Strengthening Health Systems through Organizing Communities (SHASTO)

Baseline Survey Report

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ACRONYMS

BDHS	Bangladesh Demographic and Health Survey
BMI	Body Mass Index
BRAC JPGSPH	BRAC James P Grant School of Public Health
COPD	Chronic Obstructive Pulmonary Disease
CVD	Cardiovascular Diseases
FGD	Focused Group Discussion
ICDDR,B	International Centre for Diarrhoeal Disease Research, Bangladesh
JICA	Japan International Cooperation Agency
MNCH	Maternal, newborn and child health
NCD	Non-communicable Diseases
NHFHRI	National Heart Foundation Hospital & Research Institute
ODA	Japan's Official Development Assistance
PI	Principal Investigator
SHASTO	Strengthening Health Systems through Organizing Communities
WHO	World Health Organization

EXECUTIVE SUMMARY

INTRODUCTION

In recent years, non-communicable diseases (NCDs) especially diabetes, hypertension, chronic obstructive pulmonary disease (COPD) and cancer have been emerged as a global concern imposing disproportionately higher impact on low and middle income countries. In 2015, 70% of global deaths were attributable to NCDs of which over three quarters occurred in low and middle-income countries. Like other developing countries, Bangladesh is also troubled with a rising burden of NCDs like hypertension and diabetes. According to 2011 Bangladesh Demographic and Health Survey Report (BDHS 2011), prevalence of hypertension and diabetes among >35 years old adults were 26.4% and 11.0% respectively. Moreover, NCDs are estimated to account for 59% of total deaths in Bangladesh. In addition, there is a high prevalence of NCD risk factors in Bangladesh. According to Bangladesh NCD risk factors survey (2010), 26.2% Bangladeshi adults smoke tobacco and 95.7% do not consumes adequate fruits and vegetables. Therefore, the government of Bangladesh along with different non-government organizations has started working to prevent and control NCDs and its risk factors in Bangladesh.

In order to improve the NCD situation in Bangladesh, Japan International Cooperation Agency (JICA), an executing agency of Japan's Official Development Assistance (ODA), has committed its support for the Government of Bangladesh to implement the Project for Strengthening Health Systems through Organizing Communities (SHASTO) in July 2017 and plans to develop a model intervention in three pilot sites for improving NCD and maternal, newborn and child health (MNCH) services in an integrated manner. In this regard, baseline data is essential to set effective implementation strategy and targets for the interventions as well as to observe the outcome of interventions at the end of the project period. Therefore, this baseline survey was conducted to report the current situation of NCDs and their behavioral and clinical risk factors in selected intervention sites (Narsingdi district and Dhaka City North) and control sites (Gazipur district and Dhaka City South) of the SHASTO project.

MATERIALS AND METHODS

Study Design

The cross-sectional study included both quantitative and quantitative approaches.

Study Site and Population

This survey was conducted in two rural sites (Shibpur sub-district of Narsingdi district and Kaliganj sub-district of Gazipur district) and four urban sites of which two were located in Dhaka City North (Mirpur 11 D Block under Pallabi thana and Vashantek sulm under Bhashantek thana) and the other two were located in Dhaka City South (Gopibag under Motijheel thana and Shefalir slum under Shahjahanpur thana). Men and women aged more than 30 years and living in the selected sites were our study population.

Sample Size and Technique

A multistage sampling approach was used for selecting participants. Using the prevalence of tobacco consumption (51%), 5% margin of error, 95% confidence level, design effect (1.5) and 10% non-response rate, our sample size was (5,072; 1,268 in each area with equal number of women and men). However, finally we were able to collect data from 4,930 respondents (2464 males, and 2466 females). For qualitative component, we conducted 8 Focused Group Discussions (FGDs) with 60 male and female diabetic and/or hypertensive participants purposively selected from quantitative sample.

Study Tools and Supporting Materials

Tools used for quantitative component of this study were household listing questionnaire, survey questionnaire, and quality control questionnaire. Some supporting materials such as showcards, measurement bowl and spoon, drug list and interview observation checklist were also used. FGDs were conducted using guidelines. All tools were pre-tested and necessary modification was done before actual data collection.

Training of Field Staffs

We provided a week-long training to the data collectors, supervisors and quality control assistants before going to field. Field staffs were trained about basics of quantitative research, qualitative research, ethical issues, SHASTO survey tools, interviewing techniques and physical measurement. Field supervisors and quality control assistants received further training on how to supervise the fieldwork to ensure data quality.

Household Listing

In rural sites, three community clinics were randomly selected form each Upazilla and household listing was carried out in the villages where community clinics were located. In Dhaka North and Dhaka South, listing was performed separately in selected slum and non-slum areas to ensure representativeness of people residing in both of these settings. Full household listing questionnaire was administered to those households/apartments where at least one >30 years old male/female were reported to live. At the end of the process, a total of 6,189 households were listed of which 1,436 were in Shibpur, 1,368 were in Kaliganj; 1,647 were in Dhaka North (Mirpur 11 D Block: 1097; Vashantek: 550) and 1,738 were in Dhaka South (Gopibagh: 1,168; Shefalir slum: 570).

Randomization

Information obtained from household listing was used to develop a sampling frame of >30 years old male and female. Then, required numbers of male and female respondents were selected for each site from sampling frames using simple random sampling technique. Randomization was performed by generating non-repeating random numbers using Microsoft Office Excel 2013. Not more than 1 male/female were selected from a household.

Data Collection

Data collection was conducted between April 2018 and May 2018. We formulated four teams (2 urban and 2 rural) for four study sites and each of these teams comprised of 6 data

collectors/interviewers, 1 field supervisor and 1 quality control assistant. Six data collectors in each team were further distributed to form three groups comprising two data collectors (male-1, female-1) in each group. On the days of data collection, each team started fieldwork between 8:00 am and 8:30 am. Before going to field in everyday morning, field supervisors calibrated BP machine, height scale and weighing scale used for physical measurements. List of randomized participants in each area was also provided to the field teams by the central research team. Quantitative data collection included face-to-face interview and physical measurements. FGDs were carried out for qualitative data collection and they were recorded using audio recorder and field notes.

Quality Control

To ensure quality of the study, we recruited experienced field staff and provided extensive training to them, pre-tested tools, performed anthropometry standardization, carried out regular monitoring and supervision of data collection, and implemented appropriate data management and processing.

Data Analysis

Quantitative data was analyzed using Stata version 13. Descriptive analysis was performed to estimate the prevalence, knowledge, attitudes and practices pertinent to hypertension, diabetes and behavioral risk factors across the study sites and gender. For qualitative component, data was transcribed verbatim into Bengali from audio recording. Coding was done manually using deductive approach. Finally, thematic analysis was performed with extraction of appropriate quotes.

Ethical Consideration

Ethical approval for this study was obtained from Institutional Review Board of BRAC James P. Grant School of Public Health, BRAC University. Informed written consent was taken for interview and physical measurement from each respondent.

RESULTS

Socio-demographic Information

A total of 4930 adults (male-2464, female-2466) of >30 years age from Narsingdi, Gazipur, Dhaka City North and Dhaka City South participated in the study. Mean (±SD) age of male participants was 49.44 (±13.43) years and that of female participants was 46.88 (±12.84) years. Mean (±SD) education years was found higher among male participants than their female counterparts. Almost all of the male respondents of this study were currently married (97.3%), however, nearly a quarter women were widowed (22.0%). Among the study participants, majority of the female were homemakers (86.0%). However, in Dhaka North and Dhaka South, 25.2% and 38.4% women were service holders respectively. Among the male participants, many were day laborers (46.0%), followed by businessmen (27.2%) and service holders (18.7%). Almost all of the participants were Muslim by faith (male-97.7%, female-96.6%).

Fruits and Vegetables Consumption

Among the participants, 76.7% stated that they heard about the harmful effect of inadequate fruits and vegetables consumption of which a higher proportion was from the urban areas. Harmful effects mentioned by the participants included weakness (66.8%), eye diseases (43.2%), diabetes (20.2%), hypertension (11.6%), cardiovascular diseases (6.7%) and kidney disease (4.5%) and cancer (2.4%). Almost all of our study participants (90.0%) also stated that it is very important to consume adequate fruits and vegetables, however, majority of the participants (70.8%) did not consume adequate fruits and vegetables (more than or equal to 5 servings per day). Noticeably, inadequate fruits and vegetables intake was higher among female and urban participants.

Salt Intake

It was revealed from our study that majority of the participants (86.1%) heard about harmful effects of high salt intake such as increase blood pressure (55.6%),dilution of blood (49.0%), kidney disease (15.7%) and fluid accumulation in the body (21.0%). Among the participants, 86.1% male and 85.1% female also stated that it is very important to reduce salt intake, though, 68.0% affirmed that they usually add extra salt with food items before or during meal. Interestingly, it was revealed that, majority of the participants think that they consume the right amount of salt and only 7.6% male and 5.6% female were trying to reduce salt intake.

Tobacco

Almost all of the participants of this study (98.1%) reported that they heard about harmful effects of tobacco consumption including cancer (76.5%), eye diseases (43.8%), weakness (30.3%), cardiovascular diseases (16.3%), hypertension (10.4%) and kidney diseases (8.0%). More than 90.0% of them also thought that consuming tobacco is very harmful to health. Still, 52.0% males and 38% females used smoke and smokeless tobacco respectively. In the urban areas, males and females in the lower two wealth quintiles had a higher prevalence of smoking and consumption of smokeless tobacco respectively. Strikingly, only 35% of male and 33% of female smokeless tobacco users reported that they tried to quit tobacco.

Physical Activity

It was revealed from our study that 82.3% respondents heard about harmful effects of inadequate physical activity including weight gain (67.7%), diabetes (49.1%), body ache (35.4%), hypertension (18.7%) and cardiovascular diseases (11.5%). Majority of the participants also thought that it is very important to perform adequate physical activity. However, 68.7% performed neither vigorous intensity nor moderate intensity physical activity as a part of daily work or recreational activities and a higher proportion of them were females. In the rural areas, there is not much difference between the prevalence of no physical activity among the wealth quintiles of a particular gender. In the urban areas, more men and women in the lowest wealth quintile met the WHO recommendation for weekly physical activity.

Overweight/Obesity

In the study, 15.6% male and 28.7% female participants were identified as overweight and 1.7% male and 7.6% female were identified as obese. High waist circumference was found prevalent among 31.0% female participants and 5.1% male participants. This prevalence was also higher among the participants from urban areas. In the rural and urban areas, males in the lowest wealth quintile had the lowest prevalence of overweight and obesity. In the rural areas, women in the fourth wealth quintile and in the urban areas, women in the highest wealth quintile had the highest prevalence of overweight and obesity.

Hypertension

According to old criteria (hypertension: diastolic BP>90 mm Hg and/or Systolic BP>140 mm Hg), prevalence of hypertension was 23.7% and 38.1% among male and female participants respectively. However, following new criteria (hypertension: diastolic BP>80 mm Hg and/or Systolic BP>130 mm Hg), 55.7% female participants and 46.1% male participants were identified as hypertensive. Prevalence of hypertension was higher among female participants than their male counterparts using both criteria. Using old criteria of hypertension, our study, also revealed that, 26.0% of hypertensive patients were undetected, 64.0% of detected hypertensive sought health care, 54.0% of the detected cases took anti-hypertensive medication and 44.0% of them had their hypertension uncontrolled. Almost all of our participants (95.2%) reported that they heard about hypertension, its risks, complications and ways to control it. Majority of them also thought that hypertension is a life-long disease (71.7%) and cannot be cured (68.9%). Among the respondents, more than two-third indicated that hypertension is not a curable disease though 27.3%, 16.5%, 30.1% and 27.1% participants respectively from Narsingdi, Gazipur, Dhaka North and Dhaka South expressed an opposite view. Of the participants who were previously diagnosed as hypertensive (according to old criteria), 59.0% sought health care, mostly from doctors (74.2%) and pharmacists/drug sellers (29.8%). Our studies also revealed that majority of study participants measured their blood pressure at nearby dispensaries (51.9%) and doctors' chamber (40.8%) In the rural areas, a higher proportion of men in the lowest three wealth quintiles sought health care for hypertension from rural medical practitioners. For the health care for hypertension, more males and females in the lowest wealth quintile in the urban areas relied on pharmacists/drug sellers than the males and females in the other wealth quintiles. The government health facilities were utilized by only a negligible proportion of participants.

Diabetes

In the study, self-reported diabetes prevalence was found 8.5% among male and 10.6% among female. Almost all of our study participants reported that they heard about diabetes, its risk factors, complications and ways to control it. Majority of the respondents of this study also responded that diabetes is a lifelong disease (85.7%) and cannot be cured (77.7%). Interestingly, all of Sour study participants indicated that diabetes can be controlled by lifestyle modification. Regarding health care seeking behaviour, it was revealed that 72.0% of diabetic participants sought health care. Most of the care-seekers went to the doctors (89.5%) and pharmacists/drug sellers (15.7%) and almost all of them (male-94.0%, female-89.1%) were taking anti-diabetic medication. In case of females, 22.2% participants from the lowest

wealth quintile in the rural areas and 20.0% participants in the same wealth quintile in the urban areas sought health care from pharmacist/drug sellers. The government facilities were hardly used (1.8%).

FINDING FROM QUALITATIVE COMPONENT

Healthy Diet

Majority of our study participants mentioned fruits especially sour fruits like tamarind, lemon, vegetables, milk, egg without yolk and different herbal products as the healthy diet for diabetic and hypertensive patients. They also believed that salt is harmful for these diseases. Some of the participants stated that they started to follow healthy dietary habit after being motivated by doctors and tried to continue the habit out of self-motivation and support of family members. However, many of them could not consume healthy diet on regular basis mostly due to financial problem, lack of time to prepare food, fear of food adulteration and lack of appetite. They also suggested some solutions to increase healthy food intake by people such as proper counseling by doctors, raising awareness by conducting campaign involving local influential people and ensuring support of family members.

Tobacco

Our study participants commonly said that tobacco product is harmful for human health though a few of them thought that smokeless tobacco like '*Zarda*' is beneficial for dental health. According to our participants, people usually start using tobacco products due to peer influence, desire to explore something new, a sense of looking smart to society and under the influence of family members. However, they thought that it is hard to quit smoking and other tobacco products because of addiction to these products, mental stress and lack of motivation. Participants suggested some measures that they think might be helpful in reducing tobacco consumption by people e.g. proper counseling by doctors, ratification and implementation of law by the government, raising awareness by arranging campaign, involving local influential people and increasing family support.

Physical activity

Most of our study participants opined that taking regular physical activity is beneficial for health. Some of them stated that they started to perform regular physical activity like walking and jogging after being motivated by doctors. A few of these participants also said that they were motivated enough to be persistent with this behavior. Still, a number of participants stated that they could not perform regular physical activity. Laziness, lack of time, lack of motivation, absence of enabling environment and lack of physical fitness (heart disease, back pain, arthritis) were identified as the barriers to performing regular physical activity by the participants.

Health care seeking practice

Majority of our study participants stated that they usually go to private hospitals for follow up and treatment of diabetes and hypertension. They prefer private health facilities because overall environment e.g. availability of sitting arrangement, fan, toilet, and diagnostic facility

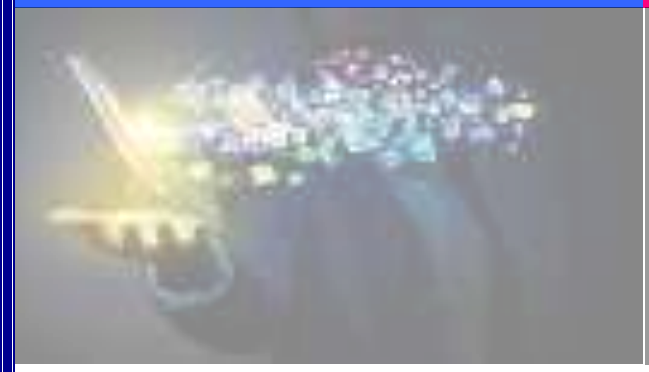
are not satisfactory in the government hospitals. A number of diabetic patients also reported that they usually go to Diabetic Somitee Hospital located in district town (Narsingdi and Gazipur) for follow-up and treatment of diabetes and they are satisfied with their service. A number of our study participants stated that it is difficult to manage time for going to hospital for regular check-ups. Therefore, they expect that there should be at least one health facility in close proximity to their home where they will receive proper treatment and medicine for diabetes and hypertension at low or no cost. They also think, at least one doctor should be assigned at every health facility who will provide treatment only for diabetes and hypertension. However, the most important virtue that they expect from a doctor is sound behavior. Majority of our participants reported that they would go to government health facilities if there are availability of qualified doctors, female doctors for female patients, diagnostic facility, sound physical environment and less corruption.

Compliance with medicines

The study participants who are diabetic and hypertensive are aware of the importance of taking medicines regularly. However, some of them have misinformation e.g. it is better not to take medicines within 1 year of diagnosis. The problems that were identified behind non-compliance included lack of money, unavailability of drug shops near home, absent-mindedness, smell of medicines, lack of self-motivation, lack of understanding about the importance of taking medicines etc. The FGD participants mentioned distribution of free medicines from the nearby community clinics will improve compliance.

CONCLUSION

It is evident form this study that a significant portion of adults in Bangladesh are suffering from hypertension and diabetes. In addition, behavioral risk factors of NCDs like tobacco consumption, high salt intake, inadequate fruits and vegetables consumption and inadequate physical activity are highly prevalent in this population. As hypertension, diabetes and their risk factors attribute to premature death and disability and pose enormous burden on the diseased individuals and their household along with the health system of Bangladesh, it is a timely need for the pertinent stakeholders to take necessary steps for the prevention and control of NCDs.



INTRODUCTION

INTRODUCTION

GLOBAL NCD SITUATION

In recent years, non-communicable diseases (NCDs) especially diabetes, hypertension, chronic obstructive pulmonary disease (COPD) and cancer have been emerged as a global concern imposing disproportionately higher impact on low and middle income countries (Alwan & MacLean, 2009; Islam et al., 2014). In 2015, 70% of global deaths (39.5 million) were attributable to NCDs of which over three quarters (30.7 million) occurred in low and middle-income countries (World Health Organization, 2018).

NCD SITUATION IN BANGLADESH

Bangladesh is going through an epidemiological transition where disease burden is shifting from communicable diseases to non-communicable diseases (Karar, Alam & Streatfield, 2009). According to 2011 Bangladesh Demographic and Health Survey Report (BDHS 2011), in Bangladesh, the overall age-adjusted prevalence of diabetes is 11.0%. The prevalence of hypertension among Bangladeshi adults is also alarming (26.4%) (BDHS, 2011). Prevalence of diabetes and hypertension have shown an increasing trend in recent years (Figure 1 & 2). Moreover, NCDs are estimated to account for 59% of total deaths in Bangladesh (WHO, 2014).

Figure 1: Trend of prevalence of hypertension in Bangladesh (Source: Zaman, M.M.2013)

Figure 2: Trend of prevalence of diabetes in Bangladesh (Source: Zaman, M.M. (2013)

In addition, there is a high prevalence of NCD risk factors in Bangladesh. According to Bangladesh NCD risk factors survey (2010), 26.2% Bangladeshi adults smoke tobacco, which is a well-known risk factor of developing NCDs. The same study also revealed that, 95.7% of the country population do not consumes adequate fruits and vegetables. Prevalence of overweight (BMI>25.0 kg/m^2) is also noticeable (18.0%) among Bangladeshi adults (Zaman et al., 2016). Therefore, government of Bangladesh along with different non-

government organizations has started working to combat NCDs and its risk factors in this country.

WHY IS THIS STUDY IMPORTANT?

Given the current situation of NCDs in Bangladesh, Japan International Cooperation Agency (JICA), an executing agency of Japan's Official Development Assistance (ODA), has committed its support for the Government of Bangladesh to implement the Project for Strengthening Health Systems through Organizing Communities (SHASTO) in July 2017 and plans to develop a model intervention in three pilot sites: Narsingdi district, Cox's Bazar district, and Dhaka city. The project aims at improving both NCD and maternal, newborn and child health (MNCH) services in an integrated manner in the pilot sites. To achieve the set objectives and outputs, the project has both facility and community level interventions including introduction of the standardized package of cardiovascular diseases (CVD) management, quality improvement of hospital services, and promotion of healthy behavior and lifestyle. In this regard, a baseline survey was essential to set effective implementation strategy and targets for the interventions as well as to observe the outcome of interventions at the end of the project period. Therefore, this baseline survey was conducted to report the current situation of NCDs and their behavioral and clinical risk factors in selected intervention sites (Narsingdi district and Dhaka City North) and control sites (Gazipur district and Dhaka City South) for the purpose of future comparison for the effect of the interventions of the SHASTO project.

STUDY OBJECTIVES

GENERAL

The overall objective of this baseline survey was to report the current situation of NCDs and their behavioral and clinical risk factor in selected intervention sites (Narsingdi district and Dhaka City North) and control sites (Gazipur district and Dhaka City South).

SPECIFIC

The specific objective of the baseline study was to report prevalence of diseases and risk factors; NCD related knowledge, attitude and practices; NCD related health care seeking practices; and compliance with treatment. A list of objectives categorized under four themes is provided below:

Prevalence

- To estimate the proportion of hypertensive (BP>90/140 mm of Hg) and diabetic (already diagnosed) patients in the community
- To estimate the prevalence of 3 risk factors (tobacco use, low vegetable and fruit consumption, and physical inactivity) and overweight in the community

- To estimate the proportion of population over 30 years old who receive annual NCD screening in the community

Compliance to treatment

- To estimate the proportion of hypertensive population who continue taking drugs for the last six months in the community
- To estimate the proportion of diabetic patients who continue taking drugs for the last six months in the community
- To explore facilitators and barriers of compliance with drug and life style advice provided by health care providers

Knowledge, attitude and practice

- To assess knowledge and attitudes on hypertension and diabetes
- To assess knowledge and attitudes on tobacco use, salt intake, inadequate fruits and vegetables consumption and inadequate physical activity
- To know current practices regarding tobacco use, salt intake, fruits and vegetables consumption and physical activity
- To assess the current health care seeking practices regarding hypertension and diabetes

MATERIALS AND METHODS

MATERIALS AND METHODS

STUDY DESIGN

This cross-sectional study followed both quantitative and qualitative approaches.

STUDY SITE

The study was conducted in two rural sites and two urban sites. Rural sites were located in Shibpur Upazilla (sub-district) of Narsingdi district and Kaliganj Upazilla (sub-district) of Gazipur district. On the other hand, urban sites were located in Pallabi thana and Vashantek thana of Dhaka City North, and Motijheel thana and Shahjahanpur than Dhaka City South (Photo 1). Shibpur Upazilla and Dhaka City North were selected since JICA, in collaboration with the government of Bangladesh, is going to introduce a package of intervention for management of NCDs in these two areas. However, Kaliganj Upazilla and Dhaka City South were selected because of their socio-demographic and economic resemblance with the intervention sites so that after providing intervention, prevalence and knowledge, attitude and practice on NCDs and its risk factors can be compared between intervention and control sites to observe the effectiveness of intervention.


Dhaka City
Dhaka City North
Non-slum
Slum


Gazipur

Photo 1: Study sites of SHASTO baseline survey 2018

STUDY POPULATION

Since this study was conducted as the baseline survey of an intervention project intended to provide NCD service to more than 30 years old adults, the study population was all the men and women aged more than 30 years age living in the selected sites.

SAMPLE SIZE

The sample size was determined using the prevalence of tobacco consumption (51%) obtained from non-communicable disease risk factors survey, 2010. Setting a 5% margin of error and 95% confidence level, the minimum sample size was 384. Since we intended to compare the study result between male and female participants and the anticipated design effect was 1.5, a minimum of (384*2*1.5) 1,152 respondents was required from each site. Considering 10% non-response rate, the sample size was 1,268. Therefore, we were supposed to collect data from 1,268 individuals from each intervention and control site making a total sample size (1268*4) 5,072. However, we were able to collect data from 4,930 respondents (male-2464, female-2466). For qualitative component, we conducted 8 Focused Group Discussions (FGDs) with 60 male and female diabetic and/or hypertensive participants purposively selected from quantitative sample. In each of four study sites, two FGDs were conducted of which one was with male and one was with female participants. Each FGD was comprised of 6-8 participants.

SAMPLING TECHNIQUE

A multistage sampling approach was used for selecting participants. Separate sampling technique was applied for urban and rural settings. For rural settings, three community clinics were selected randomly from the list of all community clinics in the selected sub-district. After that, household listing was conducted in the selected villages where the selected community clinics were located. In case of urban sites, we included participants from both slum and non-slum areas to get representative data from the particular site. In Dhaka North, we conducted household listing in Vashantek slum area of Vashantek thana and non-slum residence of Mirpur 11 D-Block under Pallabi thana. Similarly, in Dhaka South, household listing was performed in slum area (Shefalir slum) of Shantibag area under Shahjahanpur thana and non-slum residence of Gopibag area, under Motijheel thana. This household listing helped us to develop sampling frame for adults aged more than 30 years in that particular area. For this study, we prepared sampling frame separately for male and female participants. Sample was finally selected from these sampling frames randomly using Microsoft Office Excel 2013. Not more than 1 male and/or female were selected from the same household. Participants for qualitative component were selected purposively from quantitative sample in a way so that they had at least one of the two major NCDs (hypertension and diabetes).

STUDY TOOL

Household Listing Questionnaire

For the purpose of household listing, 'Household Listing Questionnaire' was prepared and provided to the data collectors. The questionnaire was prepared in English and then translated into Bengali. This questionnaire comprised of household information (household number and name; name and phone number of household head; name of village/mahalla, district/city corporation, upazilla/thana, union; name of community clinic/urban dispensary located in that village/mahalla; number of >30 years old adults) and information of >30 years old adults (name, nickname, age, date of birth, sex, national ID card (NID) number, probable time of presence at household). Open Data Kit (ODK) form was developed for household listing questionnaire. Data collectors executed this tool using tablet computer.

Survey Questionnaire

SHASTO study adapted the World Health Organization (WHO) STEPS questionnaire for data collection. The questionnaire was divided into four segments: demographic information, behavioral measurements, clinical risk factors and physical measurements. Demographic information segment was intended to collect data on age, education, marital status, main occupation, religion, total monthly household income, total monthly individual income, and wealth quintile of the respondents. In behavioural measurement section, questions on knowledge, attitude and practice regarding diet (salt, fruits and vegetables, oil), tobacco consumption (both smoking and smokeless tobacco) and physical activity (vigorous intensity, moderate intensity, leisure time) were incorporated. Clinical risk factors section comprised questions on knowledge, attitude and health care seeking practice on hypertension and

diabetes. Physical measurement section was developed to record measurements of blood pressure, heart rate, height, and waist circumference. Proper instruction and appropriate response options were ensured while developing questionnaire. The questionnaire was translated into local language (Bengali). Both the English and Bengali version of questionnaire was finalized after incorporating feedback of data collectors obtained from their pre-testing experience. Later, an Open Data Kit (ODK) form was developed for data collection. Data were collected using Tablet computers.

Quality Control Questionnaire

Quality control managers used this questionnaire to conduct interview 5% of the respondents randomly selected at each of four sites to ensure quality of study. 'Quality Control Questionnaire' was prepared based on the final version (Bengali) of survey questionnaire. This comprised a set of questions from each of the four sections (Demographic information, Behavioral measurements, Clinical risk factors and Physical measurements) of survey questionnaire. Quality control managers collected data using hard copy of questionnaire.

FGD Guideline

For qualitative component, eight FGDs were conducted using FGD guideline.

SUPPORTING MATERIALS

Showcard

As in different sections of the questionnaire, a wide range of examples of food items, tobacco products and physical activities were used, we prepared showcards for easy and consistent understanding of these items by both the interviewers and the respondents. Five showcards were prepared (salted food, fruits and vegetables, tobacco products, vigorous intensity physical activity and moderate intensity physical activity) (Photo 2). We provided color printed and laminated copies of showcards to all the interviewers and trained them to use them in appropriate manner.

Measurement Bowl and Spoon

In this study, we intended to know the number of serving of fruits and vegetables intake by the respondents. We, for this purpose, provided interviewers with serving size measurement bowl (200 ml) equivalent to 1 serving of uncooked fruits/vegetable and 2 servings of cooked fruits/vegetable. We also provided teaspoons to them to help them collecting information about salt intake (Photo 3).

Drug List

In health care seeking practice section of questionnaire, patients were asked to mention the name of antihypertensive, anti-diabetic and lipid lowering drugs they reported to take at the time of data collection. For this purpose, a drug list comprising generic and trade name of

antihypertensive, anti-diabetic and lipid lowering medicine that are available in Bangladesh was prepared. This drug list was provided to the interviewers so that they could correctly document the names of medicine.

Photo 2: Examples of showcards used in SHASTO baseline survey 2018

Interview Observation Checklist

Field supervisors observed the interview sessions conducted by data collectors using 'Interview Observation Checklist'. The checklist was segregated into three sections- a) basic interviewing skill, b) interviewing techniques, and c) measurement techniques. Topics covered in basic interviewing skill section were whether data collectors shared greetings to the participants, introduced themselves and organization, confirmed identification of participants, exhibited warm behavior to them, kept mobile phone silent, showed respect to the cultural norms, acknowledged participant at the end of the interview for sharing their valuable time etc. Interviewing techniques section comprised issues like whether the consent

form was read and signed properly, whether the data collectors asked question in an appropriate way, introduced specific sections appropriately, maintained the sequence of sections and skip pattern correctly, explained the time period (7 days/6 months/12 months) properly when necessary, did not ask leading question, demonstrated show card/measurement cup/spoon properly, asked to see medicine strips/prescriptions when necessary, allowed participants to know all response options except for knowledge questions, reviewed whole form in tab after completing the interview. Measurement techniques section was intended to monitor whether data collectors maintained standard procedure for physical measurements (blood pressure, heart rate, height, weight and waist circumference). In the checklist, there was also a section for supervisors to note down the question numbers where the interviewer recorded wrong code. Supervisors also made comment in the checklist if any interviewer missed to bring any logistic.

Photo 3: Instruments and supporting materials used in SHASTO baseline survey

TRAINING OF FIELD PERSONNEL

Though we recruited field personnel (data collectors, filed supervisors and quality control assistants) having prior experience in conducting quantitative survey, we provided a week-long training to them before going to the field (Photo 4). Field staff were taught about basics of quantitative research and ethical issues. An overview of the SHASTO baseline survey (study objective, importance of this study, study site, study population) was also discussed with them. Field personnel were then trained on the questionnaire and response options according to a Standard Operating Procedure (SOP). The SOP was adapted from the WHO STEPS manual that described different aspects of the survey questionnaire and physical measurements. Bengali questionnaire was used during the training and was simultaneously checked against the English questionnaires to ensure accurate translation. A considerable amount of time was spent during the training to discuss interviewing techniques. On the fifth

day of training, field staff participated in mock interviews in pairs under the supervision of investigators. On the following day, an anthropometry master trainer trained them on physical measurement (height, weight, blood pressure, waist circumference) using the same instruments they used in the field. Lastly, staff were deployed for field practice so that they could gain more experience on interviewing and in arranging fieldwork logistics. Field supervisors and quality control assistants received further training on how to supervise the fieldwork, find the assigned households and carry out spot checks in order to maintain data quality.

Photo 4: Training of field personnel at BRAC JPGSPH

PRETEST

Prior to the start of the fieldwork, the questionnaires were pretested to make sure that the questions were understandable by the respondents. It would have been ideal to conduct pretesting in both urban and rural settings, however, due to resource constrain, the fieldwork for pretest was carried out only in Dhaka city. Nevertheless, we expect that it will not affect the quality of study as we adopted WHO STEP Survey Questionnaire, which is a universally accepted tool for NCD survey. Interviewers carried out pre-testing for three days while they completed all sections of questionnaire along with physical measurement. Every day, as soon as the fieldwork has been completed, a debriefing session was held with the field staffs and necessary modifications were made to the questionnaires based on the findings of the pretest.

HOUSEHOLD LISTING

Household listing process was carried out in the selected villages (rural) and mohallahs (urban) mentioned above. In Dhaka City North and Dhaka City South, listing was performed separately in slum and non-slum areas to ensure representativeness in that particular area. Field team of every site was divided into three groups comprising one male data collector and one female data collector. For each of four sites, one field supervisor and one quality control assistant were appointed. During the visit, field personnel contacted local key persons and obtained permission from them to conduct household listing and interviews. Then they

travelled across the entire village/mohalla/segment to get an idea about the geographical boundary of that area. They took help from local residents and administrative bodies in this regard. Subsequently, they prepared social map for each site comprising principal physical features such as institutional buildings (school, madrasa, office), rivers, roads, paddy field, bazar etc. After being confirmed of the boundary, field staff went to the North-East corner of the village/mohallah/segment, started to conduct household listing and continued in serpentine or clockwise direction. Central research team at BRAC JPGSPH generated a scheme for unique household numbers before the initiation of fieldwork. Field staff assigned a unique number to every household/apartment of the selected village/mohallah/segment and then asked the available household members whether any >30 years old adult reside at that house or not. Full household listing questionnaire was administered to those households/apartments where at least one >30 years old male/female were reported to live. Household listing questionnaire covered information about household and >30 years old adults (please see 'Household Listing Questionnaire' section). Tablet computer was used to conduct household listing. At the end of the process, a total of 6,189 households were listed of which 1,436 were in Shibpur, 1,368 were in Kaliganj; 1,647 were in Dhaka North (Mirpur 11 D Block-1097; Vashantek 550) and 1,738 were in Dhaka South (Gopibagh-1,168; Shantibag-570).

RANDOMIZATION

Information obtained from household listing was used to develop sampling frame of >30 years old males and females. For every site, we randomly selected required number of male and female participants from separate sampling frames prepared for male and female participants separately. We did not include more than one male and one female from one household. If any household was found having more than one >30 years old male, then only one male was selected randomly from them. Similarly, if any household had more than one >30 years old female, then only one female was selected randomly. Then, required numbers of male and female respondents were selected for each site from these sampling frames using simple random sampling. Randomization was performed by generating non-repeating random numbers using Microsoft Office Excel 2013. All these activities related to sample selection was carried out by the central research team at the BRAC JPGSPH.

DATA COLLECTION

Data collection of SHASTO baseline survey was launched on first and second week of April 2018 in rural and urban sites respectively. After the training sessions, we deployed four teams (urban-2, rural-2) for four study sites. As mentioned earlier, each of these large teams was comprised of six data collectors/interviewers, one field supervisor and one quality control assistant. Six data collectors in each group were further distributed to form three groups comprising two data collectors (male-1, female-1) in each group. We deployed the team in this way so that male and female data collectors could interview and conduct physical measurements of male and female respondents respectively. During data collection period, each team started fieldwork in the early morning between 8:00 am and 8:30 am. Before going for data collection, field supervisors calibrated machines/scales used for physical

measurement. List of participants was also provided to the field teams by the central research team. Every day, data collectors at each of these four sites used to conduct interview and physical measurement among around 25 respondents (Photo 5). Data collection was finished on 25th May 2018. In Shibpur Upazilla, data was collected from three villages (Chotaband, Munsefer Char and Baghaba) under three unions (Josar, Putia and Saforia). In Kaliganj Upazilla data were collected from the respondents from three villages (Dakshmin Som, Jangalia and Uttargaon) under three unions (Tumolia, Jangalia and Uttargao). In Dhaka North, data was collected in Mirpur 11 D-Block under Pallabi thana (non-slum) and in Vashantek slum under Vashantek thana (slum). In Dhaka South, data collection was performed in Ramkrishna Mission road of Gopibag area (non-slum) under Motijheel thana and Shefalir slum area under Shahjahanpur thana. FGDs were carried out for qualitative data collection and interviews were recorded using audio recorder and field notes.

Photo 5: Data Collection of SHASTO baseline survey 2018

PHYSICAL MEASUREMENT

Overview

SHASTO baseline survey carried out some physical measurements including blood pressure and heart rate, height, weight, and waist circumference. Blood pressure was measured to determine the proportion of participants having raised blood pressure. Height and weight measurements were taken to assess body mass index (BMI), which is used to identify the prevalence of overweight and obesity among the population. Waist circumference was also measured to get additional information on overweight and obesity. Unit of measurement for blood pressure, heart rate, weight and BMI were mmHg, beats/minute, centimeter (cm), kilogram (kg) and kilogram/meter^2 (kg/m^2) respectively. For height and waist circumference, centimeter (cm) was used as unit of measurement.

Sequence

In our study, physical measurement was taken immediately after interview. However, in exceptional situations when physical measurement was conducted prior to the interview, participants were asked to take rest for 15 minutes for preparation of blood pressure measurement.

Privacy

All physical measurements were conducted maintaining adequate privacy.Physical measurements were done either in a separate room or in a separate area of household as per the choice of the participants.

Measuring Blood Pressure and Heart Rate

SHASTO study used Omron automatic digital blood pressure machine (Omron HEM 7120) to measure blood pressure and heart rate of eligible participants (Photo 3). A mercury sphygmomanometer was also used for calibration of the digital BP machine. In our study, blood pressure was measured immediately after interview. However, when blood pressure measurement was conducted prior to interview, participants were asked to take rest for 15 minutes with legs uncrossed. In our study, blood pressure was measured in the left arm. However, when right arm was used interviewers recorded this information along with reason. For measuring BP, participants were asked to place the left arm on a table with the palm facing upward. Then interviewers rolled up the clothes on their arms in a way so that rolled up clothes do not stretch the arm. A universal cuff was subsequently positioned above the elbow so that the lower band is placed 1.2-2.5 cm above the inner side of the elbow joint. Cuff was then wrapped snugly onto the arm keeping it at the same level as the heart during measurement. For each respondent, interviewers measured blood pressure and heart rate two times each at 3 minutes interval. When the difference between 1st and 2nd measurement of BP was more than 10 mmHg, the 3rd measurement was obtained. Reading of all the measurements were documented in tablet computer along with device ID and interviewer ID.

Measuring Height

In this study, portable height measuring board was used to measure height of male and female participants (Photo 3). Height was measured after removing footwear and headgear that might give false reading. Participants were asked to keep their feet together, heels against the back board, knees straight and to look straight ahead and not to tilt head up before measuring height (Photo 6). Height measurement was recorded in centimeters for two times. When the difference between 1st and 2nd measurement was greater than 0.5 cm, the 3rd measurement was taken. Reading of all the measurements were documented in tablet computer along with device ID and interviewer ID.

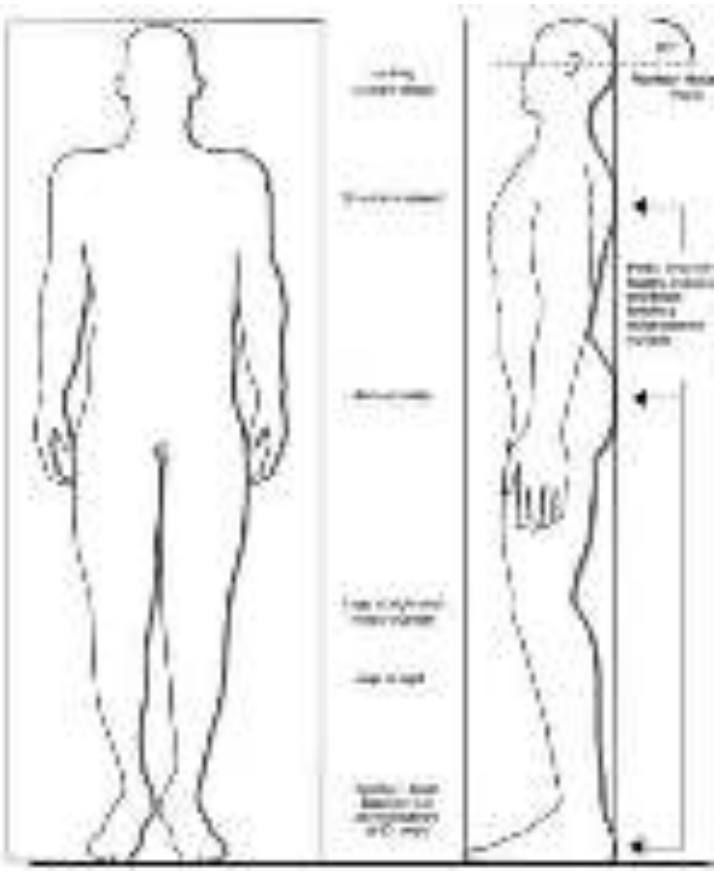


Photo 6: Postion of participant for height measurement

Measuring Weight

Weight measurement scale (TANITA UM 070) (Photo 3) was used to measure weight of the study participants. Weight was measured after taking mobiles, wallets and coins out of their pockets and after removing shoes, slippers, sandals, socks, and heavy belts that might give false reading. Interviewers ensured that the scales are placed on a firm and flat surface. Participants were asked to step onto scale with one foot on each side of the scale. They were also instructed to stand still with face forward and placing arms on the sides. Weight measurement was recorded in kilograms for two times. When the difference between 1st and 2nd measurement was more than 0.1 kg, the 3rd measurement was taken. Reading of all the measurements were documented in tablet computer along with device ID and interviewer ID.

Measuring Waist Circumference

We used tailoring tape (Photo 3) to measure waist circumference of male and female participants. Male and female interviewers measured waist circumference of male and female participants respectively. Waist circumference measurement was taken directly over the skin after removing thick/heavy clothes. Interviewers took the measurement after a normal expiration at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest (hip bone) with the arms relaxed at the sides. Waist circumference measurement was recorded in centimeters for two times. When the difference between 1st and 2nd

measurement was greater than 0.5 cm, 3rd measurement was attained. Reading of all the measurements were documented in tablet computer along with device ID and interviewer ID.

RESPONSE RATES

For SHASTO baseline survey, total of 5,072 samples were selected of which 4,956 could be approached for interview and 4,930 were successfully interviewed yielding a response rate of 97.7%. Response rates were found higher among female respondents than their male counterparts. This discrepancy might be due to the fact that data collection was primarily conducted in daytime when male respondents usually stayed at workplace.

QUALITY CONTROL

Methodology

In SHASTO baseline survey, quality was assured at every step. We selected study participants randomly from sampling frame to avoid selection bias. Sample size was calculated considering potential design effect. Questionnaire used in our study was adopted from widely used standard questionnaire used by WHO STEP Survey (please see study tool section).

Field Staffs

Qualified data collectors, field supervisors and quality control managers were recruited for this study. Level of education, total work experience, experience in conducting quantitative survey and anthropometric measurement was considered for recruitment of field staffs. They were also provided with extensive training by research team (please see training section).

Pretest of Questionnaire

Before going for data collection, tools were pretested and necessary modifications were made based on the field experience (please see pretesting section).

Calibration of the equipment

Every day, in the morning during data collection, instruments were calibrated by the field supervisors of respected sites to ensure quality of physical measurement data.

Supervision and Monitoring of Data Collection

During the data collection, field supervisors and quality control assistants closely monitored the work of data collectors. For this purpose, one quality control assistant and one field supervisor were assigned in each of four study sties. The main duty of field supervisors were to confirm that the teams were in the right village/mahalla/segment and interviewed right person, to contact the local authority and obtain their permission, to ensure the general safety of data collectors. They also used to observe several interviews every day and assessed the performance of data collectors using an observation checklist (please see observation checklist section). When any data collector exhibited low performance, field supervisors used

to sit and discussed the issues with them on the same day. Field supervisors, additionally, used to monitor whether the devices (tablet computer, height, weight and blood pressure machine) were functioning accurately or not. To ensure this, they used to calibrate height, weight and blood pressure machine every day in the morning before the team was deployed for data collection. On the other hand, quality control managers were responsible to observe ongoing interviews in the field and verify the accuracy of the method of asking questions, recording answers, following skip instructions and steps of physical measurement. They also monitored the progress of fieldwork and took immediate action when necessary. Members of central research team also visited study sites frequently to oversee the field activities. Field supervisors and quality control managers maintained regular contact with the research team, reported on the progress of fieldwork and notified them about difficulties they faced during fieldwork and the way out.

Re-interview

In our study, quality control assistants re-interviewed 5% of total respondents using 'Quality Control Questionnaire' to ensure quality of study.

Management of Non-response

Non-responses due to refusals and absence of respondents were minimized efficiently to ensure quality of data. Data collectors put a lot of efforts into place to do this that includes clearly describing the purpose and importance of this study, ensuring anonymity and confidentiality and beginning interview with appealing opening remarks and questions. We also ensured male and female data collectors for male and female respondents respectively to minimize non-response rate. When any respondent was absent or refused to participate in this study, field supervisors contacted with the respondent over phone, tried to motivate them and collected information about the date and time of their availability at home. To reach male participants who usually were found to be absent at household at day time, data collectors conducted interview at weekends or at night.

Data processing

Every day, at the end of data collection, data were uploaded to the server. Afterwards, data were downloaded from the server and assessed to check the completeness and consistency. A statistician of central research team identified the missing data and inconsistencies present in the data set and notified the respective data collectors, supervisors and quality control asssitants. Supervisor and quality control assistants then discussed the identified errors with data collectors and resolved the problem the next day. At the end of data collection in all the four sites, data set was finally checked and cleaned before analysis.

DATA ANALYSIS

Upon completion of data collection, data were downloaded from the server and were immediately converted into STATA file format from the CSV file format. Variable names and labels were checked and then data were cleaned. Recoding of values and categorization of variables were done to facilitate further analysis. Descriptive analysis was performed

including frequencies, means, proportions and standard deviations to estimate the prevalence of hypertension, diabetes, overweight and obesity, tobacco use, physical inactivity, low vegetable and fruit consumption; to assess knowledge, attitudes and health care seeking practice of hypertension and diabetes; to assess knowledge and attitudes on tobacco use, physical inactivity, low vegetable and fruit consumption across the study sites and gender. Results were presented in tables, graphs and charts. Data were analysed using Stata version 13. For qualitative component, data were transcribed verbatim into Bengali from audio recording. Coding was done manually using deductive approach. Finally thematic analysis was performed with extraction of appropriate quotes.

ETHICAL CONSIDERATION

Ethical approval for this study was obtained from Institutional Review Board of BRAC James P. Grant School of Public Health, BRAC University. Informed written consent was taken for interview and physical measurement from each respondent after clarifying the study objective, voluntary nature of their participation, and rights of withdrawal at any time during the interview. Consent was also obtained for taking photographs. Confidentiality was ensured by not disclosing the identity of respondents to any third party but the research team. The completed questionnaires were given unique ID to maintain the anonymity of the respondents. Participants, in addition, had the right to withdraw from the study without any prejudice or penalty. Furthermore, participants did not receive any financial incentive or compensation for participating.

RESULTS AND DISCUSSIONS

RESULTS

SOCIODEMOGRAPHIC INFORMATION

Table 1 describes the socio-demographic information of the participants of SHASTO baseline survey. A total of 4,930 adults (male-2464, female-2466) of ≥30 years age from Narsingdi (male-623, female-643), Gazipur (male-645, female-630), Dhaka City North/Dhaka North (male-599, female-597) and Dhaka city South/Dhaka South (male-597, female-596) participated in the study. Mean (±SD) age of the male participants was 49.44 (±13.43) years and that of the female participants was 46.88 (±12.84) years. Mean (±SD) completed years of education was found slightly higher among male participants than their female counterparts (5.2 years vs 4.1 years). Almost all of the male respondents of this study were currently married (97.3%); however, nearly a quarter of female respondents were widowed (22.0%). Among the female participants, majority were homemakers (86.0%). However, in urban sites of Dhaka North and Dhaka South, just above one-fourth (25.2%) and one-third (38.4%) of women were service holders respectively. Among the male participants, many were day laborers (46.0%), followed by businessmen (27.2%) and service holders (18.7%). Almost half of the male participants residing in rural sites reported to earn their livelihood working as day laborer (Narsingdi-49.5%, Gazipur-45.9%), however, business (Dhaka North-33.4%, Dhaka South-33.5%) and service (Dhaka North-32.8%, Dhaka South-41.9%) were common profession of urban men. Almost all of the participants were Muslims by faith (male-97.7%, female-96.6%). Median monthly household income of male and female participants was 18,000 BDT and 16,000 BDT respectively.

Table 1: Socio-demographic information of study participants (n=4,930)

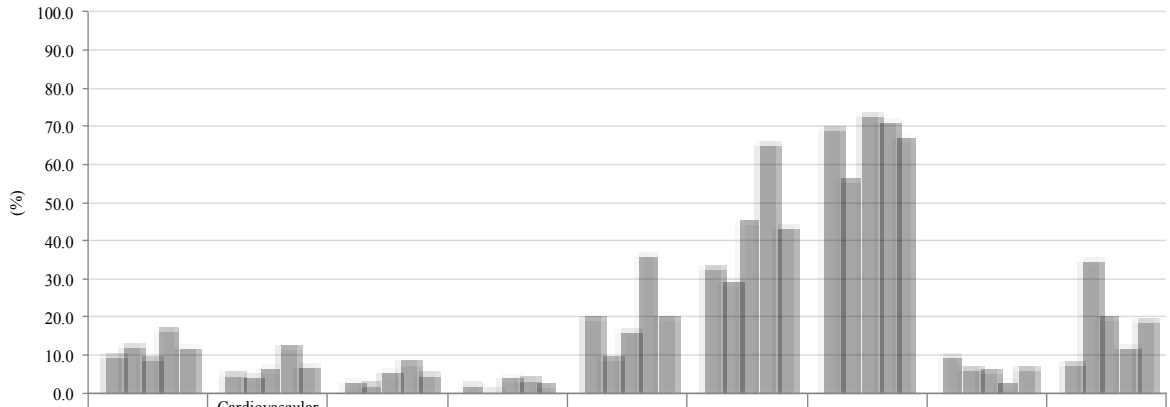
Variables	Narsingdi (Male-623, Female-643)		Gazipur (Male-645, Female-630)		Dhaka North (Male-599, Female-597)		Dhaka South (Male-597, Female-596)		Total (Male-2464, Female-2466)	
	Male (%)	**Female (%)**	**Male (%)**	**Female (%)**	**Male (%)**	**Female (%)**	**Male (%)**	**Female (%)**	**Male (%)**	**Female (%)**
Age (year) Mean±SD	50.03± 13.91	47.74± 13.09	49.36± 12.93	46.58± 12.66	45.88± 12.92	42.87±1 0.83	44.88± 11.98	43.04±1 2.09	49.44± 13.43	46.88±1 2.84
Education (year) Mean±SD	5.17± 4.47	4.04± 4.08	5.00± 4.46	4.00± 3.80	5.41± 5.28	4.39± 4.85	8.06± 6.6	5.91± 6.22	5.19± 4.62	4.09± 4.07
Marital status										
Currently married	97.8	76.5	97.1	79.1	96.3	79.3	96.19	81.64	97.3	78.0
Others	2.3	23.5	2.93	21.0	3.7	20.1	3.8	17.99	2.7	22.0
Religion										
Muslim	99.4	99.7	94.4	94.2	98.1	98.7	87.43	86.43	96.7	96.6
Others	0.6	0.3	5.6	5.8	1.9	1.2	12.6	13.57	3.3	3.4

Variables	Narsingdi (Male-623, Female-643)		Gazipur (Male-645, Female-630)		Dhaka North (Male-599, Female-597)		Dhaka South (Male-597, Female-596)		Total (Male-2464, Female-2466)	
	Male (%)	**Female (%)**	**Male (%)**	**Female (%)**	**Male (%)**	**Female (%)**	**Male (%)**	**Female (%)**	**Male (%)**	**Female (%)**
Occupation										
Day labour	49.5	0.8	45.9	2.1	23.0	2.9	15.95	0.00	46.0	1.5
Business	25.9	1.0	27.7	0.9	33.4	3.8	33.5	2.92	27.2	1.1
Home maker	0.4	87.3	0.6	88.1	0.0	65.0	0.13	54.70	0.5	86.0
Service	15.4	6.3	19.6	3.6	32.8	25.2	41.9	38.43	18.7	6.6
Others	8.8	4.6	6.3	5.4	10.8	3.2	8.6	3.95	7.7	4.9
Total monthly household income (BDT)										
Median	15500	14333	15000	15000	17000	16000	25000	25000	18000	16000

FRUITS AND VEGETABLES CONSUMPTION

Knowledge

To assess the knowledge on fruits and vegetables consumption, we asked participants whether they heard about the harmful effects of inadequate fruits and vegetables consumption and what are those effects. Just above three-quarters of the participants (76.7%, n=3,952) stated that they heard about the harmful effect of inadequate fruits and vegetables consumption. Amongst them, majority stated that weakness (66.8%), eye diseases (43.2%), diabetes (20.2%) and hypertension (11.6%) can develop if a person does not consume adequate fruits and vegetables. Some of the participants also mentioned cardiovascular diseases (6.7%) and kidney diseases (4.5%) in this regard, and only a few of them identified cancer (2.4%) as the harmful effects of inadequate fruits and vegetables consumption. It was also revealed from our study that higher proportion of the participants from urban residence mentioned about different harmful effects of inadequate fruit and vegetable consumption such as eye diseases (urban: Dhaka North-45.3%, Dhaka South-64.7%; rural: Narsingdi-32.3%, Gazipur-29.1%) and weakness (urban: Dhaka North-72.3%, Dhaka South-70.7%; rural: Narsingdi-68.8%, Gazipur-55.3%) in comparison to participants from rural residence. Cardiovascular diseases, kidney disease and cancer were also mentioned more frequently by urban participants than their rural counterparts (**Figure 3**).



	Hypertension	Cardiovascular diseases	Kidney disease	Cancer	Diabetes	Eye diseases	Weakness	Don't know	Others
Narsingdi	9.5	4.6	2.8	1.8	20.1	32.3	68.8	9.3	7.1
Gazipur	12.0	4.2	2.0	0.5	8.8	29.1	55.3	5.9	34.3
Dhaka North	8.5	6.5	5.3	4.0	15.6	45.3	72.3	6.2	20.2
Dhaka South	16.0	11.3	7.5	3.4	35.7	64.7	70.7	2.7	11.7
Total	11.6	6.7	4.5	2.4	20.2	43.2	66.8	6.0	18.4

Figure 3: Knowledge on harmful effects of inadequate fruits and vegetables consumption

When segregated by gender, it was found that similar proportion of male and female participants mentioned hypertension, cardiovascular disease, kidney disease and cancer as the harmful consequences of lack of fruits and vegetables consumption. However, in comparison to their female counterparts, slightly higher proportion of male participants stated that diabetes (male-22.2%, female-18.3%), eye diseases (male-46.0%, female-40.4%) and weakness (male-68.4%, female-65.1%) might be developed if a person does not consume adequate fruits and vegetables (**Figure 4**).

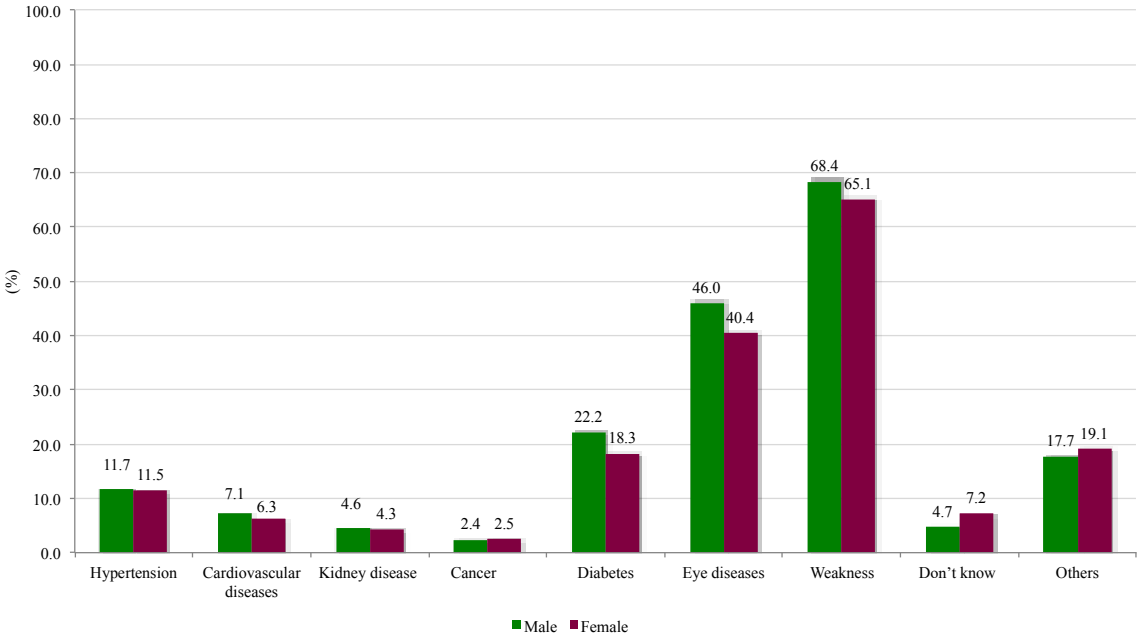


Figure 4: Knowledge on harmful effects of inadequate fruits and vegetables consumption by gender

Attitude

To understand participants' attitude on adequate fruit and vegetable consumption, we asked them how important it is to consume adequate fruits and vegetables. Among the study participants, around 90.0% from each of four sites stated that it is very important to consume adequate fruits and vegetables. A few participants also reported that consuming adequate fruits and vegetables is somewhat important and participants from Dhaka North (male-11.3%, female-10.9%) followed by Narsingdi (male-8.4%, female-8.8%) stated this more frequently (**Figure 5**).

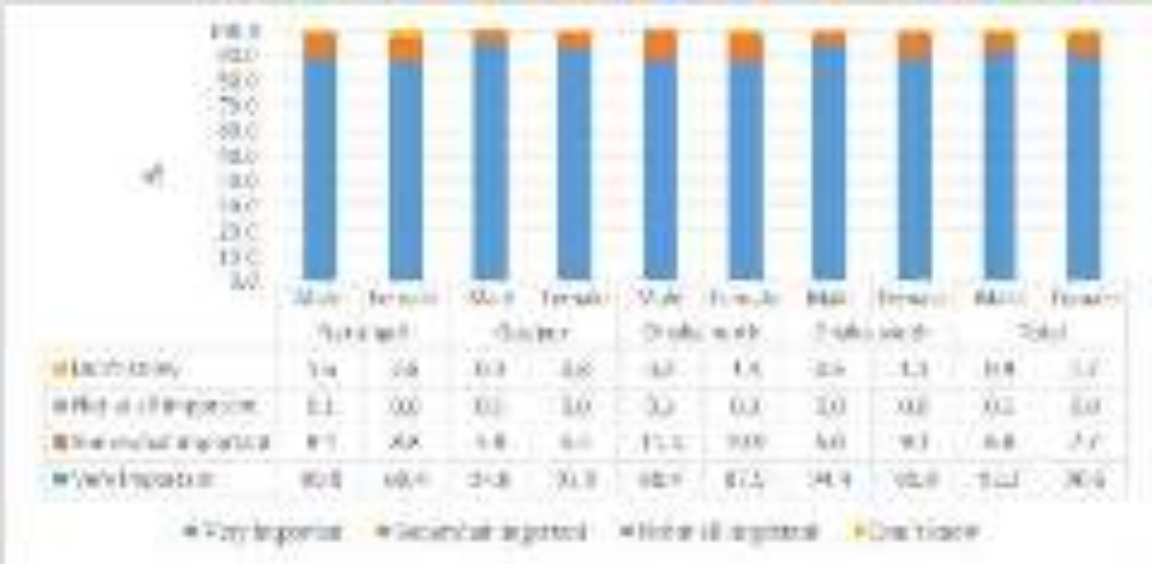


Figure 5: Attitude of participants on importance of adequate fruit and vegetable consumption

Practice

It was revealed from the study that, majority of the participants (70.8%) did not consume adequate fruits and vegetables (more than or equal to 5 servings per day). Noticeably, higher proportion of urban participants (Dhaka North-92.8%, Dhaka South-87.6%) were found to consume inadequate fruits and vegetables (less than 5 servings per day) than their rural counterparts (Narsingdi-64.4%, Gazipur-74.4%) (**Figure 6**).

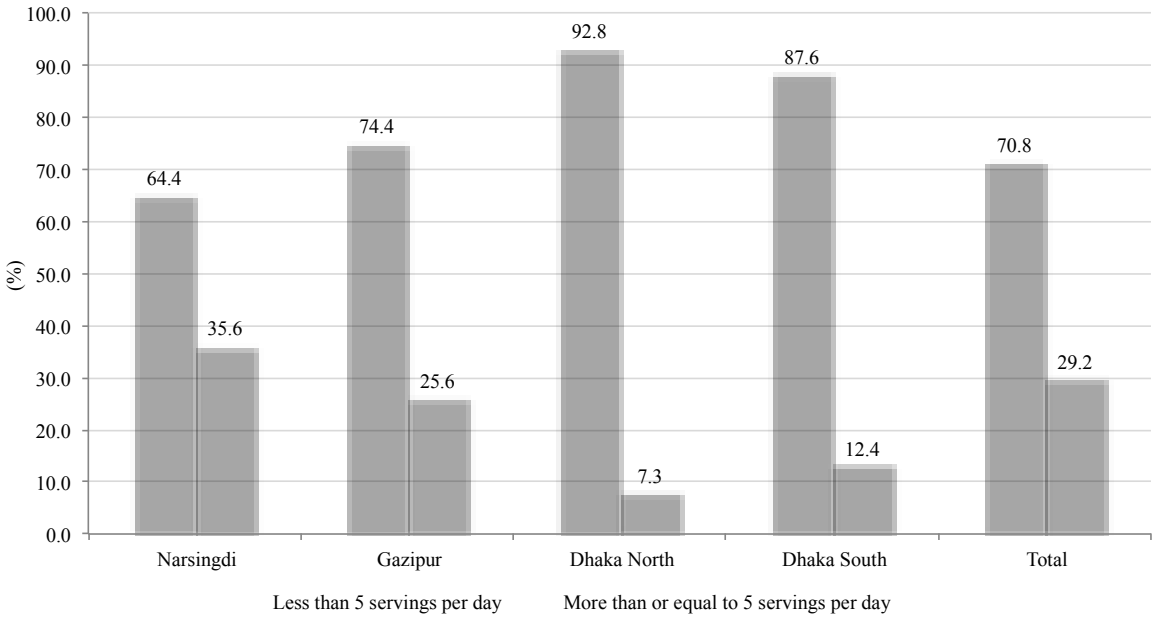


Figure 6: Pattern of fruits and vegetables consumption by study site

Moreover, among the study participants, more females were observed to consume inadequate fruits and vegetables than male (male-46.0%, female-54.0%) (**Figure 7**).

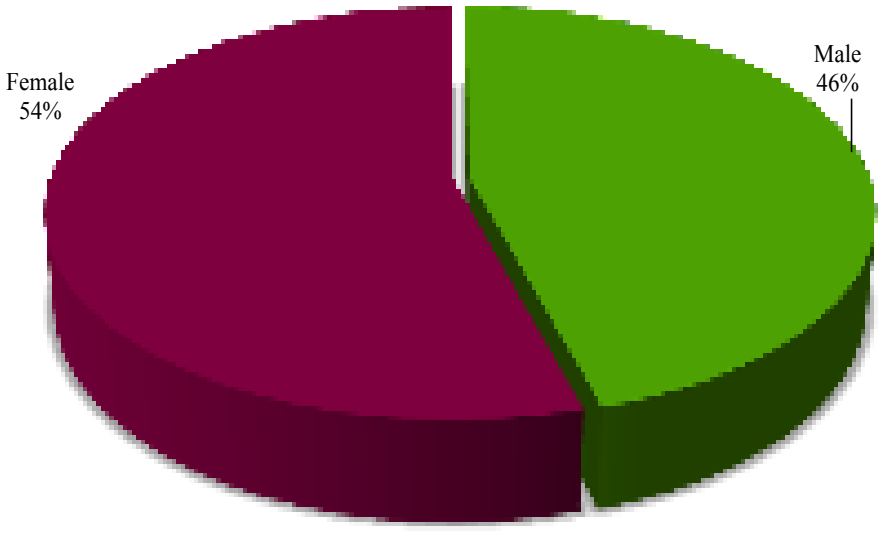


Figure 7: Inadequate fruit and vegetable consumption by gender

This difference between male and female was higher in Gazipur and Narsingdi district where 15.3% and 9.9% more women respectively reported to consume inadequate fruits and vegetables (**Figure 8**).

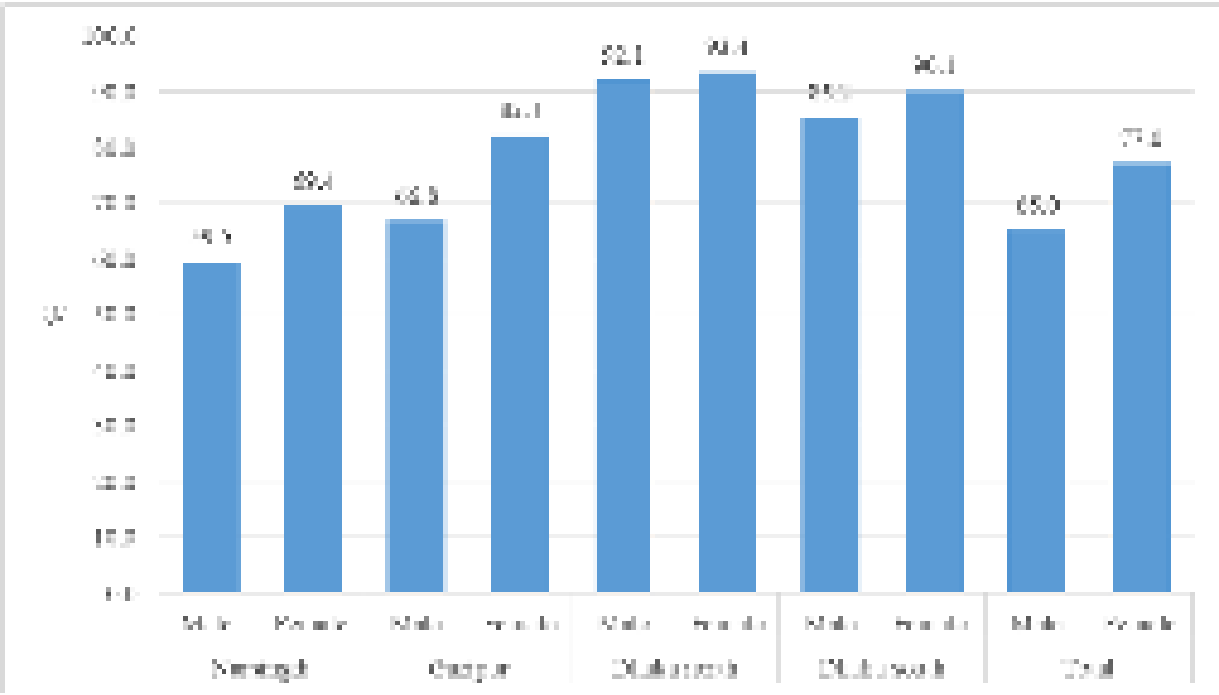
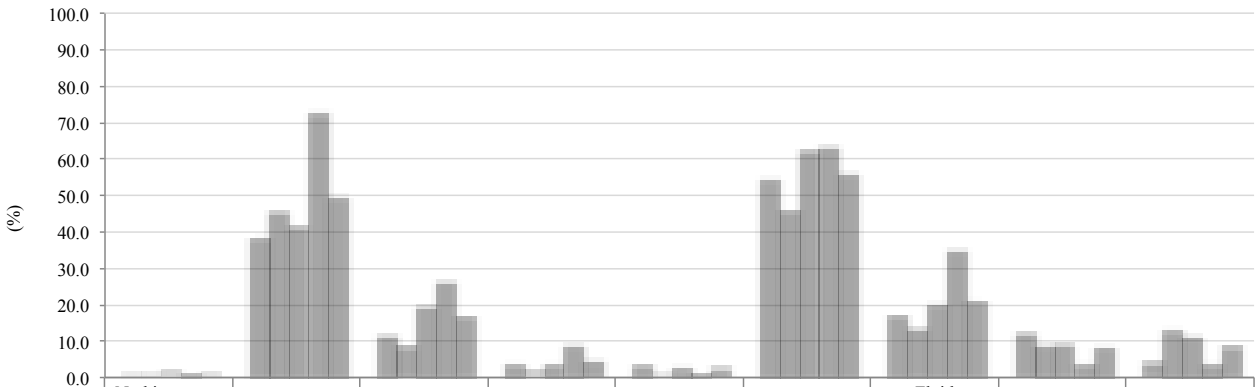


Figure 8: Prevalence of inadequate fruits and vegetables consumption by study site and gender

SALT INTAKE

Knowledge

To assess the knowledge about salt intake, participants were asked question on whether they heard about harmful effects of taking extra salt on health and what those harmful effects could be. It was revealed from our study that majority of the participants (86.1%, n=4243) respondents heard that taking extra salt is harmful for human health. Among these participants (n=4243), more than half (55.6%) and nearly half (49.0%) respectively mentioned increased blood pressure and dilution of blood (*rokto pani hoe jay*) as the harmful effects of higher salt intake. Kidney disease (15.7%) and fluid accumulation in body (21.0%) were also sated by some respondents. While segregated by study sites, it was revealed that a higher proportion of participants from Dhaka South were able to mention the harmful effects of extra salt intake (**Figure 9**).



	Nothing, more salt is good for one's health	Increase blood pressure	Kidney disease	Asthma	Cancer	Dilution of blood	Fluid accumulation in body	Don't know	Others
Narsingdi	0.1	38.2	11.1	3.8	3.6	54.2	17.0	11.3	3.5
Gazipur	0.2	44.3	7.7	0.8	0.4	44.7	12.4	8.2	13.1
Dhaka North	0.7	40.5	19.0	3.8	2.6	61.6	19.8	8.6	10.8
Dhaka South	1.1	72.6	25.5	8.2	1.1	62.4	34.6	3.8	3.8
Total	0.5	49.0	15.7	4.2	2.0	55.6	21.0	8.0	7.6

Figure 9: Knowledge on harmful effect of extra salt consumption

Attitude

When asked about the importance of lowering salt consumption, majority of the participants stated that it is very important to reduce salt intake, however, the proportion was highest among participants of Narsingdi district (male-86.1%, female-85.1%) and was lowest among the participants of Dhaka North (male-76.4%, female-66.4%). A few participants also stated that lowering salt consumption in diet is not important at all (**Figure 10**).

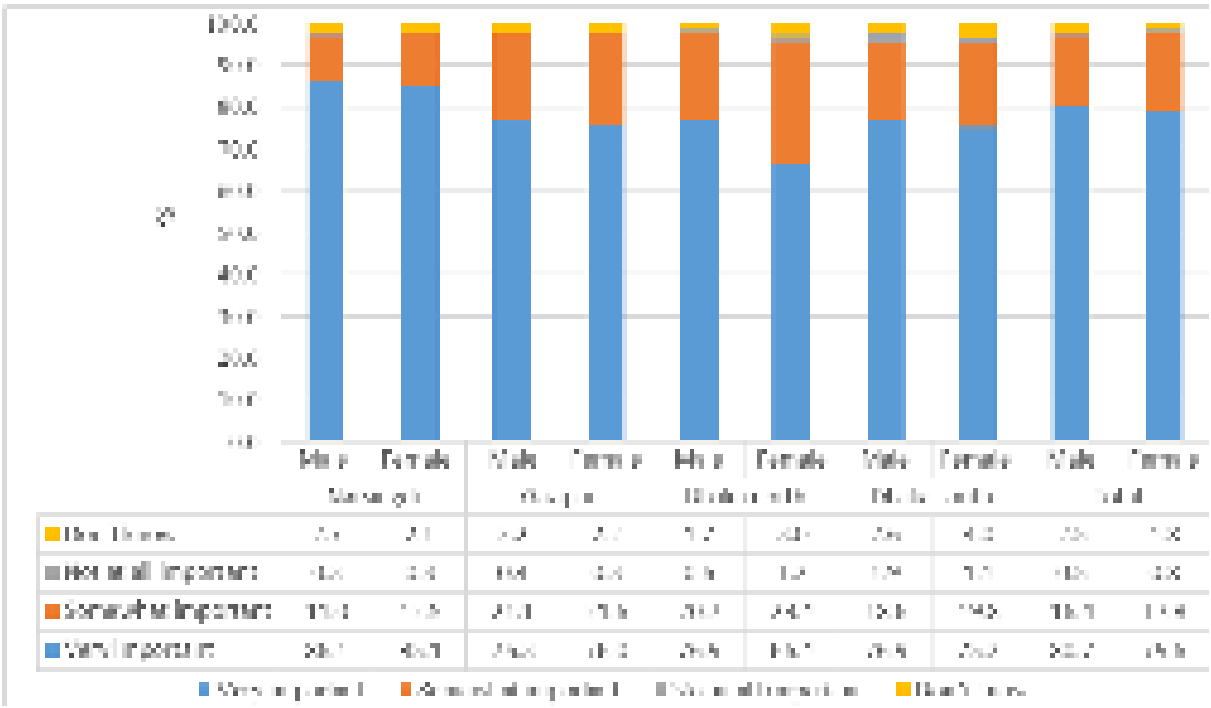


Figure 10: Attitude on importance of lowering salt consumption

Practice

Among our study participants, more than two-third (68.0%) stated that they consumed just the right amount of salt while only 15.0% and 12.0% reported that the amount of salt they consume is too little or too much respectively (**Figure 11**). Majority of the participants (68.0%), also, affirmed that they usually add extra salt with food items before or during meals (**Figure 12**).

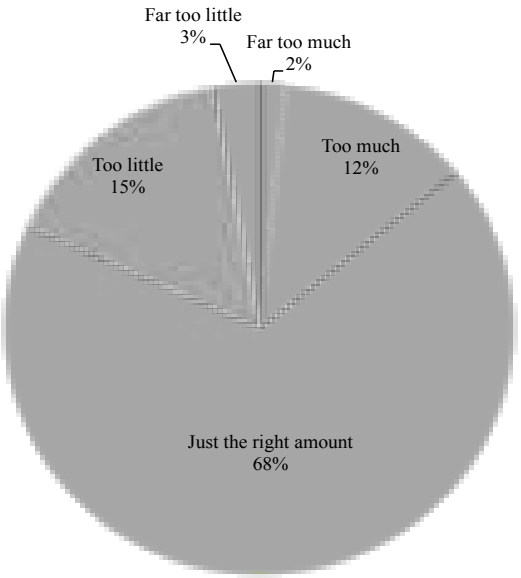


Figure 11: Amount of self-reported salt intake

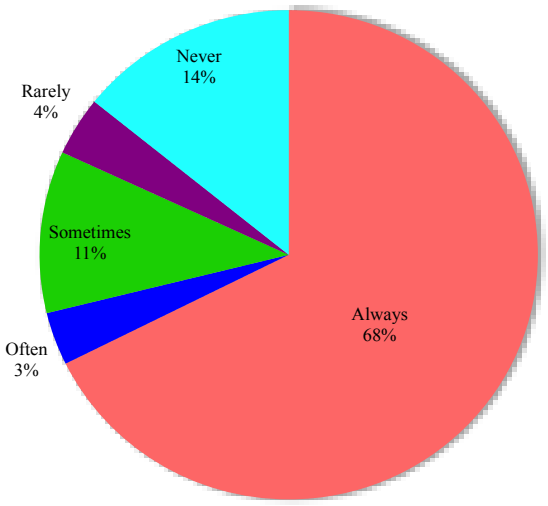


Figure 12: Frequency of self-reported added salt intake

While looking for geographical and gender segregated distribution, it was revealed that highest proportion of female from Gazipur stated that they consume normal amount of salt (77.5%). However, this proportion was the lowest among female participants residing in Narsingdi (56.0%) (Figure 13).

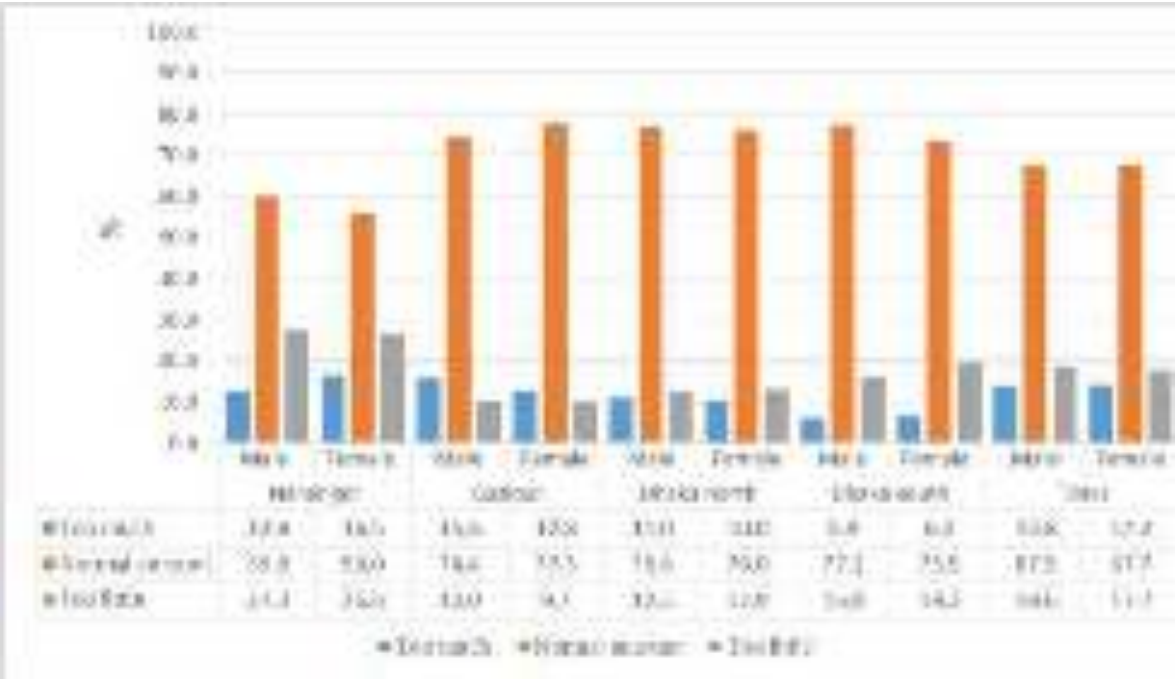


Figure 13: Self reported salt intake by study sites and gender

Interestingly, it was revealed from our study that, only 7.6% male and 5.6% female participants were trying to reduce salt intake. In all the sites, the proportion of male participants trying to reduce salt consumption was higher except for Dhaka South (male-6.7%, female-11.2%) (**Figure 14**).

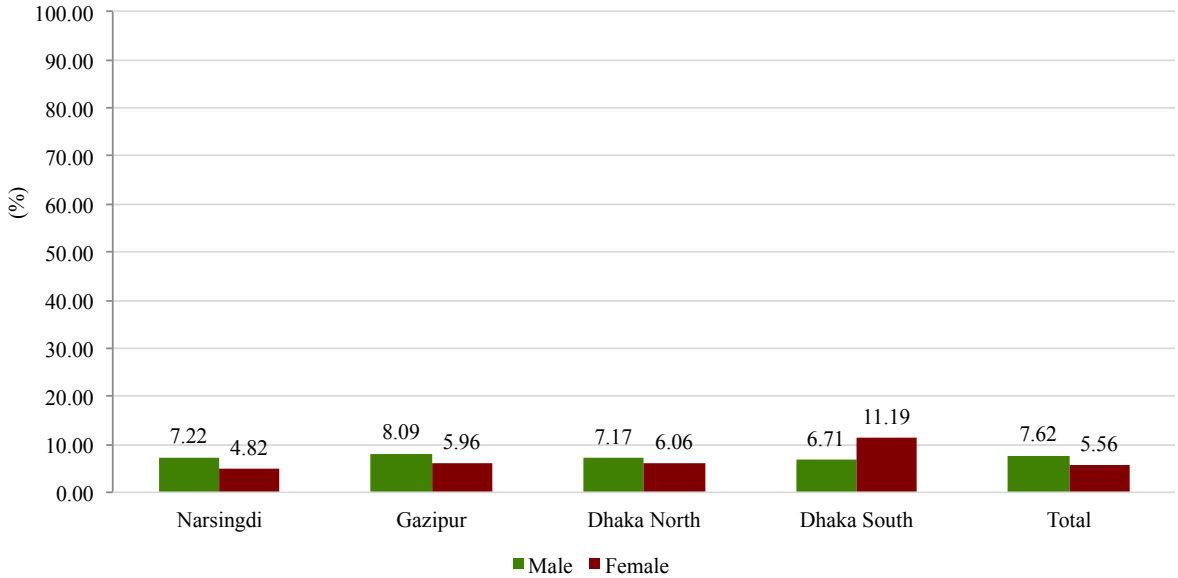


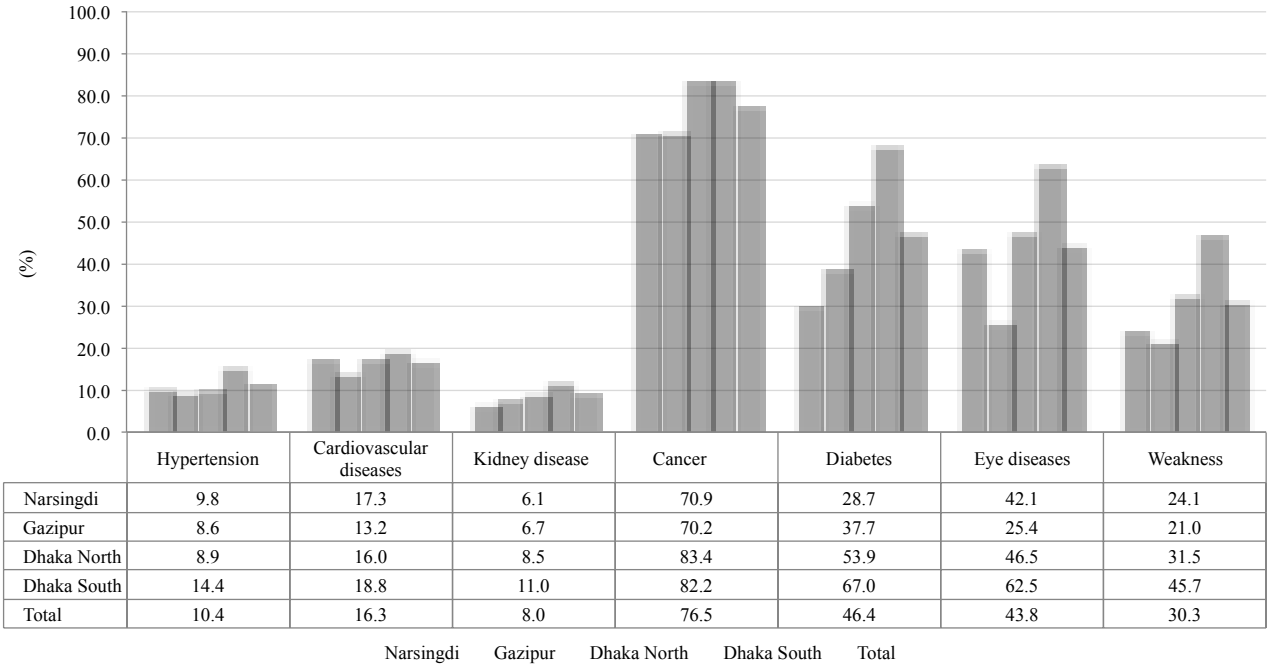
Figure 14: Proportion of participants trying to reduce salt intake

TOBACCO

Knowledge

Among our study participants, almost all (98.1%, n=4850) reported that they heard about harmful effect of tobacco consumption. When the participants were asked to mention the

harmful effects, the responses included cancer (76.5%) followed by diabetes (46.4%), eye diseases (43.8%), weakness (30.3%) cardiovascular diseases (16.3%), hypertension (10.4%) and kidney diseases (8.0%). Knowledge on harmful effects of tobacco consumption has shown some geographical variations. For example, 70.9% respondents in Narsingdi and 70.2% respondent in Gazipur district mentioned cancer as a harmful effect of tobacco consumption. Whereas, these proportions were 83.4% and 82.2% in Dhaka North and Dhak South respectively (**Figure 15**).



	Hypertension	Cardiovascular diseases	Kidney disease	Cancer	Diabetes	Eye diseases	Weakness
Narsingdi	9.8	17.3	6.1	70.9	28.7	42.1	24.1
Gazipur	8.6	13.2	6.7	70.2	37.7	25.4	21.0
Dhaka North	8.9	16.0	8.5	83.4	53.9	46.5	31.5
Dhaka South	14.4	18.8	11.0	82.2	67.0	62.5	45.7
Total	10.4	16.3	8.0	76.5	46.4	43.8	30.3

Figure 15: Knowledge on harmful effects of tobacco consumption

Attitude

To get idea about the participants' attitude on tobacco consumption, we asked them how harmful tobacco consumption was for health. Among the study participants, >85.0% from each site stated that consumption of tobacco was very harmful for health. Participants of Dhaka North more frequently stated that consumption of tobacco products is not at all harmful (male-2.3%, female-5.6%) and somewhat harmful (male-3.9%, female-4.3%) (**Figure 16**).

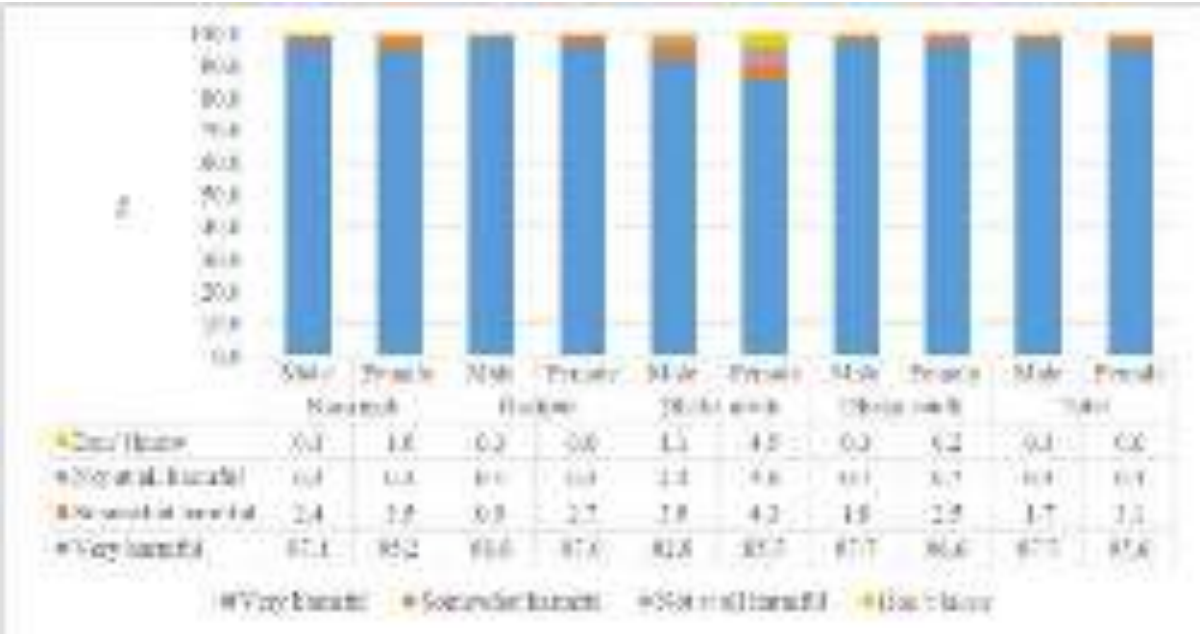


Figure 16: Attitude on harmful effect of tobacco consumption

Practice

Among the study participants, more than a quarter (26.3%) stated that they were current smoker and almost all of the current smoker smoked on daily basis. However, more than two-third of the participants (66.1%) reported that they currently consume smokeless tobacco and 38.7% of them consumed smokeless tobacco daily. Mean age of starting smoking and smokeless tobacco consumption was 17.46 years and 30.84 years respectively (**Table 3**).

Table 2: Prevalence of tobacco consumption among >30 years old adults in Narsingdi, Gazipur, Dhaka North and Dhaka South (n=4926)

	Status of tobacco consumption	Frequency	(%)
Smoking	Currently smoke	1264	26.3
	Currently smoke daily	1231	97.4
	Mean age of starting smoking	17.46 years	
Smokeless tobacco	Currently use smokeless tobacco	3483	66.1
	Currently use smokeless tobacco daily	1347	38.7
	Mean age of starting smokeless tobacco	30.84 years	

After analyzing the distribution of tobacco users, it was found that female participants hardly smoke and but a lot of them consume smokeless tobacco daily. This proportion of consumption of smokeless tobacco was higher among women residing in rural sites (Narsingdi-41.2%, Gazipur-35.6%) than the women in urban sites (Dhaka North-32.5%, Dhaka South-27.0%). However, male participants were observed to consume tobacco in both smoke and smokeless form. Among the participants who smoked daily, the highest proportion was in Narsingdi district (46.4%) followed by Dhaka South (45.4%); and the lowest proportion was in Gazipur district (28.5%). However, male participants from Gazipur

district reported more frequent consumption of smokeless tobacco (22.3%). Male participants from Narsingdi (combined-15.8%) and Gazipur (combined-12.6%) reported to use both forms of tobacco more than the participants from other study sites (**Figure 17**).

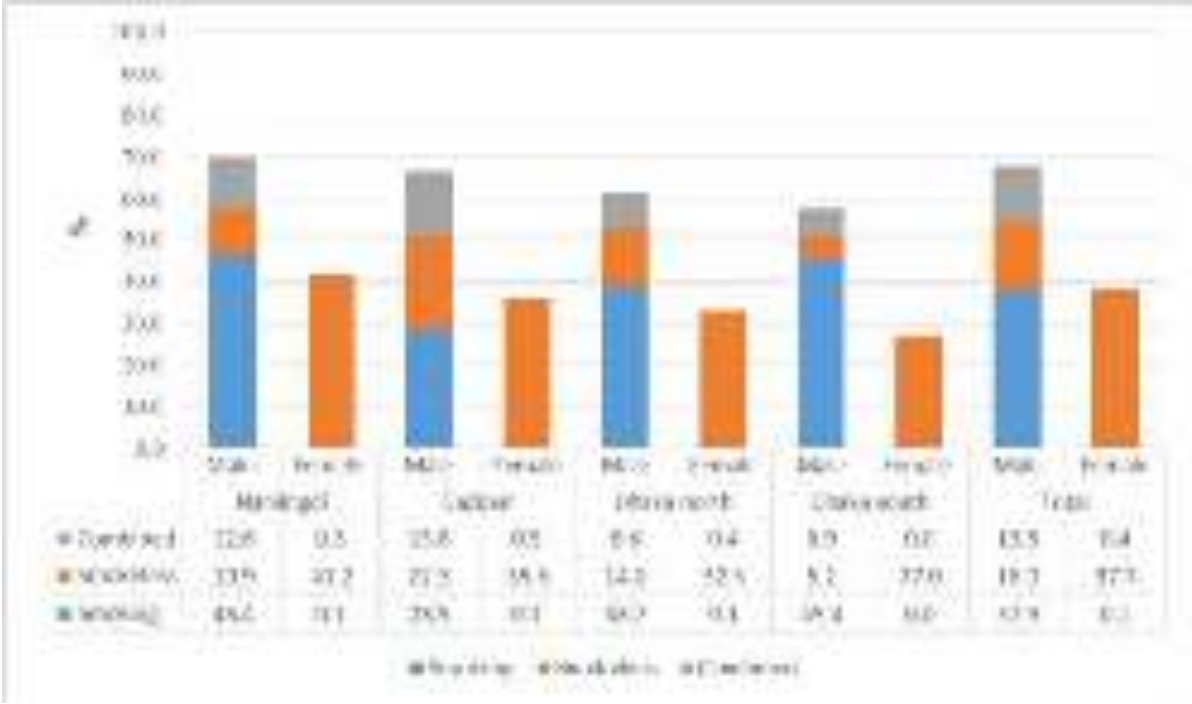


Figure 17: Geographical and gender wise distribution of tobacco consumption

In the rural areas, there is not much difference in the prevalence of tobacco consumption by wealth quintile. However, the males and females of second wealth quintile had the highest prevalence of any form of tobacco consumption (73.7% among males and 47.6% among females) (**Table 3**).

Table 3: Prevalence of consumption of tobacco products by wealth quintile and gender in rural areas

Wealth quintile	Male (Rural)			Female (Rural)		
	Smoking only	Smokeless only	Combined only	Smoking only	Smokeless only	Combined only
Lowest	26.4	26.9	15.6	0.0	37.5	0.4
Second	48.2	10.9	14.6	0.7	46.6	0.3
Middle	42.8	14.9	13.5	0.0	37.4	0.8
Fourth	34.1	17.5	16.1	0.0	36.6	0.6
Highest	36.7	12.4	10.9	0.0	33.3	0.0

In the urban areas, males and females in the lower two wealth quintiles had a higher prevalence of smoking and consumption of smokeless tobacco respectively. Moreover, the males in the second wealth quintile and females in the lowest wealth quintile had the highest prevalence of any form of tobacco consumption (73.7% among males and 42.9% among females) (**Table 4**).

Table 4: Prevalence of consumption of tobacco products by wealth quintile and gender in urban areas

Wealth quintile	Male (Urban)			Female (Urban)		
	Smoking only	Smokeless only	Combined only	Smoking only	Smokeless only	Combined only
Lowest	50.3	7.0	12.2	0.0	42.9	0.0
Second	54.5	10.8	8.4	0.0	41.0	0.7
Middle	32.6	9.0	7.3	0.3	22.7	0.0
Fourth	33.8	10.2	3.1	0.0	20.3	0.0
Highest	38.4	9.9	6.6	0.0	22.7	0.3

Strikingly, it was revealed from the study that only 56.2% of males and 56.7% of females who smoked (n=1264) were trying to quit smoking during the past 12 months (**Figure 18**).

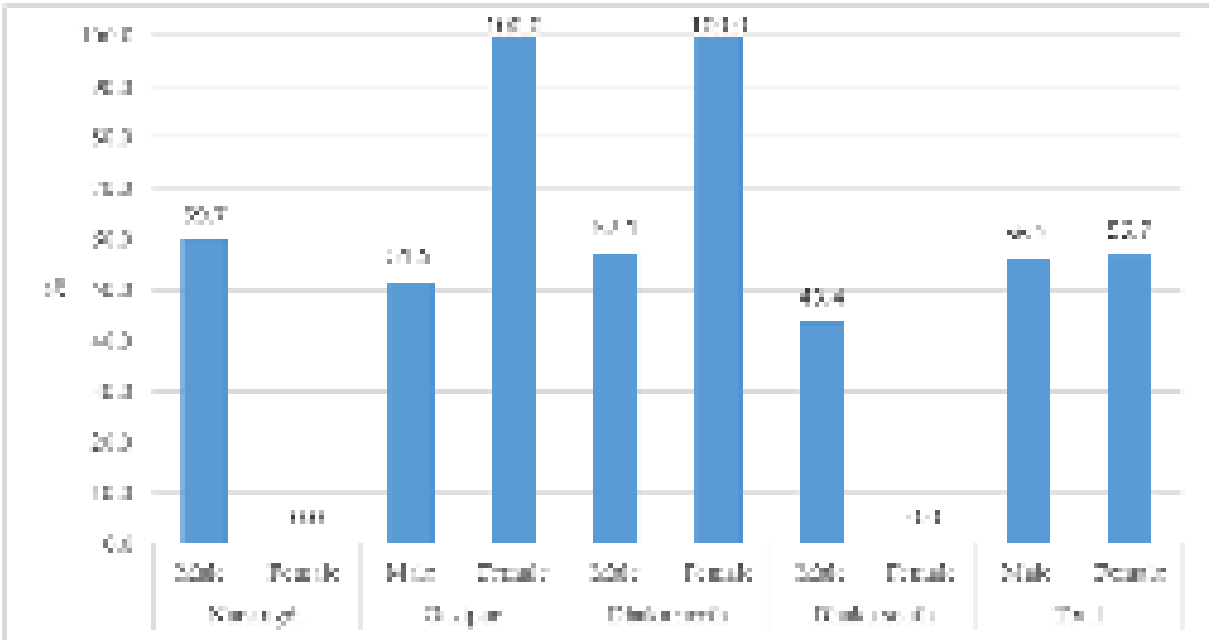


Figure 18: Proportion of smokers trying to quit smoking

On the contrary, slightly more than one third (male -34.8%, female-33.1%) of the smokeless tobacco users reported that they were trying to quit smokeless tobacco consumption. This proportion was also highest among the female participants of Dhaka North (51.2%) followed by the male participants of Dhaka North (34.8%) (**Figure 19**).

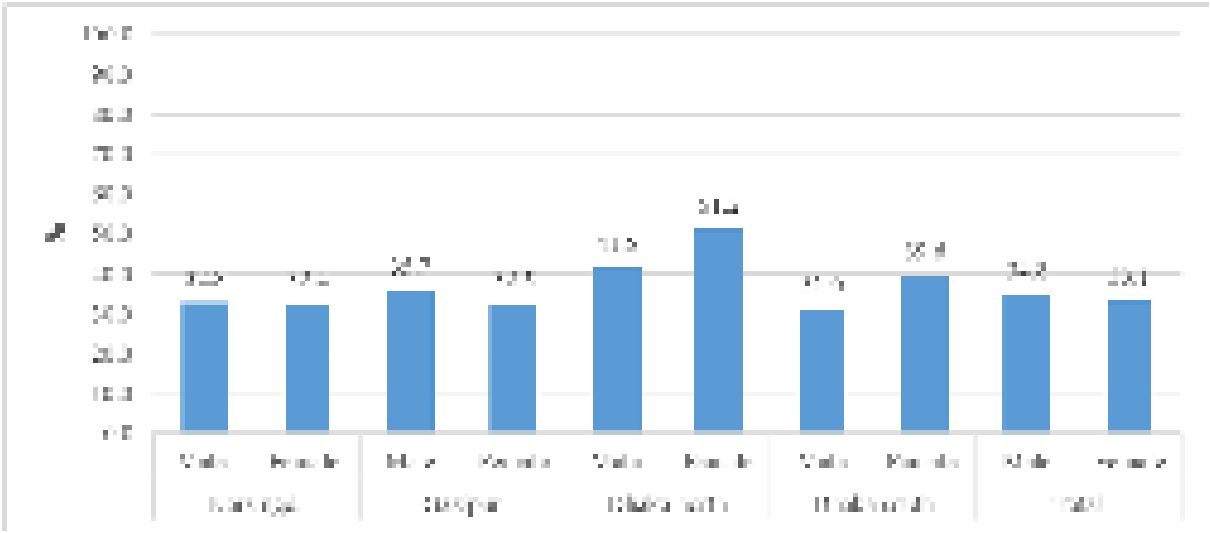
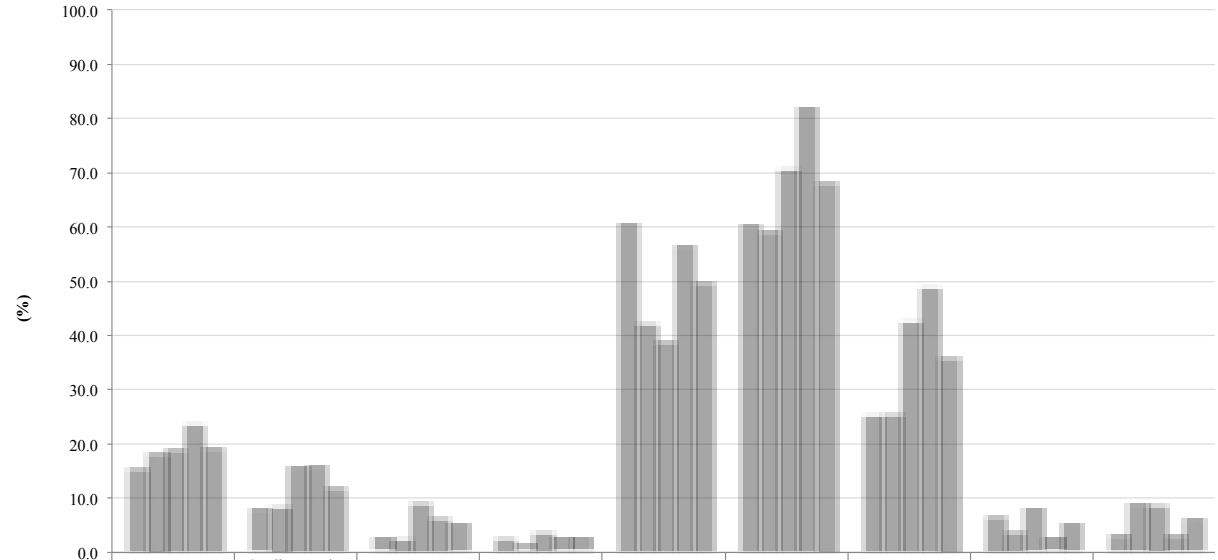


Figure 19: Proportion of smokeless tobacco users trying to quit smokeless tobacco

PHYSICAL ACTIVITY

Knowledge

To assess the knowledge regarding physical activity, participants were asked whether they heard about harmful effects of inadequate physical activity and what those harmful effects could be. It was revealed from our study that 82.3% (n=4147) respondents heard that inadequate physical activity is harmful for health. Amongst these harmful effects, weight gain was mentioned by majority of the participants (67.7%) followed by diabetes (49.1%) and body ache (35.4%). Around one-fifth (18.7%) and one-tenth (11.5%) of the participants also mentioned about hypertension and cardiovascular diseases as the consequence of lack of physical activity. When we segregated data by geographical area, it was found that urban participants could mention different NCD related harmful effects of inadequate physical activity more frequently than their rural counterparts such as cardiovascular disease (urban: Dhaka North-15.2%, Dhaka South-15.3%; rural: Narsingdi-7.4%, Gazipur-8.1%) and weight gain (urban: Dhaka North-70.5%, Dhaka South-81.4%; rural: Narsingdi-59.9%, Gazipur-58.7%).However, a higher proportion of participants from Narsingdi (60.1%) and Dhaka South (23.4%) stated that hypertension and diabetes could be developed as the consequence of inadequate physical activity respectively (**Figure 20**).



	Hypertension	Cardiovascular disease	Kidney disease	Cancer	Diabetes	Weight gain	Body ache	Don't know	Others
Narsingdi	15.0	7.4	2.1	2.4	60.1	59.9	25.0	6.2	2.8
Gazipur	17.8	8.1	2.2	0.9	41.9	58.7	25.2	3.4	8.2
Dhaka North	18.4	15.2	8.7	3.3	38.5	70.5	42.5	7.4	8.4
Dhaka South	23.4	15.3	6.0	2.1	55.8	81.4	48.8	2.1	2.7
Total	18.7	11.5	4.7	2.2	49.1	67.7	35.4	4.7	5.5

Figure 20: Knowledge on harmful effect of inadequate physical activity

When the knowledge on harmful effects of inadequate physical activity was analyzed by gender, it was revealed that slightly higher proportion of female participants mentioned hypertension (male-17.2%, female-20.2%) and body ache (male-34.7%, female-36.1%) than their male counterparts. On the contrary, 6.9% and 6.0% more men identified diabetes and weight gain as the consequence of lack of adequate physical activity respectively (**Figure 21**).

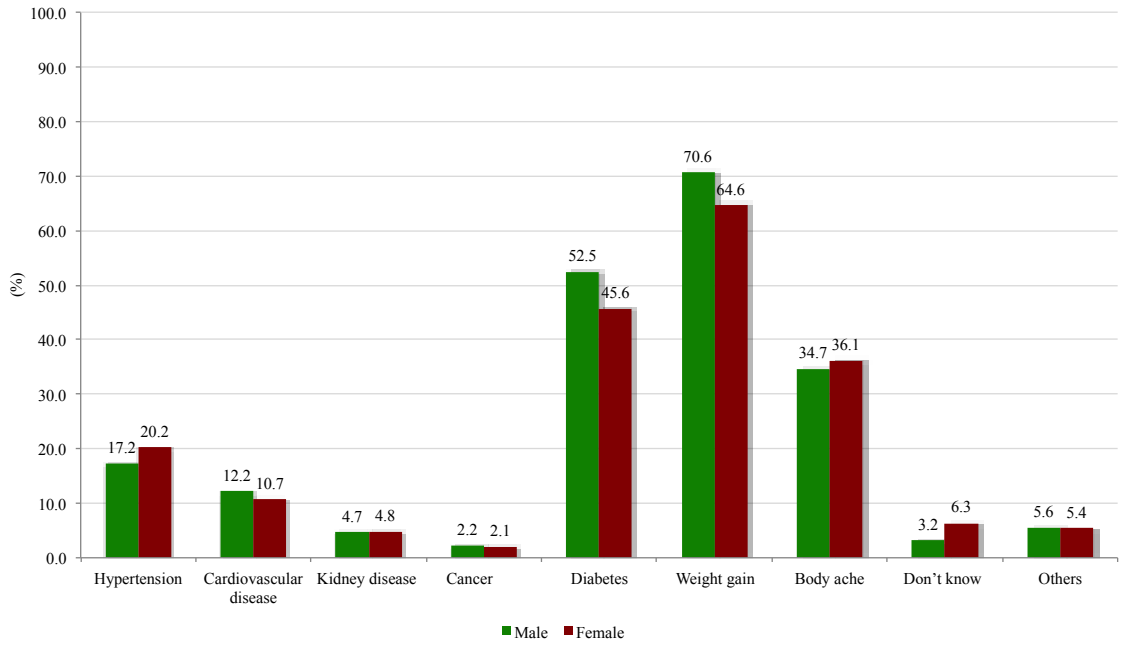
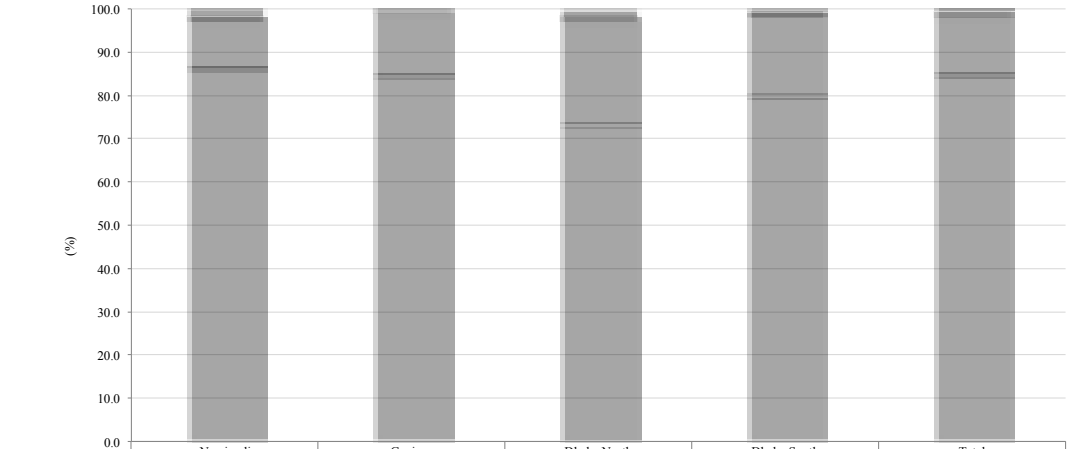


Figure 21: Knowledge on harmful effect of inadequate physical activity by gender

Attitude

Among our study participants, 84.4% stated that it is very important to perform adequate physical activity. Some participants (13.8%), however, opined that performing adequate physical activity is somewhat important too. (**Figure 22**).



	Narsingdi	Gazipur	Dhaka North	Dhaka South	Total
Don't know	2.5	0.7	2.1	1.2	1.6
Not at all important	0.2	0.1	0.4	0.6	0.2
Somewhat important	11.6	15.0	24.3	18.4	13.8
Very important	85.7	84.2	72.9	79.6	84.4

Figure 22: Attitude on importance of performing adequate physical activity

Practice

Our study remarkably found that, more than two-third (68.7%) of our study participants stated that they perform neither vigorous intensity physical activity nor moderate intensity physical activity as a part of daily work or recreational activities (**Figure 23**) as per WHO recommendation i.e. 75 minutes of vigorous intensity physical activity per week or 150 minutes of moderate intensity physical activity).

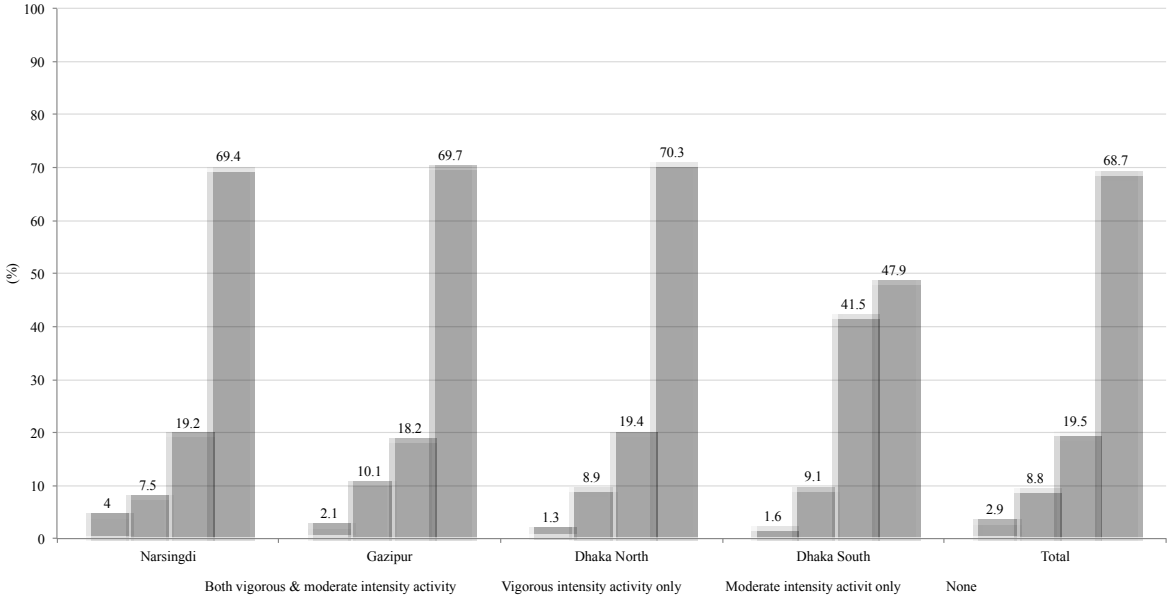


Figure 23: Practice of physical activity

When the practice of physical activity was segregated by gender, it was found that 18.7% more women reported to not to meet any of the WHO recommendations for physical activity than men (male-59.4%, female-78.1%). Vigorous intensity activities were performed more by male participants than their female counterparts (male-5.9%, female-0.0%). However, a higher proportion of female participants reported to be engaged in moderate intensity physical activity (male-17.8%, female-21.2%). Our study did not find any female participant who met the WHO recommendations for both vigorous and moderate intensity physical activities (**Figure 24**).

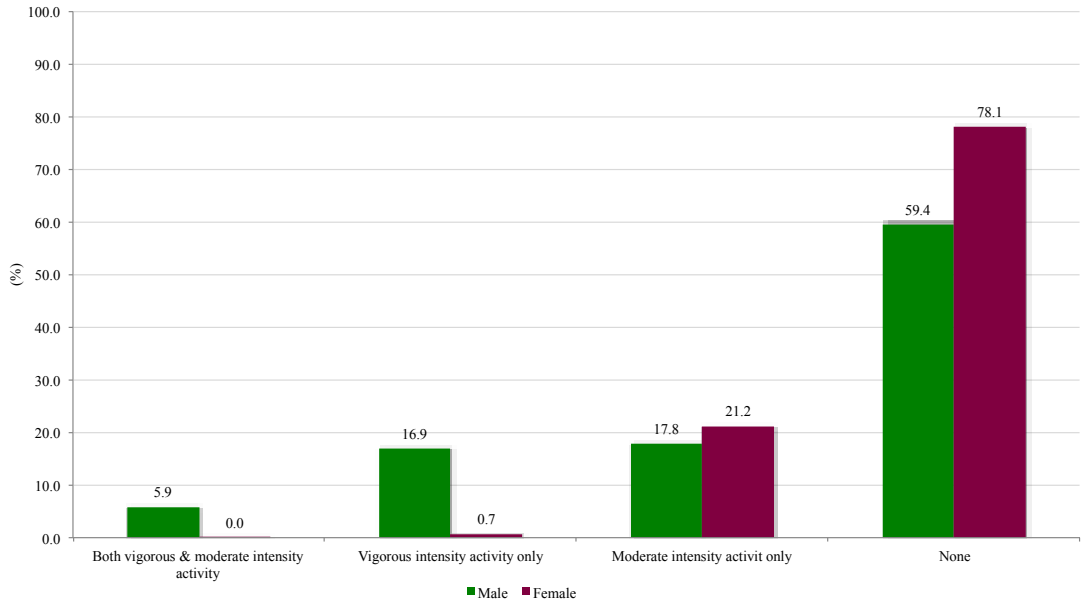


Figure 24: Practice of physical activity by gender

In the rural areas, there is not much difference between the prevalence of no physical activity among the wealth quintiles of a particular gender. Some men in all wealth quintiles meet the WHO recommendation of vigorous physical activity, whereas, almost no women meet the WHO recommendation of vigorous physical activity (**Table 5**).

Table 5: Prevalence of different types of physical activity by wealth quintile and gender in rural areas

Wealth quintile	Male (Rural)				Female (Rural)			
	Both	Moderate only	Vigorous only	None	Both	Moderate only	Vigorous only	None
Lowest	6.4	16.5	17.4	59.8	0.0	23.3	0.7	75.9
Second	10.8	20.1	22.7	46.4	0.0	21.5	1.7	76.8
Middle	7.0	16.9	22.2	53.8	0.0	11.2	1.2	87.6
Fourth	1.9	16.9	13.1	68.2	0.0	19.9	0.0	80.1
Highest	4.9	18.4	9.1	67.6	0.0	22.2	0.0	77.8

In the urban areas, 34.6% of males in the lowest wealth quintile met the WHO recommendation of vigorous physical activity and 48.9% females in the lowest wealth

quintile met the WHO recommendation of moderate physical activity. Almost no females met the WHO recommendation of vigorous physical activity (**Table 6**).

Table 6: Prevalence of different types of physical activity by wealth quintile and gender in urban areas

Wealth quintile	Male (Urban)				Female (Urban)			
	Both	Moderate only	Vigorous only	None	Both	Moderate only	Vigorous only	None
Lowest	4.8	13.5	34.6	47.2	1.4	48.9	2.0	47.7
Second	1.7	23.6	19.2	55.4	0.4	48.3	0.4	51.0
Middle	1.7	21.6	9.5	67.1	0.4	35.3	0.3	63.9
Fourth	1.8	21.8	6.0	70.5	0.4	43.5	0.0	56.1
Highest	1.6	15.2	15.7	67.5	0.3	41.1	0.0	58.6

OIL USE

Almost all of our study participants reported that they used soybean oil for cooking purpose (male-99.0%, female-99.0%). Very few participants used palm oil, mustard oil, rice bran oil and sunflower oil.

OVERWEIGHT

In our study, 15.6% of male and 28.7% of female participants were identified as overweight (BMI$\geq$25kg/m^2 to <30kg/m^2). This prevalence was found much higher among female participants than their male counterparts across the study sites. Prevalence of overweight was also higher among urban participants (Dhaka North: male-28.4%, female-37.5%; Dhaka South: male-32.5%, female-37.2%) than the participants residing in the rural sites (Narsingdi: male-12.4%, female-27.9%; Gazipur: male-17.1%, female-18.5%) (**Figure 25**).

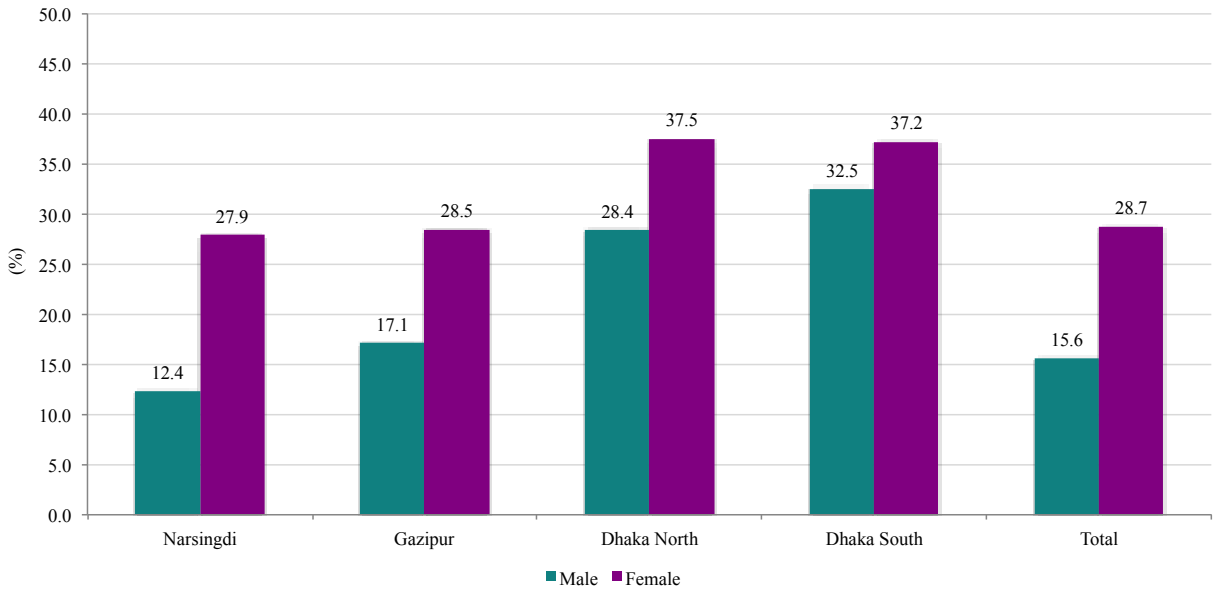


Figure 25: Prevalence of overweight among >30 years old men and women in by study site

OBESITY

Among our study participants, 1.7% male and 7.6% female were classified as having obesity (BMI≥ 30kg/m^2). Highest prevalence obesity was observed among female participants of Dhaka South (17.9%) followed by Dhaka North (16.6%), Narsingdi (8.4%) and Gazipur (5.8%). Among the male participants, prevalence of obesity was higher in urban sites (Dhaka North-5.5%, Dhaka South-5.7%) than in rural sites (Narsingdi-1.4%, Gazipur-1.5%) (**Figure 26a**).

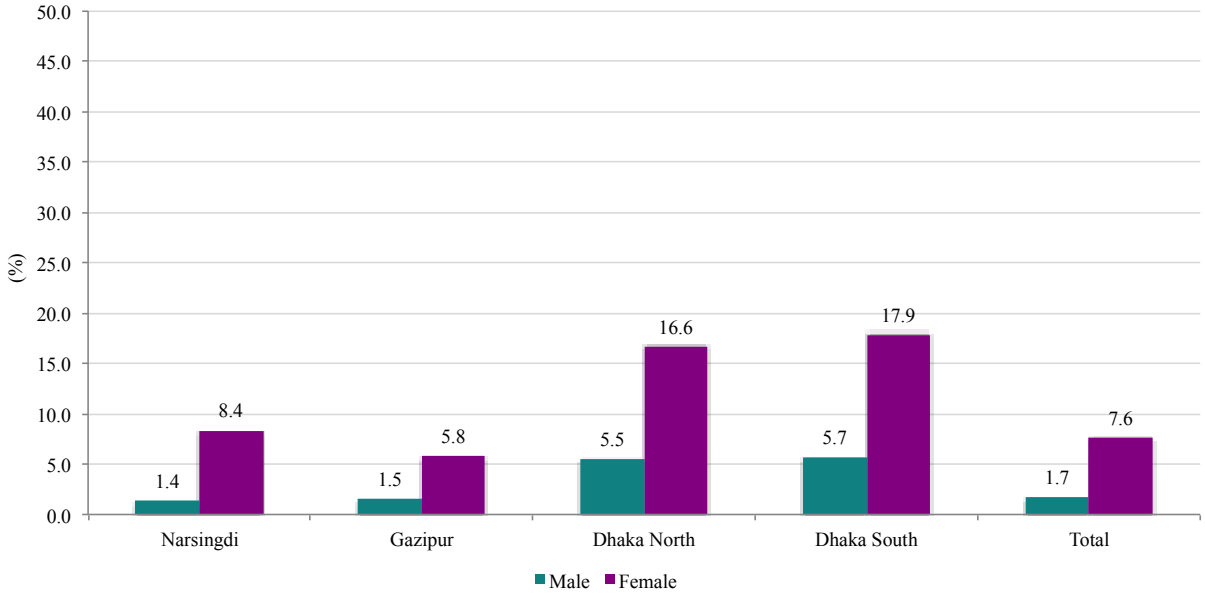


Figure 26a: Prevalence of obesity among >30 years old men and women by study site

We also analyzed data using Asian cut-off for BMI (Overweight 23.00 kg/m^2 to 27.49 kg/m^2; and obesity ≥27.50 kg/m^2). Overall, the prevalence of underweight was higher among males than the females and among the participants in the rural areas that the participants in the urban areas. On the other hand, the prevalence of overweight and obesity combined was higher among females than the males and among the participants on the urban areas that the participants in the urban areas. The prevalence of overweight and obesity combined among males ranged between 30.4% to 36.1% in the rural areas and between 51.3% to 60.0% in the urban areas. The prevalence of overweight and obesity combined among females ranged between 51.3% to 52.3% in the rural areas and between 71.4% to 72.9% in the urban areas (**Figure 26b**).

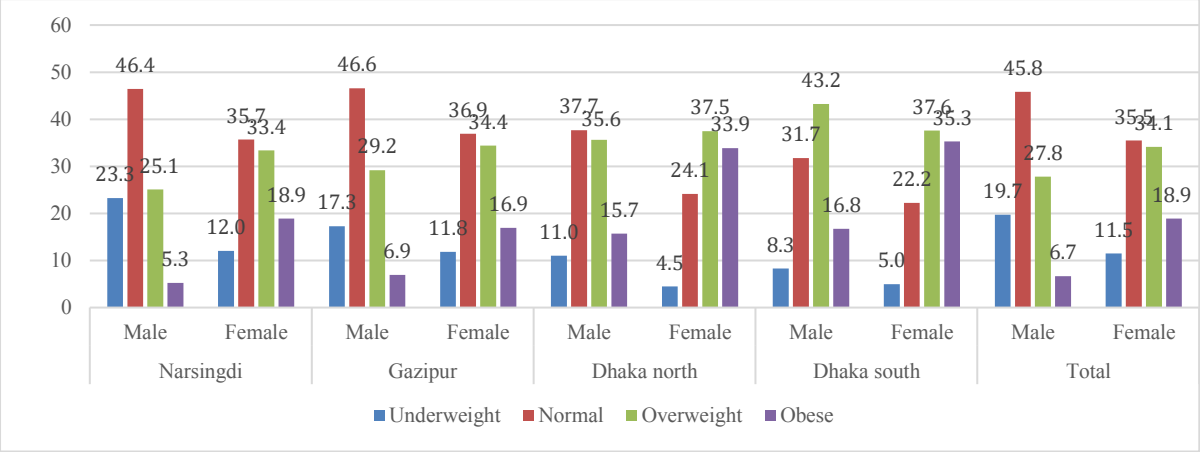


Figure 26b: Prevalence of underweight, overweight and obesity among >30 years old men and women by study site using Asian cut-off for BMI

We also looked at the prevalence of overweight and obesity by wealth quintile (using Asian cut-off). As we were not powered to perform sub-group analysis, we combined data from both rural and urban areas. **Table 7** and **8** below present data from the analyses. In the rural areas, the males in the lower quintiles had a higher prevalence of underweight than the males in other quintiles. If we combine overweight and obesity, males in the second lowest quintile had the lowest prevalence and the males in the highest wealth quintile had the highest prevalence. Among the females in the rural area, those in the fourth quintile had the lowest prevalence of underweight and the highest prevalence of overweight and obesity combined. Compared to males, the prevalence of overweight and obesity was higher among the females in the rural areas.

Table 7: Prevalence of underweight, normal, overweight, obesity in rural area by wealth quintile and gender

Wealth quintile	Male (Rural)				Female (Rural)			
	Underweight	Normal	Overweight	Obese	Underweight	Normal	Overweight	Obese
Lowest	30.0	46.9	25.9	6.2	12.8	40.2	32.7	14.3
Second	28.1	51.8	15.3	4.8	15.4	40.2	29.3	15.1
Middle	25.2	47.7	21.8	5.3	16.3	37.8	30.5	15.5
Fourth	13.1	45.7	31.1	10.1	4.0	30.2	44.8	21.0
Highest	13.4	40.1	39.7	6.9	9.5	31.9	35.4	23.2

In the urban areas, the males and females in the lower quintiles had a higher prevalence of underweight than the males and females in other quintiles. If we combine overweight and obesity, males in the lowest quintile had the lowest prevalence and the males in the fourth wealth quintile had the highest prevalence. Among the females, those in the highest wealth quintile had the highest prevalence of overweight and obesity combined. Compared to males, the prevalence of overweight and obesity is higher among the females in the urban areas (**Table 8**).

Table 8: Prevalence of underweight, normal, overweight, obesity in urban area by wealth quintile and gender

Wealth quintile	Male (Urban)				Female (Urban)			
	Underweight	Normal	Overweight	Obese	Underweight	Normal	Overweight	Obese
Lowest	16.7	46.6	28.7	8.0	7.0	36.8	39.0	17.1
Second	13.3	41.3	33.5	12.1	6.6	26.2	39.3	28.0
Middle	5.6	25.0	47.6	21.8	1.5	16.4	36.5	45.6
Fourth	6.0	21.7	48.9	23.5	3.1	18.3	37.1	41.5
Highest	5.3	32.5	42.5	19.7	4.0	17.3	37.0	41.8

WAIST CIRCUMFERENCE

In our study, high waist circumference (male ≥ 100 cm, female ≥ 90 cm) was found prevalent among nearly one-third of female participants (31.0%) though the proportion was much lower among the males (5.1%). A higher proportion of males and females from urban sites (Dhaka North: male-10.0%, female-41.6%; Dhaka South: male-9.6%, female-43.4%) were found to have higher waist circumference than their counterparts in rural sites (Narsingdi: male-4.6%, female-30.8%; Gazipur: male-4.9%, female-29.7%) (**Figure 27a**).

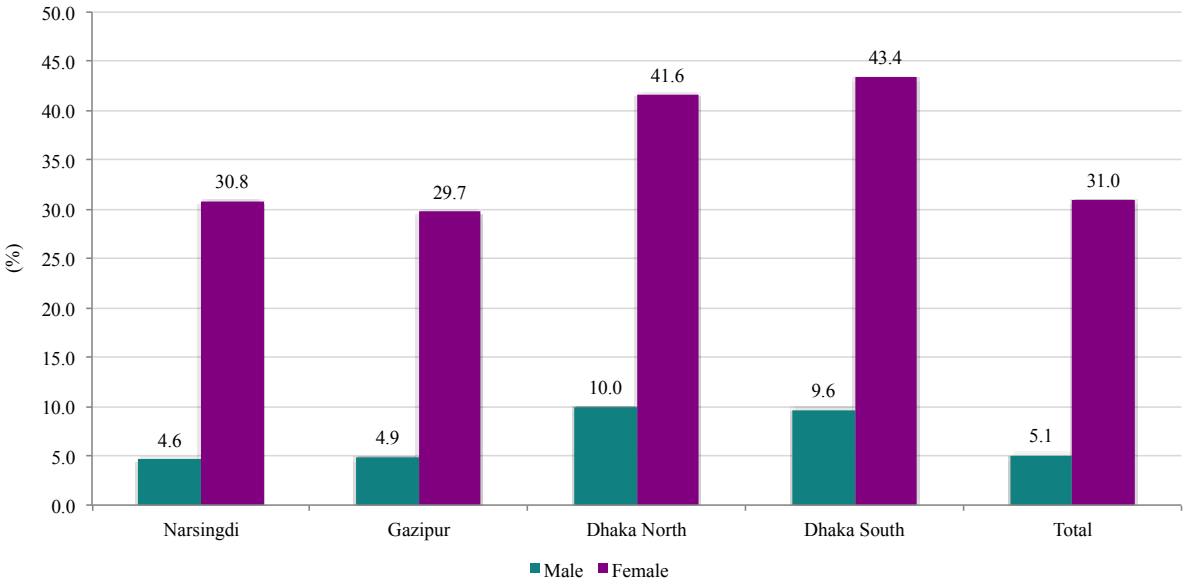


Figure 27a: Prevalence of high waist circumference (male ≥ 100 cm, female ≥ 90 cm) among >30 years old men and women by study site

We also analyzed data using Asian cut-off for waist circumference (very low: male <80 cm, female <70cm; low: male ≥80 cm to <90 cm, female male ≥70 cm to <80 cm; high: male ≥90 cm to <110 cm, female male ≥80 cm to <100 cm; and very high waist circumference male ≥110 cm, female male ≥100 cm). Overall, the prevalence of low waist circumference was higher among males than the females and among the participants in the rural areas than the participants in the urban areas. On the other hand, the prevalence of high and very high waist circumference combined was higher among females than the males and among the participants on the urban areas that the participants in the urban areas. The prevalence of high and very high waist circumference combined among males ranged between 21.8% to 29.3% in the rural areas and between 36.2% to 46.1% in the urban areas. The prevalence of high and very high waist circumference combined among females ranged between 63.2% to 63.6% in the rural areas and between 74.5% to 78.8% in the urban areas (**Figure 27b**).

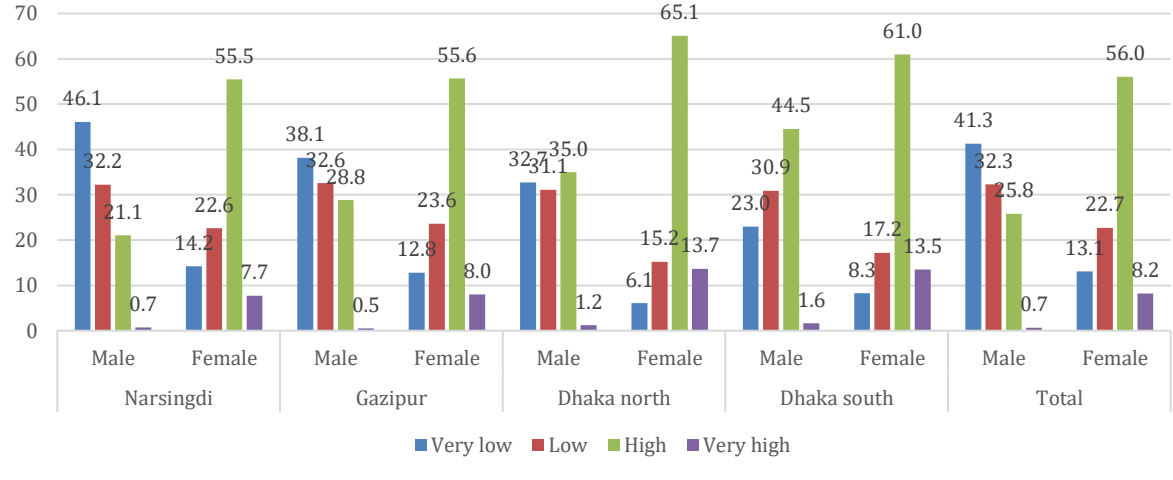


Figure 27b: Prevalence of very low, low, high and very high waist circumference among >30 years old men and women by study site (Using Asian cut-off)

In the rural areas, considering Asian cut-off for the waist circumference, it is evident that both males and females in the lower wealth quintiles had a higher prevalence of very low waist circumference. Women the higher wealth quintiles also had a higher prevalence of very high waist circumference (**Table 9**).

Table 9: Prevalence of very low, low, high, very high waist circumference in rural area by wealth quintile and gender

Wealth quintile	Male (Rural)				Female (Rural)			
	Very low	Low	High	Very high	Very low	Low	High	Very high
Lowest	46.1	29.2	24.3	0.4	14.34	26.4	54.3	4.9
Second	57.4	27.7	14.1	0.8	19.1	23.7	51.8	5.5
Middle	46.9	31.9	20.4	0.8	16.3	27.2	49.2	7.3
Fourth	29.8	37.4	31.7	1.1	5.7	18.6	64.9	10.9
Highest	32.1	33.3	34.6	0.0	9.9	20.6	59.1	10.3

In the urban areas, considering Asian cut-off for the waist circumference, it is evident that both males and females in the lower wealth quintiles had a higher prevalence of very low waist circumference. Women the higher wealth quintiles also had a higher prevalence of very high waist circumference (**Table 10**).

Table 10: Prevalence of very low, low, high, very high waist circumference in urban area by wealth quintile and gender

Wealth quintile	Male (Urban)				Female (Urban)			
	Very low	Low	High	Very high	Very low	Low	High	Very high
Lowest	48.4	30.4	20.8	0.4	14.5	25.6	53.3	6.6
Second	37.1	33.5	29.4	0.0	9.4	20.5	58.5	11.6
Middle	16.1	29.7	52.2	2.0	3.5	10.5	69.0	17.1
Fourth	12.0	28.7	56.9	2.3	2.7	13.0	67.3	17.0
Highest	19.0	34.5	44.7	1.8	4.5	11.4	68.3	15.9

HYPERTENSION

Prevalence (Using old criteria)

In our study, prevalence of hypertension was estimated separately for male and female participants using both old and new criteria of classification of hypertension. According to old criteria (hypertension: diastolic BP>90 mm Hg and/or Systolic BP>140 mm Hg as proposed by the American Heart Association in 2013), more than one-third female participants (38.1%) and nearly one-fourth of male participants (23.7%) were identified as having hypertension. Prevalence of hypertension was found higher among female than their male counterparts in all four study sites (Narsingdi, Gazipur, Dhaka north and Dhaka South). However, this difference was more obvious in rural sites (Narsingdi and Gazipur). In

Narsingdi and Gazipur district, respectively 17.0% and 13.0% more women were found having high blood pressure, whereas this difference was 3.6% and 5.7% in Dhaka North and Dhaka South respectively. Prevalence of hypertension was higher among urban male (Dhaka North-34.9%, Dhaka South-35.7%) than their rural counterparts (Narsingdi-21.2%, Gazipur-24.8%) (**Figure 28**).

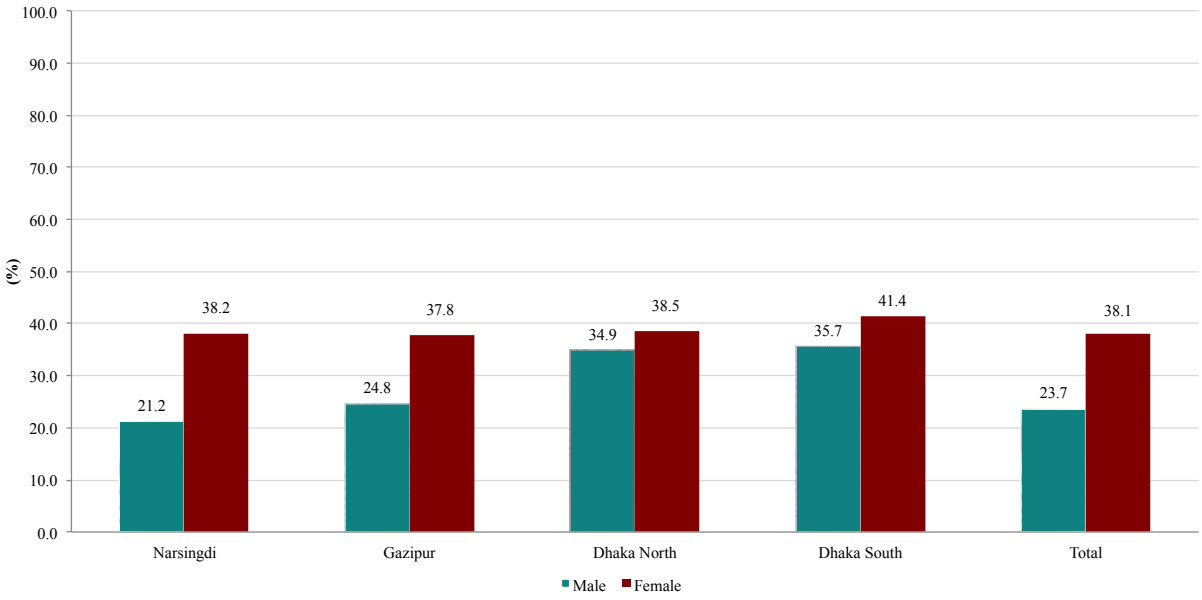


Figure 28: Prevalence of hypertension (using old criteria) among ≥30 years old men and women by study site

Prevalence (New criteria)

Following new criteria (hypertension: diastolic BP>80 mm Hg and/or Systolic BP>130 mm Hg as proposed by the American Health Association in 2018), 55.7% female participants and 46.1% male participants were identified as hypertensive. The prevalence of hypertension was also found higher among female participants in all the study sites (**Figure 29**).

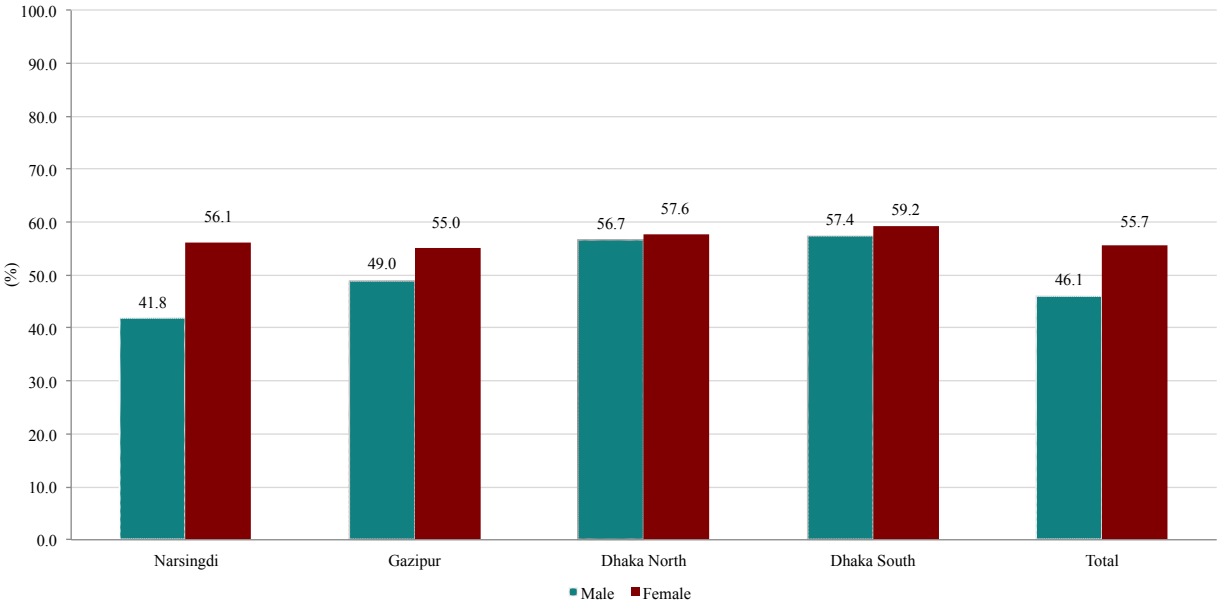


Figure 29: Prevalence of hypertension (new criteria) among >30 years old men and women by study site

Uncontrolled Hypertension

Our study revealed that, more than a quarter of hypertensive study participants (26.0%) were undetected (as per old criteria). Two-thirds (64.0%) of the detected cases sought health care for hypertension. However, just above half of the participants (54.0%) of the detected cases reported to take anti-hypertensive medication and 44.0% of those who are taking medications had their hypertension uncontrolled. While considering new criteria, more than half of hypertensive participants (54.0%) were undetected. Among the detected cases, nearly two-third (64.0%) sought health care. However, just above half of the participants (54.0%) seeking health care reported to take anti-hypertensive medication and 78.0% of those who were taking medicines had their hypertension uncontrolled (**Photo 7**).

Photo 7A: Undetected and uncontrolled hypertension

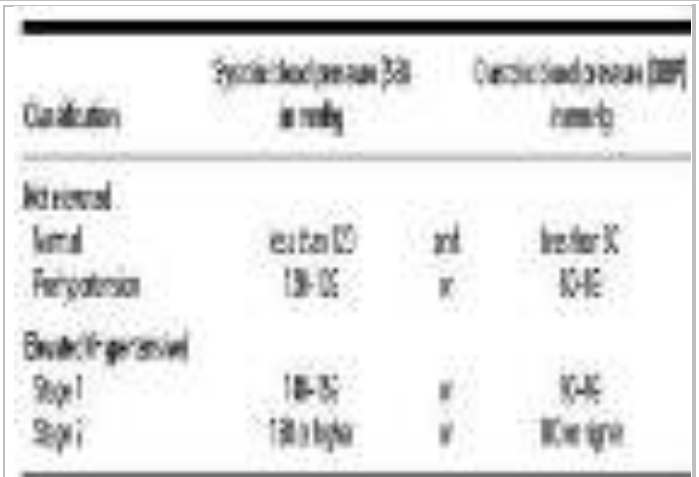


Photo 7B: Old classification of hypertension (American Heart Association, 2003)

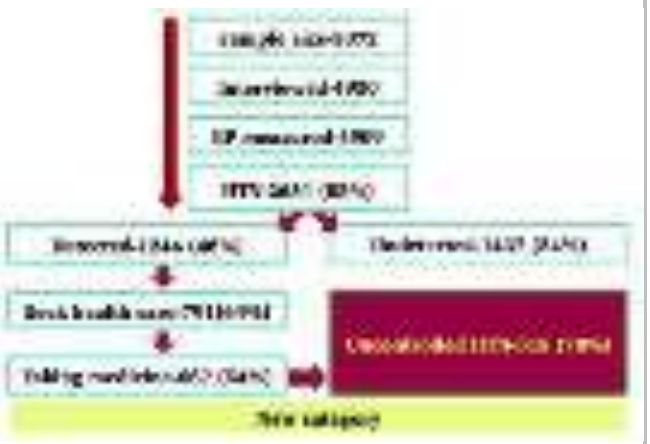


Photo 7C: Undetected and uncontrolled hypertension

Photo 7D: New classification of hypertension (American Heart Association, 2018)

Photo 7: Prevalence of undetected and uncontrolled hypertension

Knowledge

To assess the knowledge on hypertension, we asked the participants whether they heard about hypertension, its risk factors, complications, ways to control the disease and duration of taking medicine. almost all of our participants (95.2%, n=4740) reported that they heard about hypertension.

Knowledge on Risk Factor

When we asked about the risk factors of developing hypertension, majority of the participants mentioned stress/anxiety (52.1%) followed by too much food intake (27.0%), high salt intake (26.2%) and inadequate physical activity (23.9%). Geographical variation was observed among respondents' knowledge on risk factors for hypertension. Our study found that a higher proportion of the participants from Dhaka South could mention different risk factors (high salt intake-38.7%, inadequate physical activity-30.8%, stress/anxiety-79.2% and too much food intake-37.4%) compared to their counterparts in Dhaka North, Narsingdi and Gazipur. On the contrary, a lower proportion of participants from Narsingdi district identified inadequate physical activity (19.2%) and too much food intake (16.7%) as the risk factors for developing hypertension. High salt intake (19.4%) and stress/anxiety (27.5%) was mentioned less frequently by the participants from Dhaka North and Gazipur respectively (**Figure 30**).

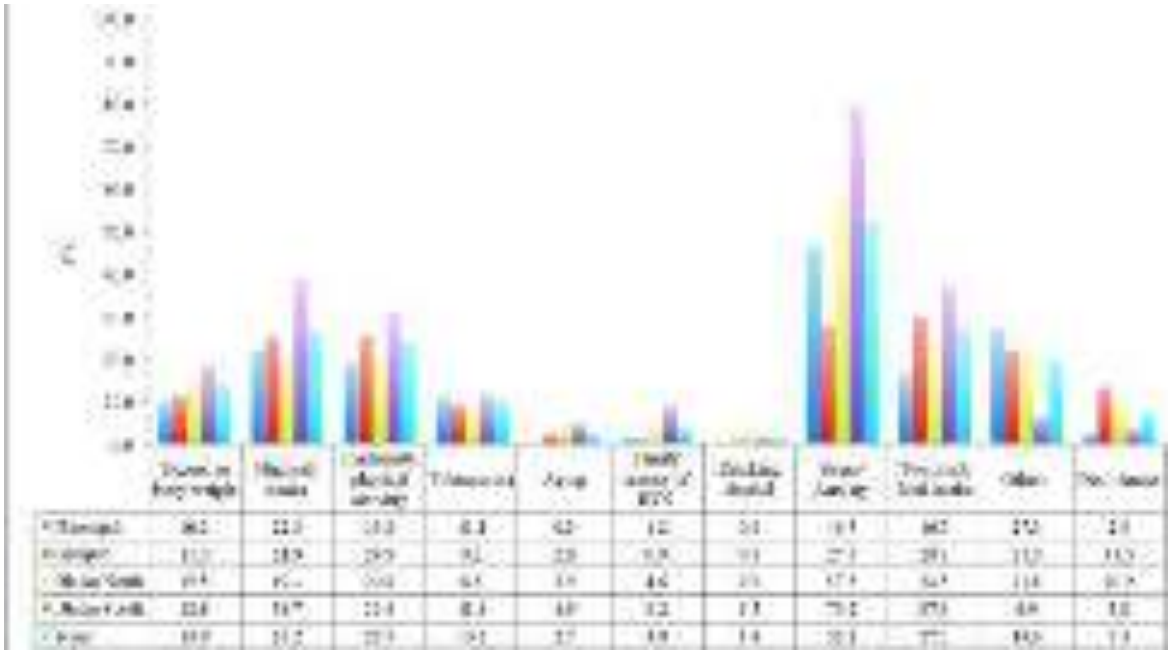


Figure 30: Knowledge on risk factors of hypertension

When the risk factors were analyzed by gender, it was revealed that almost similar proportion of male and female participants mentioned about high salt intake (male-26.5%, female-26.0%) as a risk factor for developing hypertension. However, stress/anxiety (male-54.1%, female-50.1%) and too much food intake (male-28.8%, female-25.2%) were stated more frequently by male participants than their female counterparts. Moreover, 8.6% less women considered inadequate physical activity as the risk factor of hypertension than their male counterparts (male-28.2%, female-19.6%) (**Figure 31**).

Knowledge on Complications

Amongst the complications of uncontrolled hypertension, brain stroke/paralysis was mentioned by nearly two-third of the participants (65.2%) followed by heart attack (38.6%). About one-third (30.9%) and just above one-fourth (27.3%) of the respondents mentioned vertigo and neck pain as the symptoms that develop as the consequence of uncontrolled hypertension. Similar to that of risk factors, participants' knowledge on complications showed some variation across the study sites. It was revealed from our study that more participants from Dhaka South could mention about different complications of uncontrolled hypertension more frequently (heart attack-58.9%, brain stroke/paralysis-72.0%, vertigo-39.5% and neck pain-44.4%) than the participants from other sites. Some participants identified that eye, kidney and blood vessels might be affected by uncontrolled hypertension and the proportion was comparatively lower in rural sites (around 5.0% in Narsingdi and Gazipur) than in urban sites (around 10.0% in Dhaka North and around 15.0% in Dhaka South) (**Figure 32**).

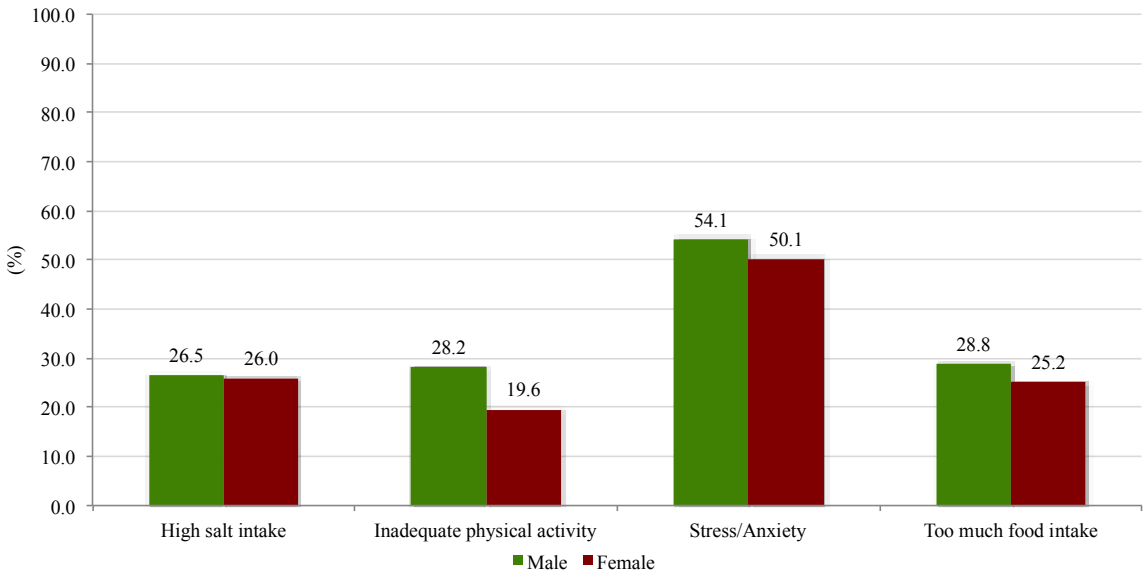


Figure 31: Gender wise distribution of knowledge on commonly stated risk factor (Hypertension)

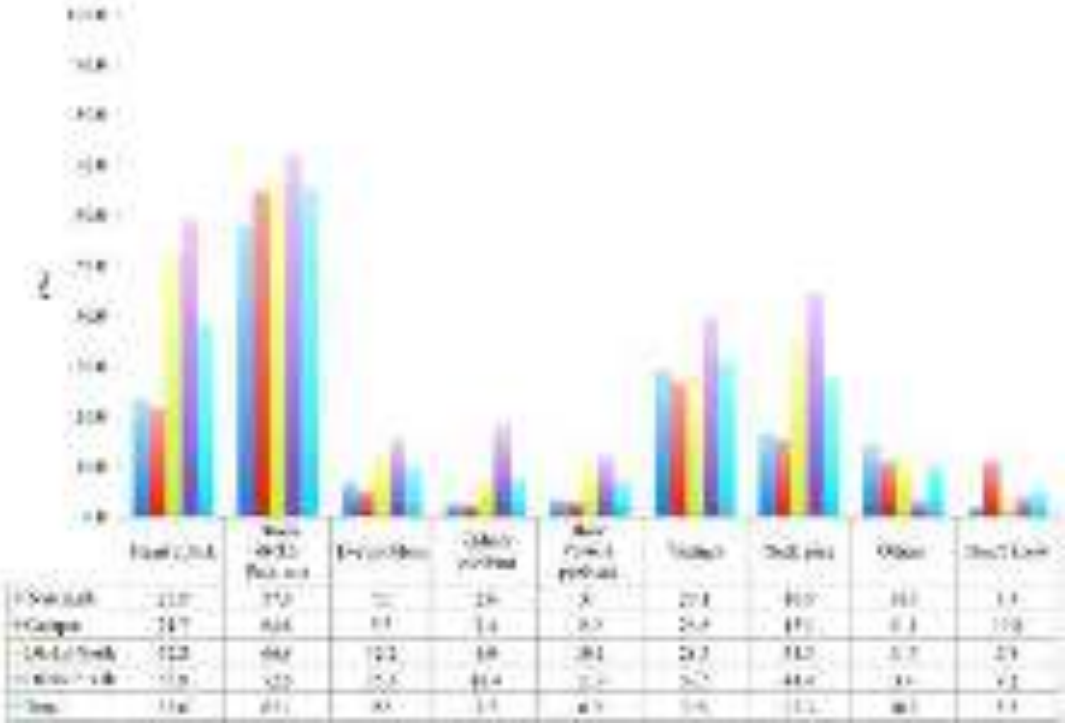


Figure 32: Knowledge on complications of hypertension

When segregated by gender, all commonly stated complications (e.g. heart attack, brain stroke/paralysis, vertigo and neck pain) were found to be reported less frequently by women than men (**Figure 33**).

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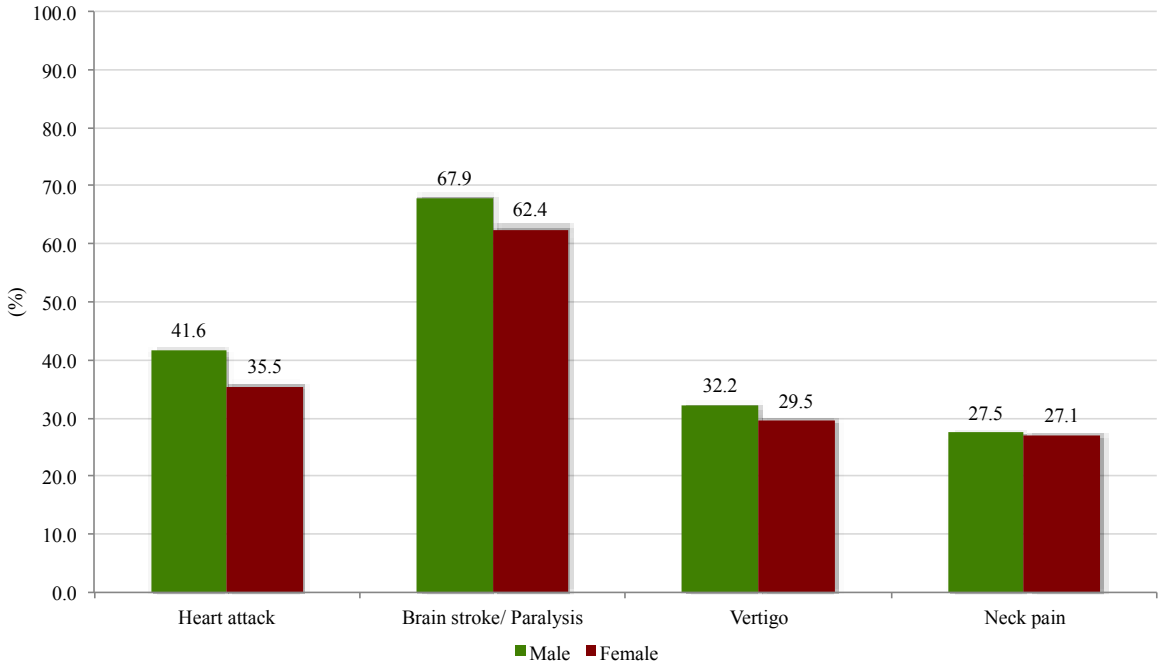
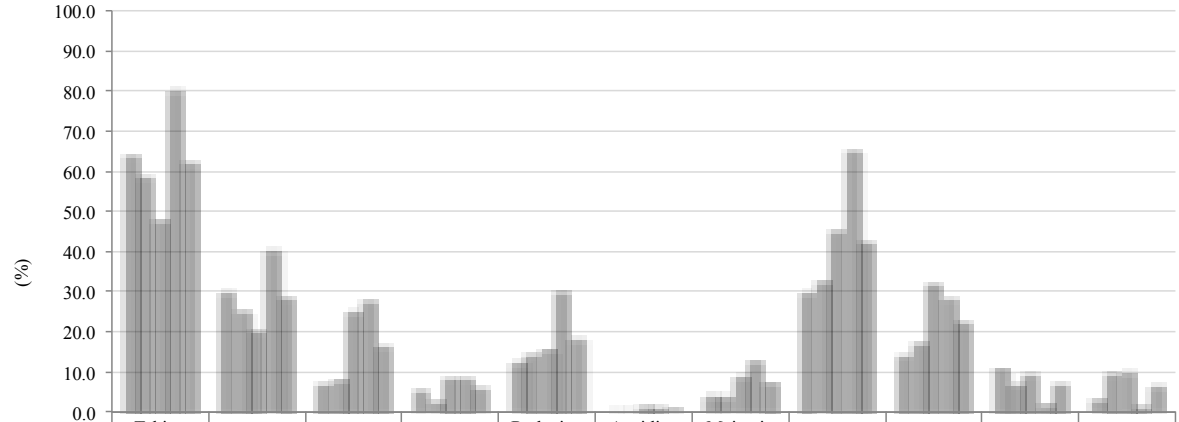


Figure 33: Knowledge on complication of hypertension by gender

Knowledge on Treatment and Control

Regarding the way to control hypertension, majority of the respondents stated about taking regular medication (62.8%), diet control e.g. eating less oily food and red meat (42.9%), performing exercise (29.0%) and eating sour food (23.1%). Some participants also stated that hypertension can be controlled by reducing salt intake (18.1%), by lessening stress (17.0%) and by maintaining normal body weight (7.3%). Geographical variation was found regarding participants' knowledge on ways to control hypertension. Compared to their rural counterparts, a higher proportion of urban participants identified less stress (urban: Dhaka North-25.0%, Dhaka South-28.0%; rural: Narsingdi-7.7%, Gazipur-8.3%), maintaining normal body weight (urban: Dhaka North-8.6%, Dhaka South-13.0%; rural: Narsingdi-4.0%, Gazipur-3.8%) and diet control (urban: Dhaka North-45.5%, Dhaka South-65.3%; rural: Narsingdi-29.6%, Gazipur-32.8%) as the measures of controlling hypertension (**Figure 34**).



	Taking medications regularly	Exercising	Less stress	Quitting smoking	Reducing extra salt in diet	Avoiding alcohol drinking	Maintain normal weight	Diet control	Eating sour food	Others	Don't know
Narsingdi	64.2	29.7	7.7	5.6	12.2	0.3	4.0	29.6	14.6	10.8	3.4
Gazipur	59.1	25.6	8.3	3.2	14.9	0.3	3.8	32.8	17.3	7.6	10.2
Dhaka North	48.0	20.7	25.0	9.0	15.5	2.1	8.6	45.5	32.5	10.1	9.8
Dhaka South	80.0	40.2	28.0	9.0	30.3	1.9	13.0	65.3	28.8	2.4	2.0
Total	62.8	29.0	17.0	6.6	18.1	1.1	7.3	42.9	23.1	7.8	6.4

Figure 34: Knowledge on ways to control hypertension

Our study also revealed that 6.0%, 7.0% and 3.5% more male participants respectively mentioned about taking regular medication, exercising and diet control as the ways to keep hypertension under control. Nevertheless, a slightly higher proportion of women considered less stress, reducing extra salt intake and eating sour food as the means to control hypertension (**Figure 35**).

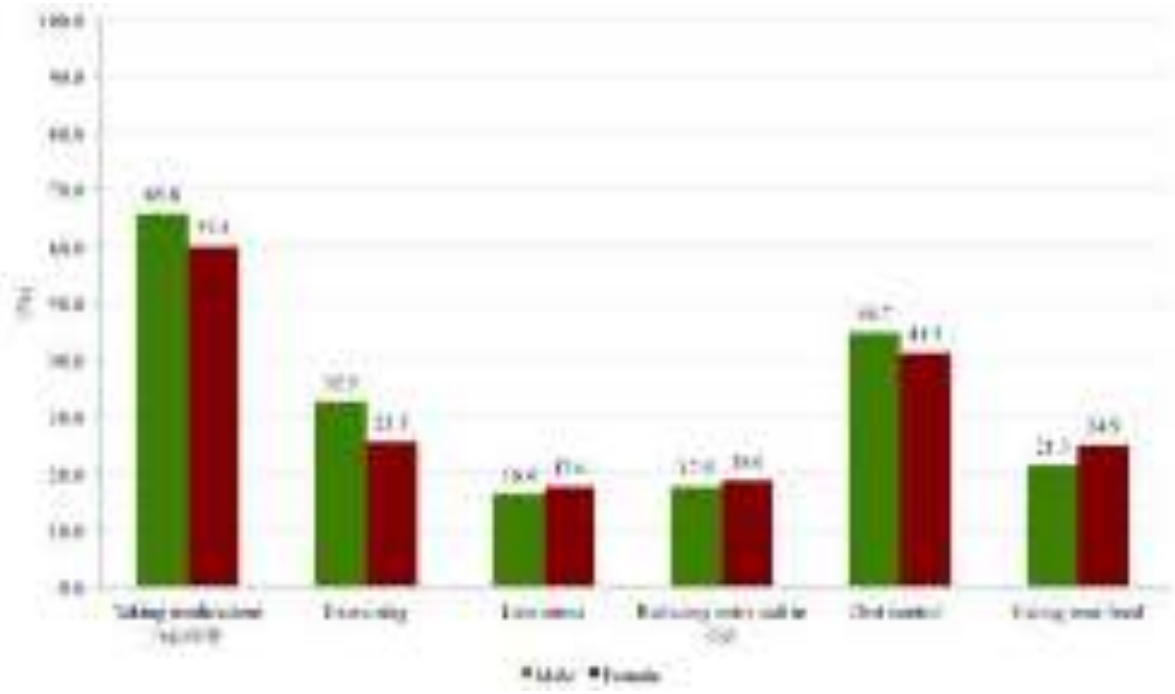
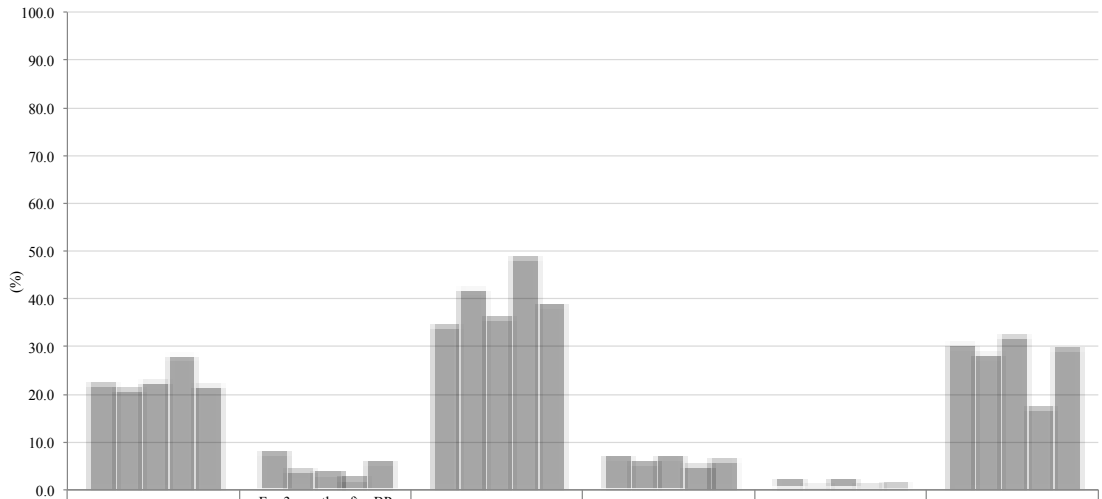


Figure 35: Knowledge on ways to control hypertension by gender

While we asked participants how long a person should take anti-hypertensive medication, more than one-third (38.0%) of them stated that hypertensive patients should take medicine for life long, though, a a lot of participants (28.9%) said that they did not know the duration. Noticeably, about one out of every five participants (21.4%) reported that anti-hypertensive medication should be taken until the blood pressure returns to normal. Among the participants who stated that hypertensive patients should take medicine for life long, the highest proportion was from Dhaka South (48.2%) and the lowest proportion was from Narsingdi district (33.7%). On the contrary, among the participants who reported that they did not know the duration of taking anti-hypertensive medicine, a higher proportion of participants were from Dhaka North (31.6%) and Narsingdi (30.2%) and a lower proportion was from Dhaka South (16.8%) (**Figure 36**).



	Until BP returns to normal	For 3 months after BP returns to normal	Life long	Only when BP is elevated	Others	Don't know
Narsingdi	21.5	7.2	33.7	6.3	1.2	30.2
Gazipur	20.7	3.7	41.8	5.1	0.4	28.3
Dhaka North	22.3	3.1	35.5	6.2	1.3	31.6
Dhaka South	27.8	2.0	48.2	4.6	0.5	16.8
Total	21.4	5.2	38.0	5.7	0.8	28.9

Figure 36: Knowledge on how long a patient should take antihypertensive medication

It was revealed from our study that, a slightly higher proportion of female participants stated that hypertensive patients should take medicine for life long (male-20.7%, female-22.0%) or until the blood pressure returns to normal (male-36.0%, female-40.1%). (**Figure 37**).

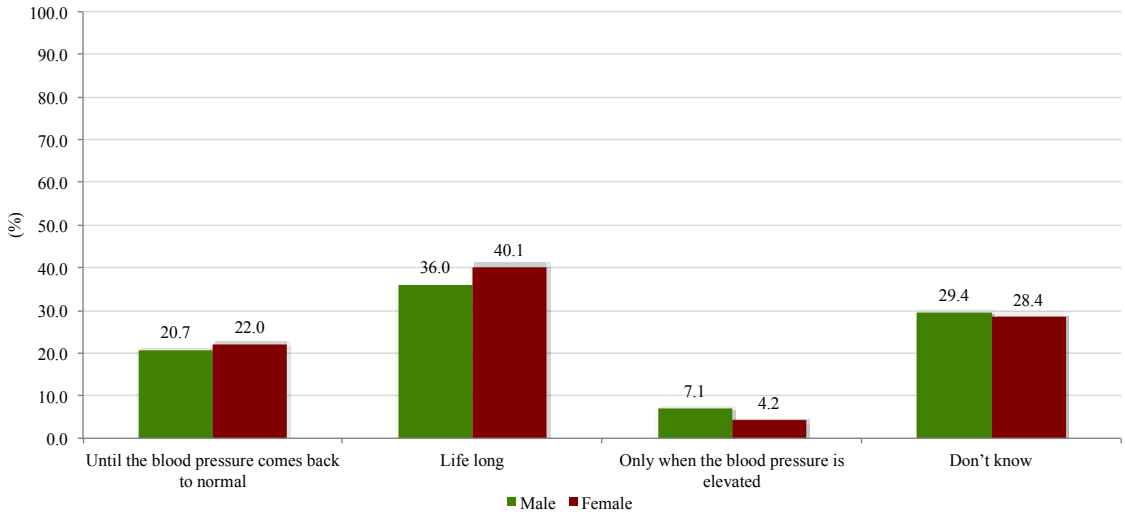
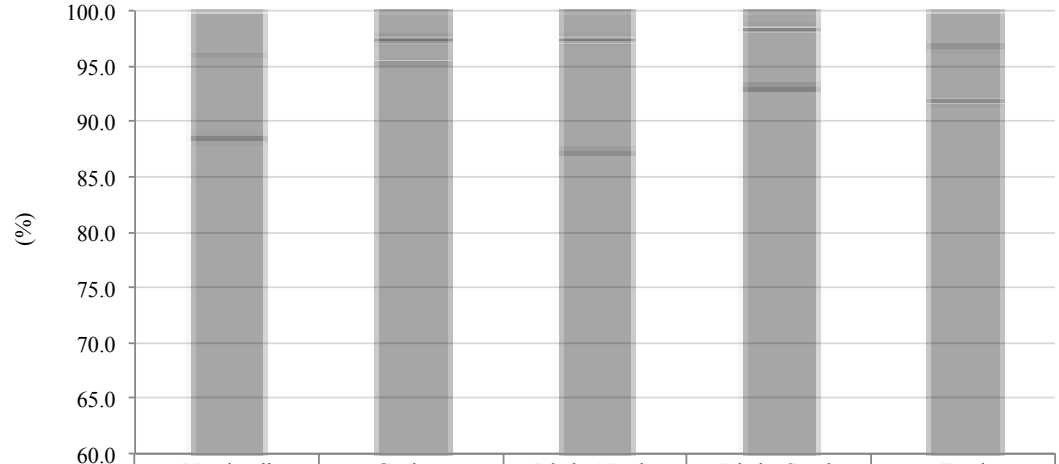


Figure 37: Knowledge on how long a patient should take anti hypertensive medication by gender

Attitude

In our study, attitude towards hypertension was evaluated by asking how important it was to keeping control high blood pressure, whether changing lifestyle help to lower blood pressure, whether hypertension is a curable disease and whether hypertension is a life-long disease. Among the respondents, almost all stated that control of blood pressure is very important (Narsingdi-88.5%, Gazipur-95.4%, Dhaka North-87.3%, Dhaka South-93.0%; total-91.9%). Among those who stated control hypertension is somewhat important, a higher proportion was from Dhaka North (10.1%) followed by Narsingdi (7.4%) and Dhaka South (5.4%) (**Figure 38**).



	Narsingdi	Gazipur	Dhaka North	Dhaka South	Total
Don't know	4.0	2.5	2.5	1.6	3.2
Not at all important	0.1	0.1	0.1	0.0	0.1
Somewhat important	7.4	2.0	10.1	5.4	4.9
Very important	88.5	95.4	87.3	93.0	91.9

Figure 38: Attitude on importance of controlling blood pressure

Almost all of our participants also thought that life style change could help lowering blood pressure (92.7%) and this proportion was highest in Dhaka South (95.3%) and the lowest in Dhaka North (90.7%) (**Figure 39**).

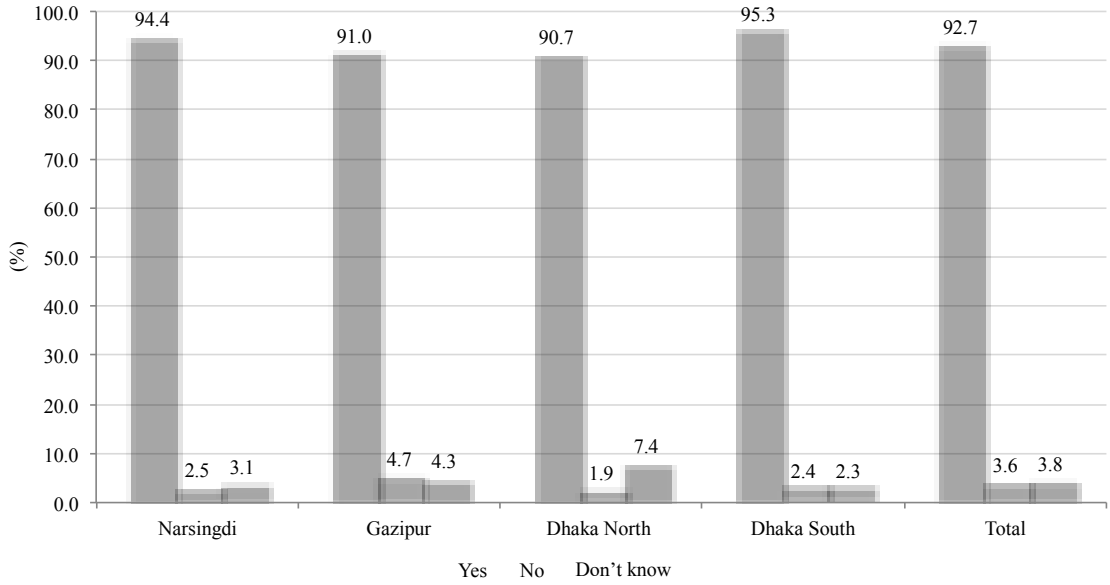


Figure 39: Attitude on whether changing lifestyle help to lower blood pressure

Though majority of the participants (71.7%) stated that hypertension is a life-long disease, it was noticeable that around one-fifth of participants from each of Narsingdi (21.0%) and Dhaka North (20.0%) thought that hypertension is not a life-long disease. Similar finding was observed in case of participants' attitude towards curability of hypertension. Among our respondents, more than two-third (68.9%) indicated that hypertension is not a curable disease though 27.3%, 16.5%, 30.1% and 27.1% participants from Narsingdi, Gazipur, Dhaka North and Dhaka South respectively expressed opposite view (**Figure 40**).

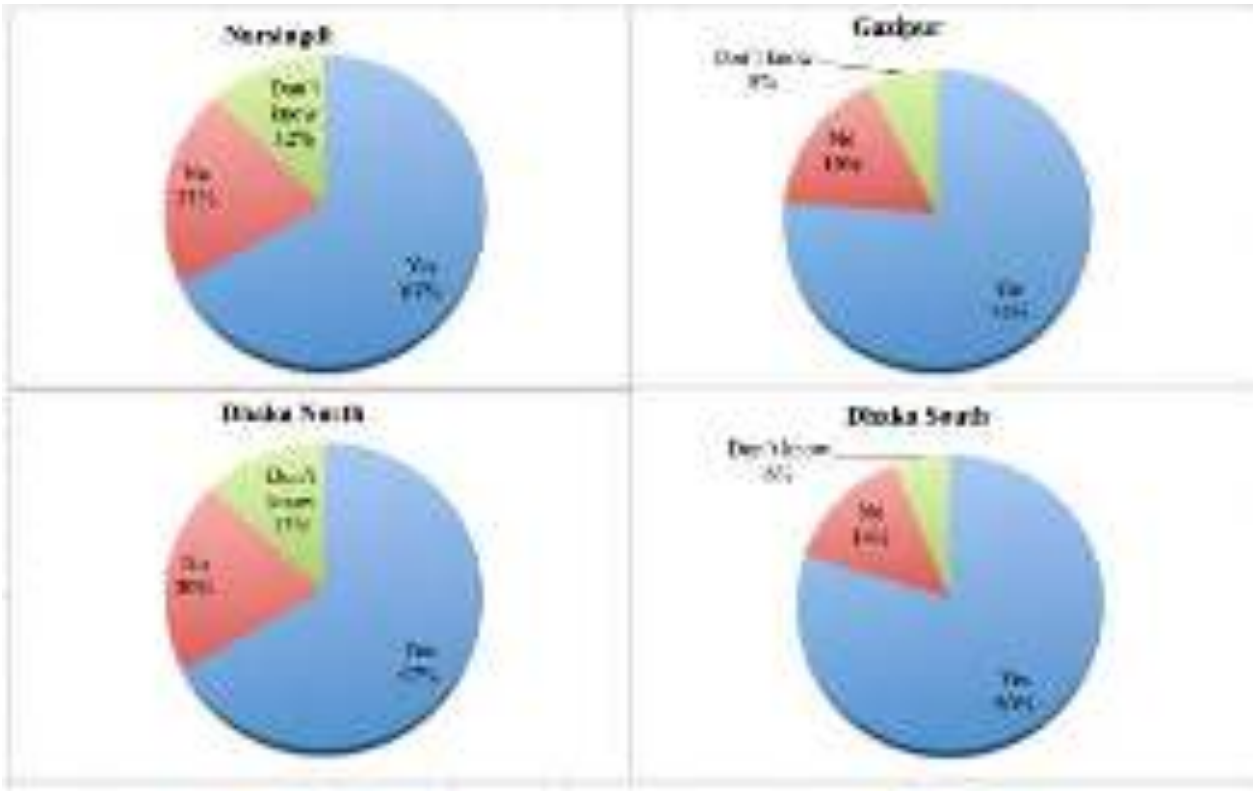


Figure 40: Attitude on whether hypertension is a lifelong disease

Health Care Seeking Practice

In our study, we intended to understand health care seeking practice of participants who were previously diagnosed as hypertensive (according to old criteria) by any health care provider (n=1244). It was revealed from the study that 59.0% of participants (n=791) who had hypertension sought care for this condition. It means an alarmingly high proportion (41.0%) stated that they did not seek any kind of health care for high blood pressure despite of being aware of having the condition (**Figure 41**).

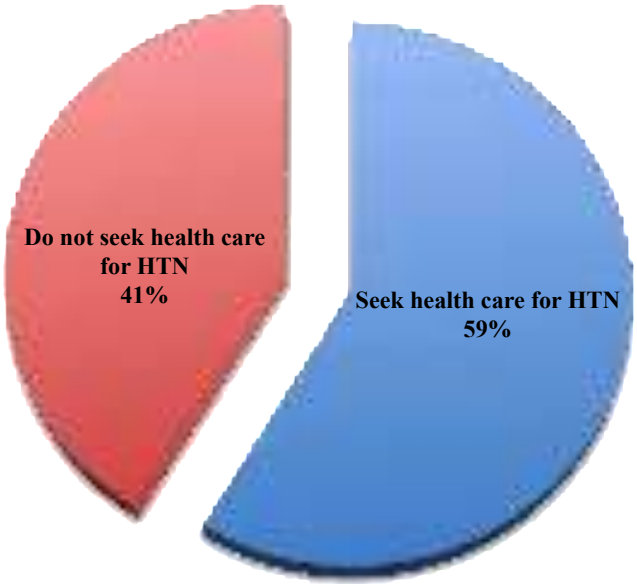


Figure 41: Health care seeking practice of hypertensive patients (Overall)

When we looked at the geographical and gender wise distribution of these participants (n=791), it was revealed that in Gazipur (male-47.3%, female-61.3%) and Dhaka North (male-56.7%, female-69.5%), a much higher proportion of female participants sought care for hypertension than their male counterparts. More women were also found to seek care for high blood pressure in Narsingdi and Dhaka South (**Figure 42**).

Health Care Provider

Majority of study participants (n=791) sought health care for hypertension from doctors (74.2%) followed by the pharmacists/drug sellers (29.8%). A few participants also stated that they went to rural medical practitioners (7.7%) for care of hypertension. However, none of our respondents sought care from the sub-assistant community medical officers (SACMO). A higher proportion of participants from urban residence (Dhaka South-88.2%, Dhaka North-69.5%) reported that they went to doctors to seek health care for hypertension. On the contrary, pharmacists/drug sellers were visited more by participants residing in rural sites (Gazipur-45.5%, Narsingdi-33.6%). Rural participants were also visited rural medical practitioners more frequently. However, the proportion was higher among participants of Gazipur (25.2%) than that of Narsingdi (14.7%) (**Figure 43**).

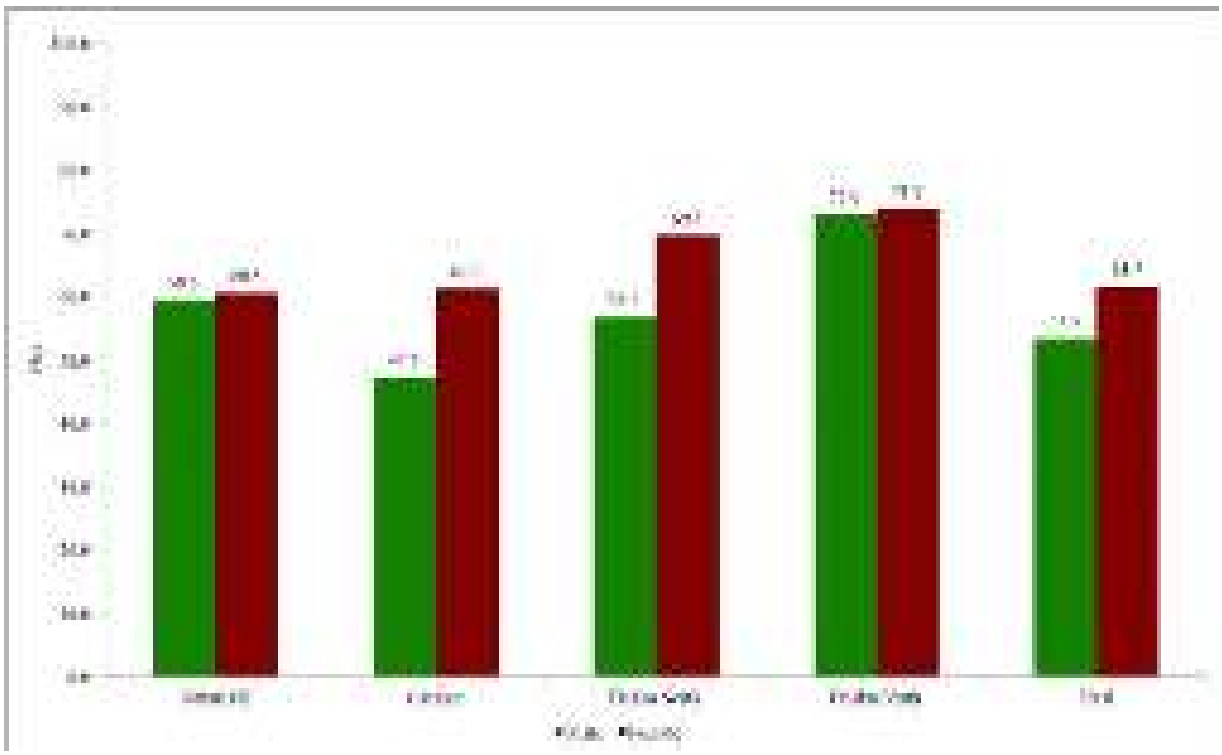


Figure 42: Hypertensive participants seeking health care by study sites and gender

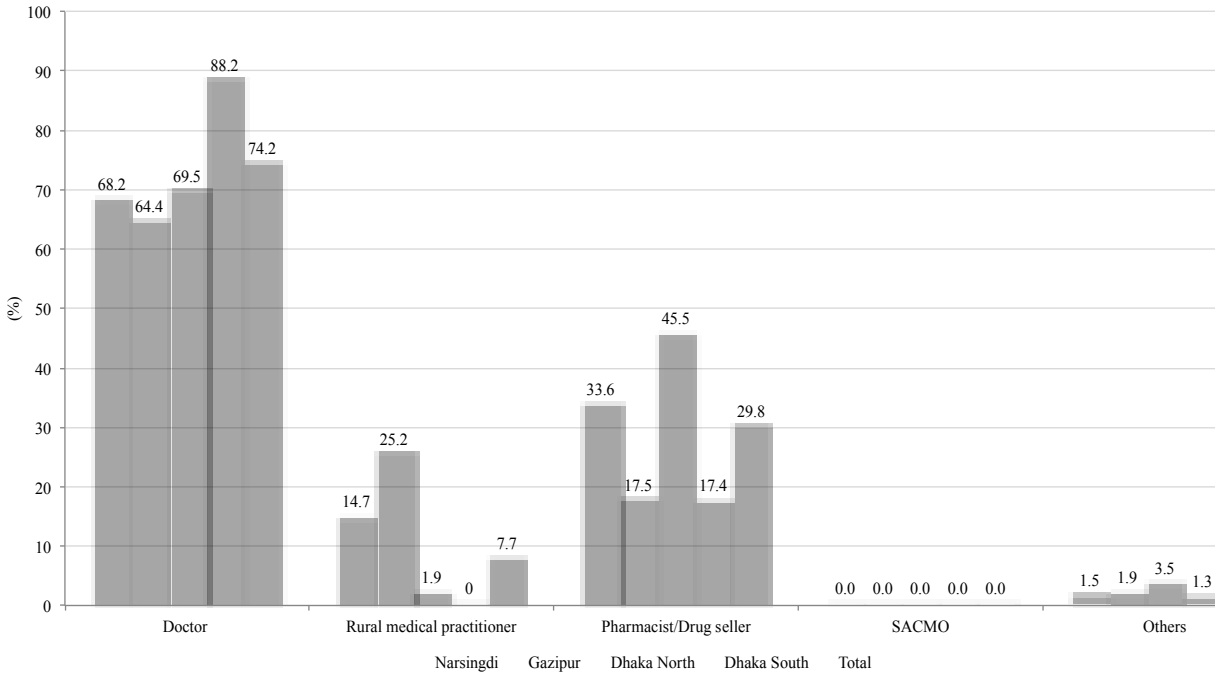


Figure 43: Health care providers from whom hypertensive patients sought care for hypertension

In the rural areas, majority of the males and females were seeking health care from qualified doctors. In case of males, 56.5% in the lowest wealth quintile saw a doctor for the treatment of hypertension whereas 75% in the highest wealth quintile saw a doctor for this purpose. A significant proportion of males in all the wealth quintiles (14.8% to 39.1%) sought health care from rural medical practitioners. Compared to the highest two wealth quintiles, more males in the lowest three wealth quintiles were seeking care from rural medical practitioners. In case of females, overall, more participants sought care from pharmacists/drug-sellers than their male counterparts **(Table 11)**.

Table 11: Health care providers for hypertension in rural area by wealth quintile and gender

Wealth quintile	Male (Rural)			Female (Rural)		
	Doctor	Pharmacist/Drug seller	Rural medical practitioner	Doctor	Pharmacist/Drug seller	Rural medical practitioner
Lowest	56.5	17.4	39.1	75.7	24.3	10.8
Second	63.6	0.0	36.4	50.0	44.1	26.5
Middle	68.4	10.5	31.6	57.9	50.0	5.3
Fourth	70.4	22.2	14.8	64.7	39.2	11.8
Highest	75.0	6.3	18.8	75.0	29.2	14.6

In the urban areas, in the 4 higher wealth quintiles, majority of the males and females were seeking health care from qualified doctors. In the lowest quintile, for both males and females, most of the participants were (76.5% for males and 57.1% for females) sought care from pharmacists/drug sellers **(Table 12)**.

Table 12: Health care providers for hypertension in rural area by wealth quintile and gender

Wealth quintile	Male (Urban)			Female (Urban)		
	Doctor	Pharmacist/Drug seller	Rural medical practitioner	Doctor	Pharmacist/Drug seller	Rural medical practitioner
Lowest	29.4	76.5	5.9	47.6	57.1	4.8
Second	73.1	26.9	0.0	71.8	35.9	0.0
Middle	93.1	12.1	0.0	85.5	22.4	1.3
Fourth	83.3	28.6	0.0	84.9	28.8	0.0
Highest	83.7	34.9	0.0	82.5	30.2	1.6

Place of BP Measurement

Our study revealed that majority of participants (n=927, including non-hypertensive participants too) measures their blood pressure at nearby dispensary (51.9%) and doctors' chamber (40.8%). A few participants also stated that they usually go to private clinics (5.6%) and diabetic hospitals (5.2%) for checking blood pressure. However, primary and secondary level government health facilities (Community clinic, Union health and family planning center, Upazilla Health Complex and District hospital) collectively were utilized by <3.0% of the study participants for the purpose of measuring blood pressure. It was also found that a lot of participants from Dhaka South measured their blood pressure at home (18.2%) but also at doctors' chamber (49.2%) and diabetic hospitals (8.1%) more frequently than their counterparts in other sites. However, a higher proportion of respondents from Narsingdi (61.9%) and Dhaka North (12.8%) went to nearby dispensary and private clinics respectively for measuring their blood pressure (**Table 13**).

Table 13: Place of blood pressure measurement of hypertensive study participants (n=927)

Place	Narsingdi	Gazipur	Dhaka North	Dhaka South	Overall
Home	4.4	2.3	11.8	18.2	10.1
Nearby dispensary	61.9	56.3	51.7	42.0	51.9
Doctor's chamber	42.5	33.3	36.0	49.2	40.8
Private clinic	1.9	4.0	12.8	3.0	5.6
Community clinic	0.0	1.2	0.0	0.4	0.4
Union health and family planning center	0.6	0.0	0.0	0.0	0.1
Upazilla Health Complex	0.0	5.2	0.0	0.0	1.2
District hospital	1.9	1.7	0.0	0.4	0.9
Diabetic hospital	3.8	2.9	4.9	8.1	5.2
Government Medical College Hospital	0.0	2.3	3.0	0.9	1.6
Others	1.3	1.7	4.9	1.3	2.3

DIABETES

Prevalence

In our study, self-reported prevalence of diabetes was estimated separately for male and female participants. Among the study participants 8.5% male and 10.6% female reported that health care providers diagnosed them as having diabetes. This prevalence was found highest among the participants of Dhaka South (male-14.8%, female-17.5%) followed by Dhaka North (male-11.3%, female-14.4%). However, a lower proportion of participants from Narsingdi reported to have diabetes (male-6.6%, female-8.4%). Prevalence of diabetes was also found higher among female participants than their male counterparts in all four study sites (**Figure 44**).

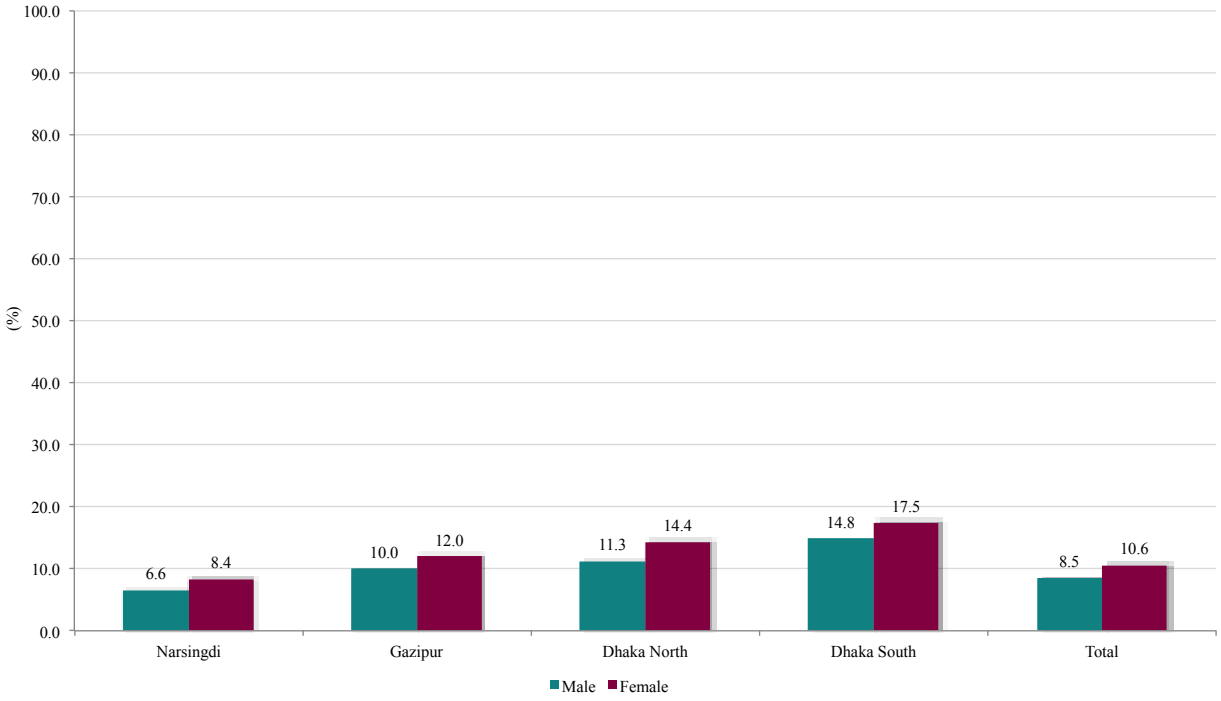


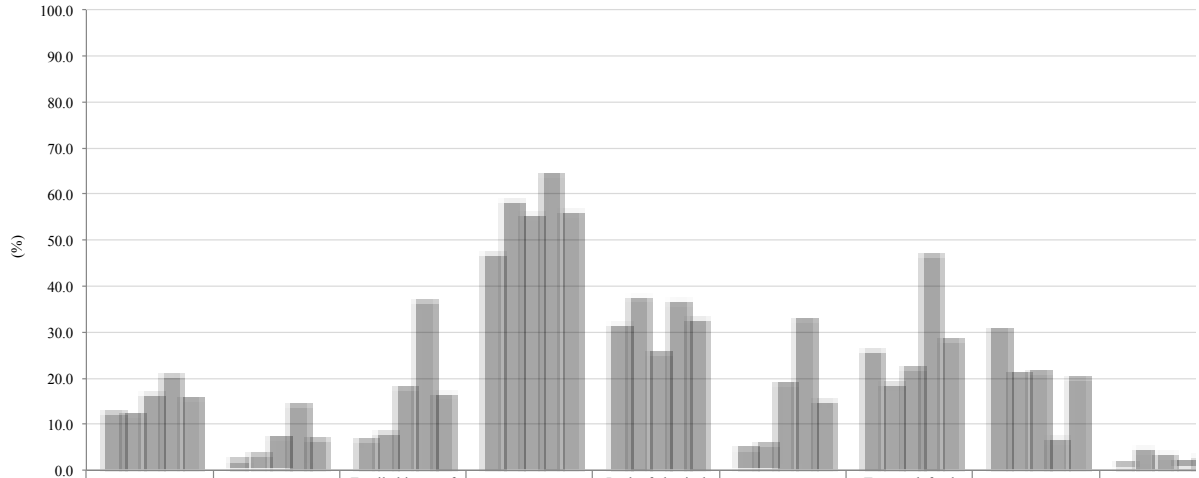
Figure 44: Prevalence of diabetes (self-reported) among >30 years old men and women by study site

Knowledge

To assess the knowledge on diabetes, we asked participants whether they heard about diabetes, its risk factors, complications, ways to control the disease and duration of taking medicine. Among our study participants, almost all (96.2%, n=4738) reported that they heard about diabetes.

Knowledge on Risk Factor

When asked about the risk factors of diabetes, majority of the participants mentioned about high sugar intake (52.1%) followed by lack of physical activity (32.7%) and too much food intake (27.8%). Some participants also identified family history of diabetes (16.5%), being fat/overweigh (14.9%) and mental stress (14.6%) as the risk factor of developing diabetes. However, about one-fifth (19.7%) of our study participants stated that they did not know the risk factors of diabetes. Geographical variation was observed among respondents' knowledge on risk factors of developing diabetes. Our study revealed that a higher proportion of participants from Dhaka South could mention different risk factors of diabetes (fat or overweight-20.1%, family history of diabetes-36.0%, high sugar intake-63.7%, mental stress-32.1%, too much food intake-46.2%) except for lack of physical activity, which was stated most frequently by the participants of Dhaka North (37.4%). Nearly one-third of participants from Narsingdi and one-fifth of participants from Dhaka North could not mention the risk factors of diabetes (**Figure 45**).



	Fat or overweight	Hypertension	Family history of diabetes	High sugar intake	Lack of physical activities	Mental stress	Too much food intake	Don't know	Others
Narsingdi	12.3	2.0	6.0	46.8	31.5	4.3	25.7	30.0	1.0
Gazipur	11.5	2.9	8.0	58.0	37.4	5.2	18.4	20.4	4.6
Dhaka North	16.3	6.6	17.3	55.4	25.0	18.3	21.7	20.9	3.4
Dhaka South	20.1	13.6	36.0	63.7	36.6	32.1	46.2	6.7	1.4
Total	14.9	6.2	16.5	55.9	32.7	14.6	27.8	19.7	2.6

Figure 45: Knowledge on risk factors of diabetes

When these risk factors were distributed by gender, it was revealed that almost similar proportion of male and female participants mentioned about being fat or overweight (male-15.2%, female-14.7%), family history of diabetes (male-17.7%, female-15.3%) and mental stress (male-14.6%, female-14.7%) as risk factor of developing diabetes. A slightly higher proportion of male participants mentioned about high sugar intake (male-57.6%, female-54.2%) and too much food intake (male-30.2%, female-25.4%) as risk factors of diabetes. Noticeably, 12.6% less female identified lack of physical activity as the risk factor of diabetes in comparison to their male counterparts. The proportion of participants who did not know the risk factor of developing diabetes (male-23.3%, female-16.1%)was also higher among female participants. (**Figure 46**).

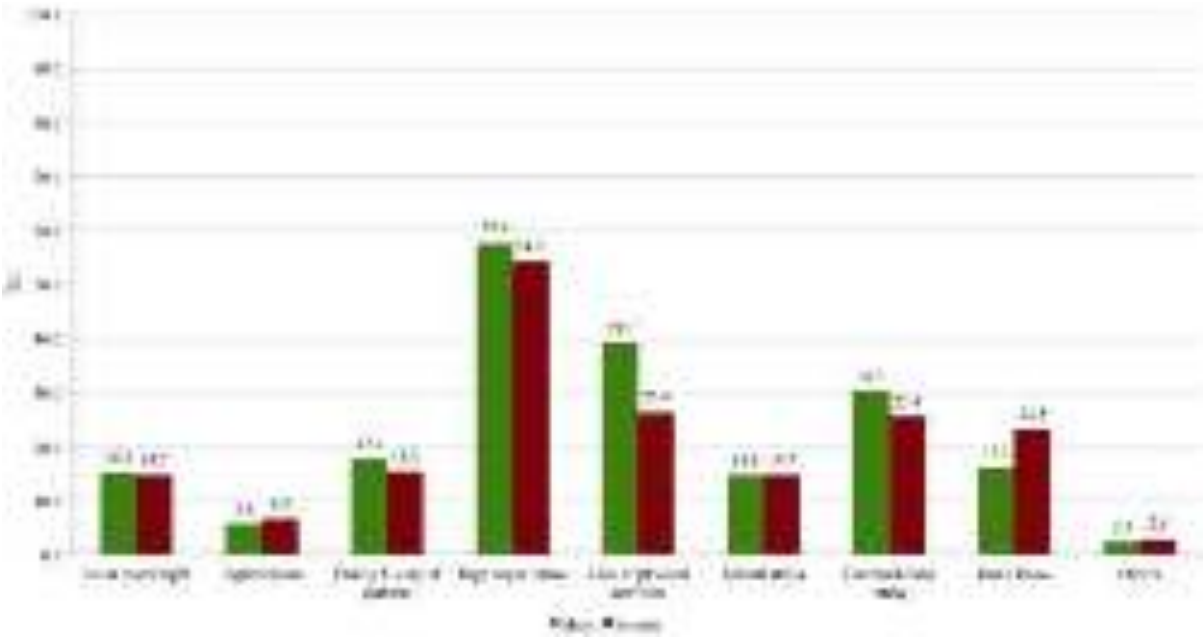
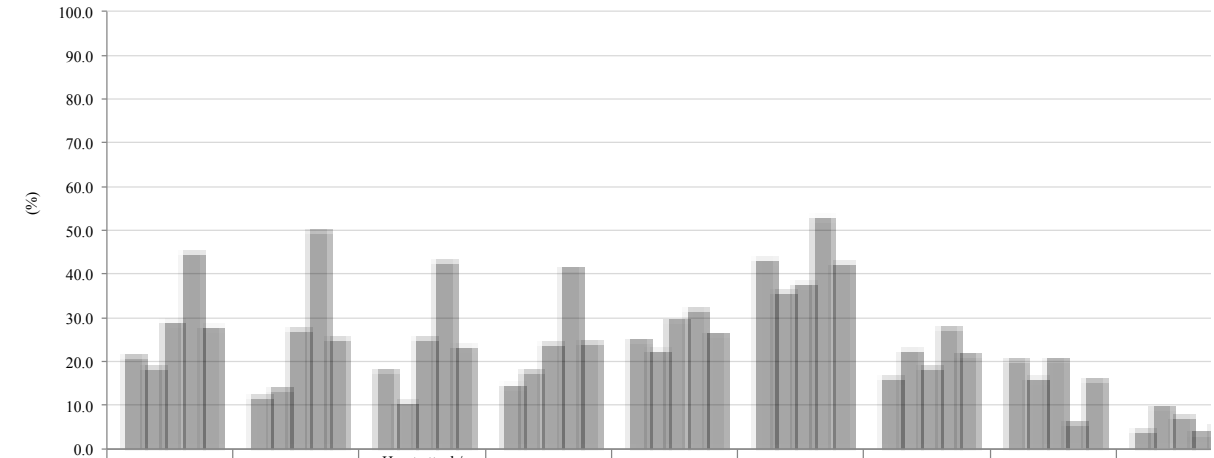


Figure 46: Knowledge on risk factor of diabetes by gender

Knowledge on Complications

Amongst the complications of uncontrolled diabetes, weakness (42.2%), eye problem (27.7%) and diabetic foot (26.5%) were mentioned most frequently by the participants. Participants also stated that kidney problem (24.8%), heart attack/ heart disease (23.4%), brain stroke/paralysis (23.7%) and premature death (20.8%) can take place if diabetes is not controlled. However, 15.1% participants stated that they did not know the complications of uncontrolled diabetes. Similar to that of hypertension, participants' knowledge on complications of diabetes showed geographical variation across the study sites. It was revealed from our study that complications like eye problem (urban: Dhaka North-28.8%, Dhaka South-44.4%; rural: Narsingdi-20.5%, Gazipur-18.2%), kidney problem (urban: Dhaka North-27.0%, Dhaka South-49.2%; rural: Narsingdi-11.6%, Gazipur-12.9%), heart attack/ heart disease (urban: Dhaka North-24.8%, Dhaka South-42.3%; rural: Narsingdi-17.4%, Gazipur-10.4%) and brain stroke/ Paralysis (urban: Dhaka North-23.6%, Dhaka South-40.6%; rural: Narsingdi-14.5%, Gazipur-17.2%) were mentioned more frequently by urban participants than the rural participants. A higher proportion of participants from Dhaka South (52.8%) followed by Narsingdi (43.1%) reported that weakness can be developed if diabetes is not controlled. Preemature death as a complication of diabetes was mentioned less frequently by the participants residing in Narsingdi (15.9%). (**Figure 47**).



	Eye problem	Kidney problem	Heart attack/ Heart disease (Angina & MI)	Brain stroke/ Paralysis	Diabetic foot (ulcer)	Weakness	Premature death	Don't know	Others
Narsingdi	20.5	11.6	17.4	14.5	24.2	43.1	15.9	19.5	3.9
Gazipur	18.2	12.9	10.4	17.2	22.3	35.6	22.4	15.8	8.9
Dhaka North	28.8	27.0	24.8	23.6	28.6	37.6	18.2	19.7	7.2
Dhaka South	44.4	49.2	42.3	40.6	31.4	52.8	27.1	5.2	3.3
Total	27.7	24.8	23.4	23.7	26.5	42.2	20.8	15.1	5.8

Figure 47: Knowledge on complications of diabetes

When segregated by gender, all complications were stated in higher proportion by male participants than their female counterparts except for diabetic foot/ ulcer, which was reported more frequently by female participants (male-25.9%, female-27.1%). Female participants also stated more than the male participants that they did not know the complications of uncontrolled diabetes (**Figure 48**).

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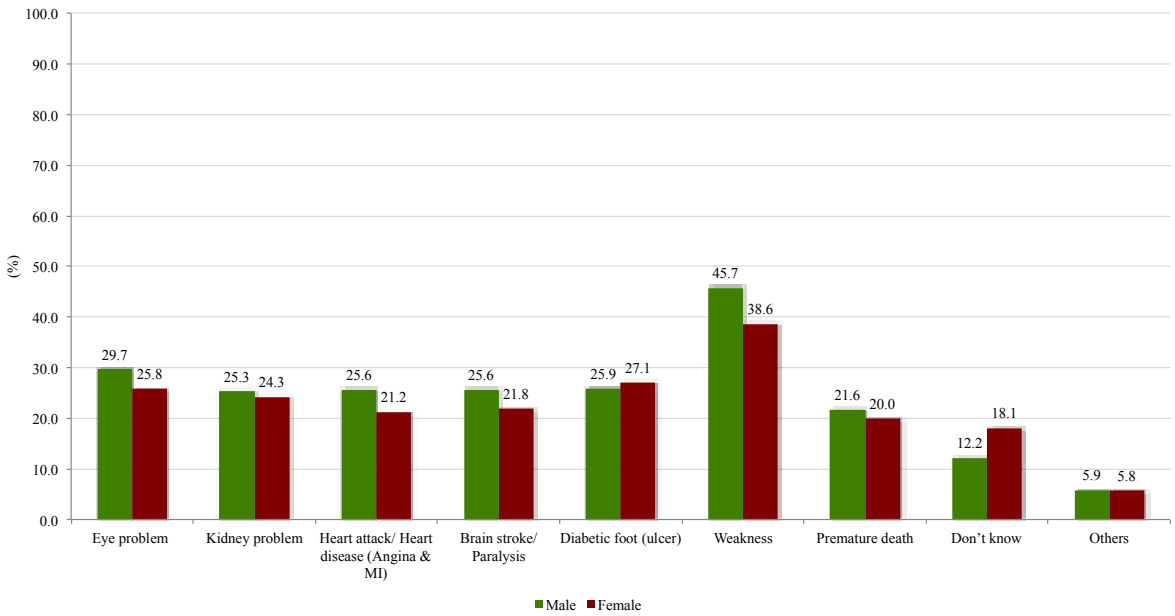
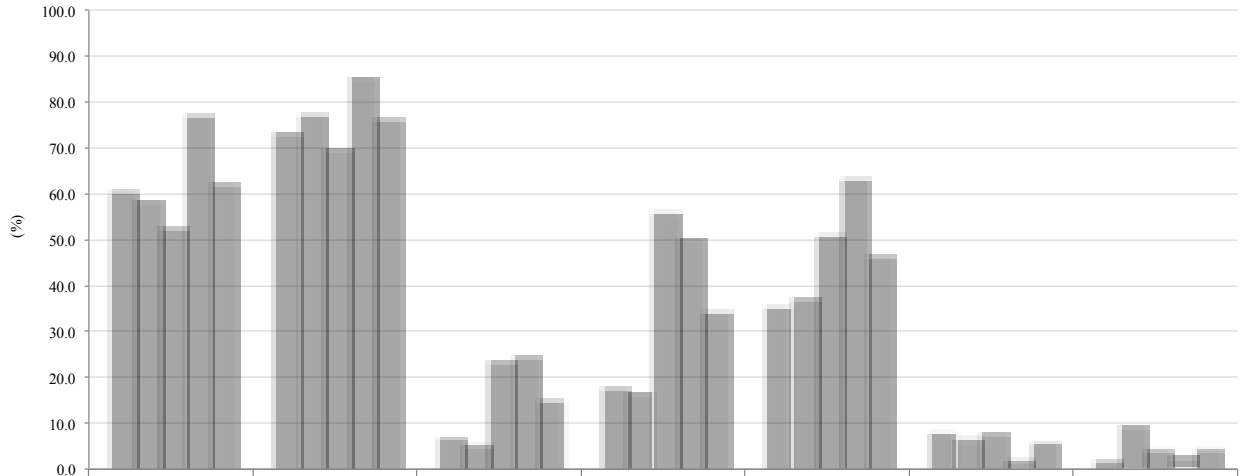


Figure 48: Knowledge on complication of diabetes by gender

Knowledge on Treatment and Control

Regarding the way to control hypertension, a higher proportion of our participants stated that diabetes can be controlled by doing exercise/ walking (75.7%) followed by taking regular medicine (61.6%), controlling diet (45.9%) and eating less sweet food items (33.9%). Some

participants also stated that maintaining normal body weight can control diabetes (14.4%). When we looked at geographical distribution, it was revealed that all these control measures were stated more frequently by participants of Dhaka South except for eating less sweet food item, which was mentiones at a higher frequency by the participants of Dhaka North (55.6%) (**Figure 49**).



	Taking medications regularly	Exercising/ Walking	Maintain normal body weight	Eat less sweet food items	Diet control	Don't know	Others
Narsingdi	60.1	72.5	6.8	17.1	35.1	7.7	2.1
Gazipur	57.7	76.9	5.0	15.9	36.4	6.5	8.6
Dhaka North	52.1	69.2	22.7	55.6	50.7	7.3	4.2
Dhaka South	76.7	84.6	24.0	49.4	62.9	1.8	2.2
Total	61.6	75.7	14.4	33.9	45.9	5.8	4.3

Figure 49: Knowledge on ways to control diabetes

When we asked the participants about the duration of taking anti diabetic medicine, more than half (56.0%) affirmed that diabetic patients should take medicine for life long, though, nearly a quarter (23.4%) stated that they did not know how long anti diabetic medication should be taken. Moreover, 14.4% of our participants reported that anti-diabetic medication should be taken until the blood glucose returns to normal. Among the participants who stated that diabetic patients should take medicine for life long, the highest proportion was from Dhaka South (61.6%) followed by Narsingdi (56.1%) and the lowest proportion was from Dhaka North (54.9%) (**Figure 50**).

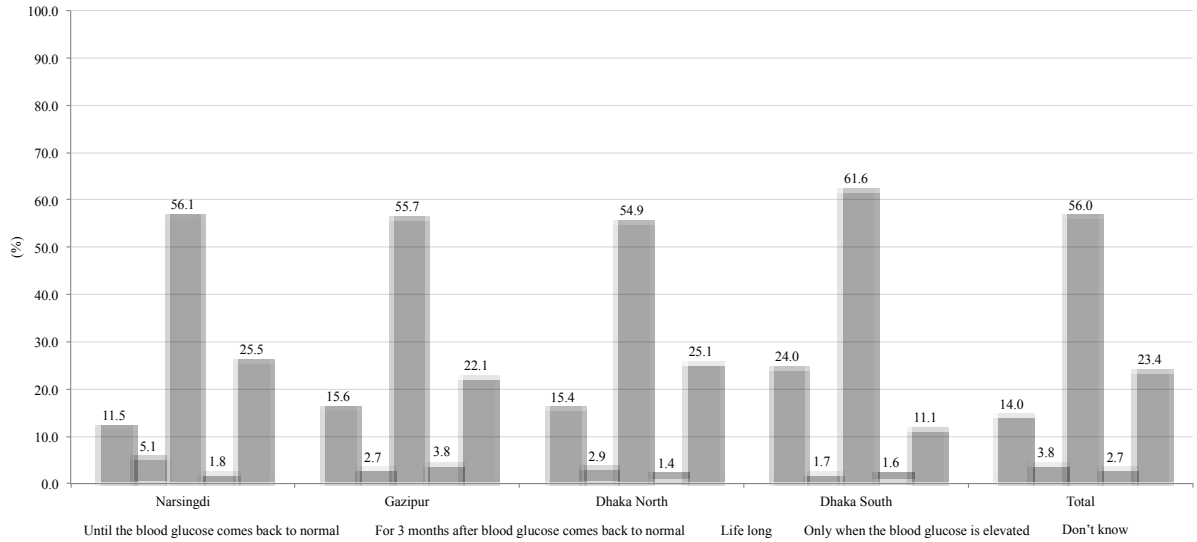
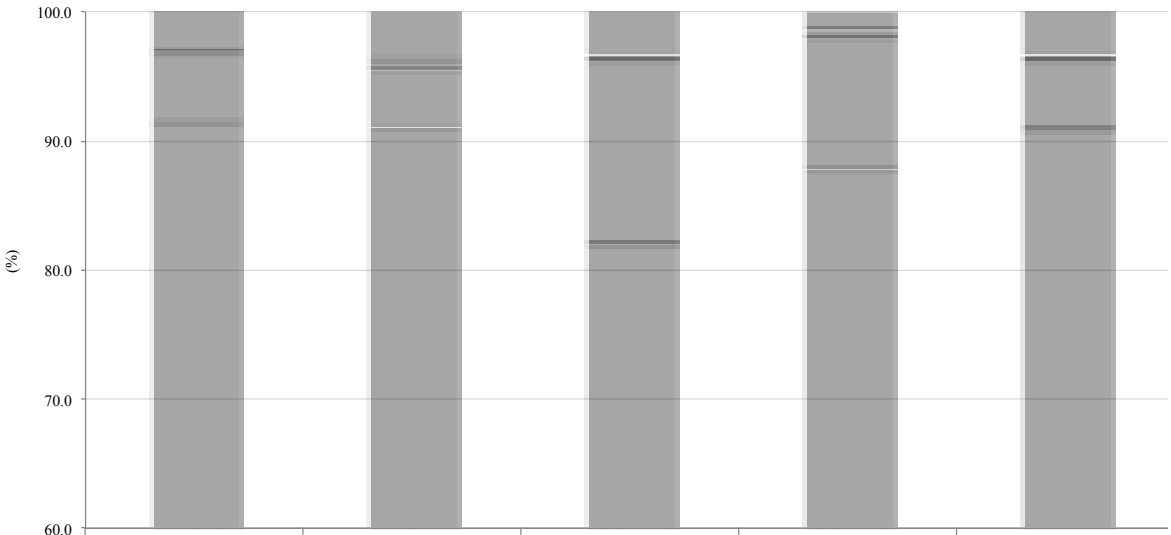


Figure 50: Knowledge on how long a person should take anti diabetic medication

Attitude

In our study, attitude towards diabetes was assessed by asking how important it was to keeping diabetes under control, whether lifestyle modification can control diabetes, whether diabetes is a curable disease and whether diabetes is a life-long disease. Among our respondents, majority stated that controlling diabetes is very important (90.9%) though this proportion was comparatively lower in Dhaka North (82.0%) compared to the other study sites. Among our participants, 5.3% also stated that it is somewhat important to keep diabetes under control and a higher proportion of participants said so (Dhaka North-14.2%, Dhaka South-10.1%) in the urban areas compared to their counterparts residing in rural settings (Narsingdi-5.4%, Gazipur-4.4%) (**Figure 51**).



	Narsingdi	Gazipur	Dhaka North	Dhaka South	Total
Don't know	3.1	3.7	3.4	1.4	3.3
Not at all important	0.1	0.9	0.4	0.7	0.5
Somewhat important	5.4	4.4	14.2	10.1	5.3
Very important	91.4	91.1	82.0	87.8	90.9

Figure 51: Attitude on importance of keeping diabetes under control

Majority of the respondents of this study also affirmed that diabetes is a lifelong disease (85.7%). This viewpoint was expressed by a higher proportion of participants of Dhaka South (89.8%) followed by that of Gazipur (88.6%). A similar proportion of participants from Narsingdi (82.8%) and Dhaka North (82.7%) stated the same (**Figure 52**).

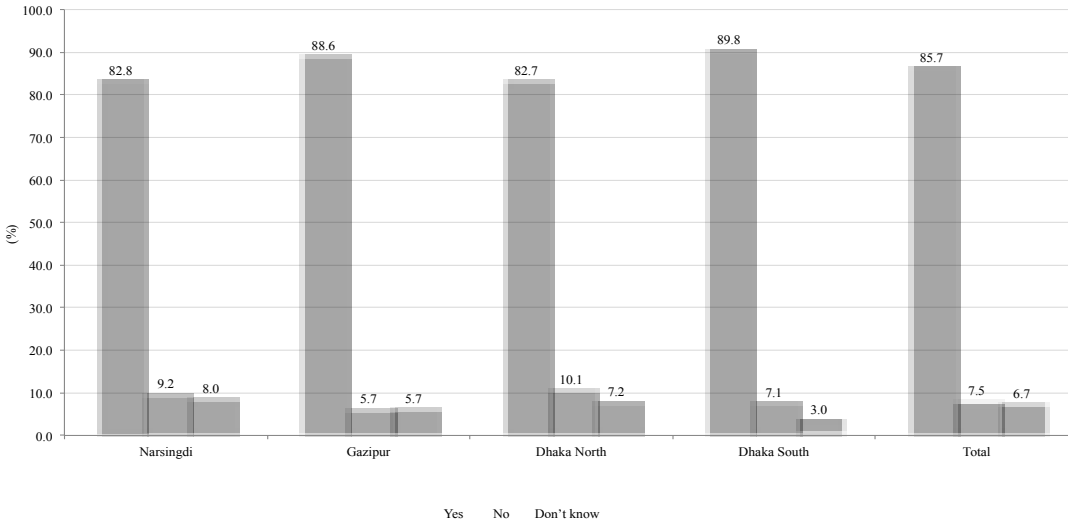


Figure 52: Attitude on whether diabetes is a life-long disease

More than a quarter of our respondents also mentioned that diabetes is a disease that cannot be cured permanently (77.7%). A higher proportion of participants from Gazipur (83.4%) have shown this attitude towards curability of diabetes. However, the participants expressing the same were less frequent inNarsingdi (72.3%) and Dhaka North (72.7%) (**Figure 53**).

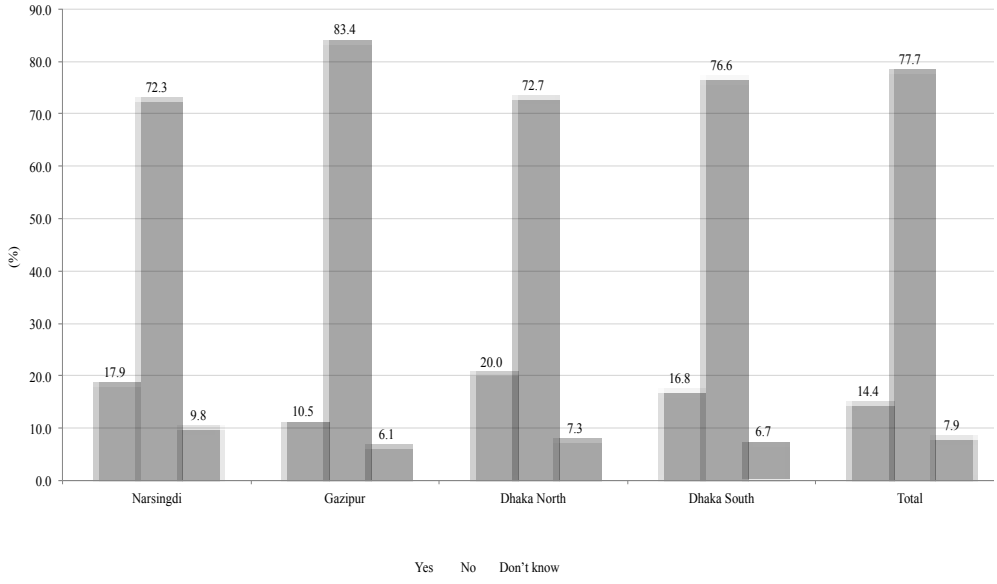


Figure 53: Attitude on whether diabetes is a curable disease

Interestingly, almost all of our study participants indicated that diabetes could be controlled by lifestyle modification (**Figure 54**).

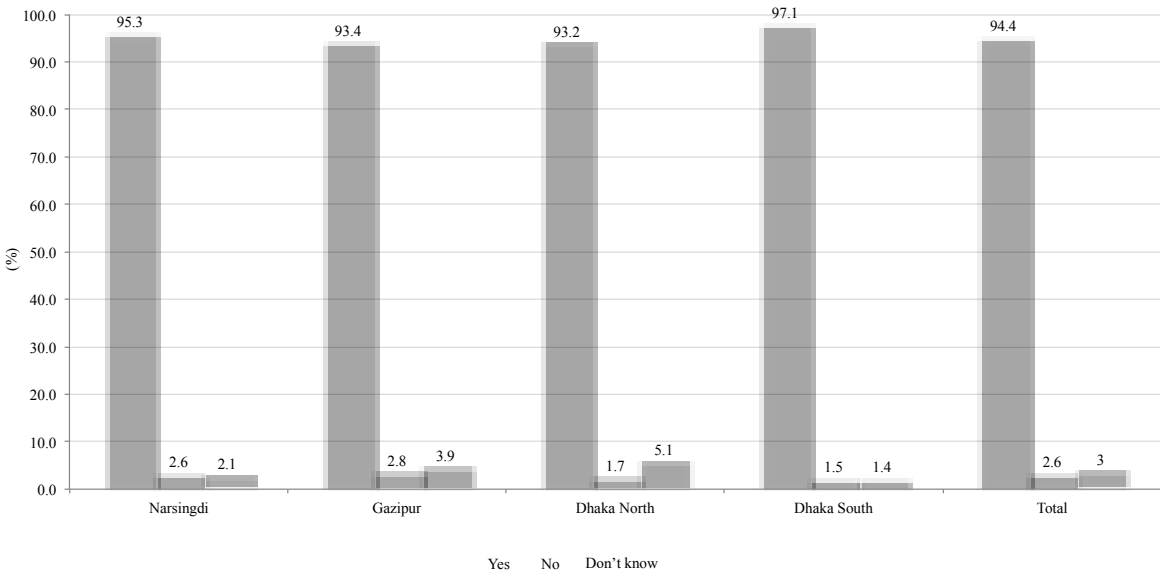


Figure 54: Attitude on whether lifestyle modification can control diabetes

Health Care Seeking Practice

In our study, we intended to understand health care seeking practices of participants who were previously diagnosed as diabetic patients by any health care provider (n=587). It was revealed from our study that nearly 72.0% of participants (n=417) who had diabetes sought health care, yet, more than a quarter (28.0%) stated that they did not seek care for diabetes despite of knowing that they had diabetes (**Figure 55**).

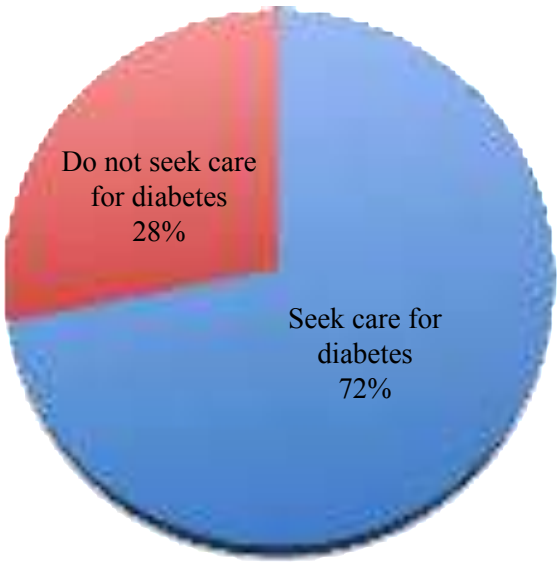


Figure 55: Health care seeking practice of diabetic patients

When we analyzed geographical distribution of these participants (n=417), it was revealed that of the proportaion of participants sought health care for diabetes was the highest in Dhaka South (male-84.4%, female-79.3%) followed by Dhaka North (male-69.7%, female-76.0%). However, this proportion was lower in Gazipur (male-68.2%, female-71.6%) and among the males in Narsingdi (male-60.5%, female-83.3%). In case of gender distribution, our study found that female participants sought care for diabetes more frequently than their male counterparts (male-66.3%, female-76.2%) and the difference was highest in Narsingdi district where 22.5% more women reported to seek health care for diabetes. However, in Dhaka South, a slightly higher proportion of male used to seek care to control diabetes (male-84.4%, female-79.3%) (**Figure 56**).

Among the diabetic patients of our study who used to seek health care (n=417), almost all (male-94.0%, female-89.1%) reported that they had been taking anti-diabetic medication for the last six months (n=390). This proportion was the highest among the males from Narsingdi (96.6%) followed by Gazipur (93.9%). However, diabetic patients of Dhaka North were found to take anti-diabetic medicines lass frequently (male-77.4%, female-80.8%). In rural sites, more male participants used to take anti-diabetic medication than their female counterparts (Narsingdi: male-96.6%, female-85.9%; Gazipur: male-93.9%, female-91.6%). On the other hand, in urban sites a slightly higher proportion of female participants stated that they were taking medicine for the treatment of diabetes (Dhaka North: male-77.4%, female-80.8%; Dhaka South: male-92.2%, female-93.3%) (**Figure 57**).

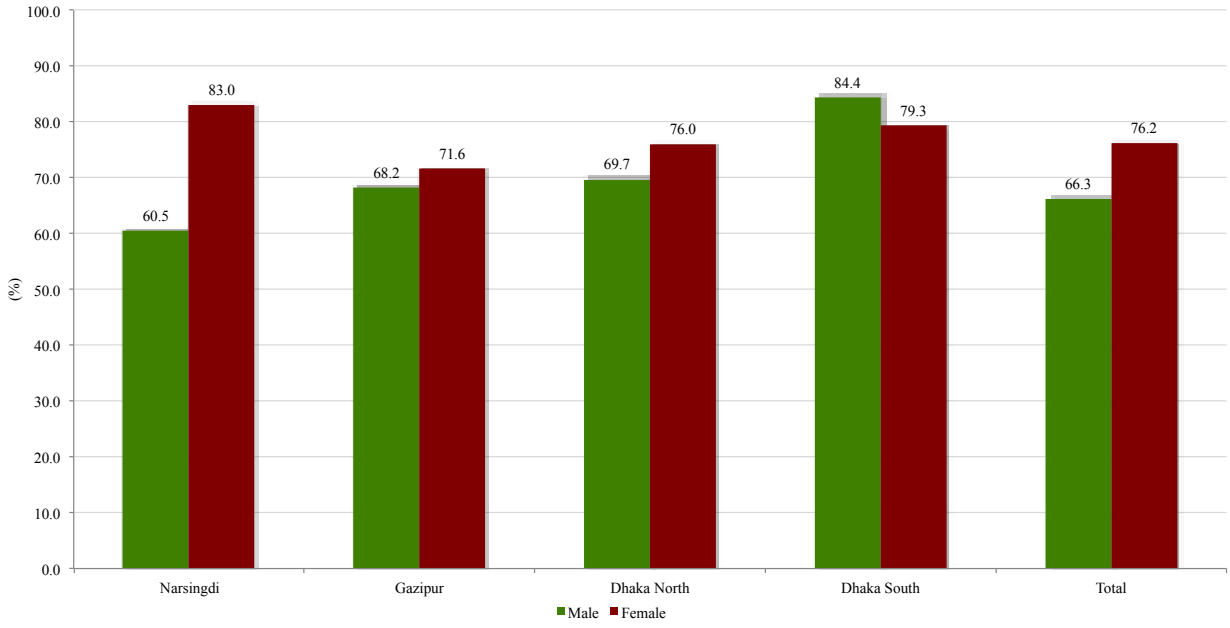


Figure 56: Diabetic participants seeking health care by study sites and gender

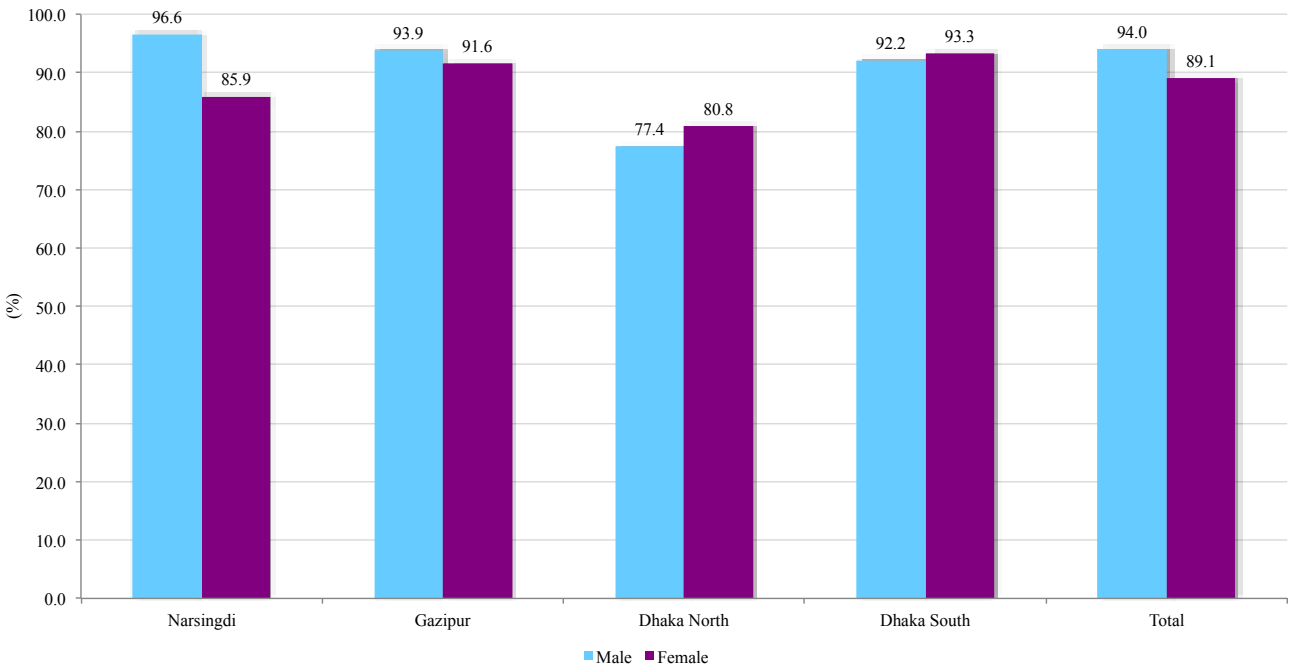


Figure 57: Diabetic patients taking anti-diabetic medication by study sites and gender

Health Care Provider

Majority of our diabetic participants reported that they sought health care for diabetes from doctors (89.5%). Some participants also went to pharmacists/drug sellers (15.7%) for diabetes care. This proportion of the participants was the highest in Narsingdi (94.2%) followed by Dhaka South (92.0%). Pharmacists/drug sellers were visited more by participants residing in Narsingdi (23.2%) and Dhaka North (18.9%). A few participants from rural sites also stated that they sought health care for diabetes from rural medical practitioners and this proportion was higher among participants of Gazipur (8.5%) than that of Narsingdi (2.9%) (**Figure 58**).

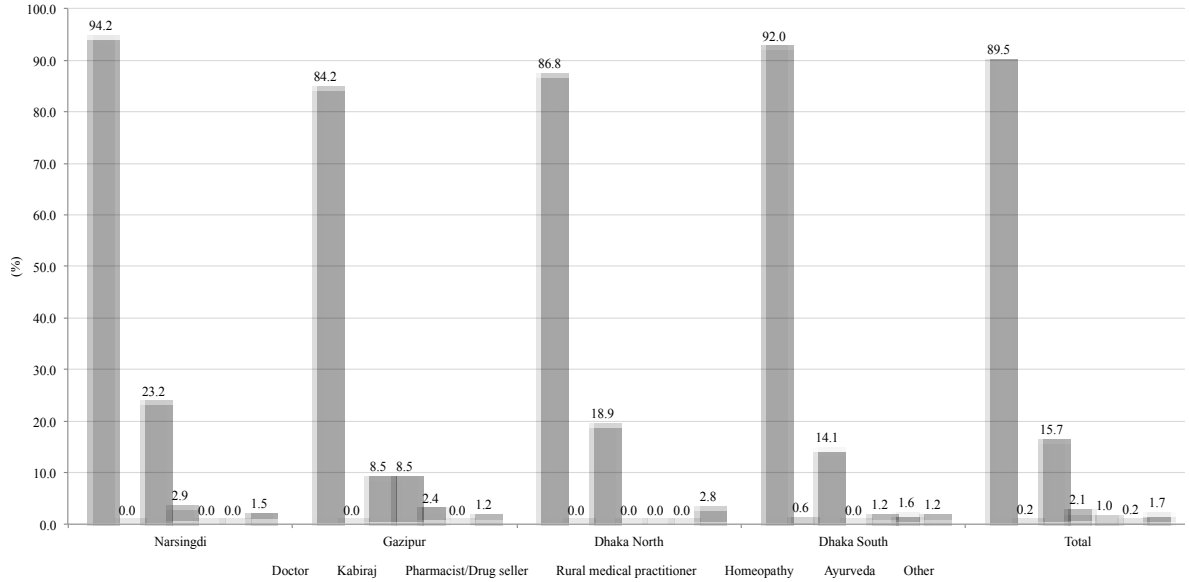


Figure 58: Health care providers from whom diabetic patients sought care for diabetes

In the rural areas, most of the males and females were seeking health care from qualified doctors. A significant proportion of males in the middle and highest quintile (37.5% and 30.0% respectively) sought health care from pharmacist/drug sellers. In case of females, 22.2% participants from the lowest wealth quintile sought health care from pharmacist/drug sellers (**Table 14**).

Table 13: Type of health care providers in rural area by wealth quintile and gender

Wealth quintile	Male (Rural)			Female (Rural)		
	Doctor	Pharmacist/Drug seller	Rural medical practitioner	Doctor	Pharmacist/Drug seller	Rural medical practitioner
Lowest	92.9	14.3	7.1	88.9	22.2	11.1
Second	83.3	8.3	8.3	85.7	0.0	14.3
Middle	93.8	37.5	0.0	72.7	9.1	18.2
Fourth	89.7	6.9	3.5	88.2	11.8	0.0
Highest	95.0	30.0	5.0	87.5	6.3	6.3

In the urban areas, similar to rural areas, most of the males and females were seeking health care from qualified doctors. A significant proportion of males in the lowest quintile (40.0%) sought health care from pharmacist/drug sellers. In case of females, 20.0% participants in the lowest wealth quintile and 25% in the second wealth quintile sought health care from pharmacist/drug sellers (**Table 15**).

Table 15: Type of health care providers in urban area by wealth quintile and gender

Wealth quintile	Male (Urban)			Female (Urban)		
	Doctor	Pharmacist/Drug seller	Rural medical practitioner	Doctor	Pharmacist/Drug seller	Rural medical practitioner
Lowest	80.0	40.0	0.0	90.0	20.0	0.0
Second	71.4	21.4	0.0	87.5	25.0	0.0
Middle	90.0	7.5	0.0	91.2	11.8	0.0
Fourth	91.2	14.7	0.0	92.3	18.0	0.0
Highest	93.1	13.8	0.0	92.5	17.5	0.0

Place of Blood Glucose Measurement

Among our study participants who measured blood glucose (n=533, including some non-diabetics), more than a third went to Diabetic Hospitals (36.4%) followed by doctors' chamber (30.8%) and nearby dispensary (28.2%). A few participants also stated that they usually measured blood glucose at home (13.4%) or at private clinics (11.3%). However, , primary and secondary level government health facilities (Community clinic, Union health and family planning center, Upazilla Health Complex and District hospital) collectively were utilized only by 1.8% of study participants for the purpose of measuring blood glucose. It was also found that, the proportion of participants measured blood glucose at home or at a nearby dispensary was the highest in Dhaka South (19.6%), measured their blood glucose at home

(and 31.4% measured blood glucose at a nearby dispensary). Nearly two-third of participants from Narsingdi reported to go to diabetic hospitals (63.4%) and a quarter of participants from Dhaka North (25.0%) utilized private clinic in this regard (**Table 16**).

Table 16: Place of blood glucose measurement of diabetic study participants (n=533)

Place	Narsingdi	Gazipur	Dhaka North	Dhaka South	Overall
Home	0.0	8.5	17.6	19.6	13.4
Nearby dispensary	29.6	20.2	29.6	31.4	28.2
Doctors' chamber	23.9	36.2	34.3	28.1	30.8
Private Clinic	1.4	6.4	25.0	9.2	11.3
Community Clinic	0.0	0.0	0.0	0.7	0.2
Union health and family planning center	0.0	0.0	0.0	0.0	0.0
Upazilla Health Complex	0.0	4.3	0.0	0.0	0.9
District hospital	1.4	2.1	0.0	0.0	0.7
Diabetic Hospital	63.4	33.0	16.7	39.9	36.4
Government Medical College Hospital	0.0	2.1	4.6	0.0	1.6
Others (specify)	1.4	0.0	4.6	0.7	1.6

FINDINGS FROM QUALITATIVE COMPONENT

HEALTHY DIET

What Do People Think about Healthy Diet?

Almost all of the FGD participants from both urban and rural residence mentioned about different fruits such as banana, jackfruit, apple, grapes, pomegranate, papaya and vegetables such as green banana, gourd, bitter gourd, pumkin, lady's finger, brinjal, malabar spinach (*pui shak*), colocassia (*kochu shak*), red spinach (*lal shak*), cucumber as the food beneficial for hypertensive and diabetic patients. A number of participants also stated that taking milk without milk skin orlactoderm (*sor chhara dudh*), egg white, pulse and hand made bread (*ruti*) are beneficial for both diabetic and hypertensive patients. On the other hand, sweet food items, rice, egg yolk, milk, salt, soft drinks and high fat containing foodstuff like any kind of meat especially beef and duck egg were cited as harmful for them. One respondent opined,

> *"Diabetic and hypertensive patients should take more fish, fruits and vegetables that contains protein, vitamins and minerals. But they should limit consumption of sweets, sugar, mirinda, pepsi, oil, fatty food and salt."* (FGD_female_Gopibag, Dhaka South)

Our participants frequently mentioned sour fruits like tamarind and lemon that they believed to control high blood pressure. Some of them also stated that herbal products like juice of bitter gourd (*korolar ros*), soaked bitter stick water (*chirotar pani*), juice of Indian lilac leaves (*neem patar pani*), Indian gooseberry (*amloki*) are beneficial for diabetic patients as these products play a role in controlling blood sugar. One female respondent from Gazipur said,

> *"Many people soak bitter stick (chirotar pata) in water for the whole night and eat in the morning. Some also eat lemon and tamarind and juice of Indian lilac leaves (neem patar pani). These foods are very beneficial to control high pressure."* (FGD_female_Kaliganj, Gazipur)

Interestingly, a few participants stated that diabetic and hypertensive patients can have any kind of food but in limited amount. Almost all of the FGD participants opined that they gained this knowledge on diet from the doctors, community health workers and manuals that were provided while seeking care from health facilities. Some of them also learnt these matters from their family members, peers and neighbors. One respondent conveyed,

> *"My parents told us which foods are good and which are bad. They knew these from doctors. I also learned these issues while visiting the doctors."* (FGD_male_Kaliganj, Gazipur)

Do People Consume Healthy Food?

A number of the participants stated that they couldn't change dietary habit after diagnosis of diabetes or hypertension. They told that in Bangladesh, women are usually responsible for preparing food for all the family members. However, sometimes they cannot cook separate

vegetable item or curry with less oil for their family members having NCDs. In this regard, one male participant said,

> *"In a family, common items are cooked that are suitable for all the members. You will not get patient's food or special food until you become a patient."* (FGD_male_Pallabi, Dhaka North)

Some participants conveyed that, in joint family different family members have different choices, so it is not possible always to take food as per individual choice. In one female participant voiced,

> *"In my family, I live with my husband, in-laws and children. Different persons have different choices. Sometimes kids do not like to eat vegetables. Some members might not like certain fish items. My daughter does not eat fish at all. She eats rice with egg. So, I always cannot cook food that I need to eat."* (FGD_female_Vashantek slum, Dhaka North)

Lack of time was revealed as another reason that prevents people to prepare and eat healthy food. One woman conveyed,

> *"Now it is the season of harvesting crops. I have very limited time for cooking. I cook foods for three meals at one time. So, I cannot prepare anything additional for me."* (FGD_female_Shibpur, Narsingdi)

Sometimes, elderly members of a family have to depend on their sons and daughter-in-laws. If the family members do not help them, they cannot eat recommended food. One participant said,

> *"I have 8 members in my family including my sons and daughters-in-law. I have diabetes, so I want to eat vegetables. But they do not like it. If I go to market, I buy fruits and vegetables. But sometimes, when I cannot go to market, my sons buy food items. Then I have to eat what they bring… … a few days ago, one of my sons went to the market and brought beef. He asked me to take meal with beef. I did not have any option."* (FGD_male_Shibpur, Narsingdi)

Many participants also said that they couldn't eat healthy food like fruits, vegetables, milk and egg white because of financial problem. One respondent in this regard stated,

> *"How can we have healthy foods? People in this area are poor. If there are six members in a family and among them only one member earns, how is it possible to arrange nutritious food for the family?"* (FGD_female_Kaliganj, Gazipur)

Another woman from urban residence said that,

> *"Many people cannot eat special food for diabetes and high pressure because of financial problem. There are some women whose husband is the only earning member of that family and his income is also limited. But the woman lives in a joint family with father in law, mother in law, brother in law and*

sister in law along with her husband and children. In this type of family, it is not always possible to arrange healthy and nutritious food especially for diabetic and hypertensive patients." (FGD_female_Gopibag, Dhaka South)

Some participants also reported that, they couldn't consume healthy food items like fruits and vegetables because either they do not like these foods or they cannot do so due to lack of appetite. One woman said in this regard,

"Sometimes I eat healthy foods but other times I do not. Sometimes I want to take those foods but I loose appetite. Nothing seems tasty to me." (FGD_female_Vashantek slum, Dhaka North)

Another man from Narsingdi said,

"We Bengali are people of rice and fish (machhe-vaate Bangali). We like to eat rice in three major meals. I know having handmade bread (ruti) is good for controlling diabetes, but if I eat this I feel like I did not eat anything. I also experience vertigo (matha ghuray)." (FGD_male_Shibpur, Narsingdi)

Several participants identified food adulteration as a major problem that prevent them from developing a healthy dietary habit. One respondents voiced,

"Fruits and vegetables are healthy, but we do not eat them. These foods become toxic and harmful now-a-days. Whether apple, orange or grape, all are contaminated with medicine. If we take these foods, we will become sick. Our kidneys will be damaged, our eye sight will be lost." (FGD_female_Shibpur, Narsingdi)

Another one said,

"How can we eat healthy food? Quality of food that we buy from the market is not in our hand. Market leaders control it. Fruits and vegetables we find in the market are not healthy at all. These are impure and toxic. Farmers use pesticides and chemical fertilizer to increase size and production of crops. Vendors mix formalin with fish, fruits and vegetables to look them fresh. These incidents never happened 15-20 years back." (FGD_male_Pallabi, Dhaka North)

What Can Be the Solution?

While we asked participants what steps could be taken to help them to adapt healthy dietary habit, majority of them stated that awareness should be raised among people about healthy diet and its advantages. This is possible if doctors spend time to counsel patients.

"We do not know which food items are good for diabetes and hypertension. We have to take these matters seriously. We have to go to doctors and doctors should let us know about this. They have to give us time to talk to us in the way you are talking to us. They have to make us understand about these issues." (FGD_female_ Shibpur, Narsingdi)

Family members also can help patients to adapt healthy dietary habit by offering reminder about what to eat and when to eat. One participant voiced,

> *"Our families can help us a lot. They can tell us what should we eat and what should we not eat. They can also remind us of the foods that can deteriorate the disease condition if we attempt to have those mistakenly."* (FGD_female_Kaliganj, Gazipur)

Few respondents also revealed some innovative ideas like arranging campaign and involving locally influential people to promote the idea of healthy diet. In one respondent's voice,

> *"It is possible to raise awareness among people if you can spread the message widely. It will be helpful if you select one leader from each village to organize the events. Staff of Community Clinics and Union Parishad can take the leadership."* (FGD_male_Kaliganj, Gazipur)

Noticeably, a number of participants affirmed that it is not possible to make people eat healthy if they do not realize the importance of healthy diet and are not self-motivated.

> *"People who have diabetes or hypertension should know which food is good for them and which is bad. They should take the matter seriously. They should eat healthy foods and avoid harmful foods. We should realize that if failure to take proper diet can lead us to more serious disease."* (FGD_female_Shibpur, Narsingdi)

Is It Possible to Eat Healthy: Listen to the Successful Stories!

A number of our study participants stated that they try to consume healthy food and continue diet control after being motivated by doctor's advice. They think that, if they do not follow doctor's advice, they will suffer from more serious diseases in future. One female respondent from Narsingdi conveyed,

> *"Eating excessive amount of food makes me feel uncomfortable. It also worsens disease condition. Now it is summer season. If I eat more food now, my blood pressure will increase that might cause stroke."* (FGD_female_Shibpur, Narsingdi)

Some participants also stated that they could manage to arrange separate meal like hand made bread (*ruti*) because their family members help them in this regard. One woman said,

> *"I can have foods beneficial for diabetes and high pressure. My daughters in law help me. Every one of my family is very cooperative. It would not have been possible if I had a mother-in-law."* (FGD_female_Shibpur, Narsingdi)

What Do People Think about Tobacco Products?

Almost all of our participants opined that tobacco products are injurious for human health especially for diabetic and hypertensive patients. They also mentioned that using tobacco for long time can cause cancer, lung diseases, liver diseases, asthma (*hapani*), and fluid accumulation in body.

> *"I do not take betel leaves, nuts and any tobacco products. These products are harmful for us. It can damage our lungs and liver. No one should use these products."* (FGD_female_Vashantek slum, Dhaka North)

Some of them also stated that, tobacco products are harmful, therefore, forbidden in the religion (Islam). One respondent in this regard said,

> *"It is not allowed in Islam to use tobacco, zorda, gul, supari. All the products are forbidden (haram) in our religion."* (FGD_female_Shibpur, Narsingdi)

Why People Smoke and How the Habit Started?

Almost all of our study participants stated that people usually start smoking at young age by the influence of peer groups. Sometimes they start using tobacco products out of desire to experience something new. People also often start smoking with the intention to make themselves look smart to the society. Gradually this practice becomes their habit and subsequently they become addicted to it. When smoking becomes an addiction to someone, they cannot pass even a day without it. Frequency of smoking usually increases when they get stressed for daily life problems or go through mental stress due to other reasons. Thus, quitting smoking turns out to be a near impossible for the smokers. One of our respondents said,

> *"People develop smoking habit while they spend time with their friends. Suppose, in one circle of a young people, everyone is smoker except one. What the smokers do then, they at every moment push the non-smoker saying, please smoke for once (just akta tan de). After a time period, it happens that the non-smoker friend smoke for the first time. Then second time, then third time and thus it becomes his habit."* (FGD_male_Shibpur, Narsingdi)

Another respondent said,

> *"Smoking habit, first of all, develops by the pressure of friends and surrounding people. Sometimes people feel that they look like a hero while smoking. It gives that person a thrilling impression. Thus one day he becomes addicted to it."* (FGD_male_Pallabi, Dhaka North)

Many participants said that people start using tobacco products being influenced by their family members. Since childhood, they have been observing their parents, grandparents and

in-laws smoking or using smokeless tobacco. This influences them to start using tobacco products and gradually they become addicted to these products. One respondent expressed,

> *"My father-in-law used to chew betel nuts. He was old. So, he used to request me to prepare betel leaves for him. He sometimes asked me to take the taste of these products and thus I started chewing betel leaves. Gradually I started to enjoy chewing betel nuts, which offers me pleasing experience till now. Now I cannot spend even a day without it. "* (FGD_female_Vashantek slum, Dhaka North)

A few female participants stated that they started chewing betel nuts during pregnancy period and they continued the habit even after delivery. One woman from Dhaka city said,

> *"I never used tobacco products before my first pregnancy. When I conceived for the first time, I lost my appetite. No food seemed tasty to me. Then, one day I started to chew betel nut and zarda and I started to feel better. Now I use these products regularly."* (FGD_female_Vashantek slum, Dhaka North)

A few respondents thought that liability goes only to the guardians only if their offspring develop a smoking habit. One of them said,

> *"Only guardians are accountable for the bad habit developed by their children. They are responsible to look after their children like where they go, who their friends are. But at current time, parents do not perform this responsibility efficiently. They don't even ask where their children go or with whom they spend time. As a result, young people are getting addicted by being influenced by ruthless friend circle."* (FGD_male_Kaliganj, Gazipur)

Why is Quitting Tobacco Hard?

Almost all of our study participants affirmed that, when someone gets addicted to smoking or other tobacco products, they cannot pass even a day without taking these substances. People usually consume tobacco products more frequently when they get stressed for day-to-day life problem or pass through mental stress. Thus, quitting smoking turns out to be impossible to the smokers. In this regards, one respondent said,

> *"It is not possible to completely quit tobacco products. It is a kind of addiction. Only addicted people know why they can't get rid of this. You might know, people who take tea habitually, they do feel worthless if they cannot manage to have a cup of tea timely."* (FGD_female_Vashantek slum, Dhaka North)

A number of women also stated that they cannot stop taking *zarda (a type of tobacco product used with betel leaves)* because they think *zarda* is good for dental health, stomach ache and ensure sound sleep. In one respondent's voice,

> *"I do not think zarda is harmful. A few months ago, I was suffering from stomach pain (pete batha) and I could not sleep well at night without pouring water on the head. These problems completely resolved when I started chewing betel with zarda… … Zarda is also beneficial for reducing tooth ache. You will*

not suffer from tooth and gum problems if you use zarda. I can survive without having rice but not without zarda!" (FGD_female_Shibpur, Narsingdi)

Noticeably, a few respondents said that doctors instruct them to not to smoke but doctors themselves do not follow the rule. They smoke like general people. This incident demotivates them to quit smoking. One respondent said,

"Doctors advise us to quit smoking. But you know, we observed them to smoke cigarettes. Why will we quit smoking following their advice? They cannot practice what they ask others to do!" (FGD_male_Kaliganj, Gazipur)

What Can Be the Solution?

Majority of our study participants opined that self-motivation is the most important quality that can help a person to quit smoking. Anyone can stop taking tobacco products if they really want to do so. One respondent from Dhaka city said,

"It is just the matter of willingness and self-motivation. Many people quit smoking by their own effort. If you are strong enough, you will be able to do this." (FGD_male_Pallabi, Dhaka North)

A number of participants expressed that family members can play a vital role in reversing the habit of using tobacco products. One participant said,

"If anyone smokes in a household, family members should motivate that person to quit smoking. Family members can inspire that person by stating benefits of quitting smoking. They also can do this by recapping that person about harmful effect of tobacco products." (FGD_male_Kaliganj, Gazipur)

Raising awareness about harmful effects of using tobacco products also emerged as an option that participants thought very important in this regard. They also said that awareness can be raised by including this issue in textbook and doing campaign against tobacco involving local influential people. One of our respondents conveyed,

"Everyone knows that smoking is harmful. But we have to remind people frequently about this fact. It will be a good step if tobacco issue is included in the national curriculum. Parents and teachers also should communicate directly with the young people to motivate them to not to smoke. If local leaders take the responsibility to do campaign against tobacco in their locality, I think it will be a strong step." (FGD_male_Shibpur, Narsingdi)

Remarkably, a number of participants argued that it is the government that can actually stop tobacco consumption by people. If government takes step to stop tobacco cultivation, to prevent the activities of tobacco companies, increase tax, and restrict smoking at public places, people will not be able to buy or consume any tobacco product. One participant in this regard said,

"If anyone can control tobacco consumption in the communities, it is the government. If government makes policy to halt smoking at any place, people are bound to follow the rule. If government declares that no tobacco will be

cultivated in the country, then cigarette production will be ceased automatically. But you know, government will not do this because they receive a huge amount of money as VAT from the tobacco companies. People always suffer for the benefit of government." (FGD_male_Kaliganj, Gazipur)

Is It Possible to Quit Tobacco: Listen to the Successful Stories!

Occasionally people quit smoking because of their family members. Women and children usually do not like the bad smell expelled from a smoker's mouth. Family members of a smoker sometimes experience smoking related complications. Considering all these things, people sometimes stop smoking. One respondent said in this regard,

"My family members and neighbors requested me to quit smoking several times but I could not do so. But I know many people who quit smoking considering the well-being of their family members. One day, such a person was smoking keeping his baby in his lap. Suddenly, he started to feel guilty because he realized that it was hurting his baby. His wife also did not like this habit. After this, he stopped taking cigarette." (FGD_male_Shibpur, Narsingdi)

Some of the participants reported that they reduced the frequency of using tobacco products following doctors' advice and they continued this out of self-motivation. These respondents also wished that gradually they would completely stop taking these products. One FGD participant said,

"Doctor told me not to chew betel leaves, nut (supari) and zarda. I could not completely stop the habit but now I use these products less frequently. I have started doing this for the betterment of my own health and to control the disease." (FGD_female_Gopibag, Dhaka South)

PHYSICAL ACTIVITY

What Do People Think about Physical Activity?

Majority of our study participants opined that it is important to perform physical activity regularly for diabetic and hypertensive patients as well as for healthy individuals. They also think that not doing any kind of physical activity is harmful for health. One respondent from Dhaka city said,

"We should perform physical activity daily. If we can do this, there will be less chance to develop diabetes and high pressure. These diseases might develop in spite of doing physical activity but at least these diseases will be under control. We have to do activities that make us sweat. People who cannot do these types of activities should walk for 2 hours daily." (FGD_male_Pallabi, Dhaka North)

However, a few participants stated that they started to perform physical activity after being diagnosed as hypertensive or diabetic patients because doctors advised them to do so. One respondent said,

"Doctor asked me to walk for 2 hours daily. I have started doing this, though I cannot do this regularly but I try. I think, every one of our community who has diabetes or high pressure, should make some changes in their life style." (FGD_male_Pallabi, Dhaka North)

When we asked female participants about religious barrier of performing physical activity, almost all of them affirmed that there is no restriction in their religion to walk or perform any other physical activity. One woman in this regard said,

"No, there is no regulation in our religion (Islam) that prohibits us to walk or perform physical activity. People do not make any comment if we go outside for walking wearing veil." (FGD_female_Shibpur, Narsingdi)

Why is Performing Physical Activity Hard?

Laziness

Majority of our study participants thought that the most important reason that prevents people to perform physical activity is laziness. One of the participant explained,

"Now a days people become too lazy. For example, after coming back from the office, we sit before television. In the past, people used to involve themselves in some kind of activities like feeding cattle, planting seedlings etc. after coming back to home. But, now people pass time watching television for hours." (FGD_male_Pallabi, Dhaka North)

Another respondent said,

"Laziness is the foremost enemy of human being. If you start becoming lazy, your life will end there. When people become solvent financially, they jump to lead inactive life and all kind of diseases start to develop in their body." (FGD_male_Pallabi, Dhaka North)

Lack of Self-motivation

Lack of self-motivation was also identified as another reason by our FGD participants for which people cannot perform regular physical activity despite having strong intention to do so. One respondent in this regard said,

"We cannot follow doctor's instruction regarding physical activity because of lack of self-motivation. Every day, I think I will start walking from today, but then resistance comes from my mind. I start to battle with my soul. I start to feel like, not today, I will start from tomorrow. But the tomorrow never comes. Self-motivation is closely related to changing life style." (FGD_male_Shibpur, Narsingdi)

Absence of Enabling Environment

A number of participants also stated that they couldn't perform physical activity due to lack of enabling environment. One male from Dhaka city conveyed,

> *"We do not have any space for walking. Two kilometers away from our home, there is a place where both men and women can do walking and jogging. But this type of facility is not available in our locality. Where will we go for walking? Place that should be utilized for physical activity is used by vendors. They are selling pineapples and apples there!"* (FGD_male_Pallabi, Dhaka North)

Lack of Time

A number of male participants conveyed that, after performing work responsibility, it is quite impossible for them to manage time for doing physical activity.

> *"I cannot perform physical activity because I do not have time to do that. I have to work all day even at the night. Would I concentrate on earning livelihood or doing physical activity? If I had free time, I would involve myself with some sorts of physical activity. But I cannot do that. This is the reality."* (FGD_male_Shibpur, Narsingdi)

Another respondent said,

> *"We wake up in the morning between 7 am and 7:30 am and start for office by 8 am. So, we do not get time in the morning for walking. We return back to home at 5-6 pm when it is almost dark everywhere. When can we walk then?"* (FGD_male_Shibpur, Narsingdi)

Some of the female participants also stated that they could not perform physical activity because of lack of time. However, they regularly performed household tasks like cooking, washing clothes and dishes, performing daily prayer, taking care of cattle and cleaning house to be physically fit. One respondent from Dhaka city said,

> *"I perform all the household tasks. At night I cook for all the family members, offer daily prayer and then have dinner. When I go to sleep, it is almost midnight. Thus I cannot wake up early in the morning. I can wake up between 8 am and 10 am. When will I go for walk?"* (FGD_female_Gopibag, Dhaka South)

Lack of Physical Fitness

A number of our study participants confirmed that they could not perform physical activity as per doctor's advice because they are not fit for walking or doing any other vigorous physical activity. Most of the cases, they were suffering from some other co-morbidities like heart failure, osteoporosis, arthritis and back pain. One respondent conveyed,

> *"I have both diabetes and heart disease. For diabetes it is important to walk but for heart disease it is harmful. If I walk for a while, I cannot breathe*

properly. If I walk for long time, I will fall down and my life might end there. So, I don't walk out of fear. I also cannot perform heavy work because I feel exhausted after doing that." (FGD_female_Vashantek slum, Dhaka North)

Is It Possible to Perform Physical Activity: Listen to the Successful Stories!

Some of our study participants reported that they started to perform physical activity continue being motivated by doctors and now they continue the practice out of self-motivation. Currently, they walk regularly to control their diseases and keep themselves fit. In one respondent's voice,

"I usually walk for 1 hour in the morning and 1 hour in the evening. I also perform household tasks regularly. If I do not do physical activity, I become weak. It makes me to feel uncomfortable and heavy." (FGD_female_Kaliganj, Gazipur)

Where Do People Go to Seek Health Care and Why?

Majority of our participants stated that they usually go to private hospitals and clinics for the treatment of diabetes and hypertension because they think that they receive better health care service in private hospitals than the government ones. One respondent in this regard said,

> *"In private clinics, doctors value us but in government hospitals doctors' behavior is very rude. The reality of this world is, if you can spend money, everyone will take care of you."* (FGD_male_Kaliganj, Gazipur)

Another respondent avowed,

> *"Government doctors get salary from the government, which is not affected if they do not care for us. If we go to a government hospital 10 days, we find doctors there only on one day."* (FGD_female_Vashantek slum, Dhaka North)

A number of our study participants also stated that they prefer private hospitals because overall environment like availability of sitting arrangement, fan, toilet, and diagnostic facility is not satisfactory in government hospitals. One female respond said,

> *"We do not go to government hospitals because there is no facility for investigations like Ultrasonography, X-ray and ECG. There is no place where we can sit while waiting for doctors. They also do not have fans and toilet facility. This is a huge crowd there. Behavior of doctors is not good as well. It is better to go to private hospital though it costs 500 taka per visit."* (FGD_female_Kaliganj, Gazipur)

Some of the participants though go to both government and private facilities depending on their ability to spend money. One slum woman conveyed her frustration in this way,

> *"Sometimes I go to private hospitals where every time I have to spend 600-1000 taka as doctor's fee. When I cannot afford it, I go to the government hospital. But when I feel that I am not getting cured, I again try to go to private doctor though it is difficult for me to arrange money."* (FGD_female_Vashantek slum, Dhaka North)

A number of diabetic patients also reported that they usually go to Diabetic Somitee Hospital located in district town (Narsingdi and Gazipur) for follow-up and treatment of diabetes. Participants of Dhaka city and some affluent participants from rural settings also stated that they go to BIRDEM hospital for this purpose. Almost all of these participants conveyed that they are satisfied with the overall health care service provided by Diabetic Somitee Hospital and BIRDEM. In one respondent's voice,

> *"When I go to Diabetic Hospital in Narsingdi (Diabetic Somitee Hospital), they test my diabetes level, prescribe medicine, and provide advice on how to maintain healthy life. In other hospitals, doctors do not spend that much time*

for counseling patients. If I go there after long time, they ask us why I did not go in time. They told me that I should go to hospital for regular check-up. Infrastructure like sitting arrangement and ventilation are decent there. The hospital is neat and clean. Doctors are always available there and their behavior is quite good with us." (FGD_male_Shibpur, Narsingdi)

However, participants frequently stated that it is difficult for them to manage time for going to hospital for regular check-up. They stated this because it takes almost a whole day, as they have to travel for a long distance and sometimes waiting time in these hospitals are lengthy. One respondent said,

"We are happy with the service they provide, however, it is difficult to manage time. In the day I go to hospital, I have to start from home very early in the morning but cannot come back home before 2:30-4:00 in the afternoon. Sometimes the entire day is spent there for doing the investigations. As I have to cook meals for my husband, mother-in-law and children, my daily routine is hampered if I go to the hospital." (FGD_female_Kaliganj, Gazipur)

What Do People Expect?

Almost all of our study participants stated that they want a health facility in close proximaty to their home where they will receive proper treatment and medicine for diabetes and hypertension at low or no cost. One respondent in this regard said,

"We need a hospital near our home where good quality health care will be provided at free of cost. It will be good if they provide medicine but it is okay if we have to buy medicine from outside. But we at least need the opportunity to consult with the doctors without any fee. We also need monetary support for buying insulin. Insulin is very expensive. It takes almost 1000 taka every month." (FGD_female_Vashantek slum, Dhaka North)

Another respondent stated,

"We desire for a health facility where we do not need to wait for long time to talk to doctors. We also expect a hospital near to our home, may be one in every union, so that we don't need to spend much time to seek care for these diseases. It would be very beneficial for us if we could consult with specialist doctors at these hospitals." (FGD_male_Shibpur, Narsingdi)

Some of the respondents also expected that one doctor should be assigned at every health facility who would provide treatment only for diabetes and hypertension. However, the most important virtue that they expect from a doctor is decent behavior. One respondent stated,

"There should be a dedicated doctor in hospital for treatment of diabetes and high pressure and the doctor should be well mannered that means he/she needs to behave well with us and needs to make every instruction clear to us." (FGD_female_Kaliganj, Gazipur)

What Can Be Done To Increase Utilization of Government Health Facilities?

As majority of our participants sought care from private health facilities, we asked them what steps could be taken that might motivate them to go to government hospitals for treatment of diabetes and hypertension. In response to this issue, majority of our participants reported that they will go to government health facilities if there are availability of qualified doctors, diagnostic facility and sound physical environment. In this regard, one respondent said,

> *"People will go to government health facilities if MBBS doctors are available there. Sometimes, there are doctors but they tell us to do the tests from outside. This situation should be changed. Government facilities should have the capability of performing all the necessary tests."* (FGD_male_Shibpur, Narsingdi)

Some of the respondents also stated that community clinics should start providing health care for diabetes and hypertension so that they do not need to go to distant hospitals or pharmacy for seeking care of these diseases.

> *"It will be very helpful, if diabetes and pressure are checked at community clinics. It will be also beneficial for us if medicines for diabetes and hypertension are supplied from these clinics. I went there. They sometimes measure our diabetes, however, they measure weight and blood pressure of only pregnant women but not ours."* (FGD_female_Kaliganj, Gazipur)

Some of the participants also expressed that utilization of government hospitals will increase if corruption is lessened there. In this regard, one respondent said

> *"If you cannot spend money, you have no value anywhere in the world. It is true in case of government hospitals too. You have to spend money at every step from hiring trolley to arranging bed and everything. They will not allow you to do the tests at any place except their preferred diagnostic centres. The same thing happens when it comes to buying medicine. You have no other way but spending 20-taka to buy a 10-taka medicine if they want so. This is the reality. These things need to be changed. We will go to the government hospitals if all the prescribed medicines are available there. If it is not possible at least we have to have the freedom to buy medicine from our preferred shops."* (FGD_male_Pallabi, Dhaka North)

Another respondent stated,

> *"We will be inspired to go to the government hospitals if they provide free treatment, reduce seat cost and investigation cost, do not prescribe unnecessary tests and doctors spend more time to talk and listen to the patients."* (FGD_male_Shefalir slum, Dhaka South)

Female participants recommended certain services they think would attract women to seek care from government health facilities such as availability of female doctors for female patients, organized sitting arrangement, fan and toilet facility etc. One woman conveyed,

"In the health facilities, female doctors should be available for female patients. Government hospitals remain overcrowded all time. So, there should be a space with adequate number of chairs where we can sit with our children while waiting for doctors. Proper ventilation, electricity and fan should be there too. Toilets in government hospitals are too dirty. As we have to wait for doctors for a long time, neat and clean toilet facilities especially for women with sufficient water supply should be there." (FGD_female_Kaliganj, Gazipur)

COMPLIANCE WITH MEDICINE

Do People Take Medicine Regularly?

Majority of our FGD participants thought that diabetic and hypertensive patients should take medicine regularly. In one respondent's voice,

"People who have diabetes or high pressure should take medicine regularly. If they do not take medicine properly, they will die." (FGD_female_Shibpur, Narsingdi)

However, one of our participants thought that patients should not take medicine within one year of diagnosis of hypertension. He said,

"It is better to not to take medicine at least for one year after diagnosis. If anyone starts taking medicine at early stage he/she will need to take it for life long. If I can control high pressure by other means, why will I take medicine?" (FGD_male_Kaliganj, Gazipur)

Among our participants, some stated that they could take medicine as per doctor's advice because of financial solvency and family support. One respondent said,

"I can take medicine properly. I do not have money problem. My son and daughter in law are very helpful. They buy medicine for me. They also remind me to take medicine timely." (FGD_female_Shibpur, Narsingdi)

However, some of our participant stated that they could not take medicine regularly mostly because of financial problem, unavailability of drug shop near home, absent-mindedness, smell of medicine, lack of self-motivation and lack of understanding about importance of taking medicine. One respondent's voicd,

"Sometimes I forget to take medicine. Sometimes I do not have money to buy medicine, so I cannot take it every day. Sometimes it happens in case of females that they have no money but their husband or son do not bring

medicine for them, so they cannot take it regularly." (FGD_female_Shibpur, Narsingdi)

A few of our respondents also reported that they stop taking medicine when their blood pressure comes back to normal. One respondent said,

> *"I do not take medicine every day. I take medicine when my blood pressure is high. If I control taking salt and food, pressure remains under control for 15 days to 1 month without taking medicine. I do the same in case of diabetes."* (FGD_male_Shibpur, Narsingdi)

What Steps Can be Taken?

A number of our study participants opined that people will be encouraged to take regular medicine if it is provided to them at free of cost. In one respondent's voice,

> *"It will be great help for us if government or NGO like BRAC provides free medicine for diabetes and high pressure."* (FGD_female_Kaliganj, Gazipur)

Some participants also stated that many people would start taking medicine if it becomes available at any health facility near to their home. In this regard one respondent conveyed,

> *"It will be easy for us to buy and take medicine if it is distributed from community clinics. Not everyone has the ability to go to Dhaka, Narsingdi or Shibpur upazilla headquarters for buying medicine because it takes much time and money."* (FGD_male_Shibpur, Narsingdi)

A few respondents also said that family members could play role for taking regular medicine by patients. One respondent said,

> *"Sometimes it happens that people forget to take medicine. If family members remind patients to take medicine in time, it will help them to take regular medicine."* (FGD_male_Kaliganj, Gazipur)

KEY FINDINGS

The key findings of this study include the followings:

- Mean age of male is 49 y, female is 47 y; males are slightly more educated than females (5yr vs 4 yr), a significant proportion of widows among females (22%), urban households have higher monthly income.
- Overall, 65% males and 77% females do not take 5 servings of fruits and vegetables per day. Females and urban residents have higher rate of inadequate intake of fruits and vegetables. The respondents have some knowledge on the harmful effect of inadequate fruits and vegetables intake but only a few of them could relate this behavior to NCDs though majority of the respondents think adequate intake of fruits and vegetables is important.
- Qualitative data suggest that study participants mentioned fruits especially sour fruits like tamarind, lemon, vegetables, milk, egg without yolk and different herbal products as the healthy diet for diabetic and hypertensive patients; and doctor's advice help people to start consumption of healthy diet.
- More than half of the respondents know that salt is responsible for raised BP and nearly 80% of the respondent think that reduction of salt intake is very important. Majority of respondents (68% of males and 68% of females) think they consume right amount of salt. Very few (8% of males and 6% of females are trying to reduce salt intake).
- There is a high burden of 'any tobacco consumption' (68% males, 38% females). Smokeless tobacco intake is lower in males than females (16% vs 38%). Majority of participants who smoke tried to quit smoking in the last 12 months (56% of male smokers). Only 35% of males and 33% of females who take smokeless tobacco tried to quit. However, more than half of the smokers tried to quit smoking. Nearly three-fourths of the respondents know that smoking causes cancer. However, only a few of the respondents (10%) could mention that smoking is related to hypertension. Nearly all of them know that smoking is very harmful.
- Qualitative data suggest that some participants have misconception that smokeless tobacco can be beneficial for dental health. Proper counseling by doctors, ratification and implementation of law by the government, raising awareness by arranging campaign, involving local influential people and increasing family support can be helpful to quit tobacco.
- Overall, 41% of males and 22% of females meet the WHO recommendation for physical activity. Vigorous physical activity is virtually absent among females. The participants have some knowledge on the harmful effects of inadequate physical activity but only a few of them (less than 20%) know that it is related to hypertension and cardiovascular diseases. Nearly 85% of the respondents think physical activity is very important.
- Prevalence of overweight and obesity is 18% among males and 37% among females. Five percent male and 31% females have high waist circumference. Females and residents of urban areas have higher overweight/obesity and high waist circumference.

- Qualitative data suggest that laziness, lack of time, lack of motivation, absence of enabling environment and lack of physical fitness (heart disease, back pain, arthritis) are barriers to performing regular physical activity by the participants.
- Using the old criteria for hypertension (BP 140/90 mm of Hg), 24% of males and 38% of females are hypertensive. Among the hypertensive patients, 74% are detected, 64% seek health care, 54% take medicines. Forty four percent of those taking medicine have uncontrolled BP. Use of new criteria significantly raise prevalence of hypertension (46% among males, 56% among females)
- Majority of hypertensive patients seek health care from doctors (76% males, 73% females) followed by pharmacists/drug sellers (24% males and 33% females). They seek care from multiple providers. However, the participants prefer private hospitals over the government hospitals when they need to seek care. Nearly all of them (93%) think that lifestyle change can help to lower blood pressure.
- Self-reported prevalence of Diabetes is 9% among males and 11% among females. Females and residents of urban areas have higher prevalence of Diabetes. Majority of the respondents are not aware of the complications of diabetes.
- Majority of diabetic patients (87% males and 91% females) seek health care from doctors followed by pharmacists/drug sellers (13% males and 18% females).
- Qualitative suggest that study participants who are diabetic and hypertensive are aware of the importance of taking medicines regularly. However, some of them have misinformation e.g. it is better not to take medicines within 1 year of diagnosis. The problems that were identified behind non-compliance included lack of money, unavailability of drug shops near home, absent-mindedness, smell of medicines, lack of self-motivation, lack of understanding about the importance of taking medicines etc.

DISCUSSION

In our study, prevalence of hypertension was found as 31.0% (male-23.7%, female-38.1%). This prevalence is much higher than the prevalence reported in Bangladesh NCD Risk Factor Survey (2010) (World Health Organization, 2011) (overall-17.9%; male-18.5%, female-17.4%), however, similar to that found in BDHS (2011) (Chowdhury, Uddin, Haque & Ibrahimou, 2016) (overall-31.0%, male-20.3%, female-32.4%). This difference can be explained by the age difference of study participants in these studies. Bangladesh NCD Risk Factor Survey collected data from ≥18 years old adults and BDHS collected data from ≥35 years old adults. Our study reveals similar result to that of BDHS (2011) as because we considered >30 years old male and female for data collection.

In our study, nearly one out of every ten participants stated that they were diagnosed as having diabetes (male-8.5%, female-10.6%). This prevalence is higher than that found in Bangladesh NCD Risk Factor Survey (2010) (overall-3.9%; male- 4.3%, female-3.6%) (WHO, 2011). This difference can be explained by the age difference of study participants in these two studies. However, diabetes prevalence found in our study is greater than the prevalence reported in BDHS (2011) (male: 4.9%, female 5.8%) (Chowdhury et al., 2016).

One possible reason for this discrepancy might be prevalence of diabetes has been increased throughout Bangladesh in the last couple of years.

One of the noticeable findings of our study is prevalence of almost all the behavioral risk factors of NCDs such as smokeless tobacco consumption, inadequate fruits and vegetables consumption and inadequate physical activity are high among female participants. Prevalence of hypertension, diabetes, high waist circumference, overweight and obesity is also higher among women. It is well known that hypertension and diabetes are significant contributor of a wide range of life threatening conditions such as myocardial infarction, stroke and chronic kidney disease, which ultimately lead people to experience premature death and disability (Cohen et al., 2017). These diseases have potential to cause more detrimental effects to women while they get pregnant because both diabetes (pre-existing or gestational diabetes) and hypertension increase the chance of pregnancy related complication and adverse birth outcome (Ovesen, Jensen, Damm, Rasmussen & Kesmodel, 2015; Nakanishi, Aoki, Nagashima & Seki, 2017). Moreover, 22% of the women are widowed. Therefore, special attention needs to be offered to women while designing public health programs for prevention and control of diabetes and hypertension and NCD risk factors.

It was revealed from our study that hypertension, diabetes, overweight and obesity were highly prevalent among urban residents than their counterparts residing in rural areas. This finding is in accordance with previous studies conducted in Bangladesh (Saquib et al., 2012; Saquib et al., 2013). Consumption of high calorie food in combination with sedentary life style, stress and exposure to environmental risk factors such as noise pollution might explain this high prevalence of NCDs among urban population. Therefore it is necessary to give special attention to the urban settings.

CONCLUSIONS

It is evident form this study that a significant portion of adults in Bangladesh are suffering from hypertension and diabetes. In addition, behavioral risk factors of NCDs like tobacco consumption, high salt intake, inadequate fruits and vegetables consumption and inadequate physical activity are highly prevalent in this population. As hypertension, diabetes and their risk factors attribute to premature death and disability and pose enormous burden on the diseased individuals and their household along with the health system of Bangladesh, it is a timely need for the pertinent stakeholders to take necessary steps for the prevention and control of NCDs.

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ANNEX

ANNEX 1

Study Team

Research Team

Name	Designation	Organization	Role
Dr. Malay Kanti Mridha	Associate Professor and Director, Center of Excellence for NCD & Nutrition	BRAC JPGSPH	Principal Investigator (PI)
Dr. Malabika Sarker	Professor and Associate Dean, Director, Center of Excellence for Science of Implementation & Scale Up (SISU)	BRAC JPGSPH	Co-PI
Ms. Yukie Yoshimura	Chief Advisor, SHASTO Project	JICA	Investigator
Dr. Sohel Reza Choudhury	Professor, Department of Epidemiology & Research	NHFHRI	Investigator
Dr. Showkat Ali Khan	Assistant Scientist	BRAC JPGSPH	Investigator
Dr. Mehedi Hasan	Senior Research Associate	BRAC JPGSPH	Investigator
Dr. Ipsita Sutradhar	Senior Research Associate	BRAC JPGSPH	Investigator
Md. Mokbul Hossain	Senior Statistician	BRAC JPGSPH	Statistician
Mushfiqur Rahman	Senior Research Assistant	BRAC JPGSPH	Tool development
Rubaiya Riya Siddiqua	Senior Research Assistant	BRAC JPGSPH	Tool development
Dr. Zakia Siddiqui	Research Investigator	ICDDR,B	Anthropometry Master Trainer

Field Team

Name	Role	Name	Role
Md. Moyazzam Hossain	Quality Control Coordinator	Swapan Kumar Chandra	Quality Control Assistant
Ashraful Alam	Field Supervisor	Kartik Chanda Das	Quality Control Assistant
Md. Moniruzzaman	Field Supervisor	Ashok Kumar Biswas	Quality Control Assistant
Iqbal Hossain	Field Supervisor	Md. Monjurul Alam	Quality Control Assistant
Nurunnabi Ashakhy	Field Supervisor	Mst. Lakia Khatun	Data Collector
Kamal Chandra Shil	Data Collector	Monjuma Aktar	Data Collector
Shahanaj Parvin	Data Collector	Subrata Kumar Biswas	Data Collector
Moksedul Haque	Data Collector	Rahena Parvin	Data Collector
Dilruba Khanom	Data Collector	Arifa Khanom	Data Collector
Sima Rani Ray	Data Collector	Nazmin Akter	Data Collector
Md. Anowarul Islam	Data Collector	Md. Mozammel Huque	Data Collector
Makluna Begum	Data Collector	Gautom Kumar Gayen	Data Collector
Bahauddin Zakaria	Data Collector	Monindra Nath Sarkar	Data Collector
Asma Akhter	Data Collector	Jamila Khatun	Data Collector
Rakib Uddin	Data Collector	Abdullah Mahim	Data Collector
Nasrin Akter	Data Collector	Dilip Howlader	Data Collector

ANNEX 2

Consent Form (Quantitative Survey)

Protocol Title: Baseline Survey of Strengthening Health Systems through Organizing Communities (SHASTO) Project

Investigators' name: Malay Kanti Mridha, Malabika Sarker, Yukie Yoshimura, Sohel Reza Choudhury, Showkat Ali Khan, Mehedi Hasan, Ipsita Sutradhar

Organization: Japan International Cooperation Agency (JICA); BRAC James P Grant School of Public Health, BRAC University

Purpose of the research

As you are >30 years of age, you are being requested to participate in a baseline survey, which Japan International Cooperation Agency (JICA) and BRAC University are doing together. This study is being conducted to know the prevalence and risk factors of NCDs; NCD related knowledge, attitude and health care seeking practices and compliance with NCD treatment among >30 years of age adults in Dhaka, Narsingdi and Gazipur district. Moreover, in this study, we want to understand community's perspective about the quality of NCD services provided from health facilities in these areas.

What will happen if you take part in the study?

If you decide to take part in the study, you will be asked to do the following activities:

Face to face interview: One data collector will conduct face-to-face interview with you at your home. He/she will also measure your blood pressure, height, weight and waist circumference. Using height and weight, we will measure body mass index (BMI).

A total of 5,072 adult men and women will take part in the study.

Risk

There is no risk of physical or emotional harm if you participate in this study.

Benefits

There is no direct benefit for taking part in this study. In the long term, the study may benefit to improve NCD related health care service in your locality and in Bangladesh.

Privacy, anonymity and confidentiality

Identifier information collected in this study will be coded with a number and will be kept confidential. All information will be saved in a different encrypted file where only authorized research staff will have access. Your name or any other privacy related information will

never appear in any publication or results from the study. The Institutional Review Boards in Bangladesh has the authority to access all research records.

Future use of information
If there is a need for future use of the information collected by data collectors, we will provide only de-identified data so that privacy, anonymity and confidentiality of the participants are ensured.

Right not to participate and withdraw
Participation in this research is voluntary. You have the right to know about the procedures, risks, and benefits of the study. Even if you decide to take part, you can change your mind later and can leave the study at any time. No matter what decision you make, there will be no problems for you.

Compensation
There will be no financial compensation for taking part in the study.

Answering your questions/ Contact persons
If you have any questions about this research project please contact Mehedi Hasan, who will answer them. Mr. Hasan can be reached at Tel: +880 1535 448291. If you have any questions regarding your rights and participation as a research subject, please contact Mr. Kuhel Faizul Islam, IRB Coordinator, BRAC James P Grant School of Public Health. Mr. Islam can be reached at Tel: +880 1715030000. You can also contact Ms. Yukie Yoshimura, Chief Advisor, SHASTO Project. She can be reached at Tel: +880-2-9891897.

If you agree to take part in our study, please indicate that by putting your signature or your left thumb impression at the specified space below.

Thank you for your cooperation

Name of Participant:	_____
Signature or left thumb impression of participant:	_____
Date:	_____
Data Collector's Name	_____

ANNEX 3

Survey Questionnaire

Information of the participant				
Name and ID of interviewer	_____ ⌊_⌊_⌋			HL12
Date of the interview	⌊_⌊_⌋ / ⌊_⌊_⌋ /201⌊_⌋ Day Month Year			HL1
Interview start time (24 hour format)	⌊_⌊_⌋ : ⌊_⌊_⌋ Hour Min			HL2
Name of respondent	_____			HL3a
Nick name of respondent	_____			HL3b
Name of the household head	_____			HL4
Household name	_____			HL5
Name of the Village/Moholla	_____			HL6a
ID of the Village/Moholla	⌊_⌊_⌋			HL6b
District/ City Corporation	1 = Dhaka North 2 = Dhaka South	3 = Gazipur 4 = Narsinghdi		HL8
Upazilla/ Thana	1 = Pallabi 2 = Motijheel	3 = Kaliganj 4 = Shibpur		HL9
Union/ Ward	1 = Mirpur 2 = Gopibag 3= Jangalia 4= Uttorgaon	5=Tumulia 6= Baghaba 7= Josar 8= Putia	9 = Vashantek 10 = Shefalir Slum 11 = TT Para Slum	HL10
Community Clinic/Urban dispensary	1= Mirpur section 10 Urban Dispensary 2= AGB Colony Urban Dispensary 3=Jangalia CC 4=Uttorgaon CC 5= South Som CC 6= Saphariya CC 7= Chotabanda CC 8= Munseferchar CC			HL11
Do you want to go to physical measurement section?	1 = Yes 2 = No [If 'Yes' please go to M1a]			HL15

Step 1 Demographic Information

Question	Response	Code
Years of education you have completed (excluding pre-school and informal education)?	Years ⌊_⌊_⌋	C4
General education and Madrasa education system equivalent is given below:		

General education	Madrasa education	Year of education

Primary	Ebtedayee		5
Secondary	Dakhil		10
Higher secondary/ Diploma	Alim		12
Graduate	Fazil		16
Post graduate	Kamil/ Dawra		18
Expanded: Demographic Information			
What is your **marital status**?	1 = Never married 2 = Currently married 3 = Separated 4 = Divorced 5 = Widowed 88 = Refused		C7
Which of the following best describes your **main work** status over the past 12 months?	1 = Government employee 2 = Non-government employee 3 = Business (small) 4 = Business (large) 5 = Agriculture (land owner and farmer) 6 = Agriculture (day laborer) 7 = Industrial laborer 8 = Day laborer 9 = Transport laborer 10 = Self employed	11 = Students 12 = Home maker/Household work 13 = Retired 14 = Unemployed (able to work) 15 = Unemployed (unable to work) 16 = Paid domestic worker (maid servant) 17 = Blacksmith/Goldsmith/ Weaver 99 = Others (Please specify) 88 = Refuse	C8
What is your monthly household income? (Considering **the past year**)	⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌋ 88 = Refuse		C10
Taking **the past year**, can you tell me your average monthly income?	⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌋ 88 = Refuse		Cost
Religion	1 = Hindu 2 = Muslim 3 = Christian 4 = Buddhist 99 = Others		SD2
EXPANDED: Demographic Information			
Question	**Response**		**Code**
Please ask and observe (if necessary) - whether this household or any person who lives in the household has the following items:			
Electricity	1 = Yes 2 = No 88 = Refuse		Cex1a

Flush toilet	1 = Yes 2 = No 88 = Refuse	Cex1b
Land Phone/Telephone	1 = Yes 2 = No 88 = Refuse	Cex1c
Mobile phone	1 = Yes 2 = No 88 = Refuse	Cex1d
Television	1 = Yes 2 = No 88 = Refuse	Cex1e
Refrigerator	1 = Yes 2 = No 88 = Refuse	Cex1g
Private car	1 = Yes 2 = No 88 = Refuse	Cex1h
Moped or scooter or motorcycle or Auto-Rickshaw	1 = Yes 2 = No 88 = Refuse	Cex1i
Washing machine	1 = Yes 2 = No 88 = Refuse	Cex1j
Bicycle	1 = Yes 2 = No 88 = Refuse	Cex1k
Sewing machine	1 = Yes 2 = No 88 = Refuse	Cex1l
Almirah or wardrobe	1 = Yes 2 = No 88 = Refuse	Cex1m
Table	1 = Yes 2 = No 88 = Refuse	Cex1n
Khat or Chowki	1 = Yes 2 = No 88 = Refuse	Cex1o
Chair or Bench or	1 = Yes 2 = No 88 = Refuse	Cex1p
Wall watch	1 = Yes 2 = No 88 = Refuse	Cex1q
Computer/Laptop/Tab	Yes1 = Yes 2 = No 88 = Refuse	Cex1r
Domestic Animal (Cow/Buffalo/Goat)	1 = Yes 2 = No 88 = Refuse	Cex1s
Shallow Machine or Power Tiller or Tractor or Water pump or Generator	1 = Yes 2 = No 88 = Refuse	Cex1t
Rickshaw or Van	1 = Yes 2 = No 88 = Refuse	Cex1u
What is the main material of the roof of the main house?	1 = Katcha (Mud /bamboo/thatched/straw/gunny)	Cex2a

[Record observation] ***Instruction:*** *If one HH has more houses then, need to add that house's roof where respondent consider as his main house.*	2 = Tin, Tiles or similar materials 3 = Cement/concrete 99 = Others If "99", please specify: [_____]	
What is the main material of the floor in this household? [Record observation] ***Instruction:*** *If one HH has more houses then, need to add that house's roof where respondent consider as his main house.*	1 = Cement 2 = Mud or sand 99 = Others If "99", please specify: [_____]	Cex2b
What is the main material of the walls in this household?	1 = Katcha (Mud /bamboo/thatched/straw/gunny) 2 = Tin, Tiles or similar materials 3 = Cement/concrete 99 = Others If "99", please specify: [_____]	Cex2c
What is the type of this family? ***Instruction:*** ***Nuclear Family:*** *Family having husband and wife or husband-wife with their child (first generation).* ***Joint family:*** *Family having husband-wife, their child, their parents or siblings (second or more generation).*	1 = Nuclear Family 2 = Joint Family	Cex3

Step 1 Behavioural Measurements

CORE: Diet		
The next questions I will ask about the fruits and vegetables that you usually eat; I have a nutrition card/picture here that shows you some examples of local fruits and vegetables; Each picture represents the size of a serving; To answer these questions, please think of a typical week.		
Question	**Response**	**Code**
In a typical week, on how many days do you **eat fruit**? (USE SHOWCARD)	Number of days ☐☐ 77 = Don't Know [If '0' days, go to D3]	D1
How many **servings** of fruit do you eat on **one** of those days? (USE SHOWCARD)	Number of servings ☐☐ 77 = Don't Know	D2
In a typical week, on how many days do you **eat vegetables**? (USE SHOWCARD)	Number of days ☐☐ 77 = Don't Know [If '0' days, go to DX1]	D3
How many **servings** of vegetables do you eat on one of those days? (USE SHOWCARD)	Number of servings ☐☐ 77 = Don't Know	D4
Knowledge on dietary habit (vegetables and fruits)		
What do you think is the desirable or recommended number of fruit and vegetable servings one should eat every day to be healthy?	Number of servings ☐☐.☐ 77 = Don't Know	DX1

Have you ever heard about harmful effects of inadequate consumption of fruits and vegetables?	1 = Yes 2 = No [If no go to AV2]	KV1
What are the harmful effects of inadequate consumption of fruits and vegetables? ***Instruction:*** *Multiple responses possible.*	1 = Hypertension 2 = Cardiovascular diseases 3 = Kidney disease 4 = Cancer 5 = Diabetes 6= Eye diseases 7= Weakness 77 = Don't know 99 = Others	KV2
Attitude on dietary habit (vegetables and fruits)		
How important do you think is to consume adequate fruits and vegetables? ***Instruction:*** Record the perception of the respondent	1 = Very important 2 = Somewhat important 3 = Not at all important 77 = Don't know	AV2
Dietary salt		
With the next questions, I would like to learn more about salt in your diet. Dietary salt includes ordinary table salt, unrefined salt such as sea salt, iodized salt, salty stock cubes and powders, bit salt, testing salt and salty sauces etc. and salty sauces such as soya sauce or fish sauce (Use show card). The following questions are on adding salt to the food right before you eat it, on eating processed foods that are high in salt such as Fast food, Chips, Dried fish, Salty fish, Pickles, Chana Chur, Jhal Muri and questions on controlling your salt intake. Please answer the questions even if you consider yourself to eat a diet low in salt.		
How often do you add salt to your food right before you eat it or as you are eating it? [SELECT ONLY ONE] [USE SHOWCARD]	1 = Always 2 = Often 3 = Sometimes 4 = Rarely 5 = Never 77 = Don't know	D5a
How often do you add salty sauce such as soya sauce to your food right before you eat it or as you are eating it? [SELECT ONLY ONE] [USE SHOWCARD]	1 = Always 2 = Often 3 = Sometimes 4 = Rarely 5 = Never 77 = Don't know	D5b
How often do you eat processed food high in salt? By processed food high in salt, I mean foods that have been altered from their natural state, such as packaged salty snacks (such as Chips, Chanachur, Jhal Muri), canned salty food including pickles and preservatives, salty food prepared at a fast food restaurant, cheese, processed meat, dried fish, salty fish etc. [USE SHOWCARD]	1 = Always 2 = Often 3 = Sometimes 4 = Rarely 5 = Never 77 = Don't know	D7
How much salt do you think you consume? ***Instruction:*** *Count all sources of salt that respondent consume. Like for meal preparation, extra salt*	1 = Always 2 = Often 3 = Sometimes 4 = Rarely 5 = Never 77 = Don't know	D8a

EXPANDED: Diet		
Question	**Response**	**Code**
How much extra salt do you take in a typical day? [USE SHOW CARD]	⌊_⌊_⌋ . ⌊_⌋ Teaspoonful (TSF) 77 = Don't know	DX2
Currently are you doing anything on regular basis to control your salt intake?	1 = Yes 2 = No 77 = Don't know [If 'No'/'Don't know go to Dx3]	DX5
Do you do any of the following on a regular basis to control your salt intake? (RECORD FOR EACH)		
Stop/reduction of taking extra salt during eating	1 = Yes 2 = No	D11a
Stop/reduction of taking salty sauce	1 = Yes 2 = No	D11b
Limit consumption of processed foods	1 = Yes 2 = No	D11c
Look at the salt or sodium content on food labels	1 = Yes 2 = No	D11d
Buy low salt/sodium alternatives	1 = Yes 2 = No	D11e
Use spices other than salt when cooking	1 = Yes 2 = No	D11f
Avoid eating foods prepared outside of a home	1 = Yes 2 = No	D11g
Do other things specifically to control your salt intake	1 = Yes 2 = No If 'Yes', go to D11other	D11n
Other (please specify)	⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌋	D11 other
Knowledge on dietary habit (salt)		
What is the maximum amount of salt do you think a person should take in a day from all sources? [USE SHOW CARD]	⌊_⌊_⌋ . ⌊_⌋ Teaspoonful (TSF) Don't know 77	DX3
Have you ever heard about the harmful effects of taking extra salt while eating?	1 = Yes 2 = No If 'No', go to D9	KL1
What do you think that too much salt or salty sauce in your diet can do to your health? ***Instruction:*** *Multiple responses possible.*	1 = Nothing, more salt is good for one's health 2= Increase blood pressure 3 = Kidney disease 4 = Asthma 5 = Cancer 6= Blood becomes thinner *(Rokto pani hoye jay)* 7= Fluid accumulation in body/ Oedema *(Shorire pani jome)* 77 = Don't know	DX4

	99 = Others (Please specify…….)	
Attitude on dietary habit (salt)		
How important to you is lowering the salt in your diet?	1 = Very important 2 = Somewhat important 3 = Not at all important 77 = Don't know	D9
Practice on dietary habit		
What type of OIL is most often used to cook food in your house? [ANSWER ONLY ONE OPTION]	1 = Soybean Oil 2 = Palm Oil 3 = Sunflower Oil 4 = Mustard Oil 5 = Rice bran oil 6 = Dalda 7 = Ghee/Butter 8 = Not specific 99 = Other (Please specify…….)	DX6
On often do you eat in a restaurant or take away in a week? (any of the meals (Breakfast, Lunch, Dinner)	⌊_⌊_⌋ Times 77 = Don't Know	DX7
On an average how many times in a day do you eat snacks such as singara, samucha, puri, chips, chanachur, fuchka, chotpoti, jhal muri, salted biscuits, etc.?	⌊_⌊_⌋ Times 77 = Don't Know	DX8

CORE: Tobacco Use		
Now I am going to ask you some questions about tobacco use.		
Do you currently smoke any tobacco products, such as cigarettes, bidis, hookah, cigars or pipes? [USE SHOWCARD]	1 = Yes 2 = No If No, go to T12	T1
Do you currently smoke tobacco products daily?	1 = Yes 2 = No	T2
How old were you when you **first started** smoking?	Age ⌊_⌊_⌋ 77 = Don't know	T3

On average, how many of the following products do you smoke each day/week?
[IF LESS THAN DAILY, RECORD WEEKLY]
[RECORD FOR EACH TYPE]
[USE SHOWCARD – 14]
Don't Know 7777

Question	**Answer**		**Code**
	DAILY	WEEKLY	
Manufactured cigarettes	|__|__|__|	|__|__|__|	T5a/ T5aw

Bidis	|___|___|___|	|___|___|___|	T5b/ T5bw
Hookah/Dhaba	|___|___|___|	|___|___|___|	T5c/ T5cw
Pipes full of tobacco	|___|___|___|	|___|___|___|	T5d/ T5dw
Hand-rolled cigarettes	|___|___|___|	|___|___|___|	T5e/ T5ew
Cigars, Cheroots, Cigarillos	|___|___|___|	|___|___|___|	T5g/ T5gw
Number of Shisha sessions	|___|___|___|	|___|___|___|	T5h/ T5hw
Other [If 'Other' please go to T5other, else go to T6]	|___|___|___|	|___|___|___|	T5f/T5fw
Other (please specify) and go to T6:	_____	_____	T5 Other
During the past 12 months, have you tried to stop smoking?	1 = Yes 2 = No		T6
During any visit to a doctor or other health worker in the past 12 months, were you advised to quit smoking tobacco?	1 = Yes 2 = No 3= No visit during the past 12 months		T7
Do you currently use any smokeless tobacco products such as Betel quid with zarda, zarda only or zarda with supari, Betel quid with sadapata, pan masala with tobacco, sadapata chewing, gul, Khoinee, Nossi, gutka? [USE SHOWCARD]	1 = Yes 2 = No [If 'NO', please go to T17]		T12
Do you currently use smokeless tobacco products such as Betel quid with zarda, zarda only or zarda with supari, Betel quid with sadapata, pan masala with tobacco, sadapata chewing, gul, Khoinee, Nossi, gutka daily?	1 = Yes 2 = No		T13
How old were you when you started smokeless tobacco?	Age ___ 77 = Don't know		TN1

On average, how many times do you use following tobacco products in a day/week? (IF LESS THAN DAILY, RECORD WEEKLY) (RECORD FOR EACH TYPE, USE SHOWCARD) Don't Know 7777			
Question	**Answer**		**Code**
	DAILY	WEEKLY	
Betel quid with zarda, zarda only or zarda with supari?	|___|___|___|	|___|___|___|	T14a/ T14aw
Betel quid with sadapata	|___|___|___|	|___|___|___|	T14b/ T14bw
Pan masala with tobacco	|___|___|___|	|___|___|___|	T14c/ T14cw
Sadapata chewing	|___|___|___|	|___|___|___|	T14d/ T14dw
Gul	|___|___|___|	|___|___|___|	T14e/ T14ew
Khoinee	|___|___|___|	|___|___|___|	T14f/ T14fw
Nossi	|___|___|___|	|___|___|___|	T14g/T14gw
Other	|___|___|___|	|___|___|___|	T14h/ T14hw
	[If 'Others' please go to T14 other]		
Other (please specify) and go to T6:			T14 other/ T14 otherw
During the past 12 months, have you tried to stop smokeless tobacco?	1 = Yes 2 = No		TN2
During any visit to a doctor or other health worker in the past 12 months, were you advised to quit smokeless tobacco?	1 = Yes 2 = No 3 = Did not visit any doctor or other health worker in the past 12 months		TN3
Does someone smoke in your home?	1 = Yes 2 = No		T17
Knowledge on tobacco/ tobacco products			
Have you ever heard about the harmful effects of tobacco/tobacco products consumption?	1 = Yes 2 = No [If 'No', please go to physical activity section]		KT1
What are the harmful effects of tobacco/tobacco products consumption? ***Instruction:*** *Multiple responses possible.*	1 = High blood pressure 2 = Cardiovascular disease 3 = Kidney disease 4 = Cancer 5= Lung problem 6= Tuberculosis 7=Cough 77 = Don't know 99 = Others (Please specify) _____		KT2

Attitude on tobacco/ tobacco products		
How harmful is using tobacco / tobacco products to your health?	1 = Very harmful 2 = Somewhat harmful 3 = Not at all harmful 77 = Don't know	AT1

CORE: Physical Activity		
Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment. [Insert other examples if needed]. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.		
Now I would like to know about the 'Vigorous-intensity activities' you perform		
'Vigorous-intensity activities' performed as a part of daily work / professional work		
Question	**Response**	**Code**
Does your daily work / professional work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging or construction work, harvesting paddy, fishing using net etc.] for at least 10 minutes continuously? (USE SHOWCARD)	1 = Yes 2 = No [If 'No', please go to P10]	P1
In a typical week, on how many days do you do vigorous- intensity activities as part of daily work / professional work?	⌊_⌊_⌋ Day 77 = Don't know [If 'Don't know', please go to P10]	P2
How much time do you spend doing vigorous-intensity activities at daily work / professional work on a typical day?	_____ Minutes	P3 (a-b)
'Vigorous-intensity activities' performed outside daily work / professional work		
Question	**Response**	**Code**
Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running, football, Kabaddi, Dariabandha, Gollachut] for at least 10 minutes continuously? [USE SHOWCARD]	1 = Yes 2 = No [If 'No', please go to P4]	P10
In a typical week, on how many days do you do vigorous- intensity sports, fitness or recreational (leisure) activities?	⌊_⌊_⌋ Day 77 = Don't know [If 'Don't know', please go to P4]	P11
How much time do you spend doing vigorous-intensity		P12

sports, fitness or recreational activities on a typical day?	_____ Minutes	(a-b)
Now I would like to know about the 'Moderate-intensity activity' you perform		
'Moderate-intensity activity' performed as a part of daily work / professional work		
Question	**Response**	**Code**
Does your daily work / professional work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously? (USESHOWCARD)	1 = Yes 2 = No [If 'No', please go to P13]	P4
In a typical week, on how many days do you do moderate- intensity activities as part of your daily work / professional work?	☐☐ Day 77 = Don't know [If 'Don't know', please go to P13]	P5
How much time do you spend doing moderate-intensity activities at daily work / professional work on a typical day?	_____ Minutes	P6 (a-b)
' Moderate-intensity activities' performed outside daily work / professional work		
Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, [cycling, swimming, volleyball and] for at least 10 minutes continuously? (USESHOWCARD)	1 = Yes 2 = No [If 'No', please go to P7]	P13
In a typical week, on how many days do you do moderate- intensity sports, fitness or recreational (leisure) activities?	☐☐ Day 77 = Don't know [If 'Don't know', please go to P7]	P14
How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?	_____ Minutes	P15 (a-b)
Travel to and from places		
The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship. [Insert other examples if needed]		
Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?	1 = Yes 2 = No [If 'No', please go to P16]	P7
In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	☐☐ Day 77 = Don't know [If 'Don't know', please go to P16]	P8
How much time do you spend walking or bicycling for travel on a typical day?	_____ Minutes	P9 (a-b)
Sedentary behavior		
The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping. (USE SHOWCARD)		

How much time do you usually spend sitting or reclining on a typical day?	_____ Minutes	P16 (a-b)
How much time do you watch television daily?	_____ Minutes	P17 (a-b)
Knowledge on physical activity		
Question	**Response**	**Code**
How long do you think an adult should perform 'Vigorous-intensity activities' every day?	_____ Minutes 77.77 = Don't know	KP1
How long do you think an adult should perform 'Moderate-intensity activities' every day?	_____ Minutes 77.77 = Don't know	KP2
Have you ever heard about harmful effect of inadequate physical activity?	1 = Yes 2 = No [If 'No', please go to AP2]	KP3
What are the harmful effects of inadequate physical activity? ***Instruction:*** *Multiple responses possible.*	1 = Hypertension 2 = Heart disease 3 = Kidney disease 4 = Cancer 5 = Diabetes 6= Weight gain 7= Body ache 99 = Others (Please specify)…… 77 = Don't know	KP4
Attitude on physical activity		
How important do you think is to perform adequate physical activity?	1 = Very important 2 = Somewhat important 3 = Not at all important 77 = Don't know	AP2

Health Care Practice of Hypertension/Raised Blood Pressure		
Question	**Response**	**Code**
Have you had your blood pressure measured by a doctor or other health worker within last 6 months?	1 = Yes 2 = No [If 'No' please go to H2b]	H1
Have you been told by a doctor or other health worker within last 6 months that you have raised blood pressure or hypertension?	1 = Yes 2 = No [If 'Yes' please go to PH1; If 'No' please go to H2b]	H2
Have you been ever told by a doctor or other health worker that you have raised blood pressure or hypertension?	1 = Yes 2 = No [If 'No' please go to H18]	H2a
Do you seek care for hypertension?	1 = Yes 2 = No [If 'No' please go to H18]	PH1
If yes, from whom you seek care for your hypertension?	1 = Doctor 2 = SACMO 3 = Nurse 4 = Kabiraj 5 = Health assistant 6 = Pharmacist/Drug seller 7 = Rural medical practitioner	PH2

	8 = Kabiraj 9 = Homeopathy 10 = Ayurveda 11 = Don't go 99 = Others (Specify)	
At what frequency you visit doctors/consultants for a regular checkup?	1 = Daily [__|__| (Times) 2 = Weekly [__|__| (Times) 3 = Monthly [__|__| (Times) 4 = Yearly [__|__| (Times) 5 = Don't go 99 = Others (specify) ……. [__|__| (Times)	PH3b
What is the consultation fee you (generally) pay for each visit?	[__|__|__|__|__|__\] (BDT)	PH4
From where you check your blood pressure level?	1 = At home 2 = At nearby dispensary 3 = Physician chamber 4 = Private Clinic 5 = Facility (CC/UD/UHC/DH/Private hospital) 99 = Others (specify) …….	PH13
Are you currently taking any medicine according to the prescription of doctor or other health care provider to control hypertension/ raised blood pressure?	1 = Yes 2 = No [If 'No' please go to PH11]	PH9

Could you mention the name of anti-hypertensive medicine (s) you are taking? Show the strip if fail to mention medicine (s) name (Multiple answer question)

Sl no	Name (use generic name)	Type (Tab)	Strength (mg)	Amount	Frequency	Unit cost
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						

How much you have to pay for these medicine?	[__|__|__|__|__|__\] (BDT)	PH9Money
Has it happened in the last 6 months that you could not take medicine according to the prescription of doctor or other health care provider to control hypertension/ raised blood pressure?	1 = Yes 2 = No [If 'No' please go to H5]	PH10
What is the most important reason for which you are not currently taking medications? (Yes, to last 12 months/ever treatment and no to current treatment) ***Instruction:*** *Multiple responses possible.*	1 = Don't think taking drug is necessary 2 = Too expensive 3 = Got side-effect or afraid of side-effect 4 = Blood pressure is now normal 5 = Medicine is not available 6 = Medicine not advised 99 = Others (specify) …….	PH11
Are you currently taking any traditional remedy for your raised blood pressure?	1 = Yes 2 = No	H5
Is your normal work interrupted due to high blood pressure?	1 = Yes 2 = No [If 'No' please go to H18]	PH15
How many days have you stopped working every month due to high blood pressure?	[__|__| Days	PH16
Are you currently taking aspirin regularly to prevent or treat heart disease?	1 = Yes 2 = No	H18

Are you currently taking statins (Lovastatin/Simvastatin/Atorvastatin or any other statin) regularly to prevent or treat heart disease?	1 = Yes 2 = No	H19
Knowledge on hypertension		
Question	**Response**	**Code**
Have you ever heard about hypertension?	1 = Yes 2 = No	KH1
A person should be considered as hypertensive when his/her blood pressure is-	Upper limit: ⌊_⌊_⌊_⌋ mmHg Lower limit: ⌊_⌊_⌊_⌋ mmHg 77 = Don't know	KH2
What are the risk factors for hypertension? (Multiple response)	1 = Excessive body weight 2 = High salt intake 3 = Lack of physical activities 4 = Tobacco consumption 5 = Aging 6 = Family history of hypertension 7 = Drinking alcohol 8= Stress/ Tension/ Anxiety 9= Too much food intake 99 = Others (Specify) …… 77 = Don't know	KH4
What are the complications of uncontrolled hypertension?	1 = Heart attack (Angina & MI) 2 = Brain stroke/ Paralysis 3 = Eye problem 4 = Kidney problem 5 = Blood vessels problem (PVD) 6= Vertigo 7= Neck pain *(ghare batha)* 99 = Others (Please specify) …….. 77 = Don't know	KH5
What are the ways to control hypertension?	1 = Taking medications regularly 2 = Exercising 3 = Less stress 4 = Quitting smoking 5 = Reducing extra salt in diet 6 = Avoiding alcohol drinking 7 = Maintain normal weight 8= Diet control (example: Eating less beef and oily food) 9= Eating sour food 99 = Other (Specify) _____ 77 = Don't know	KH6
How long should a person who has hypertension (high blood pressure) generally take his/her medication?	1 = Until the blood pressure comes back to normal and then medication can be stopped 2 = For 3 months after blood pressure comes back to normal and then stopped 3 = Life long 4 = Only when the blood pressure is elevated, other times the medications need not be taken 99 = Other (Specify) _____ 77 = Don't know	KH7
Attitude related to hypertension		
Question	**Response**	**Code**
How important do you think is to keeping blood pressure under control?	1 = Very important 2 = Somewhat important 3 = Not at all important	AH2

	77 = Don't know	
Do you think that high blood pressure (hypertension) is a life-long disease?	1 = Yes 2 = No 77 = Don't know	AH3
Do you think that high blood pressure (hypertension) is something you can cure?	1 = Yes 2 = No 77 = Don't know	AH4
Can changing lifestyle help to lower your blood pressure? ***Instruction:*** *Changing Lifestyle means not to take tobacco and tobacco products (for example : not smoking, not eating betel leaf with jarda), consuming adequate fruits and vegetables and perform adequate physical activity*	1 = Yes 2 = No 77 = Don't know	AH5

Health Care Practice of Diabetes		
Question	**Response**	**Code**
Have you had your blood sugar measured by a doctor or other health worker within last 6 months?	1 = Yes 2 = No [If 'No' please go to H7a]	PD1
Have you been told by a doctor or other health worker within last 6 months that you have raised blood sugar or diabetes?	1 = Yes 2 = No [If 'Yes' please go to PD3; If 'No' please go to H7a]	PD2
Have you been ever told by a doctor or other health worker that you have raised blood sugar or diabetes?	1 = Yes 2 = No [If 'No' please go to KD1]	H7a
Do you seek care for diabetes?	1 = Yes 2 = No [If 'No' please go to H5]	PD3

If yes, from whom you seek care for your diabetes? ***Instruction:*** *Multiple responses possible.*	1 = Doctor 2 = SACMO 3 = Nurse 4 = Kabiraj 5 = Health assistant 6 = Pharmacist/Drug seller 7 = Rural medical practitioner 8 = Kabiraj 9 = Homeopathy 10 = Ayurveda 11 = Don't go 99 = Others (Specify)	PD4
At what frequency you visit doctors/consultants for a regular checkup?	1 = Daily [__|__| (Times) 2 = Weekly [__|__| (Times) 3 = Monthly [__|__| (Times) 4 = Yearly [__|__| (Times) 5 = Don't go 99 = Others (specify) ……. [__|__| (Times)	PD5b
What is the consultation fee you (generally) pay for each visit?	[__|__|__|__|__|__] (BDT)	PD6
From where you check your blood glucose level? ***Instruction:*** *Multiple responses possible.*	1 = At home 2 = At nearby dispensary 3 = Physician chamber 4 = Private Clinic 5 = Facility (CC/UD/UHC/DH/Private hospital) 99 = Others (specify) …….	PD12
Are you currently taking any medicine according to the prescription of doctor or other health care provider to control diabetes?	1 = Yes 2 = No [If 'No' please go to PD10]	PD7

Could you mention the name of anti-diabetic medicine (s) you are taking? Show the strip if fail to mention medicine (s) name (Multiple answer question)

Sl no	Name (use generic name)	Type (Tab)	Strength (mg)	Amount	Frequency	Unit cost
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						

How much you have to pay for these medicines?	[__|__|__|__|__|__] (BDT)	PD8
Has it happened in the last 6 months that you could not take medicine according to the prescription of doctor or other health care provider to control diabetes?	1 = Yes 2 = No [If 'No' please go to H9]	PD9
What is the most important reason for which you are not currently taking medications? (Yes, to last 12 months/ever treatment and no to current treatment)	1 = Don't think taking drug is necessary 2 = Too expensive 3 = Got side-effect or afraid of side-effect 4 = Blood pressure is now normal	PD10

Instruction: *Multiple responses possible.*	5 = Medicine is not available 6 = Medicine not advised 99 = Others (specify) …….	
Are you currently taking insulin to control diabetes?	1 = Yes 2 = No	H9
Are you currently taking any traditional remedy for your diabetes?	1 = Yes 2 = No	H11
Do you use any special product (diabetic food) to control diabetes?	1 = Yes 2 = No [If 'No' please go to PD17]	PD14
What product (s) you use?	Please specify _____	PD15
How much you have to spend for these products?	[__|__|__|__|__] (BDT)	PD16
Is your normal work interrupted due to diabetes?	1 = Yes 2 = No [If 'No' please go to KD1]	PD17
How many days have you stopped working every month due to diabetes?	[__|__] Days	PD18
Knowledge on diabetes		
Question	**Response**	**Code**
Have you ever heard about diabetes?	1 = Yes 2 = No	KD1
Normal fasting blood sugar of a health person is-	1 = 7 2 = 11 3 = More than 7 4 = Less than 7 99 = Other (Specify the exact value) _____ 77 = Don't know	KD2
Normal random blood sugar of a health person is-	1 = 11 2 = Less than 11 3 = 6 4 = Less than 11 99 = Other (Specify the exact value) _____ 77 = Don't know	KD3

What are the risk factors for diabetes? (Multiple response)	1 = Fat or overweight 2 = Hypertension 3 = Family history of diabetes 4 = High sugar intake 5 = Lack of physical activities 6 = Mental stress 7= Too much food intake 99 = Others (Specify) …… 77 = Don't know	KD4
What are the complications of uncontrolled diabetes?	1 = Eye problem 2 = Kidney problem 3 = Heart attack/ Heart disease (Angina & MI) 4 = Brain stroke/ Paralysis 5 = Diabetic foot (ulcer) 6= Weakness 7= Premature death 99 = Others (Please specify)…… 77 = Don't know	KD5
What are the ways to control diabetes?	1 = Taking medications regularly 2 = Exercising/ Walking 3 = Maintain normal body weight 4= Eat less sweet food items 5= Diet control 99 = Other (Specify) _____ 77 = Don't know	KD6
How long should a person who has diabetes generally take his/her medication?	1 = Until the blood glucose comes back to normal and then medication can be stopped 2 = For 3 months after blood glucose comes back to normal and then stopped 3 = Life long 4 = Only when the blood glucose is elevated, other times the medications need not be taken 77 = Don't know 99 = Other (Specify) _____	KD7
Attitude related to diabetes		
Question	**Response**	**Code**
How important do you think is to keeping diabetes under control?	1 = Very important 2 = Somewhat important 3 = Not at all important 77 = Don't know	AD2
Do you think that diabetes is a life-long disease?	1 = Yes 2 = No [77 = Don't know]	AD3
Do you think that diabetes is something you can cure?	1 = Yes 2 = No 77 = Don't know	AD4
Can changing lifestyle help to lower your diabetes? ***Instruction:*** *Changing Lifestyle means not to take tobacco and tobacco products (for example : not smoking, not eating betel leaf with jarda), consuming adequate fruits and vegetables and perform adequate physical activity*	1 = Yes 2 = No 77 = Don't know	AD5

Health Care Practice of Raised Total Cholesterol		
Question	**Response**	**Code**
Have you had your cholesterol (fat levels in your blood) measured by a doctor or other health worker within last 6 months?	1 = Yes 2 = No [If 'No' please go to H13a]	H12
Have you been told by a doctor or other health worker within last 6 months that you have raised cholesterol?	1 = Yes 2 = No [If 'Yes' please go to PC1. If 'No' please go to H13a]	H13b
Have you ever been told by a doctor or other health worker that you have raised cholesterol?	1 = Yes 2 = No [If 'No' please go to H20]	H13a
Do you seek care for raised cholesterol?	1 = Yes 2 = No [If 'No' please go to H20]	PC1
If yes, from whom you seek care for your raised cholesterol?	1 = Doctor 2 = SACMO 3 = Nurse 4 = Kabiraj 5 = Health assistant 6 = Pharmacist/Drug seller 7 = Rural medical practitioner 8 = Kabiraj 9 = Homeopathy 10 = Ayurveda 11 = Don't go 99 = Others (Specify)	PC2
At what frequency you visit doctors/consultants for a regular checkup?	1 = Daily [__|__| (Times) 2 = Weekly [__|__| (Times) 3 = Monthly [__|__| (Times) 4 = Yearly [__|__| (Times) 5 = Don't go 99 = Others (specify) ……. [__|__| (Times)	PC3b
Where you usually go to receive treatment, advice and to check your cholesterol level?	1 = At home 2 = At nearby dispensary 3 = Physician chamber 4 = Private Clinic 5 = Health facility (CC/UD/UHC/DH/Private hospital) 99 = Others (specify) …….	Hx10
Are you currently taking any medicine according to the prescription of doctor or other health care provider to control your cholesterol level?	1 = Yes 2 = No [If 'No' please go to Hx12]	PC4
Has it happened in the last 6 months that you could not take medicine according to the prescription of doctor or other health care provider to control cholesterol level?	1 = Yes 2 = No [If 'No' please go to H16]	JICA
What is the most important reason for which you are not currently taking medications? (Yes, to last 12 months/ever treatment and no to current treatment) ***Instruction:*** *Multiple responses possible.*	1 = Don't think taking drug is necessary 2 = Too expensive 3 = Got side-effect or afraid of side-effect 4 = Cholesterol level is now normal 5 = Medicine is not available 6 = Medicine not advised 99 = Others (specify) …….	Hx12
Are you currently taking any herbal or traditional remedy for your raised cholesterol?	1 = Yes 2 = No	H16

CORE: Lifestyle Advice			
Question	**Response**		**Code**
During the past 12 months, have you visited a doctor or other health worker?	1 = Yes 2 = No [If No please go to CT1]		H20
During any of your visits to a doctor or other health worker in the past 12 months, were you advised to do any of the following? (RECORD FOR EACH)			
Quit using tobacco or don't start ***Instruction:*** *If the responded is female and she smoke tobacco product then ask the question by specifying that particular product. (Example: Betel leaf with jorda, areca catechu/supari with zorda, Chewing sadapata, pan masala, khoinee, ghul, ghutka etc.)*	1 = Yes 2 = No		H20a
Reduce salt in your diet	1 = Yes 2 = No		H20b
Eat at least five servings of fruit and/or vegetables each day	1 = Yes 2 = No		H20c
Reduce fat in your diet	1 = Yes 2 = No		H20d
Start or do more physical activity	1 = Yes 2 = No		H20e
Maintain a healthy body weight or lose weight	1 = Yes 2 = No		H20f
Reduce sugary beverages in your diet	1 = Yes 2 = No		H20g
Within last 12 months have you been hospitalized?	1 = Yes 2 = No [If 'No' please go to X]		CT1
How many times you have been hospitalized within last 12 months?	[__|__| (Times)		CT2
What type of symptoms/illness you suffered? (Multiple answer question)	1=Asthma 2=Diarrheal diseases/dysentery 3=Gastric/duodenal ulcer 4=arthritis/rheumatism 5=Eye related disease 6=Diabetes 7=Cancer 8=Leprosy 9=Kidney Disease 10=Liver disease 11=Tuberculosis 12=Typhoid 13=Pneumonia 14=Viral hepatitis 15=Malaria 16=Dengue 17=Pregnancy/child birth related condition 18=Gallbladder disease 19=ENT problems 20=Mental disorders 21=Bronchitis 22=Appendicitis 23=Sinusitis 24=Dermatitis/ Eczema/ Skin related problem 25=Heart disease	26=Accident/injury/disability 27=Paralysis 28=Epilepsy 29=Minor injury 30=Female specific disease 31=Fever 32=Abnormalities of heartbeat 33=High/low blood pressure 34=Breathing trouble 35=Cough/common cold 36= Throat pain 37=Chest pain 38=Migraine 39=Acute abdomen 40=Heart burn 41=Nausea 42= Dysphagia 43= Jaundice 44=Other chronic pain 45= Malise/weakness 46= Vertigo/ Dizziness 47= Anemia/ blood related 99=Others (Please	CT3

		Specify) 77=Do not know	
How many days you have stayed in the hospital?	[__|__|__] Days		CT4
Have you gone through any surgery? If yes then ask the next question	1 = Yes 2 = No [If 'No' please go to CT7]		CT5
Cost of surgery	[__|__|__|__|__] BDT		CT6
Cost incurred for bed rent	[__|__|__|__|__] BDT		CT7
Cost of drug/medication	[__|__|__|__|__] BDT		CT8
Cost of consultation fee	[__|__|__|__|__] BDT		CT9
Investigation cost	[__|__|__|__|__] BDT		CT10
Cost of Transport	[__|__|__|__|__] BDT		CT11
Other Cost (specify) ……	[__|__|__|__|__] BDT		CT12
Total cost of hospitalization	[__|__|__|__|__] BDT		CT13
Have you finished the physical measurement section?	1 = Yes 2 = No [If 'Yes' please go to M19]		X

Step 2 Physical Measurements		
CORE: Blood Pressure (Ask the participant to sit quietly with his/her legs uncrossed. Before the measurement begins, make sure that the participant is in rest at least for 15 minutes and does not have the urge to urinate. In addition, make sure that he/she did not have any tea or coffee or did not consume tobacco (smoking or smokeless) within last 15 minutes.)		
Question	**Response**	**Code**
Starting time of measurement	|___|___|:|___|___| Hour: Minute	M1a
Interviewer ID	☐☐	M1
Device ID for blood pressure	☐☐	M2
Cuff size used	1 = Small 2 = Medium (common) 3 = Large	M3
Question	**Response**	**Code**
Reading 1 Measure blood pressure for the first time after interviewee takes rest at least for 15 minutes ***Instruction:*** *If the respondent refuse, then type "0"*	Systolic (mmHg) |___|___|___|	M4a
	Diastolic (mmHg) |___|___|___|	M4b
	Heart rate (beats /minute) |___|___|___|	M16a
	Time of measuring blood pressure |___|___|:|___|___| Hour: Minute	MTBP1
Reading 2 Measure blood pressure for second time. Before second measurement ask patient to take rest for 3 minutes. If the difference between reading 1 to reading 2 is more than 10 mmHg then reading 3 must be recorded. *If the respondent refuse, then type "0"*	Systolic (mmHg) |___|___|___|	M5a
	Diastolic (mmHg) |___|___|___|	M5b
	Heart rate (beats /minute) |___|___|___|	M16b
	Time of measuring blood pressure |___|___|:|___|___| Hour: Minute	MTBP2
Reading 3 Measure blood pressure for third time. Before third measurement ask patient to take rest for 3 minutes. ***Instruction:*** *If the respondent refuse then type "0"*	Systolic (mmHg) |___|___|___|	M6a
	Diastolic (mmHg) |___|___|___|	M6b
	Heart rate (beats /minute) |___|___|___|	M16c
	Time of measuring blood pressure |___|___|:|___|___| Hour: Minute	MTBP3
Referred? (For referral, take decision based on reading 3) (If systolic BP is >140 mmHg and diastolic BP>90 mmHg, please refer the respondent to nearby health facility or physician after	1 = Yes 2 = No	Add (?)

completing the referral card)		

CORE: Height and Weight		
Question	**Response**	**Code**
For women: Are you pregnant now? ***Instruction:*** *Ask every female respondent*	1 = Yes 2 = No [If 'Yes' please ask these questions: M8b, BRFSS Q 4.1 and BRFSS Q 6.12. If 'No', please go to M11 and ask questions onwards]	M8a
How many times have you been pregnant so far? ***Instruction:*** *Ask every female respondent/ If she never gets pregnant then type "0"*	|___|___|	M8b
Did you ever get hypertension while pregnant? ***Instruction:*** *Ask every female respondent*	1 = Yes 2 = No 77 = Don't know	BRFSS Q 4.1
Did you ever get diabetes while pregnant? ***Instruction:*** *Ask every female respondent*	1 = Yes 2 = No 77 = Don't know	BRFSS Q 6.12
Interviewer ID	☐☐	M9
Device IDs for height and weight	Height ☐☐	M10a
	Weight ☐☐	M10b
Height (in centimeters) ***Instruction:*** *If the respondent refuse, then type "0"*	Reading 1 |___|___|___|.|___| (cm)	M11 a, b, c
	Reading 2 |___|___|___|.|___| (cm)	If the difference between 1st and 2nd measure is greater than 0.1 cm, measure 3rd time.
	Reading 3 |___|___|___|.|___| (cm)	
Weight (in kilograms) (If the maximum level of the machine exceeds, write 777.7) ***Instruction:*** *If the respondent refuse, then type "0"*	Reading 1 |___|___|___|.|___| (kg)	M12 a, b, c
	Reading 2 |___|___|___|.|___| (kg)	If the difference between 1st and 2nd measure is greater than 0.1 kg, measure 3rd time.
	Reading 3 |___|___|___|.|___| (kg)	
	1 = Light cloth 2 = Moderately heavy cloth 3 = Heavy cloth	

CORE: Waist		
Question	**Response**	**Code**
ID of measuring tape for waist measurement	☐☐☐	M13
Waist circumference (in centimeters) ***Instruction:*** *If the respondent refuse then type "0"*	Reading 1 |___|___|___|.|___| (cm)	M14 a, b, c
	Reading 2 |___|___|___|.|___| (cm)	If the difference between

		1st and 2nd measure is greater than 0.5 cm, measure 3rd time.
	Reading 3 |___|___|___|.|___| (cm)	
The end time of the measurement	|___|___|:|___|___| Hour: Minute	M17
Do you want to go to 'Demographic section'?	1 = Yes 2 = No [If 'Yes' please go to C4]	M18

Interview status	1 = Complete 2 = Incomplete 88 = Refused [If '88' please specify]	M19
Interview end time (Use 24 hour format)	[__|__| : [__|__| Hour Min	M20
Comments of the interviewer		M21

Thank you for your participation in the survey

ANNEX 4

Consent Form (Qualitative Component)

Protocol Title: Baseline Survey of the Project for Strengthening Health Systems through Organizing Communities (SHASTO) (Qualitative Component)

Investigators' name: Malay Kanti Mridha, Malabika Sarker, Yukie Yoshimura, Sohel Reza Choudhury, Showkat Ali Khan, Mehedi Hasan, Ipsita Sutradhar

Organization: Japan International Cooperation Agency (JICA); BRAC James P Grant School of Public Health, BRAC University

Purpose of the research

As you are >30 years of age and suffering from diabetes/hypertension, you are being requested to participate in this focused group discussion. This focused group discussion is being conducted as a component of a baseline survey, which Japan International Cooperation Agency (JICA) and BRAC University are conducting together. This qualitative study is being conducted among >30 years old diabetic/hypertensive patients of Dhaka, Narsingdi and Gazipur district to understand the knowledge, perception, and positive/negative factors that shape the study participants' attitudes towards diseases (hypertension and diabetes) and NCD risk behaviors.

What will happen if you take part in the study?

If you decide to take part in the study, you will be asked to do the following activities:

Focused Group Discussion: Two qualitative researchers will conduct focused group discussion (FGD) with you and your neighbours at any of your house.

A total of 5,072 adult men and women will take part in the baseline survey and 60-70 of these people will participate in this qualitative component.

Risk

There is no risk of physical or emotional harm if you participate in this study.

Benefits

There is no direct benefit for taking part in this study. In the long term, the study may benefit to improve NCD related health care service in your locality and in Bangladesh.

Privacy, anonymity and confidentiality

Identifier information collected in this study will be coded with a number and will be kept confidential. All information will be saved in a different encrypted file where only authorized research staff will have access. Your name or any other privacy related information will

never appear in any publication or results from the study. The Institutional Review Boards in Bangladesh has the authority to access all research records.

Future use of information

If there is a need for future use of the information collected by data collectors, we will provide only de-identified data so that privacy, anonymity and confidentiality of the participants are ensured.

Right not to participate and withdraw

Participation in this research is voluntary. You have the right to know about the procedures, risks, and benefits of the study. Even if you decide to take part, you can change your mind later and can leave the study at any time. No matter what decision you make, there will be no problems for you.

Compensation

There will be no financial compensation for taking part in the study.

Answering your questions/ Contact persons

If you have any questions about this research project please contact Mehedi Hasan, who will answer them. Mr. Hasan can be reached at Tel: +880 1535 448291. If you have any questions regarding your rights and participation as a research subject, please contact Mr. Kuhel Faizul Islam, IRB Coordinator, BRAC James P Grant School of Public Health. Mr. Islam can be reached at Tel: +880 1715030000. You can also contact Ms. Yukie Yoshimura, Chief Advisor, SHASTO Project. She can be reached at Tel: +880-2-9891897.

If you agree to take part in our study, please indicate that by putting your signature or your left thumb impression at the specified space below.

Thank you for your cooperation.

ANNEX 5

FGD Guideline

General information of study participants	
Type of participants:	District:
Upazilla:	Union:
Village:	Date:
Starting time:	Ending time:
Name of the facilitator:	Name of Note taker:

Specific information of study participants							
Sl. no.	Name	Age	Level of education	Occupation	Disease status	Thumb impression/ Signature/Date	Signature of study representative/ Date
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

Facilitators and barriers of compliance with life-style advice (Healthy Diet)

1. What comprises a healthy diet that can prevent and control non-communicable diseases like diabetes and hypertension? How your ideas about a healthy diet changed after you have been diagnosed as diabetic or hypertensive?
2. What prevents people from consuming a healthy diet that can prevent non-communicable diseases like diabetes and hypertension?

3. What can be done to help people to consume healthy diet to prevent and control non-communicable diseases like diabetes and hypertension? (Probe: explore individual, family, societal and health system factors)

Facilitators and barriers of compliance with life-style advice (Physical Activity)

1. What are the physical activities a person should do to prevent and control non-communicable diseases like diabetes and hypertension? (Probe: explore type of physical activities with duration)? How your ideas about adequate physical activity changed after you are diagnosed as diabetic or hypertensive?
2. What prevents people from doing adequate physical activity to prevent and control non-communicable diseases like diabetes and hypertension?
3. What can be done to help people to perform adequate physical activity to prevent and control non-communicable diseases like diabetes and hypertension?

Facilitators and barriers of compliance with life-style advice (Salt Reduction)

1. How much salt a person should take to prevent and control non-communicable diseases like hypertension. How your ideas about adequate salt intake changed after you are diagnosed as diabetic or hypertensive?
2. What prevents people from reducing salt intake to prevent and control non-communicable diseases like diabetes and hypertension?
3. What can be done to help people to reduce salt intake to prevent and control non-communicable diseases like diabetes and hypertension?

Facilitators and barriers of compliance with life-style advice (Smoking)

1. Why do people smoke? Why do people take smokeless tobacco? How your ideas about tobacco changed after you are diagnosed as diabetic or hypertensive?
2. What prevent people from quitting smoking or consuming smokeless tobacco?
3. What can be done to help people to reduce tobacco consumption to prevent and control non-communicable diseases like diabetes and hypertension?

Facilitators and barriers of drug compliance

- There are some patients who are unable to take diabetes/hypertension medications regularly. What are the reasons behind the irregular intake of the anti-hypertensive/anti-diabetic drugs? (Ask patients what factors prevent them from taking antihypertensive/ antidiabetic medicine: probe for individual, household, societal, health system factors)
- There are some patients who are able to take diabetes/hypertension medications regularly. What are the reasons behind the regular intake of the anti-hypertensive/anti-diabetic drugs? (Ask patients what factors enable them to take antihypertensive/ antidiabetic medicine: probe for individual, household, societal, health system factors)
- What can be done to help the diabetes/hypertension patients so that they are able to take drugs regularly?

Quality of NCD services

1. Where do you go for treatment of diabetes currently?
2. Are you satisfied with service they provide? (Probe: physical infrastructure: how is physical infrastructure e.g. room, cleanliness, ventilation; human resource: providers are available or not, how they behave, waiting time; drug: what drugs are provided, availability of drug, cost of drug; investigations: what investigations are performed, at what cost, equipment are functioning or not, how long people have to wait for doing investigation/getting report, consultation etc.)
3. How can government health facilities be improved so that you can be willing to visit for treatment (Probe: improving physical infrastructure, increasing number of providers, improving drug supply, improving diagnostic facility, reducing cost of drug and investigation etc.)

Quality of NCD services (Hypertension)

1. Where do you go for treatment of hypertension currently?
2. Are you satisfied with service they provide? (Probe: physical infrastructure: how is physical infrastructure e.g. room, cleanliness, ventilation; human resource: providers are available or not, how they behave, waiting time; drug: what drugs are provided, availability of drug, cost of drug; investigations: what investigations are performed, at what cost, equipment are functioning or not, how long people have to wait for doing investigation/getting report, consultation etc.)
3. How can government health facilities be improved so that you can be willing to visit for treatment (Probe: improving physical infrastructure, increasing number of providers, improving drug supply, improving diagnostic facility, reducing cost of drug and investigation etc.)

Closing questions

1. Do you think there is something important that we should have been asked but we overlooked?
2. Do you want to know anything from us? Or, anything else you want to say to us?

Thank you for your participation in the interview

ANNEX 6

Observation checklist

Baseline Survey of the Project for Strengthening Health Systems through Organizing Community (SHASTO)

Interview Observation Checklist

Participant name: _____

Community clinic/Urban Dispensary/Slum name:_____

Code:|__|__|

Name of Observer: _____ Code: |__|__|

Date of observation: |__|__|/|__|__|/201 _

Name of Interviewer: _____ Code: |__|__|

Observation start time: |__|__|:|__|__|Observation end time: |__|__|:|__|__|

Section A: Basic Interviewing Skill

Sl. No.	Procedure Checked	Marks 1/0/NA	Comments
01.	Greetings shared		
02.	Introducing self		
03.	Introducing Organization		
04.	Explaining purpose of the visit		
05.	Asking for time of interview		
06.	Identification confirmed		
07.	Showing warm behavior to the participant		
08.	Sitting at the same level with the participant		
09.	Handling unsolicited listeners politely		
10.	Allow the participant to do emergency work during interview (if any)		
11	Asking private questions secretly		
12.	Making eye contact and listening attentively to participant		
13.	Avoid irrelevant conversation (If any)		
14.	Avoid to showing inappropriate body language (before and during interview)		
15	Uttered code loudly when appropriate		
16	Mobile phone was kept silent and received (if needed) with permission		
17	Show respect to the cultural norms		
18	Listening attentively and show sympathy (If any)		
19.	Thanks the participant at the end of the interview		
20.	At the end of interview asking participant for her		

	comments and questions		

A= Number of zero is 0-5, B= Number of zero is 6-10, C= Number of zero is >10

Section B: Interviewing Techniques

Sl. No	Procedure Checked	Marks 1/0/NA	Comments
01.	Consent was read and singed properly		
02.	Asked question in standard way		
03.	Introduced appropriately before specific sections		
04.	Maintained the sequence of sections and skip pattern properly		
05.	Explain 7days properly where necessary		
06.	Explain 6 months properly where necessary		
07.	Explain 12 months properly where necessary		
08.	Did not ask leading question		
09.	Demonstrated show card properly		
10.	Demonstrated cup properly		
11.	Demonstrated spoon properly		
12	Showed calculation skill (**Household or personal income/ Servings/Time spent in each day for heavy or moderate physical activities in minutes/Medicine cost/Hospitalization cost)**		
12.	Asked for medicine **strip/prescription when necessary** (Antihypertenisve/Antidiabetic/Aspirin/Statin) medicine info properly including combination drug/insulin)		
13.	Allowed participant's to know all response options except knowledge related questions (Research Assistants allowed respondents to know all the examples from response option for better understanding if participant's remain silent/answer inappropriately)		
14.	Showed Appropriate probing skill (where necessary)		
15.	Avoid excessive probing		
16.	Uttered code loudly		
17.	Reviewed whole form in tab after completing the interview		
18.	Equipped with all logistics		

A= Number of zero is 0-5, B= Number of zero is 6-9, C= Number of zero is >7

Section C: Measurement Techniques

Sl. No	Procedure Checked	Marks 1/0/NA	Comments
Blood pressure measurement (BP measurement)			
1	Ensured participant was in resting condition for at **least 15 minutes** before measuring blood pressure		
2	Ensured participant did not take any tea/coffee/smoke tobacco/smokeless tobacco within 15 minutes		
3	Asked participants whether bladder was empty before BP measurement		
4	BP machine was kept at heart level using pillow		
5	Asked the participant not to talk during BP measurement		
Sl.	Procedure Checked	Marks	Comments

Sl. No	Procedure Checked	Marks 1/0/NA	Comments
No		1/0/NA	
6	BP measured in left hand (Except any other unavoidable condition)		
7	Ensured **03 minutes interval** between two measurements		
8	Took 3rd measurement if **difference is more than 10 mm Hg** between 1st and 2nd measurement		
9	Ensured that participant did not hear BP value while interviewer uttered		
10	Referred participant properly if systolic or/and diastolic BP is **more than 140 or 90 mm Hg**		
Height measurement			
11.	Asked all 04 questions to respondent if she is women before taking height measurement		
12.	Recorded ID of height board		
13.	Participant was asked to stand properly on board (Both feet together, heels against the back board, Knees straight).		
14.	Ensured "Frankfort horizontal plane" with the help of a pen		
15	Ensured **3rd height measurement** if difference between 1st and 2nd measurement **is more than 0.5 cm**		
Weight measurement			
16	Scale was on a firm, flat surface		
17	Asked the participant to remove any heavy items (belts) and empty out their pockets of mobiles, wallets and coins (If any)		
18	Ensured **3rd measurement** if difference between 1st and 2nd measurement **is more than 0.1 Kg**		
Waist circumference measurement			
19	Privacy ensured		
20	Midpoint was identified properly [At the midpoint between the lower margin of the last palpable rib and the top of the iliac crest (hip bone)]		
21	Checked that the tape is horizontal across the back and front of the participant and as parallel with the floor as possible		
22	Checked that the tape is not folded		
23	Measurement was taken at the end of a normal expiration		
24	Ensured **3rd measurement** if difference between 1st and 2nd measurement **is more than 0.5 cm**		

A= Number of zero is 0-6, B= Number of zero is 7-12, C= Number of zero is >13

Section D: According to your observation write down the question numbers where the interviewer recorded wrong code. (Check some code randomly)

Section E: According to your observation write down whether the interviewer was equipped with all logistics? If not please write down the name

Observation note (Please write in Bangla):