food purchasing living in rural and urban areas. Education level was identified as a significant predictor of medium basic nutrition knowledge level. It was observed that food purchasers who completed primary and secondary level education had statistically significant higher odds of having medium knowledge level of basic nutrition compared to those with no formal education. Significant difference was observed among respondents having medium knowledge level based on wealth index as well. Respondents from households belonging to low, middle, high and highest wealth index had significantly higher likelihood of obtaining medium knowledge scores compared to those from the lowest. Additionally, those who completed secondary and higher secondary level respectively had 3.1 times and 5.6 times higher odds of having medium basic nutrition knowledge. Food purchasers from Khulna and Rangpur, had 1.9 and 2.1 times higher odds of having medium knowledge of basic nutrition compared to food purchaser from Barisal division. Underweight food purchasers were 1.8 times more likely to have medium level of basic nutrition knowledge. Odds of belonging to the high basic nutrition knowledge level group significantly increased with higher educational attainment. It was found that food purchaser who completed secondary and higher secondary levels had significantly higher likelihood of belonging to the high knowledge level category. Living in Rangpur division was significantly associated with higher odds of having high basic nutrition knowledge. Compared to the food purchaser from the lowest households, food purchaser belonging to the poor, middle high and highest wealth index had significantly higher odds of belonging to high knowledge level group. Normal-weight, overweight and obese food purchaser were more likely to have high basic nutrition knowledge. Food purchasers with somewhat or bad self-perceived health condition were less likely to score high basic nutrition knowledge level compared to those reporting very good health.

Table 20: Factors associated with basic nutrition knowledge levels of persons involved in purchasing food using multinomial logistic regression model (Rural-urban)

	Basic nutrition knowledge levels of persons involved in purchasing food		
VARIABLES	Low knowledge level OR (SE)	Medium knowledge level OR (SE)	High knowledge level OR (SE)
Low knowledge (ref)	1.00		
Age groups			
10-19 (ref)	1.00		
20-29		0.969	0.592*
		(0.295)	(0.179)
30-39		0.837	0.569**
		(0.245)	(0.163)
40-49		0.900	0.616*
		(0.266)	(0.179)
50-59		0.962	1.230
		(0.294)	(0.368)
60+		0.937	0.791
		(0.289)	(0.245)
Sex			
Male (ref)	1.00		
Female		1.162	0.846
		(0.310)	(0.286)
Education level			
No education (ref)	1.00		
Primary		1.725***	3.932***
		(0.204)	(0.607)
Secondary		3.124***	9.749***
		(0.439)	(1.653)
Higher secondary +		5.560***	41.38***
		(1.498)	(11.11)
Area			
Rural(ref)	1.00		
Urban		0.974	1.020
		(0.154)	(0.171)
Division			
Barisal (ref)	1.00		
Chattogram		1.525*	1.256
		(0.339)	(0.307)
Dhaka		1.015	1.453
		(0.238)	(0.366)
Khulna		1.935***	1.678*
		(0.472)	(0.453)
Rangpur		2.154***	2.725***
		(0.504)	(0.697)
Rajshahi		0.975	1.006
		(0.224)	(0.251)
Mymensingh		1.842**	1.400
		(0.450)	(0.392)
Sylhet		0.937	1.156
		(0.259)	(0.356)

Wealth Index			
Lowest (ref)	1.00		
Low		1.565***	1.428**
		(0.230)	(0.244)
Middle		1.402**	1.324*
		(0.187)	(0.209)
High		1.526**	2.275***
		(0.282)	(0.444)
Highest		1.378	2.509***
		(0.308)	(0.593)
Dietary Diversity			
Inadequate dietary diversity	1.00		
Adequate dietary diversity		0.822*	0.888
		(0.0865)	(0.102)
Nutrition status (BMI)			
Underweight	1.00		
Normal weight		1.758***	1.716***
		(0.273)	(0.317)
Overweight		1.432*	2.110***
		(0.277)	(0.454)
Obese		1.370	2.799***
		(0.543)	(1.090)
Overall Health			
Very good	1.00	1.050	0.786*
		(0.129)	(0.102)
Good		1.096	0.518***
		(0.165)	(0.0889)
Somewhat		0.430**	0.322***
		(0.160)	(0.137)
Bad		0.958	2.05e-06
		(1.270)	(0.00107)
Constant		0.199***	0.0914***
		(0.0723)	(0.0351)
Observations	2,836	2,836	2,836

SE (Standard error) form in parentheses, OR=odds ratio, ref=Reference category; *** p<0.01, ** p<0.05, * p<0.1

Comparing the effect of education and socioeconomic conditions on basic nutrition levels among consumers (Table 20, A20, 21, A21, A22, A23), it was found that consumer having secondary and higher secondary education level had 6 and 41 fold, 6 and 23 fold, 5 and 28 fold higher likelihood to belong to high knowledge level respectively, compared to no education in case of purchasers, cooks and adolescents (Figure 4). Consumer belonging to the low, middle, high and highest socioeconomic condition had likelihood of having high knowledge level compared to lowest socioeconomic group among various consumers (Figure 5).

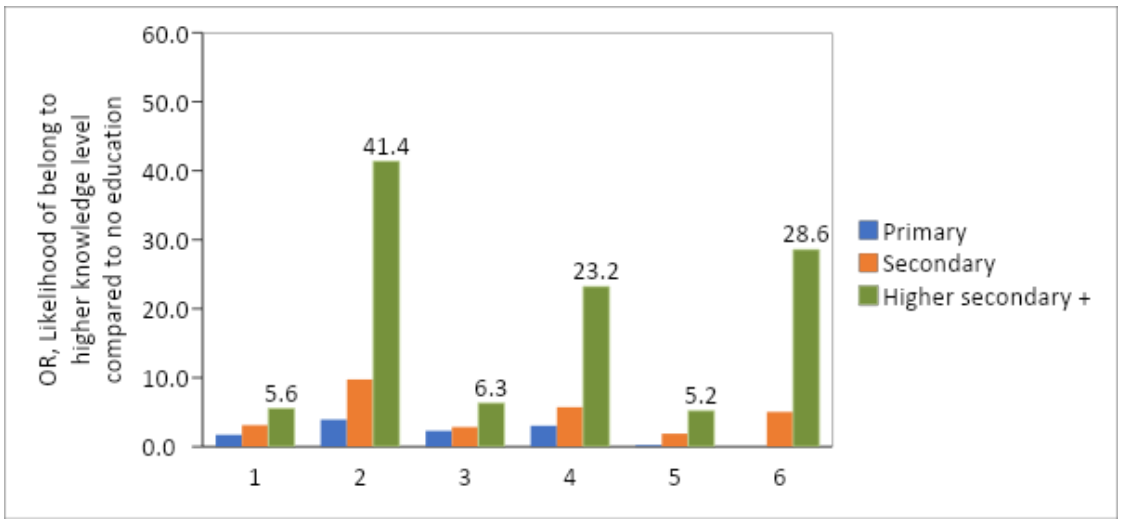

Figure 4: Likelihood of belonging to higher knowledge level compared to no education among various consumers living in rural-urban areas

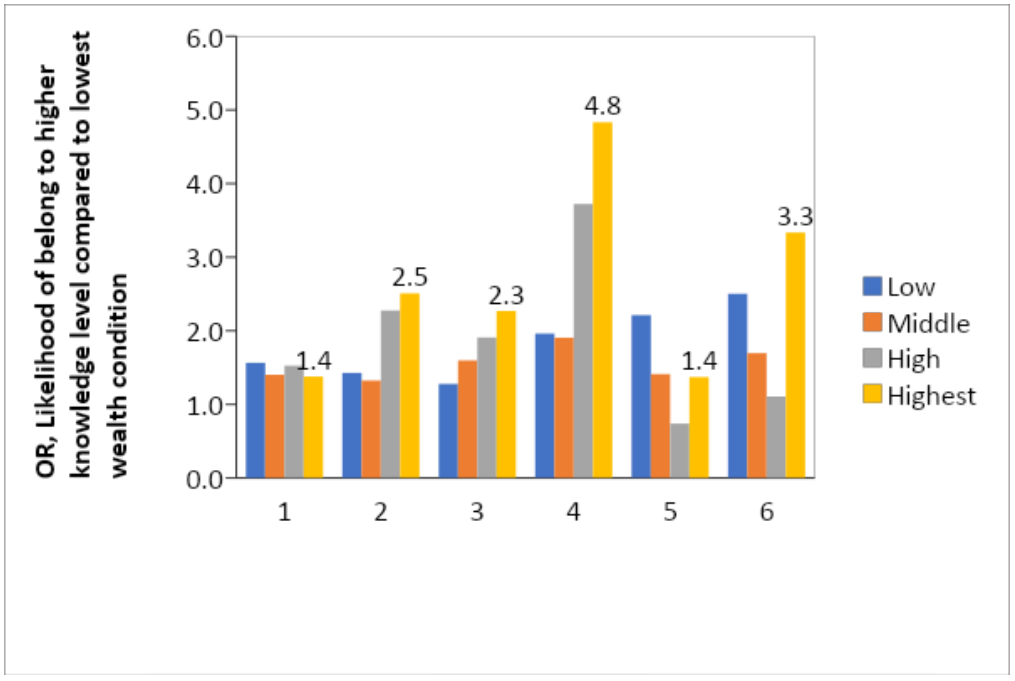

Figure 5: Likelihood of belonging to higher knowledge level compared to lowest wealth condition among various consumers living in rural-urban areas

Factors associated with different infant and young child feeding (IYCF) knowledge levels of caregiver

Only two divisions like Chattogram and Rajshahi showed significant association with IYCF knowledge of caregiver. Odds of having high IYCF knowledge was 3.586 times higher among caregiver living in rural and urban areas of Chattogram division as compared to Barisal (Annex A Table A24). In the slum area, only nutrition behavior of caregiver is significantly associated Odds of medium IYCF knowledge level was more than three times higher among favorable nutritional behavior as compared to unfavorable nutritional behavior (Annex Table A25).

Table 19: Factors associated with different levels of basic nutrition knowledge, food safety and hygiene and cooking best practices of cook according to different background characteristics

	Basic Nutrition knowledge of cook			Food safety and hygiene knowledge of cook			Cooking best practices knowledge of cook		
VARIABLES	Low	Medium	High	Low	Medium	High	Low	Medium	High
	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)	OR (SE)
Low Knowledge (ref)	1								
10-19 (ref)	1			1			1		
20-29		0.872	0.747		0.961	0.667*		0.901	1.273
		-0.206	-0.178		-0.224	-0.159		-0.19	-0.336
30-39		1.077	1.003		1.089	0.816		1.063	1.382
		-0.266	(0 .249)		-0.262	-0.201		-0.229	-0.379
40-49		1.267	0.889		1.087	0.807		1.018	0.925
		-0.33	-0.238		-0.278	-0.213		-0.232	-0.284
50-59		1.271	0.743		1.519	0.645		1.435	0.883
		-0.359	-0.222		-0.419	-0.191		-0.354	-0.318
60+		0.636	0.159***		1.04	0.802		0.952	0.989
		-0.249	-0.0846		-0.389	-0.331		-0.324	-0.519
Education level									
No education (ref)	1			1			1		
Primary		2.298***	3.040***		1.316**	1.679***		1.455***	2.000***
		-0.322	-0.503		-0.179	-0.271		-0.188	-0.401
Secondary		2.849***	5.736***		1.156	2.302***		1.443***	2.364***
		-0.448	-1.002		-0.173	-0.39		-0.199	-0.496
Higher secondary +		6.318***	23.22***		1.941***	2.917***		1.258	3.059***
		-2.19	-7.807		-0.47	-0.761		-0.272	-0.927
Area									
Rural(ref)	1			1			1		
Urban		1.666***	0.888		1.302*	1.29		1.463***	0.716
		-0.279	-0.159		-0.201	-0.209		-0.2	-0.155
Division									
Barisal (ref)	1			1			1		
Chattogram		2.735***	0.823		1.886***	5.905***		1.746***	0.959
		-0.7	-0.19		-0.435	-1.447		-0.337	-0.302
Dhaka		1.749**	1.571*		1.467*	1.126		1.824***	1.221
		-0.483	-0.375		-0.323	-0.285		-0.37	-0.386
Khulna		2.947***	0.902		0.442***	0.592**		0.515***	2.326***
		-0.817	-0.231		-0.103	-0.149		-0.115	-0.717
Rangpur		5.418***	1.606*		0.409***	0.437***		1.112	1.207
		-1.445	-0.4		-0.0895	-0.109		-0.224	-0.377
Rajshahi		1.178	0.458***		1.072	0.859		6.478***	3.130***
		-0.315	-0.111		-0.236	-0.215		-1.383	-1.02
Mymensingh		4.661***	0.928		0.937	1.02		1.366	2.832***

		-1.298	-0.255		-0.218	-0.27		-0.305	-0.884
Sylhet		2.400***	1.084		1.948**	1.753*		1.348	3.289***
		-0.728	-0.308		-0.515	-0.529		-0.339	-1.081
Wealth Index									
Poorest (ref)	1			1			1		
Poorer		1.278	1.964***		1.134	1.246		0.937	1.186
		-0.196	-0.323		-0.166	-0.202		-0.13	-0.215
Middle		1.596***	1.906***		1.357**	1.351**		0.952	0.737*
		-0.221	-0.294		-0.181	-0.205		-0.121	-0.132
Richer		1.909***	3.721***		1.347*	1.652***		1.059	0.698
		-0.377	-0.74		-0.239	-0.312		-0.17	-0.162
Richest		2.270***	4.833***		1.543*	2.506***		1.845***	1.148
		-0.541	-1.19		-0.353	-0.585		-0.362	-0.339
Dietary Diversity									
Not Adequately diet	1								
Adequately Diet		0.801**	0.889						
		-0.0884	-0.101						
Nutrition status (BMI)									
Underweight	1			1					
Normal weight		1.032	1.147		0.686***	1.426**			
		-0.152	-0.19		-0.0966	-0.249			
Overweight		0.87	1.584**		0.691**	1.597**			
		-0.152	-0.297		-0.113	-0.309			
Obese		1.098	1.781**		0.636*	1.289			
		-0.296	-0.49		-0.154	-0.347			
Nutritional behavior (NB)									
Unfavorable NB	1			1					
Favorable NB		0.847	0.646***		1.114	1.428***			
		-0.0962	-0.0775		-0.121	-0.17			
Overall health									
Very good	1			1			1		
Good		0.623***	0.528***		1.236*	0.757**		0.575***	3.917***
		-0.0811	-0.0711		-0.151	-0.0956		-0.0626	-0.829
Somewhat		0.559***	0.351***		0.909	0.555***		0.478***	3.529***
		-0.091	-0.0618		-0.139	-0.0904		-0.0667	-0.846
Bad		0.404**	0.105***		2.014*	0.483		0.382***	1.985
		-0.157	-0.0468		-0.761	-0.214		-0.129	-1.079
Very Bad		3.77E-08	2.36E-08		0.733	9.14E-07		585,939	3.374
		-7.89E-05	-4.11E-05		-0.97	-0.000382		-4.62E+08	-5,504
Long time illness									
Yes				1			1		
No					0.861	0.438***		0.520***	0.729
					-0.153	-0.0786		-0.0807	-0.155
Limitations in work									

Lot of problems	1						
Sometimes		1.094	0.343***				
		-0.423	-0.128				
No		0.781	0.146***				
		-0.297	-0.0534				
Constant		0.259**	1.969	0.923	0.657	1.149	0.0384***
		-0.145	-1.079	-0.366	-0.286	-0.401	-0.0198
Observations	2843	2843	2843	2843	2843		

SE (Standard error) form in parentheses, OR=odds ratio, ref=Reference category

*** p<0.01, ** p<0.05, * p<0.1

Discussion

The present study found that the persons involved in purchasing foods in rural, urban and slum areas had poor knowledge on sources of energy giving food, foods rich in vitamin A and Iron. Poor knowledge about micronutrient-rich foods has been deemed as one of the major underlying causes of micronutrient deficiencies in all segments of the population in Bangladesh (Institute of Public Health Nutrition, 2015); which supports the findings of the present study that there is a lack of knowledge among people about micronutrient rich foods in adult Bangladeshi population. The current study found that low basic nutrition knowledge of consumers from rural and urban areas was comparatively higher among males, people without any formal education, persons aged 60 years and above, and those belonging to lowest and low wealth index category. Besides, higher proportions of respondents from rural area had low knowledge compared to their urban counterparts. Basic nutrition knowledge was poorest among consumers of Barisal division. Rural and urban respondents, who were underweight and had somewhat or bad self-perceived health conditions, predominantly had low knowledge of basic nutrition. Similar evidence is available from the previous studies support the findings of the present study (Khan & Kraemer, 2009; Kamal et al., 2015; Biswas et al., 2017).

As per the multinomial logistic regression analysis, all these variables except gender and area of residence of respondents were found to be significantly associated with different knowledge levels of respondents. In slum areas, low knowledge was more prevalent among consumer belonging to lowest wealth index and those having no formal education. According to multinomial regression model for slum areas, having higher education level and belonging to higher position in wealth index ladder were found predictive of high knowledge levels in food purchasers. To the best of our knowledge no study has been carried out in Bangladesh targeting the persons responsible for purchasing food items . However, the observed positive association between higher educational level and high basic nutrition knowledge of persons responsible for purchasing foods are in line with earlier studies conducted on consumers in settings comparable to Bangladesh (Ahmadi et al., 2013; Cannoosamy et al., 2014). As highly educated individuals are more likely to be exposed to health or nutrition related news sources (Nayga, 1996), it is quite plausible that they would have better knowledge of basic nutrition than those having lower education level or no education at all. The urban people in the present study don't have statistically significant better knowledge of basic nutrition than their rural counterparts, as reported by earlier findings elsewhere (Naghashpour et al., 2020; Yang et al., 2020). The present study also found that basic nutrition knowledge was poorest among slum inhabitants. A study conducted among adolescents in India supports the findings of the present study (Dixit et al., 2014). Educational attainment, poverty, as well as other enabling factors like access to internet and other sources of nutrition related messages are comparatively lower in slum areas, which may have resulted this urban-rural-slum difference in basic nutrition knowledge level in our study.

A number of earlier studies found that younger people have better nutrition-related knowledge than their older counterparts (Lin and Ya-Wen, 2005; Hendrie et al., 2008), which coincides with the finding of the present study. In general, younger people are becoming more conscious about their health, have better access to several sources to search for knowledge, and increasingly turning to internet contents and social media for health-related information in areas such as diet/nutrition and body image (Goodyear et al., 2018). These maybe the reason behind the observed difference in nutritional knowledge levels according to age groups. The difference in basic nutrition knowledge levels based on wealth index is in line with findings of earlier studies reporting positive association between lower socio-economic status and poor nutritional knowledge (Drichoutis et al., 2005; Nayga Jr, 2000). It is quite reasonable that by belonging to a higher position in wealth index ladder, one has much higher chance of getting formal education, better access to media and other sources from which he/she can gain knowledge of nutrition. In this study, we found nutrition knowledge level was low in Barisal followed by Sylhet division. This is likely, less number of activities for raising nutrition knowledge and awareness including training program were held in Barisal division compared to other divisions (World Bank, 2015). Also, people had lowest access to improved WASH facilities in Barisal division compared to other divisions (UNICEF, 2019), which is an important enabling indictor for better knowledge of basic nutrition. Deep rooted patriarchal society also limits the transformation of knowledge in the family even if father is educated (Saha et al., 2019), remain higher in both Barisal and Sylhet divisions. Therefore, the finding of the present study that low basic nutrition knowledge is higher among consumers from Barisal division is plausible. Similarly, Sylhet region is considered as one of the pockets of slower progress in food security and nutrition indicators over the last decades, for which strong social, cultural and economic inequalities have been sought as possible reasons (Nisbett et al., 2017). Furthermore, Sylhet is also reported to be a poor-performing region for other social indicators including literacy (Mohsena et al., 2015), which is an important enabling factor for better knowledge of basic nutrition. On the other hand, much greater progress in these indicators have been reported in Rangpur division (Nisbett et al., 2017). A recent study conducted in Rangpur identified substantial knowledge about good health and nutrition practices in school-going adolescents and reported that they acquire nutrition information from many sources including teachers, family members (usually mothers), textbooks as well as indirectly from traditional media and online resources, of which family members are the primary sources (Lee et al., 2019). This finding thus indirectly proves better nutritional knowledge among people from Rangpur and confirms the finding of the present study.

Furthermore, the positive association between better self-perceived health and higher nutritional knowledge has been observed in the past (Jeruszka-Bielak et al., 2018; Yang et al., 2020). This finding suggests that better basic nutrition knowledge may lead people to a enjoy healthier lives, although focused research on this issue is necessary before reaching to a conclusion. In the current study, proportions of respondents having low nutrition knowledge decreased with increasing BMI in both rural-urban areas, except the obese group among whom the proportion was similar to overweight group. However, literatures on association between BMI and nutritional knowledge among people offer ambiguous conclusions, with similar and contradictory findings (Thakur and D'Amico, 1999; Kearns et al., 2014). The result of the current study thus implies that there may be reasons other than poor nutrition knowledge that account for the higher BMIs of the overweight and obese respondents (O'brien and Davies, 2007).

Food safety and hygiene knowledge

Low knowledge on food safety and personal hygiene has been identified from the respondents living in different settings of the country. Similar evidence is also available in the previous studies (Roy, 2011; Dey et al. 2013, 2019). Majority of the cook had no knowledge on the matter regarding proper food storage that should never be stored near chemicals and cleaning supplies, and most of them

had poor knowledge on how many times the foods could be reheated; how to ensure safety of cooked food; how to prevent food from becoming contaminated during preparation and handling.

It is evident from this study that people's knowledge of handwashing with soap and water at critical times is high but the practice in ground is low. Similar evidence is available from the previous studies conducted by Rabbi and Dey (2013) and MICS (2019). Proper handwashing has been established as one of the key issues for food safety by controlling the transmission of pathogens (bacterial and viral) causing foodborne illness from hands to food, or mouth (Hunter, 2000; Kohl et al., 2002; Dey, 2017). However, the practice is quite limited for most of the rural households due to the lack of knowledge about the benefit of handwashing with soap or low socioeconomic condition of some proportion of those households in keeping soap/soapy water at critical times and scarcity of safe running water (Dey et al., 2018; Saha et al., 2019).

It is found from the study that most of the respondent had poor knowledge about potential sources of contamination where diseases transmit. The findings of the study may also consistent with the previous one (Dey et al, 2019). It was identified that many diseases are occurred or spread over in rural areas due to the lack of awareness about cleanliness, improper sanitation and hygiene behavior, low-cost WASH infrastructure, and microbial contamination from the potential sources of pollution, and withdrawal of periodic monitoring of hygiene behavior at household level after completion of project period (Dey et al. 2015, 2017, 2019; MICS, 2019). Previous findings suggest that increasing access to improved latrine and safe drinking water may bring expected safety and hygienic situation as compared to some alternative, community based strategies such as imposing fines and eliciting shame and disgust as motivation would be effective to mitigate unhealthy and unhygienic practices (Dey et al. 2019). The study reiterates the significance of simultaneous provision of software support for behavior change communication (BCC) strategies, such as, raising awareness among mothers about the adverse effect of unsafe disposal of child faeces and educating them on environmentally safe disposal of child faeces to protect endangered public health from cross-contamination, hardware support (improved latrine, improved water source, finished flooring for protecting enteric illness of children) in addressing the required behavior change to optimize the impact of WASH services in communities and institutions towards the desired health impact (Velleman et al., 2014; Dey et al., 2019; Dey and Parvez, 2021). Unhealthy environments in household surroundings and unclean toys have been found to be responsible for recurring rotavirus infection for children, which may also result in poor nutritional outcomes (Junaid et al., 2011). It is very important to get insights on people's knowledge on issues like these, which critically impinge the importance of food safety and hygiene, but which have received little attention so far.

Chapter 9
Conclusion and Recommendations

Conclusion

The survey aims to identify people's knowledge of basic nutrition, food safety and hygiene basics at the consumer level in different settings, namely, rural-urban and slum areas of Bangladesh. The survey is expected to serve as a baseline of nutrition, food safety and hygiene knowledge across different populations in the country. To this end, the study results will inform the implementation by helping to address food safety and nutrition knowledge gaps.

Basic nutrition knowledge: The study identified that overall, one-third of the respondents living in rural and urban areas and two-fifths in slum area had low basic nutrition knowledge. Absence of knowledge was mainly on foods rich in vitamin A and Iron, adverse health effects of trans-fatty acid, such as, cardiovascular disease risk. Lack of knowledge was found on unfavorable nutrition behavior (those who eat salty/savory foods—puri, singara, crisps and chips, chanachur, etc; sweet foods/sugary foods; sugar sweetened beverages); adequate dietary diversity with a variety of foods and well-balanced diet. Respondents being adolescents living in slum areas had the lowest knowledge of basic nutrition and adverse health effects of unfavorable nutrition behavior compared to other types of consumers.

Cooking best practices: Over two-fifths of consumers living in rural-urban and slum areas had low knowledge on cooking best practices. Most of the cooks (74.5 percent) did not mention that vegetables need to be cleaned before cooking, and over half of cooks did not know how many times cooked food is safe to reheat before consumption.

Food safety and hygiene knowledge: Overall, one-third of cooks had low food safety and hygiene knowledge. Low food safety and hygiene knowledge was mainly, lack of knowledge about the sources of possible cross-contamination in the household to protect potential food safety and hygiene hazards and risk; low personal hygiene and inadequate handwashing practices at critical times during food preparation and before eating; lack of knowledge and understanding regarding the: concepts of "food safety" and "food hygiene"; low knowledge on the need to avoid keeping cooked foods at ambient temperature for prolonged periods and to reheat leftover food properly before eating; and feeding to infants; low knowledge of practices of water purification before drinking mainly in the rural household. Due to public health messaging regarding the Covid-19 pandemic, the handwashing practice with soap increased by one-fifth and is expected to continue at this level after the crisis is over. Low access to pipe water—a high demanding option for increasing access to safe drinking water, washing fresh fruits and vegetables before preparation and eating, mainly in the rural households.

Having no formal education, belonging to the low wealth category, having inadequate dietary diversity, being underweight or obese, and having somewhat or bad health condition were identified as significant predictors/indicators of low levels of knowledge and awareness. There were also geographical differences with those in Barisal faring worse in terms of knowledge and awareness while those in Khulna division has worse knowledge of cooking best practices, and those in Rangpur had low food safety and hygiene knowledge.

Respondents belonging to secondary and higher secondary education level, respectively had 2.0 to 3.0 times higher and 5.0 to 6.0 times higher likelihood of having medium basic nutrition knowledge, and 5.0 to 10.0 times and 23.0 to 41.0 times higher likelihood of having high nutrition knowledge compared to those with no formal education. Similarly, middle and high wealth categories respectively had 1.4 times and 1.5 times higher having medium basic nutrition knowledge compared to those with lowest wealth category.

The findings of the study thus have important policy implications. Knowledge of basic nutrition, food safety and hygiene and cooking best practice was alarmingly low among some populations and groups; who need special attention. Besides, knowledge on some specific issues was very low. Appropriate evidence-based policy formulation and interventions based on these are essential to improve the low knowledge level among these populations.

Recommendations

- This household survey has identified a need to raise awareness of basic nutrition, cooking best practices and food safety and hygiene, and to improve the knowledge, attitudes and practices (KAP) of consumers at household level. To this effect, it is suggested to promote effective awareness campaigns to:
  ix. Increase knowledge on foods rich in vitamin A and Iron;
  x. Increase knowledge on adverse health effects of trans-fatty acid, such as, cardiovascular disease risk;
  xi. Increase knowledge on adverse health effects of unfavorable nutrition behavior (those who eat salty/savory foods—puri, singara, crisps and chips, chanachur, etc; sweet foods/sugary foods; sugar sweetened beverages).
  xii. Popularize the adoption of balanced diets and quality eating behavior for a healthy life. Special attention should be given to nutritionally vulnerable people being underweight, somewhat or bad health condition and adolescent girls.
  xiii. Promote effective training to those purchasing food for the household regarding dietary diversity and healthy diet and develop network among purchaser, producers, and relevant departments to obtain necessary support for ensuring availability of diversified food items at household/community level.
  xiv. Popularize the importance of soap and water for cleaning and safety and ensure that these are available at all times close to food preparation and feeding areas.
  xv. Inform of the dangers of unhygienic food handling, preparation, safe storage, reheating of foods where necessary, and distribution and demonstration of appropriate practices is essential.
  xvi. Improve hygiene knowledge through Behavior Change Communication (BCC) followed by community–based monitoring through public and private sector partnerships to check whether environmental sanitation and hygiene practices are maintained properly in the household to protect potential food safety and hygiene hazards and risk.
- Nutrition training, BCC for enhanced knowledge of safe handling, processing and storing of foods and improved consumption need to be scaled up.
- Food safety priority issues should be clearly defined, developed and incorporated into the health education curriculum of current school textbooks.
- Food safety and hygiene surveillance systems to monitor and evaluate progress overtime and inform policy need to be developed.

Accordingly, it is recommended that a communication strategy be developed with information, education and communication (IEC) materials and tools aimed at addressing the identified high-risk food safety and hygiene behaviors. Specifically:

- Primary target audience should be the general population , however, special focus should be given to persons involved in purchasing food, cooks, adolescents and caregivers having no formal education, belonging to low socio-economic categories, having inadequate dietary diversity, having unfavorable nutritional behavior, being underweight or obese and having overall health condition as somewhat or bad.
- Key messages should be culturally appropriate, clear, simple and practical, and easy to understand by people with low education and literacy skills.

- Communication channels and selection of the appropriate communication media for a BCC campaign should be planned in consultation with key stakeholders, including BFSA, BNCC, JICA, SUN Movement, Bureau of Health Education, Directorate General of Health Services, Institute of Public Health, and the Department of Mass Communication. Strategies may include but not be limited to:
  - € Production of relevant basic nutrition, food safety and hygiene information/educational print materials for distribution to households in rural and slum areas. This may include booklets, leaflet, flip charts, posters and billboards;
  - € Grassroots informal meetings with the person involved in cooking/mothers and mothers-in-laws involving interpersonal communication supported by community health workers and community leaders; and
  - € National coverage/reach using mass media, including Government and private television and radio channels, with information spots and practical demonstration on environmental sanitation, potential sources of contamination and risk for food safety and hygiene in the household, safe food handling and preparation practices. Short documentary film and video can be used to communicate more effectively with illiterate groups.
  - € Rural Community **Radio Krishi**, which is the only government community radio, and was established by Agricultural Information Service, can be engaged to disseminate key messages for improving knowledge of basic nutrition, diversified food items and healthy diet, and preventive aspects of food safety and hygiene among community people including farmers.

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Annex-Table A5: Status of dietary diversity of 10 food groups

	Food Purchasers	Cooks	Adolescents
Food groups		**%**	
Grains, white roots and tubers, and plantains	99.9	99.9	68.4
Pulses (beans, peas and lentils)	53.4	53.7	46.5
Nuts and seeds	5.8	5.5	6.8
Dairy (Milk and milk products)	14.7	15.5	13.5
Meat, poultry and fish	79.3	79.7	71.5
Eggs	30.3	28.7	29.8
Dark green leafy vegetables	45.2	46.6	38.6
Other vitamin A-rich fruits and vegetables	19.5	20.6	18.4
Other vegetables	71.9	71.8	59.4
Other fruits	17.2	18.2	18.6
	3989.0	3989.0	2473.0

Annex -Table A6:

Status of basic nutrition knowledge levels of food purchasers according to different background characteristics (**slum areas)**

Basic nutrition knowledge related questions	Overall			Food purchaser			Cook			Adolescents		
	Fully Correct	Partially correct	Incorrect	FC	PC	IC	FC	PC	IC	FC	PC	IC
	%			%			%			%		
Which foods are rich in vitamin A?	41.0	6.6	52.4	58.9	0.0	41.1	59.6	0.0	40.4	4.4	19.8	75.8
Which foods are rich in Iron?	11.3	32.2	56.5	2.6	28.8	68.6	3.2	67.8	29.1	28.2	0.0	71.8
What do you know about trans-fatty acid?	1.9	72.2	26.0	0.1	97.4	2.5	0.1	97.5	2.4	5.4	21.7	73.0
What is energy rich foods for the body?	5.3	67.2	27.5	7.5	86.5	6.0	7.1	86.2	6.7	1.2	28.9	69.9
Foods from which food group(s) need to be included in a balance diet?	0.0	93.1	6.9	0.0	96.8	3.2	0.0	97.3	2.7	0.0	85.3	14.7
Which types of foods you consider as unhealthy food and why?	36.6	37.3	26.1	75.6	24.5	0.0	34.2	0.0	65.8	0.0	87.4	12.6
What will happen if we consume unhealthy foods (harmful impact on health)?	0.0	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0	87.7	12.4
Overall, what are the features of a healthy diet? (dietary guideline based)	2.2	48.1	49.8	2.4	34.7	62.9	4.1	31.2	64.8	0.0	78.3	21.7
What physical problems will arise if balance foods/ balanced diet are not taken?	3.2	89.9	6.9	0.0	100.0	0.0	0.0	100.0	0.0	9.6	69.7	20.8
Which foods you consider as unhealthy food?	12.4	20.9	0.0							37.3	62.7	0.0
How should a pregnant woman eat in comparison with a non-pregnant woman to provide good nutrition to her baby and help him grow?	33.2	20.5	46.3	35.6	0.0	64.4	64.0	0.0	36.0	0.0	61.5	38.5
How should a lactating woman eat in comparison with a non-lactating woman to be healthy and produce more breast milk?	0.1	85.9	14.0	0.1	97.8	2.1	0.2	98.1	1.7	0.0	61.8	38.2
What are body building foods?	20.0	30.5	49.5	1.6	33.3	65.1	1.5	33.4	65.1	56.9	24.9	18.2
What are body protective foods?	50.5	35.9	13.5	60.7	34.4	4.9	60.8	33.3	5.8	30.1	40.1	29.8
Which foods are rich in vitamin C?	43.1	32.2	24.7	37.7	48.3	14.0	37.4	48.3	14.3	54.1	0.0	45.9
N						1011						

Appendix- Table A8: Percentage distribution of nutritional behavior and status, and overall health of food purchasers form rural-urban and slum areas

Variables	Food purchaser		Cook		Adolescents	
	Rural-urban	Slum	Rural-urban	Slum	Rural-urban	Slum
	%		%		%	
Dietary practices						
Inadequately dietary diversity (0-4 food groups)	57.3	65.9	56.6	65.7	63.5	70.2
Adequately diversity (≥5 food groups)	42.7	34.1	43.4	34.3	36.5	29.8
Nutritional behavior (NB)						
Favorable NB	39.2	33.6	36.0	23.8	21.7	14.4
Unfavorable NB	60.8	66.4	64.0	76.2	78.3	85.6
Nutritional Status (BMI)						
Normal	62.7	11.3	55.5	9.5	35.6	50.8
Underweight	11.1	59.5	11.2	55.4	48.5	32.6
Overweight	21.8	22.6	26.3	26.5	3.3	4.2
Obese	4.4	6.7	7.0	8.6	12.6	12.4
Overall Health						
Very Good	25.5	21.2	25.5	21.2	25.0	17.1
Good	51.5	53.9	51.5	53.9	53.2	52.5
Medium	20.6	21.9	20.6	22	19.8	27.1
Bad	2.4	3	2.4	3	2.0	3.3
Very Bad	0.1	0	0.1	0	0.0	0
Long time illness						
Yes	12.1	10.2	12.1	37	11.2	12.7
No	87.9	89.8	87.9	327	88.8	87.3
Limitations in work						
Lot of problems	2.5	2.7	2.5	10	2.3	3.3
Sometimes	11.9	8.2	11.9	30	10.8	8.3
No	85.7	89.0	85.7	324	87.0	88.4
N	3989	1011	3989	1011	1011	429

Table A13: Percentage distribution of basic nutrition knowledge of cook according to their involvement in the households (slum area)

Background characteristics	Basic nutrition knowledge of cook						
	Low		Medium		High		
	%	n	%	n	%	n	p-value
Age groups							
10-19	47.83	33	30.43	21	21.74	15	
20-29	36.42	114	34.19	107	29.39	92	0.440
30-39	34.03	98	37.85	109	28.13	81	
40-49	42.36	86	32.51	66	25.12	51	
50-59	44.44	44	29.29	29	26.26	26	
60+	43.59	17	35.90	14	20.51	8	
Sex							
Male	0.00	0	66.67	4	33.33	2	0.117
Female	39.00	392	34.03	342	26.97	271	
Division							
Dhaka+Mymensingh	39.58	190	31.67	152	28.75	138	0.231
Others	38.04	202	36.53	194	25.42	135	
Wealth index							
Lowest	60.47	26	30.23	13	9.30	4	
Low	31.87	29	50.55	46	17.58	16	<0.001
Middle	45.11	106	30.64	72	24.26	57	
High	39.60	139	33.62	118	26.78	94	
Highest	31.62	92	33.33	97	35.05	102	
Level of Education							
No education	53.67	212	31.39	124	14.94	59	<0.001
Primary	35.08	134	34.55	132	30.37	116	
Secondary	21.70	46	39.62	84	38.68	82	
Higher secondary+	0.00	0	35.29	6	64.71	11	

Overall	39	392	34	346	27	273	

Appendix- Table A17: Comparative knowledge levels based on simple assessment of people's dietary practices, nutritional behavior and status, and overall health of consumers (Slum area)

Variables	Food purchaser				Cook				Adolescents			
	L %	M	H	p-value	L %	M	H	p-value	L %	M	H	p-value
Dietary practices												
Inadequate dietary diversity (<5 food groups)	34.8	33.8	31.4	0.205	39.5	36	24.6	0.001	42.5	32.6	24.9	0.144
Adequate dietary diversity (≥5 food groups)	30.4	33	36.5		37.5	30.8	31.7		33.6	33.6	32.8	
Nutritional behavior (NB)												
Favorable nutritional behavior	32.9	32.3	34.7	0.264	52.3	28.2	19.5	<0.001	40.7	38.9	20.4	0.127
Unfavorable nutritional behavior	34.2	35.9	29.8		34.6	36.1	29.4		29.8	37.3	32.9	
Nutritional status (BMI)												
Normal	34.1	34.6	31.3		38.4	36.6	25.0		23.6	37.9	38.6	
Underweight	39.5	31.6	28.9	0.275	46.9	29.2	24.0	0.3	39.0	36.7	24.3	<0.001
Overweight	30.3	32.0	37.7		36.6	32.1	31.3		0	44.4	55.6	
Obese	26.5	32.4	41.2		39.1	31.0	29.9		100	0	0	
Overall health												
Very Good	28.6	37.7	33.7	0.08	24.8	45.8	29.4	<0.001	41.9	25.8	32.3	0.873
Good	34.2	35.2	30.6		38.7	32.0	29.3		41.1	29.5	29.5	
Somewhat	50.0	31.3	18.7		48.9	29.0	22.1		49.0	22.5	28.6	
Bad	54.5	27.3	18.2		55.6	33.3	11.1		67.0	16.7	16.7	
Very Bad	0	0	0		0	50.0	50.0		0	0	0	
Long time illness												
Yes	37.8	32.4	29.7	0.955	32.1	42.5	25.4	0.1	61.0	30.4	8.7	0.06
No	37	34.9	28.1		39.8	33	27.3		41.8	26	32.3	
Limitations in work												
Lot of problems	70.0	20.0	10.0	0.177	40.6	31.3	28.1	0.8	66.7	33.3	0	0.464

Sometimes	26.7	43.3	30	39.7	37.4	22.9	53.3	26.7	20	
No	37	34.3	28.7	38.6	33.8	27.6	42.5	26.3	31.3	

Appendix-Table A21: Factors associated with basic nutrition, food safety and hygiene, and cooking best practices knowledge of cook according to different background characteristics (slum area)

	Basic nutrition knowledge of cook			Food safety and hygiene knowledge of cook			Cooking best practices knowledge of cook		
VARIABLES	HKL OR (SE)	MKL OR (SE)	HKL OR (SE)	HKL OR (SE)	MKL OR (SE)	HKL OR (SE)	HKL OR (SE)	MKL OR (SE)	HKL OR (SE)
Low Knowledge (ref)	1.00								
Education level									
No education (ref)	1.00			1.00			1.00		
Primary		1.033	2.321**						
		(0.325)	(0.964)						
Secondary		4.226***	7.220***						
		(1.558)	(3.564)						
Higher secondary +		5.041e+06	9.586e+06						
		(2.727e+09)	(5.187e+09)						
Division									
Others division (ref)	1.00			1.00			1.00		
Dhaka+Mymenisngh					1.066	0.289**		2.379***	1.664**
					(0.402)	(0.143)		(0.367)	(0.405)
Wealth Index									
Poorest (ref)	1.00	0.965	17.45	1.00			1.00		
Poorer		(0.454)	(36.41)		3.556**	7.111***		0.954	1.026
		1.619	37.82*		(1.801)	(4.907)		(0.331)	(0.793)
Middle		(0.834)	(79.80)		2.122	6.123**		0.535	1.862
		1.800	110.6**		(1.208)	(4.503)		(0.211)	(1.481)
Richer		(0.931)	(230.9)		7.861***	13.02***		0.735	2.706
		1.682	106.3**		(4.284)	(9.432)		(0.259)	(2.034)
Richest		(0.876)	(222.2)		4.064**	21.30***		0.941	2.868
					(2.292)	(15.35)		(0.329)	(2.149)
Dietary Diversity									
Not Adequately diet	1.00								
Adequately Diet		1.415	0.983					0.728**	1.601**
		(0.386)	(0.322)					(0.108)	(0.365)
Nutritional behavior (NB)									
Unfavorable NB	1.00			1.00					
Favorable NB		0.529**	0.692		0.668	1.079			
		(0.172)	(0.275)		(0.208)	(0.364)			
Overall health									
Very good	1.00			1.00			1.00		
Good		1.265	1.254		0.479**	1.058			
		(0.467)	(0.554)		(0.172)	(0.413)			
Somewhat		1.260	0.283**		1.075	0.665			
		(0.518)	(0.160)		(0.424)	(0.318)			
Bad		0.657	0.203		0.913	2.973			
		(0.446)	(0.257)		(0.694)	(2.290)			
Very Bad		0.00	0.00		0.00	0.00			
Constant		0.289**	0.00491**		0.367*	0.0887***		1.289	0.0919***
		(0.157)	(0.0104)		(0.199)	(0.0651)		(0.422)	(0.0673)
Observations		361	361		364	364		1011	1011

SE (Standard error) form in parentheses, OR=odds ratio, ref=Reference category; *** p<0.01, ** p<0.05, * p<0.1
LKL-Low knowledge level, MKL: Medium knowledge level; HKL: High knowledge level

Table A22: Factors associated with basic nutrition knowledge levels of adolescents using multinomial logistic regression model

VARIABLES	Basic nutrition knowledge level of adolescents		
	Low Knowledge OR (SE)	Medium Knowledge OR (SE)	High knowledge OR (SE)
Low Knowledge (ref)	1.00		
Sex			
Male (ref)	1.00		
Female		2.378***	2.409***
		(0.314)	(0.347)
Education level			
No education (ref)	1.00		
Primary		0.197**	3.69e-07
		(0.137)	(0.000232)
Secondary		1.889***	5.045***
		(0.268)	(0.797)
Higher secondary +		5.205**	28.57***
		(3.909)	(20.48)
Area			
Rural(ref)	1.00		
Urban		1.271	0.598**
		(0.232)	(0.125)
Division			
Barisal (ref)	1.00		
Chattogram		1.283	0.307***
		(0.363)	(0.0881)
Dhaka		1.372	1.221
		(0.429)	(0.368)
Khulna		1.595	0.678
		(0.505)	(0.216)
Rangpur		3.761***	2.185**
		(1.343)	(0.778)
Rajshahi		2.589***	0.896
		(0.851)	(0.299)
Mymensingh		2.980***	1.702
		(1.125)	(0.640)
Sylhet		1.512	0.648
		(0.596)	(0.261)
Wealth Index			
Lowest (ref)	1.00		
Low		2.210***	2.504***
		(0.488)	(0.604)
Middle		1.411*	1.696**
		(0.290)	(0.377)
High		0.739	1.107
		(0.173)	(0.278)

Highest		1.371	3.332***
		(0.357)	(0.977)
Dietary Diversity	1.00		
Inadequate dietary diversity			
		0.935	1.036
Adequate dietary diversity			
		(0.135)	(0.162)
BMI			
Underweight	1.00		
Normal weight		2.334***	3.046***
		(0.377)	(0.514)
Overweight		4.378**	6.165***
		(2.565)	(3.667)
Obese		0.00519***	0.0104***
		(0.00326)	(0.00475)
Constant		0.296***	0.213***
		(0.0902)	(0.0658)
Observations		2042	2042

SE form in parentheses, OR=odds ratio, ref=Reference category
*** p<0.01, ** p<0.05, * p<0.1

Table A23: Factors associated with basic nutrition knowledge levels of adolescents using multinomial logistic regression model (Slum area)

	Basic nutrition knowledge levels of adolescents		
VARIABLES	**Low knowledge OR (SE)**	**Medium knowledge OR (SE)**	**High knowledge OR (SE)**
Low knowledge (ref)	1.00		
Education level			
No education (ref)	1.00		
Primary		3.989**	2.34
		(2.756)	(4.63)
Secondary		55.91***	8.58
		(43.23)	(1.69)
Higher secondary +		4.901	1.62
		(7.808)	(3.20)
Division			
Other divisions (ref)	1.00		
Dhaka+Mymensingh		0.687	0.425**
		(0.204)	(0.148)
Wealth Index			
Lowest (ref)	1.00		
low		1.045	3.892
		(0.822)	(4.174)
Middle		2.065	8.354*
		(1.715)	(9.382)
High		0.980	2.765
		(0.745)	(2.915)
Highest		2.152	10.25**
		(1.659)	(10.86)
BMI			
Underweight	1.00		
Normal weight		1.370	1.866*
		(0.445)	(0.681)
Overweight		1.640e+07	2.87
		(2.686e+10)	(4.71)
Obese		1.57e-09	3.45
		(2.75e-06)	(4.15)
Constant		0.132**	2.79e-09
		(0.126)	(5.51e-06)
Observations		429	429

SE form in parentheses, OR=odds ratio, ref=Reference category

*** p<0.01, ** p<0.05, * p<0.1

Table A24: Factors associated with infant and young child feeding (IYCF) related knowledge of caregiver using multinomial logistic regression model (Rural-urban area)

Variables	Infant and young child feeding (IYCF) of caregiver		
	Low Knowledge OR (SE)	Medium Knowledge OR (SE)	High knowledge OR (SE)
Low Knowledge (ref)	1.00		
Division			
Barisal (ref)	1.00		
Chattogram		0.858	3.586**
		(0.418)	(2.025)
Dhaka		0.804	1.789
		(0.424)	(1.095)
Khulna		0.545	0.666
		(0.269)	(0.406)
Rangpur		0.479	0.726
		(0.244)	(0.448)
Rajshahi		0.184***	0.916
		(0.109)	(0.563)
Mymensingh		0.871	2.859
		(0.582)	(2.052)
Sylhet		0.819	0.828
		(0.466)	(0.585)
Constant		2.000*	0.783
		(0.838)	(0.404)
Observations	481	481	481

SE (standard error) form in parentheses, OR=odds ratio, ref=Reference category
*** p<0.01, ** p<0.05, * p<0.1

Appendix-Table A25: Factors associated with infant and young child feeding (IYCF) related knowledge of caregiver using multinomial logistic regression model (Slum area)

	IYCF related knowledge of caregiver		
VARIABLES	Low Knowledge OR (SE)	Medium Knowledge OR (SE)	High knowledge OR (SE)
Low Knowledge (ref)	1.00		
Nutritional behavior			
Unfavorable nutrition behavior (ref)	1.00		
Favorable nutrition behavior		3.326**	2.579
		(1.774)	(1.613)
Constant		0.209***	0.152***
		(0.0838)	(0.0697)
Observations	90	90	90

SE (standard error) form in parentheses, OR=odds ratio, ref=Reference category
*** p<0.01, ** p<0.05, * p<0.1

Food Policy and Planning Unit, Ministry of Food
Government of the People's Republic of Bangladesh

Survey on consumer awareness of nutrition, food safety and hygiene

BRAC James P Grant School of Public Health, BRAC University and

Household ID:						

INFORMED CONSENT

Good morning/afternoon!

I am _____ from BRAC University and conducting a survey on awareness of nutrition, food safety and hygiene. Your household has been chosen by a random selection process.

We are inviting you to be a participant in this study. We value your opinion and there are no wrong answers to the questions we will be asking in the interview.

We will use approximately 1 hours of your time to collect all the information. There will be no cost to you other than your time. There will be no risk as a result of your participating in the study. Your participation in this research is completely voluntary. You are free to withdraw your consent and discontinue participation in this study at any time.

This study is conducted anonymously. You will only be identified through code numbers. Your identity will not be stored with other information we collect about you. Your responses will be assigned a code number, and the list connecting your name with this number will be kept in a locked room and will be destroyed once all the data has been collected and analysed. Any information we obtain from you during the research will be kept strictly confidential.

Your participation will be highly appreciated. The answers you give will help provide better information to policy makers, practitioners and program managers so that they can plan for better services that will respond to your needs.

The researcher read to me orally the consent form and explained to me its meaning. I agree to take part in this research. I understand that I am free to discontinue participation at any time if I so choose, and that the investigator will gladly answer any question that arise during the course of the research.

Contact Person: Mahmood Parvez/ Tridib Roy/Iftikhar ul Karim
Name of the Principal Investigator (PI): Dr. Nepal C. Dey
Address: BRAC James P Grant School of Public Health, BRAC University
Tel: 01714-091-310 E-mail of PI: nepal.cd@bracu.ac.bd

Signature of the Enumerator: _____ Date of interview: /_____/_____/_____/

Module A: Identification and household information	
Respondent: Primary female of the household	**Respondent ID:**

Module A1: Interview related information

No.	Question	Response		Code	Instruction
	Interviewers Name and ID	_____ |____|____|		Write down your Full Name and Id	
	Cluster Name and Code	_____ |____|____|		Filled out before starting Interview	
	Union Name and code	_____ _____ |____|____|			
	Upazilla Name and code	_____ |____|____|			
	District Name and code	_____ |____|____|			
	Division Name and code	_____ |____|____|			
	HH Number	|____|____|____|____|____|			
	HH Head Name	_____			
	HH head father/husband Name (Nick name)	_____			
	HH Head Contact No	|____|____|____|____|____|____|____|____|____|____|____|			
	House name	_____			
	Village/Para Name	_____			
	How many member of your HH/Family	|____|____|	Exclude the HH member who are staying outside for at least 6 months		
	Information would be taken For module?	Module A	1 = Yes, 2 = No		
		Module B	1 = Yes, 2 = No		
		Module C	1 = Yes, 2 = No		
		Module D	1 = Yes, 2 = No		
		Module E	1 = Yes, 2 = No		

Module A2: Household related information and respondent identification

A2.1: Demographic and socio-economic characteristics

HH Member ID	HH member name	Relationship with the household head [code]	Gender 1= Male; 2=Female	Age		Marital status [code]	Main occupation [code]	Which class you have passed? [code]	Can write and read letters? 1= yes, 2=no, 99 = not applicable	Food related involvement or responsibility [code] List one by one according to name and age	General illness or morbidity in last 6 months? [code] List one by one according to name and age	Water borne disease in the last 2 weeks
				Year	Month							
1	2	3	4	5	6	7	8	9	10	11*	12*	13*
		1=Household head										

Code 3 (Relationship): 1= Household head, 2= wife/husband, 3=son/daughter, 4=father/mother, 5=brother/sister, 6=daugher-in-law/son-in-law, 7=grandson/granddaughter, 8=nephew/niece, 9=brother-in-law/sister-in-law, 11=domestic helper (female) 12=domestic helper (male)/driver 13=others.

Code 7 (Marital status): 1= Unmarried, 2=Married, 3=widow/widower, 4=divorced, 5=seperated, 6= others

Code 8 (Main Occupation): 1 = Agricultural work (paddy); 2 = Agricultural work (other than paddy); 3 = Agricultural day labor; 4 = Unskilled day labor; 5 = Skilled day labor; 6= Rickshaw puller/ van/wheel barrow/Baby taxi/boatman; 7=Fisherman; 8=Employer; 9=Professionals; 10=Businessman; 11= Petty businessman; 12= House maid; 13=Zoom farmer; 14= Do not earn; 15=Poultry/dairy farmer; 16=Handicrafts; 17 = Vegetable cultivation; 18=Fishery; 19 = Homemaker; 20= Student; 21=disable; 77 = Don,t know; 66 =Age below 06 years
99 = Others (specify……)
**Main occupation from last 12 month: Instruction: If the respondent involved more than one profession since last 12 months, then consider the main occupation which he spent most of the time and write down the answer code.

Code 9 (Which class you have passed): Need to write the class he/she has passed (1= class 1, 2=class 2, ..., 10= SSC/Dakhil), 12=HSC/Alim, 14=BA/ BSc/BCom/Fazil/graduate/ BA (honours), 16=MA/Phd/Kamil, 17=diploma/ vocational , 50=Hafezi/Qawmi/Kharizi, 66= never went to school, 0=went to school but hasn't passed any class, 88= don't know, 99 = not appliable/less than 6 years old

Code 11 (Food related involvement or responsibility): 1= diet planning; 2= purchasing food; 3= food preparation (cutting, washing); 4= cooking; 5=food serving; 6=not involved at all; 7=not applicable (age less than 6 years); 8=others (specify_____)

Code 12 (General illness or morbidity): 00=No disease at all; 1= Fever (FUO); 2= Arthritis; 3= Dyspepsia/peptic/gastric ulcer/ gastritis; 4= High Blood Pressure; 5= Diabetes; 6= Acute respiratory infection (ARI); 7= skin disease; 8= conjunctivitis/eye infection; 9= cancer/malignancy (any); 10= burns and injuries; 11= common cold and cough; 12= dyspepsia/gastritis; 13= tuberculosis; 14= malaria; 15=Dengue; 16= asthma; 17= pneumonia; 18= Measles; 19= abdominal pain; 20= cataract; 21= disability; 22= paralysis; 23= Goitre; 24=night blindness; 25=epilepsy; 26= rabies; 27= chicken pox; 28= diphtheria; 29= kala-azar; 30= hepatitis-b; 31= urinary tract infection; 32= tetanus; 33= mumps; 34=whooping cough; 35= diphtheria; 36= infection in ears; 37= migraine; 38= kidney disease; 39= heart disease; 40= Liver disease; 41= anaemia; 42= back pain; 43= hernia; 44= stroke; 45= appendicitis; 46= gallbladder stone; 47=others (specify_____)

Code 13 (Water borne diseases): 1= diarrhoea 2= dysentery; 3= cholera; 4= hepatitis A; 5=worms infection; 6= jaundice; 7= arsenic affected diseases; 8= typhoid; 9= amibiasis; 10= others (specify_____)

A2.2: Respondent identification and Covid-19 related information

No.	Question	Responses and code categories	Code	Instructions
1	Who is primarily responsible for cooking in the household?	Name: HH member ID:		For respondent selection
2	Who is primarily responsible for purchasing foods in the household?	Name: HH member ID:		For respondent selection
3	Who is primarily responsible for child feeding in the household? (if there is any child in the HH)	Name: HH member ID:		For respondent selection
4	Adolescent respondent (if any)	Name: HH member ID:		For respondent selection
5	Did you or any of your family member eat any food particularly considering beneficial during Covid-19 pandemic?	1 = Yes 2 = No		
6	If yes, which food(s)?	1= 2= 3=		
7	Did you or any of your family member avoid any food particularly considering beneficial during Covid-19 pandemic?	1 = Yes 2 = No		
8	If yes, which food(s)?	1= 2= 3=		

A2.3: Household related other information

No.	Question	Responses and code categories	Code	Instructions
	Do at least one member of your household have access to internet?	1=Yes 2=No		
	If yes, who?	HH member ID: HH member ID: HH member ID:		
	Which device s/he use for internet?	1= Smartphone 2= Laptop/desktop computer 3= Others (specify……..)		
	Amount of homestead HH land	|____|____|____|____| decimal		
	Amount of own cultivating land	|____|____|____|____| decimal		
	Sources of foods in this household	1= Purchased 2= Own household production 3= Both 4=Others (Specify……)		
	What type of fuel did you usually use for cooking?	1= Electricity 2= LPG 3= Piped Natural gas 4= Kerosene 5= Coal/Lignate 6= Charcoal 7= Wood		

		8= Straw/grass/agri waste/leaves 9= Animal dung 10 = Bio-gas 99 = Others (Specify)			
	Do you have livestock or poultry currently at your household? If yes, how many you have?				
		A. 1 = Yes 2 = No	B. Number (If Yes)		
	Cow/ Buffalo	1= Yes 2 = No	|____|____|____|		
	Sheep/Goat/pig	1 = Yes 2 = No	|____|____|____|		
	Chickens/ Duck/Geese	1 = Yes 2 = No	|____|____|____|		
	Small game (rabbits, pigeon etc)	1 = Yes 2 = No	|____|____|____|		
	Others (Specify)_____	1 = Yes 2 = No	|____|____|____|		
	Which of the following items are currently active at your household?				
	Electricity	1= Yes 2= No			
	Solar Electricity	1= Yes 2= No			
	Radio/ Television	1= Yes 2= No			
	Telephone/Mobile telephone	1= Yes 2= No			
	Electric fan	1= Yes 2= No			
	Bedstead	1= Yes 2= No			
	Almirah/wardrobe	1= Yes 2= No			
	Refrigerator	1= Yes 2= No			
	Table/chair	1= Yes 2= No			
	Watch/ wall clock	1= Yes 2= No			
	Bicycle	1= Yes 2= No			
	Motorcycle / motor scooter/tempu	1= Yes 2= No			
	Animal powered cars	1= Yes 2= No			
	Car/truck	1= Yes 2= No			
	Boat	1= Yes 2= No			
	Engine powered boats?	1= Yes 2= No			
	Rickshaw/ van	1= Yes 2= No			
	Power tiller	1= Yes 2= No			
	Water pump	1= Yes 2= No			
	Plow	1= Yes 2= No			
	IPS/generator ?	1= Yes 2= No			
	Net for fishing	1= Yes 2= No			
	What is the main construction material used for the outer wall of respondent's house? (Record based on your own observation)	Natural walls 1= No walls 2= Cane/ Palm/ Trunk 3= Dirt Rudimentary walls 4= Bamboo with mud 5= Stone with mud 6= Playwood 7 = Cardboard/polythene	Finished walls 8= Tin 9=Bricks/ Cement 10= Stone with lime/ Cement 11= Wood planks/ Shingles 99 = Other (Specify)_____		(Record answer after observation)
	What is the main construction material used for the roof of respondent's house? (Record based on your own observation)	Natural Roofing 1= No roof 2= Thatch/ Palm leaf Rudimentary roofing 3= Bamboo/Mud 4= Wood Planks 5 = Cardboard/ polythene	Finished roofing 6= Tin 7= Wood 8= Ceramic Tiles 9=Bricks/ Cement 10=Wooden blade 99 = Other (Specify)___		

	What is the main construction material used for the floor of respondent's house? (Record based on your own observation)	Natural Floor 1= Earth/Sand Rudimentary Floor 2= Wood Planks 3= Palm/ Bamboo Finished Floor 4= Ceramic Tiles 5=Bricks/ Cement 6=Mojaic 99 = Others (Specify)_____		
	How many living rooms does your household have (Including home maid room)	|_____|_____|		
	At present, any member of your household has been taking any advantage from the specified government program? ((May be multiple answers, if coded "food for work"then justify, is it running government program?)	1 =Get nothing 2 =Money for education 3 =Freedom fighter allowance 4 =Elderly allowance 5 =V.G.D 6 =Widow allowance 7 = 100 days program (money for work, current program) 8 =V.G.F 9 =National service program 77 =Don,t know 99 Others (specify _____)		
	Religion *Instruction:* Write down the religions of respondent	1 = Islam 2= Hindu 3 = Christian 4 = Buddhist 99 = Others (Specify)_____		
	What is your ethnicity?	|____|____|		
Code: 1 =Chakma; 2 =Marma; 3 =Tripurav; 4 =Murong; 5 =Toncongav; 6 =Bom; 7 =Pankho; 8 =Chak; 9 =Khiyangs; 10 =Khumi;11 =Lusai; 12 =Koch; 13 =Saowtal; 14 =Daluy; 15 =Lusai; 16 =Rakhain; 17 =Monipuri; 18 =Garow; 19 =Hajong; 20 =Khasiyav; 21 =Mongs; 22 =Oraow; 23 =Bormon; 24 =Pahari; 25 =Mal pahari; 26 =Munda; 27 =Khol; 28 =Bangali; 99 = Others (Specify)_____				
	Did you receive money from anyone during last 6 month who are not in your HH (who are from abroad or other area)	1 = No 2 = Yes 77 = Dont Know		If answer No then go to
	On average, how much amount you have received per month ? (Considering last 6 month)	|____|____|____|____|____|____| Taka		
	What is your average monthly household income ?	|___|___|___|___|___|___|___| Taka 88 = Disagreed		
	What is your average monthly household expenditure?	|___|___|___|___|___|___|___| Taka 88 = Disagreed		
	What is your average monthly household expenditure only for food?	|___|___|___|___|___|___|___| Taka 88 = Disagreed		
	What was the cost for health (treatment, medicine etc.) for all household member in last 12 months?	|___|___|___|___|___|___|___| Taka 88 = Disagreed		

Module A3: Household WASH

No.	Question	Response	Code	Instruction or skips
	What is the main source of drinking water of your household?	Piped Water 1= Piped to dwelling 2= Piped to yard/plot 3= Public tap Tubewell or Borehole 4= Shared 5 = Household Dug Well 6= Protected 7= Unprotected 8= Rainwater Groud water 9= Surface water (Pond/ River/ Canal/Hawar/ irrigation channels) 10= Water tanker Spring 11 = Protected 12 = Unprotected 99 = Others (Specify)_____		
	Do you have any soap in your household?	1= Yes ; 2= No		
	Did you use soap within the last 24 hours?	1= Yes ; 2= No		If No, go to …question.
	If you used soap today or yesterday, then why you used soap? *If the respondent answered, washed hand myself or* my child then try to know other purpose of use, just probe it don't read out the answer code. (Multiple answers can be coded, Do not read out the answers code, ask "what else" until get right answer.)	1= Washing cloths	1= Yes; 2= No	
		2= Washing my body	1= Yes; 2= No	
		3= Washing my children	1= Yes; 2= No	
		4= Washing child's bottoms	1= Yes; 2= No	
		5= Washing my children's hands	1= Yes; 2= No	
		6= Washing hands after defecating	1= Yes; 2= No	
		7= Washing hands after cleaning child	1= Yes; 2= No	
		8= Washing hands before feeding child	1= Yes; 2= No	
		9= Washing hands before preparing food	1= Yes; 2= No	
		10= Washing hands before eating	1= Yes; 2= No	
		11= Others (Specify)_____	1= Yes; 2= No	

No.	Question	Response	Code	Were these your usual practice before the COVID-19 pandemic? [1= Yes; 2= No]	Are these practices developed among them due to public health messaging on COVID-19? [1= Yes; 2= No]	Whether the current practices will persist after COVID-19? [1= Yes; 2= No]
	Is it necessary to wash hands in a day?	1= Yes 2= No				

	If yes, how do you wash hands?	1= with water only 2= with soap and water 3= with ash				
	How long should you wash your hands with soap?	1= 1-2min 2=20 -30sec 3=>30 sec				
	Do you wash your hands at least for 20 seconds?	1= Yes 2= No				
	What do you use to wash your hands?	1= Soap and water 2= Liquid hand wash 3= Alcohol-based hand rub 4= Only water 5= Other				
	When do you wash your hands?	1= After coughing or sneezing 2= Before and after caring of the sick 3= Before eating food 4= After defecation 5= After handling money 6= When hands are visible dirty 7= After coming home from outside 8= Every 1 hour later 9= Any other				
	If you feel the need to touch your eyes, nose or mouth, what do you do?	1= Touch immediately 2= Wash hands and then touch 3= Wait until washing hands 4= Others				
	Is there any change in your monthly budget for buying soap/detergent?	1= Yes 2= No 3= As before				
	If yes, How much extra budget do you need for this in every month?	1= 30-50% 2=51-100% 3=101-200%				
	What is the source of water for washing hands?	1= Tubewell-own 2= Tubewell (shared) 2= Pondwater/River/Lake 3= Tape water through piped supply (public line) 5= Tape water supply built by NGO 4= Tape water temporary privately built (Own)				
	What is the source of water for defecation?" (going and return)	1= Tubewell-own 2= Tubewell (shared) 2= Pondwater/River/Lake 3= Tape water through piped supply (public line) 5= Tape water supply built by NGO				

		4= Tape water temporary privately built (Own)				
	What is the time to collect drinking water?" (going and return)	1= 30 min 2= Within household premises 3= 30-60 min 4= >1 hour				
	What is the time to collect handwashing water?" (going and return)	1= 30 min 2= Within household premises 3= 30-60 min 4= >1 hour				

No.	Question	Response	Code	Instruction or skips
	What type of toilet used by your family members? (Ensured after your own observation)	1= Piped sewer system 2= Septic tank 3= Ring slab with water seal 4= Ring slab without water seal 5= Pit latrine with slab 6= Pit latrine without slab 7= Hanging latrine 8= No facility (Bush/open field/river pond side) 99= Others (Specify)_____		If Answer '8' ,go to
	Is your toilet shared or a public toilet? *(Ask regardless of location. A shared toilet is a joint asset between a set numbers of household.* *Public means the number of people sharing is not precisely know...i.e a community toilet*)	1= Not shared 2= Shared 3= Communal 4= Don't know		
	Is the toilet is cleaned? (Observation)	1= Yes ; 2= No		
	Is there any odor smell? (Observation)	1= Yes ; 2= No		
	Do you go to the toilet wearing shoes? (Observation)	1= Yes ; 2= No		
	Could you show me where you usually wash your hands? *(Ask and observe)*	0= Modern piped facilities in dwelling 1= Inside/near toilet facility 2= Inside/near kitchen/cooking place 3= Elsewhere in yard 4=Inside yard 5= Outside yard 6= No specific place 8= No permission to see		If Answer 6/8, then go to question ……
	Is there any soap or detergent or locally used cleansing agent? Circle the answer code after your observation. This item should be either in place or brought by the interviewee within one minute then code "yes". If the item is not present within one minute check none, even if brought out later then code "6" (observation).	1= Soap 2= Liquid soap (commercially prepared of homemade) 3= Detergent 4= Ash 5= Mud/sand 6= None		

		99= Other (Specify)_____		
	Is there water? Circle the answer code after your observation. Interviewer: turn on tap and/or a check container and note if water is present. This item should be either in place or brought by the interviewee within one minute. If the item is not present within one minute check no, even if brought out later.	1= Yes ; 2= No		
	Are there any hand washing materials such as a tap, basin, bucket, sink, or tippy tap? Please circle the answer code based on your observation. This item should be either in place or brought by the interviewee within one minute. If the item is not present within one minute check no, even if brought out later.	1= Yes ; 2= No		

Module B: Food preparation and cooking related knowledge and practices	
Respondent: The person who primarily cook	**Respondent ID:**

Module B1: Knowledge and practices: Basic nutrition; food preparation, cooking, processing, serving, storage, hygiene; sources of foods

No.	Question	Response	Code	Instruction
	Nutrition related basic knowledge			
	Foods from which food group(s) need to be included in a balance diet? [Multiple response] [Please do not prompted]	1= Grains, white roots and tubers, and plantains 2= Pulses (beans, peas and lentils; nuts and seeds) 3= Dairy (milk and milk products) 4= Meat, poultry, fish and eggs 5= Dark green leafy vegetables 6= Other vitamin A-rich fruits and vegetables 7= Other vegetables 8= Other fruits 77 = Don't know		
	Do you heard about healthy food plate?	1= Yes 2 = No 77 = Don't know		
	Have you seen healthy food plate?	1= Yes 2 = No 77 = Don't know		
	Which foods you consider as unhealthy food?	**Salty/savoury foods (puri, singara etc.)** 1=Crisps and chips, chanachur etc. 2=Salty biscuits 3= Fried dough or other fried snacks singaru, samarcha, puri etc. **Sweet foods/sugary foods** 4= Cookies/sweet biscuits 5=Cake cakes, sweet pastries or ice cream 6= Any kind of sweets ,honey, halua , condensed milk, tiler khaza, jilapi		

		7= Chocolates, candies etc. **Sugar sweetened beverages (SSB**) 8=Fruit juices 9=Fruit drinks 10=Sport drinks/energy drinks (speed etc.) 11=Soft/carbonated drinks (7 up, coca cola etc. 12=Sweetened milk/yogurt drinks 13=Horlicks/maltova etc.		
	Which types of foods you consider as unhealthy food?	1= Fast foods (burger… etc.) 2= Oily/high fat containing foods 3= Spicy foods 4= Cheap sweetened foods from shops 5= Soft drinks 6= Fried or over cooked 7= Processed foods 8= Open street foods Others (specify……..)		
	Why? [what criteria make these foods unhealthy]	1= High in fat 2= High sugar content 3= High calories 4= Bad for health 5= Lack nutritional value Other (apecify……..)		
	What is the unhealthiest source of unhealthy food?	1=Local shops 2= Restaurants 3=Home 4=Street foods/hawker 5=Grocery shop		
	Unhealthy foods are available from which sources?	1=Local shops (puri/singara r dokan) 2= Restaurants 3=Home 4=Street foods /hawker 5=Grocery shop		
	What will happen if we consume unhealthy foods (harmful impact on health)	1= Diarrhoea 2= Dysentery 3= Typhoid 4=Non-communicable disease (such as, Kidney failure) 5= Allergy 6= Obesity 7= Weight loss 8= High blood pressure 9= Diabetes 8=Others (Specify……)		
	Does everybody need to have balance food?	1= Yes 2 = No 77 = Don't know		
	Do any physical problems arise if balance food is not taken?	1= Yes 2 = No 77 = Don't know		
	What physical problems will arise if balance foods/ balanced diet are not taken?	1 = Will suffer from malnutrition 2 = Feel physical weakness 3 = Disease will attack 5 = Others 77 = Don't know		

	What is energy giving foods for the body?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	What is body building foods?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	What is body protective foods?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	Which foods are rich in vitamin C?	1 = Amlaki/Lemon/Orange 2 = Apple 3 = Mango/Jack fruit 77 = Don't know		
	Have you heard about iron-deficiency anaemia?	1= Yes 2 = No 77 = Don't know		
	Which foods are rich in vitamin A?	1 = Sweet potato 5= Grape fruit 2 = Carrot 6= Don't know 3 = Pepper 4 = Spinach		
	Which foods are rich in Iron?	1= Potato 2 = Fish/Meat/Organ meat/flesh foods 3 = Pulses 4 = Leafy and Non leafy veg 77 = Don't know		
	What is the source of Arsenic?	1 = Shallow tubewell water 2. Deep tubewell water 3 = Other foods 4 = Medicine 5= Other 77= Don't know		
	How should a pregnant woman eat in comparison with a non-pregnant woman to provide good nutrition to her baby and help him grow?	1= Eat more food (more energy) 2= Eat more at each meal (eat more food each day) 3= Eat more frequently (eat more times each day) 4= Eat more protein-rich foods 5= Eat more iron-rich foods 6= Use iodized salt when preparing meals 7= Other 77= Don't know		
	How should a lactating woman eat in comparison with a non-lactating woman to be healthy and produce more breast milk?	1= Eat more food (more energy) 2= Eat more at each meal (eat more food each day) 3= Eat more frequently (eat more times each day) 4= Eat more protein-rich foods 5= Eat more iron-rich foods 6= Use iodized salt when preparing meals 7= Other		

		77= Don't know		
	Do you heard about trans fatty acid?	1= Yes 2 = No 77 = Don't know		
	If yes, what do you know about it?	1=It is good for health 2=It is bad for health 3=It is neither good or bad for health 4=We should avoid it 5=We should consume it more 6=Others (specify……..)		
	Overall, what are the features of a healthy diet? (dietary guideline based)	1=Eat adequate amount of cereals and cereal products and preferably whole grain cereals daily 2= Consume required amounts of fish, meat, poultry, egg and legumes daily 3=Eat plenty of fruits and vegetables everyday 4=Consume adequate amounts of milk and milk products 5=Consume moderate amounts of oils, and fats 6=Limit salt intake and condiments and use only iodized salt 7= Take less sugar, sweets or sweetened drinks 8= Drink plenty of water daily 9= Consume safe and clean foods and beverages 10= Food intake and regular physical activity 11= Practise healthy life style with right cooking and healthy eating 12= Eat additional food during pregnancy and lactation 77= Don't know		
	Food preparation, cooking, processing, serving, storage, hygiene: Knowledge and practices			
	Should gruel be discarded during rice cooking?	1= Yes 2 = No 77 = Don't know 88= Don't understand		
	How vegetables need to be cleaned before cook?	1 = Cut into small pieces & then wash in water 2 = Wash whole first & than cut into small pieces 3 = Both 1 and 2 should practice 77 = Others		
	On boiling the vegetables and leafy vegetables in water, should one discard water?	1= Yes 2 = No 77 = Don't know 88= Don't understand		
	Is it right to put lid on the pot while cooking vegetables and leafy vegetables?	1= Yes 2 = No 77 = Don't know 88= Don't understand		
	After cooking what is the right time to eat food?	1 = Immediately after cooking 2 = Within 1 hour after cooking 3 = Within 2 hours after cooking 4= Others		
	Is there any need to keep the food covered after cooking?	1= Yes 2 = No 3 = Sometimes 4= No need 5 = Others		
	Is it right to eat stale food or uncovered food?	1= Yes 2 = No 3 = Sometimes can be eaten 4= Others		

	Do you discard gruel during cooking rice?	1= Yes 2 = No 3 = Sometimes 4= Other		
	How do you clean vegetables and leafy vegetables before cooking?	1 = Cut into small pieces & then wash in water 2 = Wash whole first & than cut into small pieces 3 = Both 1 and 2 should practice 4 = Others		
	Do you discard gruel while cooking rice?	1= Yes 2 = No 3 = Sometimes		
	During cooking do you cover the cooking pot with lid?	1= Yes 2 = No 3 = Sometimes		
	Do you keep your food covered after cooking?	1= Yes 2 = No 3 = Sometimes		
	Where do you eat after cooking?	1 = In Kitchen 2 = In courtyard on a mat 3 = Sitting on chowki,/Table/Chair/Bench 4= Others		
	What are the important points to consume safe and clean foods?	1= Buy food items from reliable sources after careful examination. 2=Refrigerate perishable food items till consumption. 3=Keep foods well covered from dirt and flies 4=Avoid eating street foods that are contaminated with polluted water and dust 77=Don't know		
	Cooking oil and salt related knowledge and practices			
	What type of salt one should use in her/his household?	1= Open salt (no iodine) 2= Salt containing iodine (but not packed) 3= Salt containing iodine (within packed) 4= Others (specify……..)		
	Do you add cooking oil during cooking of vegetables and leafy vegetables?	1= Yes 2 = No 3 = Sometimes		
	What type of salt do you use during cooking?	1= Packet/Iodized salt 2 = Open salt		
	How do you preserve salt at home?	1 = Keep Open 2 = Keep in a pot having lid 3 = Keep in an open pot 4 = Keep in the packet at which salt is available		
	What type of cooking oil do you use in your household?	1=Soybean 2=Mustard 3= Supper/Palm 4= Coconut 5=Sunflower oil6=canola oil 7= Rice brand oil 99= Others (Specify)____		
	Which kind of cooking oil did you buy?	1= Brand oil 2= Open oil 3= Both 99= Others (Specify)____		If "2" go to …
	Which brand of cooking oil did you buy for household cooking?	1= Teer 2= Fresh 3= Rupchanda 99= Others (Specify)____		
	Which brand you used for cooking? Is it Vitamin A/D/E fortified?	1= Fortified with Vitamin A 2= Fortified with Vitamin D 3= Fortified with Vitamin E 4= Others		

	[Instruction: Observation of the oil packet to make sure]				
	What type of salt used in your household? (Read the following type and answer Yes or No Code)	Open salt	1 = Yes 2= No		If answer for Open salt is 'No' then go to
		Packing salt (Without brand)	1 = Yes 2= No		
		Packing salt (Brand)	1 = Yes 2= No		
	Which brand used in your household.	1 =Molla Salt 2 =ACI 3 =Brac Salt 4 =Tir Salt 5= Fresh Salt 6=Confidence 99=Others (specify ……)			
	How much salt required per week in your household for food and food preparation?	|____|____|____|____| gm			
	Food safety, hygiene and cleanliness during food handling				
	Do you know food should never be stored near chemicals or cleaning supplies?	1= Yes 2 = No			
	Is food stored near chemicals or cleaning supplies? (Observation)	1= Yes 2 = No			
	Do you think that the hand should be properly cleaned before cooking?	1= Yes 2 = No 3 = Sometimes 4 = Others			
	Do you wash well your hands before cooking?	1= Yes 2 = No 3 = Sometimes 4 = Others			
	Is there any need to wash hand before having food?	1 = Always should wash hand 2 = If hand is clean no need to wash 3 = Never to wash 4 = No need 5 = Others			
	Do you wash your hand well before eating?	1 = Everybody always wash hand 2 = Do not wash hand if it is Clean 3 = Children sometimes don't wash hands 3 = Some elders don't wash hands 4 = Others			
	Do you know it is necessary to do separate storage of raw and cooked food?	1= Yes 2 = No 77= Don't know			
	How do you store raw and cooked foods? Separate storage of raw and cooked food	1=Always separately 2= Most of the time separately 3=Sometimes separately 4= Together 5=Others (specify……)			
	How do you ensure safety of green végétales ?	1= Buying fresh vegetables 2= Washing hands before handling 3= Washing with clean and safe water before préservation 4= Washing with clean water before cutting			

		5= Washing with vinegar for removing adulteration 6= Preserve after packing with safe paper/foil properly in the refrigerator 7= Others		
	How do you ensure safety of fruits ?	1= Buying fresh Fruits 2= Washing hands before handling 3= Washing with clean and safe water before préservation 4= Washing with clean water before cutting 5= Washing with vinegar for removing adulteration 6= Preserve after packing with safe paper/foil properly in the refrigerator 7= Others		
	How do we can ensure safety of cooked food ?	1= Washing hands before eatingg 2= Cover properly for protecting flies 3= Reheat properly before eating (2 hours) 4= Preserve cooked and non-cooked food saperately 5= Lon-time preservation of cooked food should be avoided. 6= Others		
	Do you eat open or stale food?	1= Yes 2 = No 3 = Sometimes 4 = Others		
	Is there any need to clean enough the cooking utensils?	1= Yes 2 = No 3 = Sometimes 4 = Others		
	Do you wash well cooking utensils before cooking?	1= Yes 2 = No 3 = Sometimes 4 = Others		
	How do you clean the cooking utensils?	1= With hot, soapy water or in dishwasher after each use 2= With hot, soapy water or in dishwasher after whole day use 3= With normal water after each use 4= With normal water after whole day use 5= No need to clean at all 6=Others 77=Don't know		
	Food contamination and pollution			
	What are the sources where disease can be transmitted overall?	1= Uncleaned toilet 2= Flies 3= Improper fecal sludge management 4= Dirty hands 5= Dirty pond nearby house 6= Unclean surroundings of households 7=Others (Specify……) 77=Don't know		
	Sources of pollution nearby kitchen? Observation	1= Uncleaned toilet 2= Flies 3= Insects/pests/animals in cooking area 4= Unclean surroundings of households 5= Dirty pond nearby house 6= Very short distance between drinking water source and toilet 7= Improper fecal sludge management 8=Others (Specify……) 77=Don't know		

	Overall cleanliness (latrine, households' surroundings, etc.)	1= Vey clean 2 = Unclean 3 = Very unclean 4 = Others		
	How many times you can reheat a cooked food?	1= Once 2= Twice 3= Thrice 4= As many times as I want 5= Others 77= Don't know		
	How can we prevent food from becoming contaminated during preparation?	1= Before preparing food is to wash and dry your hands thoroughly 2= Use separate utensils when preparing food that will not be cooked before it is eaten, such as salads and sandwiches 3= Never use the same utensils for raw meats and foods that are ready to eat, such as cooked meats 4= Cooked food and other food that is ready to eat, such as salads, should always be placed on clean and dry serving dishes 7=Others (Specify……) 77=Don't know		

Module B2: Exposure to nutrition related message; food marketing and promotion

No	Question	Response Options	Code	Instruction / Skip
	Who do you rely on for food and nutrition related information/messages? Multiple responses	1=Spouse (Husband/wife) 2= Mother/Mother in law 3=Father/Father in law 4= Other members of the family 5= Relatives 6= Neighbours 7= Community health worker who came to my door (GO/NGO) 8= Person in the local pharmacy I went for health issues (informal providers) etc. 9= Doctors (MBBS) etc. 10= Media: Radio 11= Media: Television 12=Media : Internet/YouTube 13=Media: Print (newspaper/magazine) 14=Media: Print (billboard, poster etc.) 15= Social media (Facebook/tweeter etc.) 16= Others (Specify……)		
	Who is the most reliable/trustworthy to you for nutritional message dissemination?	1=Spouse (Husband/wife) 2= Mother/Mother in law 3=Father/Father in law 4= Other members of the family 5= Relatives 6= Neighbours 7= Community health worker who came to my door (GO/NGO) 8= Person in the local pharmacy I went for health issues (informal providers) etc. 9= Doctors (MBBS) etc. 10= Media: Radio 11= Media: Television 12=Media : Internet/YouTube		

		13=Media: Print (newspaper/magazine) 14=Media: Print (billboard, poster etc.) 15= Social media (Facebook/tweeter etc.) 16= Others (Specify……)		
	Do you notice any messages on nutrition awareness, food safety and hygiene related information on any media in the last 30 days?	1= Yes 2= No		
	If yes, which media?	1= Media: Television 2=Media : Internet 3=Media: Print (newspaper/magazine) 4=Media: Print (billboard, poster etc.) 5= Media: Radio 6= Others (Specify……)		
	If yes, on what?	1= Infant and young child complementary feeding which includes breast feeding 2= Diet during pregnancy and lactation 3= Adolescent nutrition 4=Food safety 4= Hand washing and other food hygiene 6= Food adulteration 7= Nutritious and balanced diet 8= Beneficial effect of any particular food 8=Others (Specify……)		
	Did you find any messages on nutrition awareness, food safety and hygiene related information on any media in the before Covid-19 beginning?	1= Yes 2= No		
	Do you know anything about healthy plate?	1= Yes 2= No		
	Have you ever seen any add in the media about healthy plate?	1= Yes 2= No		
	What types of information you think would be useful for you regarding nutrition awareness, food safety and hygiene to disseminate through different media?	1= Infant and young child complementary feeding which includes breast feeding 2= Diet during pregnancy and lactation 3= Adolescent nutrition 4=Food safety 4= Hand washing and other food hygiene 6= Food adulteration 7= Nutritious and balanced diet 8= Beneficial effect of any particular food 8=Others (Specify……)		Multiple answers
	What would be the best media to disseminate messages on nutrition awareness, food safety risks and hygiene related information FOR YOU?	1= Media: Television 2=Media : Internet 3=Media: Print (newspaper/magazine) 4=Media: Print (billboard, poster etc.) 5= Media: Radio 6= Community health worker who came to my door (GO/NGO) 7= Person in the local pharmacy I went for health issues (informal providers) etc. 8= Doctors (MBBS) etc. 9= Text books (secondary/higher secondary level) 10= Others (Specify……)		

	Which group of people influence by the marketing and promotional activities about foods?	1= Children (up to 9 years old) 2= Adolescents (10-19 years old) 3= Adults (20-59 years old) 4= Elderly (60 and above years old)		
	According to you what types of foods are most advertised/promoted?	1= Oil 2= Salt 3= Powder milk 3= Cereal/Horlicks 4= Soft drinks 5= Chips 6= Noodles 7= Others (Specify……..)		
	Do you notice any advertisement promotional activity on foods on any media in last 30 days?	1= Yes 2= No 77= Don't know		
	If yes, mostly on which food?	1= Oil 2= Salt 3= Powder milk 3= Cereal/Horlicks 4= Soft drinks 5= Chips 6=		
	Food labeling			
	Do you thing food labelling is an effective tool to protect consumer health in terms of food safety and nutrition?	1= Yes 2= No 77= Don't know		
	Do you found it useful to mention the ingredients, nutritional value, safety facts and other information on the label of a food you want to buy?	1= Yes, always 2= Yes, sometimes 3= No		
	Do you make your decision to buy some foods over another similar foods based on what was written on the labelling?	1= Yes, always 2= Yes, sometimes 3= No		
	What types of information you GET through food labelling in the package of food?	1= Product's identity and contents 2= Manufacturing and expiry date 3= Ingredients 4= Nutritional value 5= Instruction on how to handle, prepare and consume 6= Presence of allergens/harmful ingredients 7= Price of the product 8= Approval from BSTI of similar authority		
	What types of information you SEEK through food labelling in the package of food?	1= Product's identity and contents 2= Manufacturing and expiry date 3= Ingredients 4= Nutritional value 5= Instruction on how to handle, prepare and consume 6= Presence of allergens/harmful ingredients 7= Price of the product 8= Approval from BSTI of similar authority 9= Others (specify……)		

Module B3: Eating behaviors and related practices (Quamrun Nahar, DGB, 2013)

Place a check mark for your answer in the space provided in accordance with your past eating behavior.

No.	Question	Response	Code	Skips
	Eating behavior and related issues	Frequency [1=Regular; 2= Occasionally (3 days/week); 3= Never (less than 3 days/week)]		
	Eat a variety of food from 6-8 food groups of food pyramid			
	Eat unpolished rice, wheat			
	Eat citrus and vit A rich fruits			
	Eat vegetables (leafy & non leafy)			
	Eat fish/meat			
	Eat pulses			
	Eat foods containing fat and oils			
	Eat sweetened foods			
	Drink milk			
	Eat fresh, well prepared foods			
	Avoid overeating			
	Eat food with proper chewing			
	Always wash hands before meals			
	Have your body weight measured weekly			
	Perform exercise			
	Undertake clinical check-up at least once a year*			
	Take enough rest and sleep			

Module B4: Dietary practice: Food consumption in last 24-hour

[Now I would like to request describing the food items that you ate at home and outside of home during the last day or night (from yesterday morning 6.00 am to today morning 6.00 am) .Please tell me, all types of food, drinks that ate you at morning, noon and dinner, or breakfast / light breakfast. Remembering if you ate any of food during the cooking, please tell us including all.

Start the interview like, which food give your child at the morning time.

-What did you eat in the morning wake up**?** Did you eat anything more**?**
-What did you eat more in the morning**?** Did you eat anything more**?**
-What did you eat at noon**?** Did you eat anything more**?**
-What did you eat at afternoon**?** Did you eat anything more**?**
-What did you eat at evening**?** Did you eat anything more**?**
-What did you eat at dinner**?** Did you eat anything more**?**

Record first the answer of the questions of column A. Collect the answer for column B/C after recording the answer of the questions of column A]

A [Yesterday during the day or night, did you consume the following food items (A)?]
B [During the last 07 days how many days did you consume the following food items (B)?]
C [During the last 07 days, how many times did you consume the following food items (C)?]

No	**Question**		**Last 24 hours [yes or no]**	**Last 07 days [number of days]**	**During the last 07 days [how many times]**
	Food group	**Food item for example**	**Column A**	**Column B**	**Column C**
	Starchy Staples/Food made from grains	Rice, flour bread, wheat, muri, maize, kichuri, barli, oot, kinoya, noodles, pasta	1 = Yes 2 = No	|____|____| days	|____|____| times

	Starchy Staples/ (root, tubers, tissue)	potatoes, sweet potatoes, sagu, erarut, cave, shalgam, kuchu, wiggle, ripe banana shaloo	1 = Yes 2 = No	|____|____| days	|____|____| times
	Lentils/Pulses	Dal/ khicuri, peas, motor, soybean, tofu peanuts, humas	1 = Yes 2 = No	|____|____| days	|____|____| times
	Legumes and Nuts	Peanut, Pistachios, kazu or any kond of peanut, ciya seeds, til, tisi, sunflower seeds, sweet pumpkin seeds	1 = Yes 2 = No	|____|____| days	|____|____| times
	Dark green leafy vegetables	All kinds of leafy vegetables (poo, kuchu, kalmi) Brooklyn	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow vegetables	Orange sweet potato, pumpkin, carrot or other yellow or orange vegetable	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow fruits	Ripe mangoes, papaya, jackfruits other red/yellow or orange fruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich fruits	Guava, Strawberry, Lemon, Orange, grapes, Pineapple, raw mango, amalaki, kueue, tomatos	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich vegetables	Raw tomato,chilli pepper, brussels sprouts,cauliflower,cabbage	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other vegetables or fruits	peas, asparagas, bit,koci bash, cauliflower,selari,shawsha,brinjal,letus,masrum ,mula,jukini	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other fruits	Apple, avakado,bam, cherry,ripe jackfruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Eggs	Hen/duck, other birds,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Organ meat	Cheeks, liver, Stomach, Ridpind, Kidney	1 = Yes 2 = No	|____|____| days	|____|____| times
	Flesh	Beef, Pork, Veal, Lamb, Goat, Chicken, Duck or flesh of any other animal	1 = Yes 2 = No	|____|____| days	|____|____| times
	Small Fish	Small Fish Eaten Whole with Bones (i.e.Kachki, mola, dhela, chapila, batashi, small prawn, dried fish)	1 = Yes 2 = No	|____|____| days	|____|____| times
	Large fish/sea food	Big whole Fish and Shell Fish and dried fish	1 = Yes 2 = No	|____|____| days	|____|____| times
	Dairy	Milk, cheese, yogurt or other milk products	1 = Yes 2 = No	|____|____| days	|____|____| times
	Insects and other protein foods	Fish egg, insect, snail	1 = Yes 2 = No	|____|____| days	|____|____| times
	Edible Oil	Ghee, butter,cream, sour, fat, margarine, mayonnaise, palm oil, vegetable oil,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Savory and fried snacks	**Crisps and chips, fried dough or other fried snacks singaru, samarcha, chanachur**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sweets	**Sugary foods, such as chocolates, candies, cookies/sweet biscuits and cakes, sweet pastries or ice cream, any kind of sweets ,honey, halua , condensed milk, tiler khaza**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sugar sweetened drinks	soft drinks, juice, energy drinks, yogurt drinks, chocolate drinks, horlicks, moltova	1 = Yes 2 = No	|____|____| days	|____|____| times

	Tea/coffee with sugar	Tea/coffee with sugar	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other beverages and foods	**Tea or coffee if not sweetened, clear broth, alcohol, Pickles, olives and similar**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Condiments or spices	Spices, coriander leaves, sausage, garlic, ketchup, lemon juice, mint leaves, drinks, betel leaves, tobacco leaves, jars	1 = Yes 2 = No	|____|____| days	|____|____| times

Module B5: Anthropometric measurement and self-perceived health status

Module B5.1: Anthropometric measurements (Height and weight) and MUAC

No	Question	Responses and code categories	Code	Instructions
	Start time of anthropometry	|____|____| : |____|____| Hr : Min		Use 24 hr format
	Weight Scale ID	|____|____|		
	Height Scale ID	|____|____|		
	Clothing type during weight measurement	1 = Light clothing 2 = Slightly heavy clothing 3 = Heavy clothing		
	Name of measurer			
	Code of measurer	|____|____|		

	Measurement	Measurement 1	Measurement 2	Measurement 3
	Height (Cm)	A.|____|____|____|.|____|	B.|____|____|____|.|____|	C.|____|____|____|.|____| If A and B differs more than 0.5 cm, take 3rd measurement
	Weight (kg)	A.|____|____|____|.|____|	B.|____|____|____|.|____|	C.|____|____|____|.|____| If A and B differs more than 0.1kg, take 3rd measurement
	Left hand circumference(MUAC) (Cm)	A.|____|____|.|____|	B.|____|____|.|____|	C.|____|____|.|____| If A and B differs more than 0.5 cm, take 3rd measurement
	End Time of measurement	|____|____|:|____|____| Hr : Min		Use 24 hr format

Module B5.2: Self-perceived health status

Perceived health status (Scale range: 0-100 where, '100' means the best health one can imagine and '0' means the worst health one can imagine) [EQ_5D_5L]	
Now we would like to know how good or bad your health is today. This scale is numbered from 0 to 100.100 means the best health you can imagine. 0 means the worst health you can imagine. Mark an X on the scale to indicate how your health is today. [Show the EQVAS scale to the respondent and ask to mark X]	
Health Score	|___|___|___|

----------End of Module B----------

Module C: Child feeding related knowledge and practices [Administer to: 6 -23 month old child]	
Respondent: Child's primary caregiver. [usually mother of the child or may be separate person]	**Respondent ID:**

Module C1: Child feeding related knowledge and practice

No.	Question	Response	Code	Instruction
	Child ID	_____		
	Child date of birth	|____|____|/|____|____|/20|____|____| DD / MM / YYYY		
	Age of child (write completed month)	|____|____| Month		
	Sex of the child	1 = Male 2= Female		
	IYCF related knowledge			
	Do you think that child should breast fed after birth?	1= Yes, 2 = No, 3 = Don't know		
	How long after birth should a baby start breastfeeding?	1= Immediately 2= Less than 1 hour after delivery 3= Some hours later but less than 24 hrs 4= 1 day later 5= More than 1 day later 6= Do not think baby should be breastfed 77= Don't know		
	What should a mother do with the "first milk" or colostrum?	1= Throw it away and start breastfeeding when the real milk comes in 2= Give it to her baby by breastfeeding soon after birth 3= Other (specify) 77= Don't know		
	How often should a baby breastfeed?	1= Whenever baby wants 2= When you see the baby is hungry 3= When the baby cries 4= Other (specify) 77= Don't know		
	What are the food items a mother should give her child during 0-6 months?	1= Only breast milk 2= Breast milk and medicine if necessary 3= Breast milk and addition foods 4= Breast milk and honey 5= Breast milk and addition liquids 6= Other (specify) 77= Do not know		
	If a mother thinks her baby is not getting enough breast milk, what should she do?	1= Breastfeed more often/more frequently 2= Give other liquids/foods 3= Mother needs to drink more water 4= Mother needs to eat more food 5= Feeding the child in correct position 6= Other (specify) 77= Don't know		
	Do you think that infants less than 6 months of age should be given water if the weather is very hot?	1= Yes 2= No 77= Don't know		

	At what age should a baby first start to receive liquids (including water) other than breast milk?	Months…… 77= Don't know			
	At what age should a baby first start to receive foods in addition to breast milk?	Months…… 77= Don't know			
	Up to what age the child should breastfed?	1 = up to _____ months 99 = It is not good to breastfed 88 = Others _____			
	Should the child fed other foods just after three days of birth?	1= Yes 2 = No 3 = Sometimes 77 = Don't know 5 = Others _____			
	IYCF related practices				
	Have you ever breastfed your child?	1= Yes 2= No			
	Is the baby currently being breastfed? [if the child was breastfed in the day or night preceding the interview]	1= Yes, 2 = No, 3 = Don't know			
	First time after birth, when you gave breast milk to your infant? If respondent reports she gave breast milk to the infant immediately after birth, circle "0" For 'Immediately'. AND RECORD "00" If less than 1 hour, circle "1" for hours AND RECORD "00" hours. If less than 24 hours, circle "1" and record number of completed hours, from 01 to 23.Otherwise, circle '2" and record number of completed days.	0 = Immediately **Or** 1 = |____|____| Hours **Or** 2= |____|____| Days			
	Did you give colostrum to your baby?	1= Yes 2 = No 77= Don't know			
	Did you give any food or drink into (name's) mouth before the first breast milk (colostrum)?	1= Yes 2 = No 77= Don't know			
	Did you give any food or drink into (name's) mouth within 6 months after birth? **(Excluding breastfeeding)**	1 = Yes 2 = No 8 = Don't know			If answer "2" go to

			A.1=Yes, 2=No	B. Number if 'Yes'	
	Did your child (Name) take any of the following food/drinks yesterday during the day and night? [24 hours]	Breast milk	1 = Yes 2 = No	|____|____|	
		Only water	1 = Yes 2 = No	|____|____|	
		Sugar water	1 = Yes 2 = No	|____|____|	
		Infant formula (i. e. Cerelac, Lactogen)	1 = Yes 2 = No	|____|____|	
		Tinted or powder milk	1 = Yes 2 = No	|____|____|	
		Fresh animal milk (cow, goat, sheep, buffalo)	1 = Yes 2 = No	|____|____|	
		Juice , Juice drink, green coconut	1 = Yes 2 = No	|____|____|	
		Yogurt	1 = Yes 2 = No	|____|____|	

		ORS	1 = Yes 2 = No	|____|____|		
		Thin soup	1 = Yes 2 = No	|____|____|		
		ORS Thin sugary	1 = Yes 2 = No	|____|____|		
		Vitamin/drop of medicine/syrup	1 = Yes 2 = No	|____|____|		
	Yesterday, over the day or night did child (name) drink anything from a bottle with a nipple?		1 = Yes 2 = No 77= Don't know			
	During the last one month, did you hear/see/read any message/information about child breast-feeding or supplementary feeding?		1 = Yes 2 = No 77= Don't know			
	If yes, where did you hear/see/read the message?		1 =Radio 2 =Television 3= News paper 4 =Mobile telephone 5 =Doctor/health worker/nurse 6 =Poster/leaflet/billboard 7 =Neighbor 99 =Others(specify ----------)			
	When did you start to give the following foods/drinks to your baby (if < 1 month/0-29 days; code 0)					
	Water		|____|____|			
	Liquids without breast milk (Sugar, glucose, tea, fruit juice etc.)		|____|____|			
	Cow/goat/buffalo milk		|____|____|			
	Baby formula/tined milk/powder milk					
	Suji, smashed rice		|____|____|			
	Semi solid foods (smashed rice, hochpoch, smashed potato, ripe banana, smashed family foods etc.)		|____|____|			
	Solid food (rice, wheat, puffed rice/flattened rice etc.)		|____|____|			
	Fish		|____|____|			
	Meat (chicken, beef, mutton etc.)		|____|____|			
	Egg		|____|____|			
	Pluses (lentil, peas, dal etc.)		|____|____|			
	Green leafy vegetables		|____|____|			
	Snacks (chanachur,Chips, biscuit, nuts etc)		|____|____|			
	Monimix, Micronutrient powder		|____|____|			
	Code:0= Within 30 days (in 0 month); 1= After 1 month; 2= After 2 month; 3= After 3 month; 4= After 4 month; 5= After 5 month; 6= After 6 month; 7= After 7 month; 8 = After 8 month; 9 = After 9 month; 10 = After 10 month; 11 = After 11 month; 12 = After 12 month; 13 = Yetn't started 77 = Don't know/ don't remember					
	Did your child (Name) take foods from any of the following food groups yesterday during the day and night? [24 hours]					
	Yesterday, during the day or night, how many times did your child (name) eat solid, semi-solid, or soft foods other than liquids at home or outside home (*exclude liquids*)?		Number of times |____|____| 77= Don't know			
	Yesterday, did your child (name) consume containing iron drops or tablets (including sprinkles/monimix)?		1 = Yes 2 = No 77 = Don't know			

	From the last 7 days, did your child (name) consume any food with added any nutrient powder (sprinkles/Monimix)?	1 = Yes 2 = No 77 = Don't know		
	Did (name) you ever fed your child any food to which you added a nutrient powder (Sprinkles/Monimix)?	1 = Yes 2 = No 77 = Don't know		
	If yes, then how long times? Please specify	|____|____| day		
	Have you been visited at home by any health worker in the last six months for dissemination of feeding your child?	1= Yes 2= No 77= Don't know		
	What advice did you receive from the health worker on feeding your child?	1= Putting baby to breast immediately after birth 2= Giving only colostrum 3= No pre- or post-lacteals (honey/mustard oil/glucose water) 4= Feed only breast milk up to six Months 5= Positioning & Attachment 6= Attachment 7= Feeding mashed family food after months 8= Feeding animal source foods 9= Cooking/adding with oil 10= Adding Sprinkles/MNP 11= Washing hands with water and soap before prep/feeding child 12= Feeding during illness/extra after illness 13= Respondent did not mention any of the above on her own 14= Other (specify……)		

Module C2: Child feeding related safety and hygiene (faecal contamination and hygiene)

No.	Question	Response	Code	Instruction
	When should you wash your hands? (multiple answers possible)	1= Before eating 2= After using the toilet 3= Before feeding the child 4= After cleaning a child who has defecated 5= Before cooking 6= Washing hands with soap after going to toilet 7= Before serving food 8= Other (specify) 77= Don't know		
	Where did the child (name of target child) defecate the last time? Do Not Read Responses If the response is Don't know/ not sure, probe to see if someone in the Household Knows	1= Potty 2= Nappy / diaper 3= In the courtyard (without potty) 4= Inside the house (without potty) 5= In Toilet / Latrine (Skip to….) 6= Bush / forest / field 7= Other (specify……) 77= Don't know / Not sure		If response is Other, Don't know, skip to --
	What was done with the feces? Do Not Read Responses	1= Left there 2= Put / rinsed into toilet or latrine 3= Put / rinsed into drain or ditch 4= Thrown into the bush / forest / field		

		5= Thrown into garbage 6= Thrown into a specific pit for child's feces 7= Buried 8= Other (specify……..) 77= Don't know / not sure		
	Where do you usually dispose of feces from the potty?	1= Latrine 2= Open Pit / separate pit for child or animal feces 3= Bury it / Covered Pit 4= Undefined open site near the compound (including open garbage disposal sites / dumps) 5= Bush / forest / field 6= Nearby water (pond, canal, river) 7= Other (specify) _____		
	How did you handle the feces? Do Not Read Responses. Mark All that Apply	1= Hands only (bare hands) 2= Hands and cloth / paper / leaves / straw 3= Scrap material to scoop feces 4= Potty 5= Local agricultural hoe/instrument 6= Sani-scoop 7= Did nothing 8= Others (specify)_____ 77= Don't know / not sure		

Module C3: Dietary practice: Food consumption in last 24-hour (child)

Now I would like to request describing the food items that you have feed your child (child name) at home and outside of home during the last day or night (from yesterday morning 6.00 am to today morning 6.00 am) .Please tell me,all types of food, drinks that fed your child (child name) at morning, noon and dinner, or breakfast / light breakfast. Remembering If you fed any of food during the cooking, please tell us including all.

Start the interview like, which food give your child at the morning time.

-What did you feed (child name) in the morning wake up**?** Did you feed anything more**?**
-What did you feed more in the morning**?** Did you feed anything more**?**
-What did you feed at noon**?** Did you feed anything more**?**
-What did you feed at afternoon**?** Did you feed anything more**?**
-What did you feed at evening**?** Did you feed anything more**?**
-What did you feed at dinner**?** Did you feed anything more**?**

Record first the answer of the questions of column A. Collect the answer for column B/C after recording the answer of the questions of column A]

A [Yesterday during the day or night, did you consume the following food items (A)?]
B [During the last 07 days how many days did you consume the following food items (B)?]
C [During the last 07 days, how many times did you consume the following food items (C)?]

No	Question		Last 24 hours [yes or no]	Last 07 days [number of days]	During the last 07 days [how many times]
	Food group	Food item for example	Column A	Column B	Column C
	Starchy Staples/Food made from grains	Rice, flour bread, wheat, muri, maize, kichuri, barli, oot, kinoya, noodles, pasta	1 = Yes 2 = No	|____|____| days	|____|____| times
	Starchy Staples/ (root, tubers, tissue)	potatoes, sweet potatoes, sagu, erarut, cave, shalgam, kuchu, wiggle, ripe banana shaloo	1 = Yes 2 = No	|____|____| days	|____|____| times
	Lentils/Pulses	Dal/ khicuri, peas, motor, soybean, tofu peanuts, humas	1 = Yes 2 = No	|____|____| days	|____|____| times

	Legumes and Nuts	Peanut, Pistachios, kazu or any kond of peanut, ciya seeds, til, tisi, sunflower seeds, sweet pumpkin seeds	1 = Yes 2 = No	|____|____| days	|____|____| times
	Dark green leafy vegetables	All kinds of leafy vegetables (poo, kuchu, kalmi) Brooklyn	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow vegetables	Orange sweet potato, pumpkin, carrot or other yellow or orange vegetable	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow fruits	Ripe mangoes, papaya, jackfruits other red/yellow or orange fruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich fruits	Guava, Strawberry, Lemon, Orange, grapes, Pineapple, raw mango, amalaki, kueue, tomatos	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich vegetables	Raw tomato,chilli pepper, brussels sprouts,cauliflower,cabbage	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other vegetables or fruits	peas, asparagas, bit,koci bash, cauliflower,selari,shawsha,brinjal,letus,masrum ,mula,jukini	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other fruits	Apple, avakado,bam, cherry,ripe jackfruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Eggs	Hen/duck, other birds,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Organ meat	Cheeks, liver, Stomach, Ridpind, Kidney	1 = Yes 2 = No	|____|____| days	|____|____| times
	Flesh	Beef, Pork, Veal, Lamb, Goat, Chicken, Duck or flesh of any other animal	1 = Yes 2 = No	|____|____| days	|____|____| times
	Small Fish	Small Fish Eaten Whole with Bones (i.e.Kachki, mola, dhela, chapila, batashi, small prawn, dried fish)	1 = Yes 2 = No	|____|____| days	|____|____| times
	Large fish/sea food	Big whole Fish and Shell Fish and dried fish	1 = Yes 2 = No	|____|____| days	|____|____| times
	Dairy	Milk, cheese, yogurt or other milk products	1 = Yes 2 = No	|____|____| days	|____|____| times
	Insects and other protein foods	Fish egg, insect, snail	1 = Yes 2 = No	|____|____| days	|____|____| times
	Edible Oil	Ghee, butter,cream, sour, fat, margarine, mayonnaise, palm oil, vegetable oil,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Savory and fried snacks	**Crisps and chips, fried dough or other fried snacks singaru, samarcha, chanachur**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sweets	**Sugary foods, such as chocolates, candies, cookies/sweet biscuits and cakes, sweet pastries or ice cream, any kind of sweets ,honey, halua , condensed milk, tiler khaza**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sugar sweetened drinks	soft drinks, juice, energy drinks, yogurt drinks, chocolate drinks, horlicks, moltova	1 = Yes 2 = No	|____|____| days	|____|____| times
	Tea/coffee with suger	Tea/coffee with suger	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other beverages and foods	**Tea or coffee if not sweetened, clear broth, alcohol, Pickles, olives and similar**	1 = Yes 2 = No	|____|____| days	|____|____| times

	Condiments or spices	Spices, coriander leaves, sausage, garlic, ketchup, lemon juice, mint leaves, drinks, betel leaves, tobacco leaves, jars	1 = Yes 2 = No	|____|____| days	|____|____| times

Module C4: Anthropometric measurements (child)

No.	Question	Response(s)	Instructions
	Start time anthropometry	|____|____|:|____|____| Hour : Minute	Use 24 Hr Format
	Name of measurer		
	Code of measurer	|____|____|	

No	Measurement	Measurement 1	Measurement 2	Measurement 3
	Left hand circumference (MUAC) (cm)	A.|____|____|.|____|	B.|____|____|.|____|	C.|____|____|.|____| If A and B differs more than 0.5 cm, take 3rd measurement
	End time of measurement	|____|____|:|____|____| Hr : Min		Use 24 hr format

----------End of Module C----------

Module D: Food purchasing

Respondent: The person primarily responsible for purchasing foods | **Respondent ID:**

Module D1: Basic nutrition and dietary practices related knowledge

No.	Question	Response	Code	Instruction
	Nutrition related basic knowledge			
	Foods from which food group(s) need to be included in a balance diet? [Multiple response] [Please do not prompted]	1= Grains, white roots and tubers, and plantains 2= Pulses (beans, peas and lentils; nuts and seeds) 3= Dairy (milk and milk products) 4= Meat, poultry, fish and eggs 5= Dark green leafy vegetables 6= Other vitamin A-rich fruits and vegetables 7= Other vegetables 8= Other fruits 77 = Don't know		
	Do you heard about healthy food plate?	1= Yes 2 = No 77 = Don't know		
	Have you seen healthy food plate?	1= Yes 2 = No 77 = Don't know		
	Which foods you consider as unhealthy food?	**Salty/savoury foods (puri, singara etc.)** 1=Crisps and chips, chanachur etc. 2=Salty biscuits 3= Fried dough or other fried snacks singaru, samarcha, puri etc. **Sweet foods/sugary foods** 4= Cookies/sweet biscuits 5=Cake cakes, sweet pastries or ice cream		

		6= Any kind of sweets ,honey, halua , condensed milk, tiler khaza, jilapi 7= Chocolates, candies etc. **Sugar sweetened beverages (SSB**) 8=Fruit juices 9=Fruit drinks 10=Sport drinks/energy drinks (speed etc.) 11=Soft/carbonated drinks (7 up, coca cola etc. 12=Sweetened milk/yogurt drinks 13=Horlicks/maltova etc.		
	Which types of foods you consider as unhealthy food?	1= Fast foods (burger… etc.) 2= Oily/high fat containing foods 3= Spicy foods 4= Cheap sweetened foods from shops 5= Soft drinks 6= Fried or over cooked 7= Processed foods 8= Open street foods Others (specify……)		
	Why? [what criteria make these foods unhealthy]	1= High in fat 2= High sugar content 3= High calories 4= Bad for health 5= Lack nutritional value Other (apecify……)		
	What is the unhealthiest source of unhealthy food?	1=Local shops 2= Restaurants 3=Home 4=Street foods/hawker 5=Grocery shop		
	Unhealthy foods are available from which sources?	1=Local shops (puri/singara r dokan) 2= Restaurants 3=Home 4=Street foods /hawker 5=Grocery shop		
	What will happen if we consume unhealthy foods (harmful impact on health)	1= Diarrhoea 2= Dysentery 3= Typhoid 4=Non-communicable disease (such as, Kidney failure) 5= Allergy 6= Obesity 7= Weight loss 8= High blood pressure 9= Diabetes 8=Others (Specify……)		
	Does everybody need to have balance food?	1= Yes 2 = No 77 = Don't know		
	Do any physical problems arise if balance food is not taken?	1= Yes 2 = No 77 = Don't know		
	What physical problems will arise if balance foods/	1 = Will suffer from malnutrition 2 = Feel physical weakness 3 = Disease will attack 5 = Others		

	balanced diet are not taken?	77 = Don't know		
	What is energy giving foods for the body?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	What is body building foods?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	What is body protective foods?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	Which foods are rich in vitamin C?	1 = Amlaki/Lemon/Orange 2 = Apple 3 = Mango/Jack fruit 77 = Don't know		
	Have you heard about iron-deficiency anaemia?	1= Yes 2 = No 77 = Don't know		
	Which foods are rich in vitamin A?	1 = Sweet potato 5= Grape fruit 2 = Carrot 6= Don't know 3 = Pepper 4 = Spinach		
	Which foods are rich in Iron?	1= Potato 2 = Fish/Meat/Organ meat/flesh foods 3 = Pulses 4 = Leafy and Non leafy veg 77 = Don't know		
	What is the source of Arsenic?	1 = Shallow tubewell water 2. Deep tubewell water 3 = Other foods 4 = Medicine 5= Other 77= Don't know		
	How should a pregnant woman eat in comparison with a non-pregnant woman to provide good nutrition to her baby and help him grow?	1= Eat more food (more energy) 2= Eat more at each meal (eat more food each day) 3= Eat more frequently (eat more times each day) 4= Eat more protein-rich foods 5= Eat more iron-rich foods 6= Use iodized salt when preparing meals 7= Other 77= Don't know		
	How should a lactating woman eat in comparison with a non-lactating	1= Eat more food (more energy) 2= Eat more at each meal (eat more food each day) 3= Eat more frequently (eat more times each day)		

	woman to be healthy and produce more breast milk?	4= Eat more protein-rich foods 5= Eat more iron-rich foods 6= Use iodized salt when preparing meals 7= Other 77= Don't know		
	Do you heard about trans fatty acid?	1= Yes 2 = No 77 = Don't know		
	If yes, what do you know about it?	1=It is good for health 2=It is bad for health 3=It is neither good or bad for health 4=We should avoid it 5=We should consume it more 6=Others (specify……)		
	Overall, what are the features of a healthy diet? (dietary guideline based)	1=Eat adequate amount of cereals and cereal products and preferably whole grain cereals daily 2= Consume required amounts of fish, meat, poultry, egg and legumes daily 3=Eat plenty of fruits and vegetables everyday 4=Consume adequate amounts of milk and milk products 5=Consume moderate amounts of oils, and fats 6=Limit salt intake and condiments and use only iodized salt 7= Take less sugar, sweets or sweetened drinks 8= Drink plenty of water daily 9= Consume safe and clean foods and beverages 10= Food intake and regular physical activity 11= Practise healthy life style with right cooking and healthy eating 12= Eat additional food during pregnancy and lactation 77= Don't know		

Module D2: Food purchasing related information (including safety and hygiene, labelling of food)

No	Question	Response Options	Code	Instructions / Skip
	When you buy different packaged foods, do you check labelling?	1= Yes 2=No		
	What is the information you sought during purchasing of labelled food products? [Multiple response]	1=List of Ingredients 2=Net Content 3=Name of the manufacturer 4=Country of origin 5=Batch/lot identification 6=Manufactured date 7=Expiry date 8=Storage condition 9=Nutrition information 10=Instructions for use 11=Others (specify……)		
	What factors you mostly consider when buying different foods?	1= Perceived quality of food 2= Locally grown/farm fresh product 3= Convenience to buy 4= Taste flavours, 5= Price 6= Packaging 7= Sales promotion (such as) 8= Country of origin/manufactured		

		9= Food safety risks such as adulteration possibility 10= Others (specify……)		
	Do you consider food brand when buying foods?	1= Yes 2=No		
	What is position regarding food brand?	1= I like to change food brand frequently 2= When I like one brand I stick on that unless quality deteriorates 3= I usually prefer international brand/other country brand 4= I usually prefer brands of my own country 5= Others		
	What are the sensory quality you consider when buying some foods?	1= Taste 2= Odour 3= Visual quality 4= Texture		
	Safety and hygiene issues during purchasing foods			
	How can we reduce contamination during purchasing foods?	1= Using separate shopping bags for different type of groceries 2= Keeping different types of foods in separate chambers in refrigerators etc. 3= Using separate shopping bag for raw (particularly animal source foods) and other groceries		
	Do you use separate shopping bag for raw (particularly animal source foods meat, fish, egg) and other groceries?	1= Yes, always 2= Yes, sometimes 3= No		
	How do you check for food adulteration when buying some food?	1= 2= 3=		

Module D3: Exposure to nutrition related message; food marketing and promotion

No	Question	Response Options	Code	Instruction / Skip
	Who do you rely on for food and nutrition related information/messages? Multiple responses	1=Spouse (Husband/wife) 2= Mother/Mother in law 3=Father/Father in law 4= Other members of the family 5= Relatives 6= Neighbours 7= Community health worker who came to my door (GO/NGO) 8= Person in the local pharmacy I went for health issues (informal providers) etc. 9= Doctors (MBBS) etc. 10= Media: Radio 11= Media: Television 12=Media : Internet/YouTube 13=Media: Print (newspaper/magazine) 14=Media: Print (billboard, poster etc.) 15= Social media (Facebook/tweeter etc.) 16= Others (Specify……)		

	Who is the most reliable/trustworthy to you for nutritional message dissemination?	1=Spouse (Husband/wife) 2= Mother/Mother in law 3=Father/Father in law 4= Other members of the family 5= Relatives 6= Neighbours 7= Community health worker who came to my door (GO/NGO) 8= Person in the local pharmacy I went for health issues (informal providers) etc. 9= Doctors (MBBS) etc. 10= Media: Radio 11= Media: Television 12=Media : Internet/YouTube 13=Media: Print (newspaper/magazine) 14=Media: Print (billboard, poster etc.) 15= Social media (Facebook/tweeter etc.) 16= Others (Specify……)		
	Do you notice any messages on nutrition awareness, food safety and hygiene related information on any media in the last 30 days?	1= Yes 2= No		
	If yes, which media?	1= Media: Television 2=Media : Internet 3=Media: Print (newspaper/magazine) 4=Media: Print (billboard, poster etc.) 5= Media: Radio 6= Others (Specify……)		
	If yes, on what?	1= Infant and young child complementary feeding which includes breast feeding 2= Diet during pregnancy and lactation 3= Adolescent nutrition 4=Food safety 4= Hand washing and other food hygiene 6= Food adulteration 7= Nutritious and balanced diet 8= Beneficial effect of any particular food 8=Others (Specify……)		
	Did you find any messages on nutrition awareness, food safety and hygiene related information on any media in the before Covid-19 beginning?	1= Yes 2= No		
	Do you know anything about healthy plate?	1= Yes 2= No		
	Have you ever seen any add in the media about healthy plate?	1= Yes 2= No		
	What types of information you think would be useful for you regarding nutrition awareness, food safety and hygiene to disseminate through different media?	1= Infant and young child complementary feeding which includes breast feeding 2= Diet during pregnancy and lactation 3= Adolescent nutrition 4=Food safety 4= Hand washing and other food hygiene 6= Food adulteration 7= Nutritious and balanced diet 8= Beneficial effect of any particular food 8=Others (Specify……)		Multiple answers

	What would be the best media to disseminate messages on nutrition awareness, food safety risks and hygiene related information FOR YOU?	1= Media: Television 2=Media : Internet 3=Media: Print (newspaper/magazine) 4=Media: Print (billboard, poster etc.) 5= Media: Radio 6= Community health worker who came to my door (GO/NGO) 7= Person in the local pharmacy I went for health issues (informal providers) etc. 8= Doctors (MBBS) etc. 9= Text books (secondary/higher secondary level) 10= Others (Specify……)		
	Which group of people influence by the marketing and promotional activities about foods?	1= Children (up to 9 years old) 2= Adolescents (10-19 years old) 3= Adults (20-59 years old) 4= Elderly (60 and above years old)		
	According to you what types of foods are most advertised/promoted?	1= Oil 2= Salt 3= Powder milk 3= Cereal/Horlicks 4= Soft drinks 5= Chips 6= Noodles 7= Others (Specify……..)		
	Do you notice any advertisement promotional activity on foods on any media in last 30 days?	1= Yes 2= No 77= Don't know		
	If yes, mostly on which food?	1= Oil 2= Salt 3= Powder milk 3= Cereal/Horlicks 4= Soft drinks 5= Chips 6=		
	Food labeling			
	Do you thing food labelling is an effective tool to protect consumer health in terms of food safety and nutrition?	1= Yes 2= No 77= Don't know		
	Do you found it useful to mention the ingredients, nutritional value, safety facts and other information on the label of a food you want to buy?	1= Yes, always 2= Yes, sometimes 3= No		
	Do you make your decision to buy some foods over another similar foods based on what was written on the labelling?	1= Yes, always 2= Yes, sometimes 3= No		
	What types of information you GET through food labelling in the package of food?	1= Product's identity and contents 2= Manufacturing and expiry date 3= Ingredients 4= Nutritional value 5= Instruction on how to handle, prepare and consume 6= Presence of allergens/harmful ingredients 7= Price of the product 8= Approval from BSTI of similar authority		

	What types of information you SEEK through food labelling in the package of food?	1= Product's identity and contents 2= Manufacturing and expiry date 3= Ingredients 4= Nutritional value 5= Instruction on how to handle, prepare and consume 6= Presence of allergens/harmful ingredients 7= Price of the product 8= Approval from BSTI of similar authority 9= Others (specify……)		

Module D4: Eating behaviors and related practices (Quamrun Nahar, DGB, 2013)

Place a check mark for your answer in the space provided in accordance with your past eating behavior.

No.	Question	Response	Code	Skips
	Eating behavior and related issues	Frequency [1=Regular; 2= Occasionally (3 days/week); 3= Never (less than 3 days/week)]		
	Eat a variety of food from 6-8 food groups of food pyramid			
	Eat unpolished rice, wheat			
	Eat citrus and vit A rich fruits			
	Eat vegetables (leafy & non leafy)			
	Eat fish/meat			
	Eat pulses			
	Eat foods containing fat and oils			
	Eat sweetened foods			
	Drink milk			
	Eat fresh, well prepared foods			
	Avoid overeating			
	Eat food with proper chewing			
	Always wash hands before meals			
	Have your body weight measured weekly			
	Perform exercise			
	Undertake clinical check-up at least once a year*			
	Take enough rest and sleep			

Module D5: Dietary practice: Food consumption in last 24-hour

[Now I would like to request describing the food items that you ate at home and outside of home during the last day or night (from yesterday morning 6.00 am to today morning 6.00 am) .Please tell me, all types of food, drinks that ate you at morning, noon and dinner, or breakfast / light breakfast. Remembering if you ate any of food during the cooking, please tell us including all.

Start the interview like, which food give your child at the morning time.

-What did you eat in the morning wake up**?** Did you eat anything more**?**
-What did you eat more in the morning**?** Did you eat anything more**?**
-What did you eat at noon**?** Did you eat anything more**?**
-What did you eat at afternoon**?** Did you eat anything more**?**
-What did you eat at evening**?** Did you eat anything more**?**
-What did you eat at dinner**?** Did you eat anything more**?**

Record first the answer of the questions of column A. Collect the answer for column B/C after recording the answer of the questions of column A]

A [Yesterday during the day or night, did you consume the following food items (A)?]
B [During the last 07 days how many days did you consume the following food items (B)?]
C [During the last 07 days, how many times did you consume the following food items (C)?]

No	Question		Last 24 hours [yes or no]	Last 07 days [number of days]	During the last 07 days [how many times]
	Food group	**Food item for example**	**Column A**	**Column B**	**Column C**
	Starchy Staples/Food made from grains	Rice, flour bread, wheat, muri, maize, kichuri, barli, oot, kinoya, noodles, pasta	1 = Yes 2 = No	|____|____| days	|____|____| times
	Starchy Staples/ (root, tubers, tissue)	potatoes, sweet potatoes, sagu, erarut, cave, shalgam, kuchu, wiggle, ripe banana shaloo	1 = Yes 2 = No	|____|____| days	|____|____| times
	Lentils/Pulses	Dal/ khicuri, peas, motor, soybean, tofu peanuts, humas	1 = Yes 2 = No	|____|____| days	|____|____| times
	Legumes and Nuts	Peanut, Pistachios, kazu or any kond of peanut, ciya seeds, til, tisi, sunflower seeds, sweet pumpkin seeds	1 = Yes 2 = No	|____|____| days	|____|____| times
	Dark green leafy vegetables	All kinds of leafy vegetables (poo, kuchu, kalmi) Brooklyn	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow vegetables	Orange sweet potato, pumpkin, carrot or other yellow or orange vegetable	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow fruits	Ripe mangoes, papaya, jackfruits other red/yellow or orange fruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich fruits	Guava, Strawberry, Lemon, Orange, grapes, Pineapple, raw mango, amalaki, kueue, tomatos	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich vegetables	Raw tomato,chilli pepper, brussels sprouts,cauliflower,cabbage	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other vegetables or fruits	peas, asparagas, bit,koci bash, cauliflower,selari,shawsha,brinjal,letus,masrum ,mula,jukini	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other fruits	Apple, avakado,bam, cherry,ripe jackfruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Eggs	Hen/duck, other birds,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Organ meat	Cheeks, liver, Stomach, Ridpind, Kidney	1 = Yes 2 = No	|____|____| days	|____|____| times
	Flesh	Beef, Pork, Veal, Lamb, Goat, Chicken, Duck or flesh of any other animal	1 = Yes 2 = No	|____|____| days	|____|____| times
	Small Fish	Small Fish Eaten Whole with Bones (i.e.Kachki, mola, dhela, chapila, batashi, small prawn, dried fish)	1 = Yes 2 = No	|____|____| days	|____|____| times
	Large fish/sea food	Big whole Fish and Shell Fish and dried fish	1 = Yes 2 = No	|____|____| days	|____|____| times

	Dairy	Milk, cheese, yogurt or other milk products	1 = Yes 2 = No	|____|____| days	|____|____| times
	Insects and other protein foods	Fish egg, insect, snail	1 = Yes 2 = No	|____|____| days	|____|____| times
	Edible Oil	Ghee, butter,cream, sour, fat, margarine, mayonnaise, palm oil, vegetable oil,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Savory and fried snacks	**Crisps and chips, fried dough or other fried snacks singaru, samarcha, chanachur**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sweets	**Sugary foods, such as chocolates, candies, cookies/sweet biscuits and cakes, sweet pastries or ice cream, any kind of sweets ,honey, halua , condensed milk, tiler khaza**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sugar sweetened drinks	soft drinks, juice, energy drinks, yogurt drinks, chocolate drinks, horlicks, moltova	1 = Yes 2 = No	|____|____| days	|____|____| times
	Tea/coffee with suger	Tea/coffee with suger	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other beverages and foods	**Tea or coffee if not sweetened, clear broth, alcohol, Pickles, olives and similar**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Condiments or spices	Spices, coriander leaves, sausage, garlic, ketchup, lemon juice, mint leaves, drinks, betel leaves, tobacco leaves, jars	1 = Yes 2 = No	|____|____| days	|____|____| times

Module D6: Anthropometric measurement and self-perceived health status

Module D6.1: Anthropometric measurements (Height and weight)

No	Question	Responses and code categories	Code	Instructions
	Start time of anthropometry	|____|____| : |____|____| Hr : Min		Use 24 hr format
	Weight Scale ID	|____|____|		
	Height Scale ID	|____|____|		
	Clothing type during weight measurement	1 = Light clothing 2 = Slightly heavy clothing 3 = Heavy clothing		
	Name of measurer			
	Code of measurer	|____|____|		

	Measurement	Measurement 1	Measurement 2	Measurement 3
	Height (Cm)	A.|____|____|____|.|____|	B.|____|____|____|.|____|	C.|____|____|____|.|____| If A and B differs more than 0.5 cm, take 3rd measurement
	Weight (kg)	A.|____|____|____|.|____|	B.|____|____|____|.|____|	C.|____|____|____|.|____| If A and B differs more than 0.1kg, take 3rd measurement
	Left hand circumference (MUAC) (cm)	A.|____|____|.|____|	B.|____|____|.|____|	C.|____|____|.|____| If A and B differs more than 0.5 cm, take 3rd measurement
	End Time of measurement	|____|____|:|____|____|		Use 24 hr format

		Hr : Min	

Module D6.2: Self-perceived health status

Perceived health status (Scale range: 0-100 where, '100' means the best health one can imagine and '0' means the worst health one can imagine) [EQ_5D_5L]	
Now we would like to know how good or bad your health is today. This scale is numbered from 0 to 100.100 means the best health you can imagine. 0 means the worst health you can imagine. Mark an X on the scale to indicate how your health is today. [Show the EQVAS scale to the respondent and ask to mark X]	
Health Score	|___|___|___|

----------End of Module D----------

Module E: Adolescents knowledge and practices on nutrition and food intake (10-19 years old)	
Respondent: Adolescent boy/girl	**Respondent ID:**

Module E1: Basic nutrition: perception on healthy/unhealthy food etc.

No.	Question	Response	Code	Instruction
	Nutrition related basic knowledge			
	Foods from which food group(s) need to be included in a balance diet? [Multiple response] [Please do not prompted]	1= Grains, white roots and tubers, and plantains 2= Pulses (beans, peas and lentils; nuts and seeds) 3= Dairy (milk and milk products) 4= Meat, poultry, fish and eggs 5= Dark green leafy vegetables 6= Other vitamin A-rich fruits and vegetables 7= Other vegetables 8= Other fruits 77 = Don't know		
	Do you heard about healthy food plate?	1= Yes 2 = No 77 = Don't know		
	Have you seen healthy food plate?	1= Yes 2 = No 77 = Don't know		
	Which foods you consider as unhealthy food?	**Salty/savoury foods (puri, singara etc.)** 1=Crisps and chips, chanachur etc. 2=Salty biscuits 3= Fried dough or other fried snacks singaru, samarcha, puri etc. **Sweet foods/sugary foods** 4= Cookies/sweet biscuits 5=Cake cakes, sweet pastries or ice cream 6= Any kind of sweets ,honey, halua , condensed milk, tiler khaza, jilapi 7= Chocolates, candies etc. **Sugar sweetened beverages (SSB)** 8=Fruit juices 9=Fruit drinks 10=Sport drinks/energy drinks (speed etc.) 11=Soft/carbonated drinks (7 up, coca cola etc.		

		12=Sweetened milk/yogurt drinks 13=Horlicks/maltova etc.		
	Which types of foods you consider as unhealthy food?	1= Fast foods (burger… etc.) 2= Oily/high fat containing foods 3= Spicy foods 4= Cheap sweetened foods from shops 5= Soft drinks 6= Fried or over cooked 7= Processed foods 8= Open street foods Others (specify……)		
	Why? [what criteria make these foods unhealthy]	1= High in fat 2= High sugar content 3= High calories 4= Bad for health 5= Lack nutritional value Other (apecify……)		
	What is the unhealthiest source of unhealthy food?	1=Local shops 2= Restaurants 3=Home 4=Street foods/hawker 5=Grocery shop		
	Unhealthy foods are available from which sources?	1=Local shops (puri/singara r dokan) 2= Restaurants 3=Home 4=Street foods /hawker 5=Grocery shop		
	What will happen if we consume unhealthy foods (harmful impact on health)	1= Diarrhoea 2= Dysentery 3= Typhoid 4=Non-communicable disease (such as, Kidney failure) 5= Allergy 6= Obesity 7= Weight loss 8= High blood pressure 9= Diabetes 8=Others (Specify……)		
	Does everybody need to have balance food?	1= Yes 2 = No 77 = Don't know		
	Do any physical problems arise if balance food is not taken?	1= Yes 2 = No 77 = Don't know		
	What physical problems will arise if balance foods/ balanced diet are not taken?	1 = Will suffer from malnutrition 2 = Feel physical weakness 3 = Disease will attack 5 = Others 77 = Don't know		
	What is energy giving foods for the body?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others		

		77 = Don't know		
	What is body building foods?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	What is body protective foods?	1 = Grain and potatos (Rice/Bread/Rooti/Potato) 2 = Fish/Meat/Egg/Pulses/Nuts 3 = Milk and milk products 4 = Leafy vegetable/Non-Leafy vegetables 5= Fruits 6 = Oils and Fats 7=Others 77 = Don't know		
	Which foods are rich in vitamin C?	1 = Amlaki/Lemon/Orange 2 = Apple 3 = Mango/Jack fruit 77 = Don't know		
	Have you heard about iron-deficiency anaemia?	1= Yes 2 = No 77 = Don't know		
	Which foods are rich in vitamin A?	1 = Sweet potato 5= Grape fruit 2 = Carrot 6= Don't know 3 = Pepper 4 = Spinach		
	Which foods are rich in Iron?	1= Potato 2 = Fish/Meat/Organ meat/flesh foods 3 = Pulses 4 = Leafy and Non leafy veg 77 = Don't know		
	What is the source of Arsenic?	1 = Shallow tubewell water 2. Deep tubewell water 3 = Other foods 4 = Medicine 5= Other 77= Don't know		
	How should a pregnant woman eat in comparison with a non-pregnant woman to provide good nutrition to her baby and help him grow?	1= Eat more food (more energy) 2= Eat more at each meal (eat more food each day) 3= Eat more frequently (eat more times each day) 4= Eat more protein-rich foods 5= Eat more iron-rich foods 6= Use iodized salt when preparing meals 7= Other 77= Don't know		
	How should a lactating woman eat in comparison with a non-lactating woman to be healthy and produce more breast milk?	1= Eat more food (more energy) 2= Eat more at each meal (eat more food each day) 3= Eat more frequently (eat more times each day) 4= Eat more protein-rich foods 5= Eat more iron-rich foods 6= Use iodized salt when preparing meals 7= Other 77= Don't know		
	Do you heard about trans fatty acid?	1= Yes 2 = No 77 = Don't know		
	If yes, what do you know about it?	1=It is good for health 2=It is bad for health 3=It is neither good or bad for health		

		4=We should avoid it 5=We should consume it more 6=Others (specify…….)		
	Overall, what are the features of a healthy diet? (dietary guideline based)	1=Eat adequate amount of cereals and cereal products and preferably whole grain cereals daily 2= Consume required amounts of fish, meat, poultry, egg and legumes daily 3=Eat plenty of fruits and vegetables everyday 4=Consume adequate amounts of milk and milk products 5=Consume moderate amounts of oils, and fats 6=Limit salt intake and condiments and use only iodized salt 7= Take less sugar, sweets or sweetened drinks 8= Drink plenty of water daily 9= Consume safe and clean foods and beverages 10= Food intake and regular physical activity 11= Practise healthy life style with right cooking and healthy eating 12= Eat additional food during pregnancy and lactation 77= Don't know		

No.	Question	Response	Code	Instruction
	Adolescent specific issue			
	Do you usually purchase any food by yourself?	1=Yes, 2=No		
	If yes, which foods you purchase usually by yourself?	1= Ready to eat foods like biscuits, cake 2= Fast foods 3= Street foods 4= Chips singara samiucha 5= Soft drinks 6=Fruits juices 7= Others (specify……..)		
	What are the factors you consider when purchase a food?	1= Taste of the food 2= Appearance of the foods 3= Price of the food 4= Availability of foods 5= Nutritional value of the food 6= Brand of the food item 7= Others (specify……..)		
	Who take the decision about your food intake?	1=Myself only 2= Jointly with my mother 3= My mother only 4= My father 5= Others (specify…….)		
	Who is the most influencing person regarding your food behaviour?	1=Myself only 2= Jointly with my mother 3= My mother only 4= My father Others (specify……..)		
	Please tell us about list of your most favorite/preferred food items **[5 items maximum]**	1= 2= 3= 4=		

		5=		
	Please tell us about list of food items that you dislike most to eat **[5 items maximum]**	1= 2= 3= 4= 5=		

Module E2: Exposure to nutrition related message; food marketing and promotion

No	Question	Response Options	Code	Instruction / Skip
	Who do you rely on for food and nutrition related information/messages? Multiple responses	1=Spouse (Husband/wife) 2= Mother/Mother in law 3=Father/Father in law 4= Other members of the family 5= Relatives 6= Neighbours 7= Community health worker who came to my door (GO/NGO) 8= Person in the local pharmacy I went for health issues (informal providers) etc. 9= Doctors (MBBS) etc. 10= Media: Radio 11= Media: Television 12=Media : Internet/YouTube 13=Media: Print (newspaper/magazine) 14=Media: Print (billboard, poster etc.) 15= Social media (Facebook/tweeter etc.) 16= Others (Specify……)		
	Who is the most reliable/trustworthy to you for nutritional message dissemination?	1=Spouse (Husband/wife) 2= Mother/Mother in law 3=Father/Father in law 4= Other members of the family 5= Relatives 6= Neighbours 7= Community health worker who came to my door (GO/NGO) 8= Person in the local pharmacy I went for health issues (informal providers) etc. 9= Doctors (MBBS) etc. 10= Media: Radio 11= Media: Television 12=Media : Internet/YouTube 13=Media: Print (newspaper/magazine) 14=Media: Print (billboard, poster etc.) 15= Social media (Facebook/tweeter etc.) 16= Others (Specify……)		
	Do you notice any messages on nutrition awareness, food safety and hygiene related information on any media in the last 30 days?	1= Yes 2= No		
	If yes, which media?	1= Media: Television 2=Media : Internet 3=Media: Print (newspaper/magazine) 4=Media: Print (billboard, poster etc.) 5= Media: Radio 6= Others (Specify……)		

	If yes, on what?	1= Infant and young child complementary feeding which includes breast feeding 2= Diet during pregnancy and lactation 3= Adolescent nutrition 4=Food safety 4= Hand washing and other food hygiene 6= Food adulteration 7= Nutritious and balanced diet 8= Beneficial effect of any particular food 8=Others (Specify……)		
	Did you find any messages on nutrition awareness, food safety and hygiene related information on any media in the before Covid-19 beginning?	1= Yes 2= No		
	Do you know anything about healthy plate?	1= Yes 2= No		
	Have you ever seen any add in the media about healthy plate?	1= Yes 2= No		
	What types of information you think would be useful for you regarding nutrition awareness, food safety and hygiene to disseminate through different media?	1= Infant and young child complementary feeding which includes breast feeding 2= Diet during pregnancy and lactation 3= Adolescent nutrition 4=Food safety 4= Hand washing and other food hygiene 6= Food adulteration 7= Nutritious and balanced diet 8= Beneficial effect of any particular food 8=Others (Specify……)		Multiple answers
	What would be the best media to disseminate messages on nutrition awareness, food safety risks and hygiene related information FOR YOU?	1= Media: Television 2=Media : Internet 3=Media: Print (newspaper/magazine) 4=Media: Print (billboard, poster etc.) 5= Media: Radio 6= Community health worker who came to my door (GO/NGO) 7= Person in the local pharmacy I went for health issues (informal providers) etc. 8= Doctors (MBBS) etc. 9= Text books (secondary/higher secondary level) 10= Others (Specify……)		
	Which group of people influence by the marketing and promotional activities about foods?	1= Children (up to 9 years old) 2= Adolescents (10-19 years old) 3= Adults (20-59 years old) 4= Elderly (60 and above years old)		
	According to you what types of foods are most advertised/promoted?	1= Oil 2= Salt 3= Powder milk 3= Cereal/Horlicks 4= Soft drinks 5= Chips 6= Noodles 7= Others (Specify……..)		
	Do you notice any advertisement promotional activity on foods on any media in last 30 days?	1= Yes 2= No 77= Don't know		

	If yes, mostly on which food?	1= Oil 2= Salt 3= Powder milk 3= Cereal/Horlicks 4= Soft drinks 5= Chips 6=		
	Food labeling			
	Do you thing food labelling is an effective tool to protect consumer health in terms of food safety and nutrition?	1= Yes 2= No 77= Don't know		
	Do you found it useful to mention the ingredients, nutritional value, safety facts and other information on the label of a food you want to buy?	1= Yes, always 2= Yes, sometimes 3= No		
	Do you make your decision to buy some foods over another similar foods based on what was written on the labelling?	1= Yes, always 2= Yes, sometimes 3= No		
	What types of information you GET through food labelling in the package of food?	1= Product's identity and contents 2= Manufacturing and expiry date 3= Ingredients 4= Nutritional value 5= Instruction on how to handle, prepare and consume 6= Presence of allergens/harmful ingredients 7= Price of the product 8= Approval from BSTI of similar authority		
	What types of information you SEEK through food labelling in the package of food?	1= Product's identity and contents 2= Manufacturing and expiry date 3= Ingredients 4= Nutritional value 5= Instruction on how to handle, prepare and consume 6= Presence of allergens/harmful ingredients 7= Price of the product 8= Approval from BSTI of similar authority 9= Others (specify……)		

Module E3: Perception of the home food environment

No	Question	Response Options	Code	Instructions/ Skip
	a) Family food rules			
	I'm allowed to buy whatever I want from fast food joint	1= never 2= sometimes 3= usually 4= always		
	I can eat whatever I like at home			

	During meal times, I'm allowed to put the TV on			
	I'm expected to eat all the foods served even if I don't like them			
	At mealtimes I have to follow certain rules			
	b) Accessibility to food at home			
	Vegetables are served at dinner			
	There is plenty of food at home			
	c) Availability of food at home			
	Potato chips or other salty snack foods			
	Soft drink (e.g. Coke)			
	Chocolate or other lollies (sweets)			
	Cakes/pastries/donuts/biscuits			
	Fruits			
	Vegetables			
	Fruit juice			
	d) Domestic cooking responsibility			
	The domestic help makes all the food at home			
	My mother makes all the food at home			
	My father makes all the food at home			

Module E4: Eating behaviors and related practices (Quamrun Nahar, DGB, 2013)

Place a check mark for your answer in the space provided in accordance with your past eating behavior.

No.	Question	Response	Code	Skips
	Eating behavior and related issues	Frequency [1=Regular; 2= Occasionally (3 days/week); 3= Never (less than 3 days/week)]		
	Eat a variety of food from 6-8 food groups of food pyramid			
	Eat unpolished rice, wheat			
	Eat citrus and vit A rich fruits			
	Eat vegetables (leafy & non leafy)			
	Eat fish/meat			
	Eat pulses			
	Eat foods containing fat and oils			
	Eat sweetened foods			
	Drink milk			
	Eat fresh, well prepared foods			
	Avoid overeating			
	Eat food with proper chewing			
	Always wash hands before meals			
	Have your body weight measured weekly			

	Perform exercise			
	Undertake clinical check-up at least once a year*			
	Take enough rest and sleep			

Module E5: Dietary practice: Food consumption in last 24-hour

[Now I would like to request describing the food items that you ate at home and outside of home during the last day or night (from yesterday morning 6.00 am to today morning 6.00 am) .Please tell me, all types of food, drinks that ate you at morning, noon and dinner, or breakfast / light breakfast. Remembering if you ate any of food during the cooking, please tell us including all.

Start the interview like, which food give your child at the morning time.

-What did you eat in the morning wake up**?** Did you eat anything more**?**
-What did you eat more in the morning**?** Did you eat anything more**?**
-What did you eat at noon**?** Did you eat anything more**?**
-What did you eat at afternoon**?** Did you eat anything more**?**
-What did you eat at evening**?** Did you eat anything more**?**
-What did you eat at dinner**?** Did you eat anything more**?**

Record first the answer of the questions of column A. Collect the answer for column B/C after recording the answer of the questions of column A]

A [Yesterday during the day or night, did you consume the following food items (A)?]
B [During the last 07 days how many days did you consume the following food items (B)?]
C [During the last 07 days, how many times did you consume the following food items (C)?]

No	**Question**		**Last 24 hours [yes or no]**	**Last 07 days [number of days]**	**During the last 07 days [how many times]**
	Food group	**Food item for example**	**Column A**	**Column B**	**Column C**
	Starchy Staples/Food made from grains	Rice, flour bread, wheat, muri, maize, kichuri, barli, oot, kinoya, noodles, pasta	1 = Yes 2 = No	|____|____| days	|____|____| times
	Starchy Staples/ (root, tubers, tissue)	potatoes, sweet potatoes, sagu, erarut, cave, shalgam, kuchu, wiggle, ripe banana shaloo	1 = Yes 2 = No	|____|____| days	|____|____| times
	Lentils/Pulses	Dal/ khicuri, peas, motor, soybean, tofu peanuts, humas	1 = Yes 2 = No	|____|____| days	|____|____| times
	Legumes and Nuts	Peanut, Pistachios, kazu or any kond of peanut, ciya seeds, til, tisi, sunflower seeds, sweet pumpkin seeds	1 = Yes 2 = No	|____|____| days	|____|____| times
	Dark green leafy vegetables	All kinds of leafy vegetables (poo, kuchu, kalmi) Brooklyn	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow vegetables	Orange sweet potato, pumpkin, carrot or other yellow or orange vegetable	1 = Yes 2 = No	|____|____| days	|____|____| times
	Red/orange/ yellow fruits	Ripe mangoes, papaya, jackfruits other red/yellow or orange fruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich fruits	Guava, Strawberry, Lemon, Orange, grapes, Pineapple, raw mango, amalaki, kueue, tomatos	1 = Yes 2 = No	|____|____| days	|____|____| times
	Vitamin C rich vegetables	Raw tomato,chilli pepper, brussels sprouts,cauliflower,cabbage	1 = Yes 2 = No	|____|____| days	|____|____| times

	Other vegetables or fruits	peas, asparagas, bit,koci bash, cauliflower,selari,shawsha,brinjal,letus,masrum ,mula,jukini	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other fruits	Apple, avakado,bam, cherry,ripe jackfruit	1 = Yes 2 = No	|____|____| days	|____|____| times
	Eggs	Hen/duck, other birds,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Organ meat	Cheeks, liver, Stomach, Ridpind, Kidney	1 = Yes 2 = No	|____|____| days	|____|____| times
	Flesh	Beef, Pork, Veal, Lamb, Goat, Chicken, Duck or flesh of any other animal	1 = Yes 2 = No	|____|____| days	|____|____| times
	Small Fish	Small Fish Eaten Whole with Bones (i.e.Kachki, mola, dhela, chapila, batashi, small prawn, dried fish)	1 = Yes 2 = No	|____|____| days	|____|____| times
	Large fish/sea food	Big whole Fish and Shell Fish and dried fish	1 = Yes 2 = No	|____|____| days	|____|____| times
	Dairy	Milk, cheese, yogurt or other milk products	1 = Yes 2 = No	|____|____| days	|____|____| times
	Insects and other protein foods	Fish egg, insect, snail	1 = Yes 2 = No	|____|____| days	|____|____| times
	Edible Oil	Ghee, butter,cream, sour, fat, margarine, mayonnaise, palm oil, vegetable oil,	1 = Yes 2 = No	|____|____| days	|____|____| times
	Savory and fried snacks	**Crisps and chips, fried dough or other fried snacks singaru, samarcha, chanachur**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sweets	**Sugary foods, such as chocolates, candies, cookies/sweet biscuits and cakes, sweet pastries or ice cream, any kind of sweets ,honey, halua , condensed milk, tiler khaza**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Sugar sweetened drinks	soft drinks, juice, energy drinks, yogurt drinks, chocolate drinks, horlicks, moltova	1 = Yes 2 = No	|____|____| days	|____|____| times
	Tea/coffee with suger	Tea/coffee with suger	1 = Yes 2 = No	|____|____| days	|____|____| times
	Other beverages and foods	**Tea or coffee if not sweetened, clear broth, alcohol, Pickles, olives and similar**	1 = Yes 2 = No	|____|____| days	|____|____| times
	Condiments or spices	Spices, coriander leaves, sausage, garlic, ketchup, lemon juice, mint leaves, drinks, betel leaves, tobacco leaves, jars	1 = Yes 2 = No	|____|____| days	|____|____| times

Module E6: Anthropometric measurement and self-perceived health status

Module E6.1: Anthropometric measurements (Height and weight)

No	Question	Responses and code categories	Code	Instructions
	Start time of anthropometry	|____|____| : |____|____| Hr : Min		Use 24 hr format
	Weight Scale ID	|____|____|		
	Height Scale ID	|____|____|		
	Clothing type during weight measurement	1 = Light clothing 2 = Slightly heavy clothing 3 = Heavy clothing		

	Name of measurer			
	Code of measurer	|____|____|		

	Measurement	Measurement 1	Measurement 2	Measurement 3
	Height (Cm)	A.|____|____|____|.|____|	B.|____|____|____|.|____|	C.|____|____|____|.|____| If A and B differs more than 0.5 cm, take 3rd measurement
	Weight (kg)	A.|____|____|____|.|____|	B.|____|____|____|.|____|	C.|____|____|____|.|____| If A and B differs more than 0.1kg, take 3rd measurement
	Left hand circumference (MUAC) (cm)	A.|____|____|.|____|	B.|____|____|.|____|	C.|____|____|.|____| If A and B differs more than 0.5 cm, take 3rd measurement
	End Time of measurement	|____|____|:|____|____| Hr : Min		Use 24 hr format

Module E6.2: Self-perceived health status

Perceived health status (Scale range: 0-100 where, '100' means the best health one can imagine and '0' means the worst health one can imagine) [EQ_5D_5L]	
Now we would like to know how good or bad your health is today. This scale is numbered from 0 to 100.100 means the best health you can imagine. 0 means the worst health you can imagine. Mark an X on the scale to indicate how your health is today. [Show the EQVAS scale to the respondent and ask to mark X]	
Health Score	|___|___|___|

----------End of Module E----------

---------Thank you very much for your valuable time and patience 😊---------