

**Final Report of Summative Learning Project (SLP) Presented to the BRAC James P Grant School of Public Health, BRAC University.**

Purpose: In Partial Fulfillment of the Requirement for the Degree of Master of Public Health (MPH).

**Prevalence of and factors associated with hypertension among the mothers of under 5 children: A cross-sectional study in the slums of Dhaka city**

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## Contents

List of acronyms	iii
Abstract	v
Introduction:	v
Method:	v
Findings:	v
Conclusion and Recommendations :	vi
Introduction	1
Justification:	4
General research question:	5
Specific research question:	6
General objective:	6
Specific objective:	6
Conceptual framework:	6
Methodology:	8
Study Design:	8
Study Site, Study Population:	8
Inclusion criteria:	8
Exclusion criteria:	8
Sample size:	8
Sampling Technique:	9
Study Tools:	9
Dependent and independent variables:	9
Data Collection Procedure:	11
Quality control of the data:	12
Data Management and Analysis:	12
Ethical Consideration:	12
Findings:	13

Discussion:	21
Limitations of the study :	25
Conclusion and recommendations:	25
Acknowledgements:	26
Declaration:	26
Funding:	26
Timeline:	26
References:	27
Annexes:	39
Annex 1	39
Table 1.1: Sociodemographic characteristics of study respondents	39
Table 1.2: Behavioural and metabolic characteristics of study respondents	41
Table 2.1: Blood pressure status of study respondents across sociodemographic characteristics	43
Table 2.2: Blood pressure status of study respondents across behavioural and metabolic characteristics	45
Table 3.1: Hypertension status of study respondents across sociodemographic characteristics	48
Table 3.2 : Hypertension status of study respondents across behavioural and metabolic characteristics	50
Table 4 : Associated risk factors of hypertension with crude Odds ratio (COR) and adjusted Odds ratio (AOR)	53
Annex 2	56
Figure 2 : knowledge of participants about hypertension	56
Fig 3: Measurement source of Blood pressure	56
Fig 4: Difference between actual Vs self-reported prevalence	57
Annex 3	57
Informed Consent Form	57
Annex 4	60
Annex 5	83
Timeline Chart	83
Annex 6	84
Do file	84

## List of acronyms

BMI	Body Mass Index
BP	Blood Pressure
CVDs	Cardio Vascular Diseases
DALYs	Disability Adjusted Life Years
DBP	Diastolic Blood Pressure
HTN	Hypertension
LBW	Low Birth Weight
LMICs	Low- and Middle-Income Countries
NA	Not Applicable
NCDs	Non-Communicable Diseases
OCP	Oral Contraceptive Pill
SBP	Systolic Blood Pressure
U-5	Under 5
WHO	World Health Organisation

## **Abstract**

### **Introduction:**

Hypertension is a significant cause of developing life-threatening cardiovascular complications. The cases of hypertension are increasing day by day at an alarming rate, mainly due to increase in unhealthy lifestyles in urban areas e.g., lack of physical exercise, intake of high salt, high sugar junk foods and drinks and so on. Urban women, especially mothers of U-5 children, are in a vulnerable situation for a variety of reasons. This study was directed to explore the prevalence of hypertension among this group of women from slums of Dhaka metropolis, including its associated factors.

### **Method:**

We have conducted a cross-sectional study among mothers having at least one U-5 child in Dholpur and Korail slums of Dhaka city during 24 November 2022 to 10 December 2022 involving the mothers having at least one under 5 children in two slums (Dholpur and Korail) from November 24,2022 to December 10,2022. We used systematic random sampling for identifying 440 mothers in total and finally analyzed data of 424 mothers after addressing inclusion exclusion criteria. Data on sociodemographic, behavioural, and metabolic factors were gathered. Besides, measurements of blood pressure, height ,weight were taken using modified guidelines of WHO STEPS. We classified hypertension and pre-hypertension according to JNC-7th protocol. Appropriate statistical tests were done to show significance of the relationship, if any.

### **Findings:**

The prevalence of hypertension (systolic BP  $\geq$  140 mmHg and/or diastolic BP  $\geq$  90 mmHg and/or previously diagnosed hypertensive cases by health professionals and/or on going current treatment for hypertension with antihypertensives) among our study population was 12% (Dholpur 9%, Korail 15%) and prehypertension (systolic blood pressure: 120 – 139 mmHg ,Diastolic blood pressure: 80 – 89 mmHg) was 20%. Bivariate analysis revealed association of mothers

hypertension with total monthly household income, total no. of children, daily food intake, history of hypertension during past pregnancy, hypertension history in the family, and BMI. In multivariable model, we found risk factors such as past pregnancy history of hypertension (AOR: 10.51; 95% CI: 4.19 – 26.36) and BMI (AOR for overweight: 4.26; 95% CI: 1.55 -11.72 & AOR for obesity: 4.24; 95% CI: 1.69 -10.62) to be significant for hypertension in mothers.

### **Conclusion and Recommendations :**

The prevalence of hypertension and prehypertension in mothers of u-5 children was found at an alarming rate. The significant factors were past pregnancy hypertension history, overweight, obesity. Life style modification and proper knowledge dissemination intervention programme are needed for stopping further progression of the disease among the mothers.

### **Keywords:**

Blood pressure, Hypertension, Hypertension: Stage 1, Hypertension: Stage 2, Pre-hypertension, Prevalence, Risk factor.

## Introduction

With rapid urbanization and transition of disease epidemiology from communicable to non-communicable diseases about 41 million deaths are occurring each year accounting for 7 in 10 deaths worldwide. (Uthman et al., 2022).

In accordance with World Health Organization report there are 1.28 billion hypertensive people worldwide (WHO, 2021). It is predicted that hypertension is going to affect 1.56 billion people throughout the world by 2025, according to a study published in 2005 (Kearney et al., 2005). Uncontrolled hypertension is becoming the most frightening cause of death (Bear et al., 2022; Magee et al., 2014; Rahman et al., 2008; Zhou et al., 2017). Chowdhury et al. (2016) mentioned that the global hypertension prevalence is about to increase from 26% to 29.2% by 2025 and this will represent almost 29% of total population of the world. Again hypertension, a prime global disease burden, is the 3<sup>rd</sup> major cause of disability-adjusted life years (DALYs) worldwide. About seventeen million deaths occur every year because of cardiovascular diseases (CVDs), with hypertension being directly responsible for more than nine million of those deaths.

Both prehypertension and hypertension have a predominant role in nephropathy, stroke, chronic vascular complications, cerebrovascular diseases, vision disorders, sexual problems (Yamazaki et al., 2018). Lago et al. (2007) also found that people who suffer from hypertension have a threat of two- times increased risk of major coronary artery disease, four-fold increased chance of heart failure, 7 times more probability of brain haemorrhage and stroke than normotensive individuals. High blood pressure has been linked to strokes (62%), coronary artery disease (49%), and non-fatal CVD (14%) events around the world, according to global estimates (Mohan et al., 2013). There is a close relation between increase in systolic blood pressure and CVD risk, a 10 mmHg rise in systolic BP accumulates the chance of developing CVD by 25% and 15%, respectively, for female and male (Wei et al., 2017). At age 30, those with hypertension have a 63.3 % more probability of having CVDs compared to the 46.1% risk among those without hypertension (Rapsomaniki et al., 2014). Again, Prehypertension is thought to be the

root cause of developing hypertension later and targeted for starting treatment in most of the hypertension management guidelines (Khanam et al., 2015).

Studies discovered that mothers with severe hypertension are at a higher risk for cardiac arrest, cardiac failure, cerebrovascular accidents, renal failure. The fetuses of such mothers are also endangered to a number of complications, including premature delivery, inappropriate placental oxygen transfer, intrauterine growth restriction, placental abruption, stillbirth, death in the neonate. 5% to 22% of all subsequent pregnancies are affected by hypertensive disorders in mothers. Hypertension, bleeding, and infections are deadly trio that contributes a lot to maternal death and illness (Khosravi et al., 2014).

Data shows that hypertension affects around 35% Latin American, 20%-30% Chinese & Indian, around 14% of the people in Sub-Saharan Africa. Several causes have been proposed for this variation: urbanization effects on lifestyle, race-related and ethnic differences in dietary practices, birth weight variation, and so on (Mittal & Singh, 2010). Furthermore, more than eighty percent of CVD-related deaths occur in developing nations (Chowdhury et al., 2016; Lim et al., 2012).

More than two-thirds of total hypertensive population of the world reside in low and middle-income countries, South Asia has the world's 23% hypertension cases (Islam et al., 2015; Lim et al., 2012). Mutowo et al. (2016) mentioned that LMICs face substantial economic burdens with reduced productivity due to HTN. Asians experience the onset of hypertension and cardiovascular disease (CVD) at a younger age than people in developed nations, as a result, CVD deaths occur at a younger age, causing severe social and economic hardship. Though complications from hypertension are costly to treat and can have a significant impact on a country's economy and healthcare infrastructure, they are almost always avoidable with some basic health education and awareness campaigns (Biswas et al., 2016).

In Bangladesh people are more vulnerable to non-communicable diseases. The hypertension prevalence in Bangladesh was reported as 25.2% among adults in the 2018 Bangladesh STEPS



Survey (WHO, 2018). Moreover, because of barriers to entry into the healthcare system, high treatment cost, a sizeable portion of hypertensive people go undiagnosed at early stages of hypertension due to lack of proper screening and awareness programme and do not receive appropriate treatment timely even if in complicated situation like organ failure due to hypertension (Chowdhury et al.,2016). Again in Bangladesh from 2011 - 2018, hypertension among women raised from 32% to 45%, 12.5% among women aged 18–34, prehypertension was about 27% ( Kibria et al., 2018; NIPORT et al., 2020). Fottrell et al. (2018) mentioned that almost 50% adults of rural Bangladesh are either prehypertensive or hypertensive. A larger proportion of women are overweight, physically inactive, eat less fruits, vegetables than men and at risk of developing hypertension in later life. Age, gender, urbanization, poverty, less education, high BMI, increased blood glucose level are all significant for developing hypertension (Iqbal et al., 2021).

Hanif et al. (2021) figured out that half of Bangladesh's aged population has hypertension, women are more vulnerable. And so 25% reduction of hypertension by 2025 is in the global action plan of WHO. Bangladesh has adopted it as primary priority in 5-years multisectoral action plan for 2018-2025 (WHO.,2013).

However, there is less research on prehypertension and hypertension in reproductive aged women, especially among mothers of LMICs including Bangladesh(Datta et al., 2022).

## **Justification:**

In Bangladesh, simultaneous with demographic transition, shifting disease pattern from communicable disease to an amalgamation of communicable and NCDs is occurring ('double burden'). The WHO-NCDs progress monitor report found that non-communicable diseases were accountable for roughly 67% of premature deaths in Bangladesh (Sathi et al., 2022). In 2010 about 0.7 million people of Bangladesh faced substantial financial hardship due to high treatment cost of NCDs (Ali et al., 2019)

Increased urbanization, improved life expectancy, poorer diet, modern lifestyle factors have all contributed to an upsurge in the prevalence of cardiovascular disease and related conditions like hypertension in Bangladesh in recent years (Joshi et al., 2007). Moreover, Bangladesh's urban poor are growing at an alarming rate (World Bank, 2022). These people may have a greater incidence of NCDs than the general population because of their sedentary urban lifestyles among adults and possibly malnourished young people (Al-Shoaibi et al., 2022; Risnes et al., 2011). Tobacco usage, obesity, hypertension, dyslipidaemia were commonly founded among Bangladesh's urban poor people (Khalequzzaman et al., 2017). Again the health problems of urban slums remain under-researched (Ezeh et al., 2017; Lilford et al., 2017). NCDs haven't still given that much priority in urban health policies of Bangladesh (CHORUS,2022).

To reduce morbidity and mortality, hypertension should be detected and managed early. When taking into account the disease's prevalence and potential outcomes, it's clear that a number of factors and barriers are involved in bringing this issue under control. The absence of appropriate knowledge, recognition and perception about various aspects of hypertension is the most significant obstacle in the diagnosis and control of this condition (Sabouhi et al., 2011).

Though female play a significant role in family, child rearing , society ,very few studies have been directed at young female hypertension in Bangladesh. That's why it is difficult to determine whether NCDs and related risk factors, such as HTN, are progressively increasing in the young

generation or not (Khan et al., 2021; Paul et al., 2020). Again there are subtypes of hypertension that are unique to women, such as the hypertension that is brought on by menopause, the use of oral contraceptives, or induced during pregnancy period which should be explored through various extensive researches (Hage et al., 2013).

Significant number of studies have been done in Bangladesh regarding hypertension among people aged above 35 years or more but the focus for hypertension and prehypertension among younger specially for women still remained ignored (Kibria et al., 2018; Rahman et al., 2021)

Early detection of hypertension may be helpful because it may lead to more targeted treatment and, in some cases, a complete resolution of high blood pressure in young patients, thereby reducing their risk of developing the disease in later life (Rahman et al., 2021). Lifestyle changes that lower blood pressure may reduce the need for anti-hypertension drugs, prevent the development of hypertension and related complications, and are essential for preventing other CVD risk factors. This shows the significance of a multifaceted measures for lowering high blood pressure that starts with early diagnosis (Das et al., 2005).

Studies found that in Bangladesh women have more behavioural risks than men for developing NCDs (Mridha et al., 2019). Maternal hypertension increases risk of prenatal malnutrition, LBW, obesity, diabetes, hypertension, heart disease of children in later life (Kapur & Hod, 2020). Hypertensive mothers having one or more child have more risk of developing complicated gestational hypertension in later pregnancies which give rise to worse maternal and child health outcome (Brown et al., 2007). Hypertension of mothers is also closely related with early childhood obesity (Huang et al., 2022). Hypertensive mothers give birth to preterm child and as a result mothers face difficulties in taking care of children for repeated hospitalization burden. This have an impact on child's malnutrition giving rise to economical burden also (Yang et al., 2015). So it is important to identify hypertension of mothers earlier through screening. We set out to conduct this study because there is a dearth of data and knowledge about hypertension risk factors among urban poor mothers. However, we found no study about

prevalence and factors of HTN among the mothers of u-5 children of Dhaka city slums. The proposed study is directed toward this gap.

**General research question:**

What is the prevalence and factors associated with hypertension among the mothers of under 5 children in selected slums of Dhaka city, Bangladesh?

**Specific research question:**

- What is the prevalence of hypertension / pre-hypertension among the mothers of under 5 children in selected slums of Dhaka city, Bangladesh?
- What are the factors associated with hypertension among the mothers of under 5 children in selected slums of Dhaka city, Bangladesh?

**General objective:**

-To determine the prevalence and factors associated with hypertension among mothers of under 5 children in selected slums of Dhaka city, Bangladesh

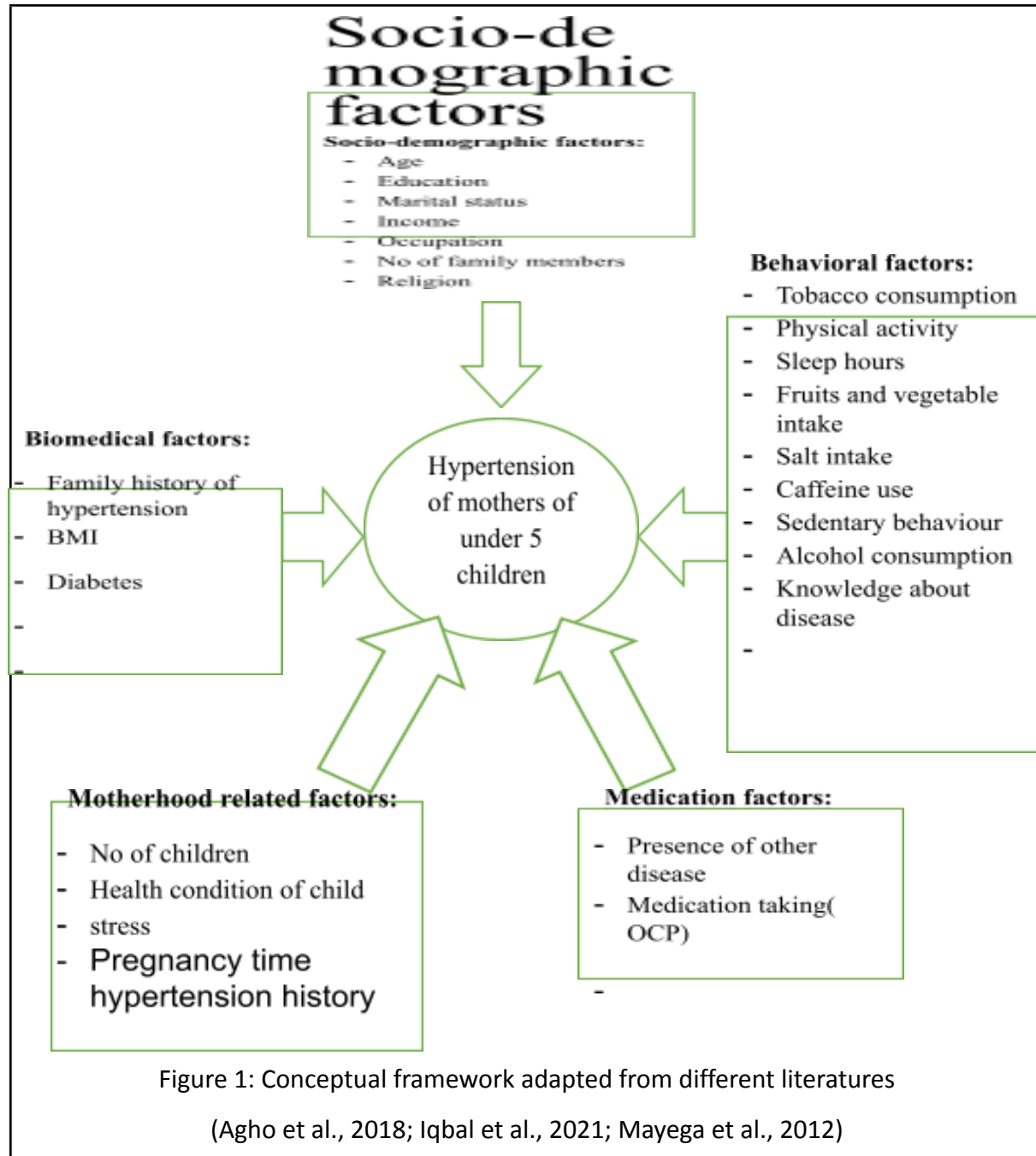
**Specific objective:**

- To assess the prevalence of hypertension/prehypertension among mothers of under 5 children in selected slums of Dhaka city, Bangladesh
- To study the factors associated with hypertension among mothers of under 5 children in selected slums of Dhaka city, Bangladesh

**Conceptual framework:**

We adapted modified conceptual framework from multiple literatures (Agho et al., 2018; Iqbal et al., 2021; Mayega et al., 2012). We divided the associated factors of hypertension into Sociodemographic, biomedical, behavioural, motherhood related factors etc. The factors for hypertension may have correlation with each other. For example, hypertension history in family is related to BMI increase eventually making a person more prone to have hypertension in future (Ranasinghe et al., 2015). From sociodemographic factors low income may be the factor of having hypertension (Khalequzzaman et al., 2017). Younger age may have less chance to

develop hypertension (Mayega et al., 2012). Biomedical factor- overweight may increase risk of hypertension (Iqbal et al., 2021). Tobacco consumption, caffeine intake were considered to have strong relation with hypertension (Agho et al., 2018).





## **Methodology:**

### **Study Design:**

We performed quantitative cross-sectional study.

### **Study Site, Study Population:**

We conducted our study among mothers having children aged 0-5 years in the Dhaka city slums. There are about 5000 slums in both city corporations of Dhaka residing over 4 million people (UNICEF, 2022). Purposively we selected two big slums ( Korail slum from Gulshan and Dholpur slum from Jatrabari) from divergent geographically representative areas of Dhaka metropolis. The purposes behind the selection of these slums : they were prototypical of other slums of Dhaka city with regard to household construction, environmental issues, religious faith, customs ,culture. The population of these slums were diverse in terms of origin place and the chosen area was large enough to obtain adequate number of respondents for the study (Uzma et al., 1999). Finally, the scarcity of variety that might result from choosing the slums from just single locality was addressed by using two different slums from two different areas.

### **Inclusion criteria:**

1. Mothers who had at least one u-5 child living in the household in study site for at least 6 months.

### **Exclusion criteria:**

1. Physically handicapped, mentally unsound, severely ill
2. Pregnant mothers at study time

### **Sample size:**

We calculated total sample size at 95% confidence interval, margin of error was considered 5%. The prevalence of hypertension was considered 24.1% (WHO, 2018). Sample size was calculated through following equation:

$$n = Z^2 P(1 - P) / d^2$$

Here, n = sample size

z= Standard normal deviation at 5% error, it is 1.96

P = prevalence which is 24.1%

d = margin of error which is 0.05

$$\text{sample size } n = (1.96)^2 * 0.241 * 0.759 / (0.05)^2$$
$$= 281$$

By adjusting for anticipated 20% non-response rate final sample size was 352.

### **Sampling Technique:**

We used systematic random sampling for selecting our participants. After visiting the slums, we chose a landmark and searched for five mothers from five households in each slum based on our inclusion criteria. Then we chose one household randomly and interviewed every third household from there.

### **Study Tools:**

After doing extensive literature review and following WHO STEP core questionnaire, we prepared combined modified structured questionnaire containing socio-demographic, personal, familial, behavioural, metabolic & other risk factors associated with hypertension in google form. We reviewed our questionnaire by our faculties, peers. Then after addressing feedback and correction we pretested the questionnaire in Sat-tola slum. The data collectors were provided with required tools, tablet computers, showcards to help participants to understand fruits, vegetable intake, moderate, vigorous physical activities, extra salt intake, smoking and smokeless tobacco products, alcohol consumption. We used OMRON digital blood pressure machine (Model: BP 710N), TANITA UM070 measuring machine, portable height measuring board. The amount of fruit and vegetable consumption was measured using bowls of 200 mL, which is equal to single serving of raw and two servings of cooked produce.

### **Dependent and independent variables:**





Alcohol consumption was defined as any alcohol intake in one's life according to participants' own reports and diabetes was considered on self-report basis. We classified participants as tobacco users if they currently used any form of smoking or smokeless tobacco (including cigarettes, cigars, pipes, zarda, sadapata, gul and snuff etc. Five servings of fruits and/or vegetables per day was used as cutoff for inadequate intake based on self-report. (Rahman et al., 2017; Hasan et al., 2021)

Again, we defined extra salt intake as minimum one teaspoonful salt consumption daily. Physical activity was considered adequate when duration of moderate intensity activities was at least 150 minutes or vigorous activities duration 75 minutes weekly (or a combination of both ), less than that was considered as inadequate (Islam et al., 2015; Hasan et al., 2021; WHO, 2018)

We considered recommended values for Asians to calculate BMI from weight (in kg) divided by height in meter square : (BMI <18.5 =Underweight, 18.5-22.9=Normal , 23-24.9=Overweight ,  $\geq 25$ =Obese) (Lim et al., 2017)

### **Data Collection Procedure:**

We conducted in person face to face interview of selected respondent from selected household after having informed written consent. Data was collected using Bangla version of consent form, structured questionnaire in the field. We used android mobile phone to record responses in google questionnaire directly into excel sheet. Data was collected from November 24, 2022 to December 10, 2022. Procedures for taking measurements were established in accordance with the anthropometric indicator measurement guide (Cogill & 1952-, 2001). Height, weight, blood pressure measurements were taken maintaining adequate privacy of mothers. Participants were given 15 minutes rest and asked to avoid tea or coffee before measurement. They sat with uncrossed legs, kept left arm on a flat surface, palm facing up for accurate measurement. In order to avoid putting unnecessary strain on their arms, data collectors rolled up participants' sleeves. Blood pressure was measured by wrapping the arm snugly in an appropriately sized cuff 1.2–2.5 cm upward from the elbow in order to keep the machine at the heart level throughout the process. We measured blood pressure 3 times at three minutes gap between each reading. The average of the 2nd and 3rd readings were calculated (WHO, 2018)

To get an accurate height, shoes and hair clips were taken off before measuring. Each participant's height was measured 2 times, a 3<sup>rd</sup> evaluation was considered if the gap between the 1<sup>st</sup> and 2<sup>nd</sup> measurements was more than half centimeter. We took an average of the two most accurate readings.

All items (including phones, wallets, coins, shoes, slippers, sandals, socks etc) were removed prior to the measurement of weight. The interviewers made sure the scales were set up on a plain stable surface. Each participant's weight was measured two times, and a 3<sup>rd</sup> reading was taken if the gap between the previous 2 readings was more than 0.1 kilogram. We took an average of two most accurate readings of weight. We maintain appropriate precaution measures (mask, gloves, sanitizers, social distance etc.) for COVID -19 for all of us.

#### **Quality control of the data:**

Interviews were taken by skilled and experienced data collectors. We gave extensive training regarding interviewing, rapport building, measurement procedure to all data collectors and monitored them very strictly during data collection and gave them time to time feedback to avoid information bias. Each day we arranged a team meeting after data collection and cross-checked data by peers. Every morning before taking any measurement we checked the right calibration of all measuring instruments.

#### **Data Management and Analysis:**

At the end of day we uploaded collected data from google form to Microsoft excel. We excluded the Bengali portion from the excel, checked the missing responses and inconsistencies and then coded data. Stata V. 17 was utilized for data analysis. Variable naming, labeling were done and checked for missing values but we didn't find. For analysis labeling of variables, categorization and recoding of values were performed. Data were analyzed descriptively and the results were shown as frequency and percentage distribution stratified by Dholpur and Korail slums. Participants' blood pressure status and hypertension prevalence were shown across sociodemographic, behavioral, metabolic strata. The associations between slums, blood pressure, hypertension & independent variables were assessed through chi-square test. The factors associated with hypertension were investigated using both adjusted and unadjusted analyses. When conducting the adjusted analysis, we eliminated any variable having p-value of

more than 0.2. For the associated factors, we reported both the crude odds ratio and the adjusted odds ratio at the 95% confidence level. We concluded that there was a significant correlation between the variables if the P-value was <0.05. The outcomes were displayed in tables and graphs.

### **Ethical Consideration:**

Ethical approval was taken from Institutional Review Board of BRAC James P Grant School of Public Health. We took informed consent from respective participants. Every participant, household and interviewer was marked with separate id. Aims, benefits, study procedures, participation liberty, confidentiality, anonymity, contact information for further query, withdrawal from study were described to all respondents before taking the informed written consent.

### **Findings:**

As part of group data collection for summative learning project, we collected 440 data from both slums. However, after applying exclusion criteria for this particular study, a total of 424 (211 from Dholpur and 213 from Korail) mothers of under 5 children aged >15 years old were kept for final analysis. The proportion of participant were almost equal from both slum (Dholpur : 49.76% , Korail : 50.23%).

**Table 1.1 (added in Annex 1) explains the sociodemographic features** of the respondents of both slums. A significant proportion (67%) of the study participants' age were 20-29 years, comprising equal proportion of total respondents of both slums (Dholpur: 67.8%, Korail: 67.1%). 8.5% of total respondents were in 15-19 years age group while only 1.9% participants were 40 and above years of age. Again 40 and above age respondents percentage was comparatively higher in Korail (Dholpur: 0.5% Vs Korail: 3.3%).

Near about all (96%) of our study members were married. Muslims were a little bit higher in number in Korail than Dholpur (Korail: 96.7% Vs Dholpur: 92.9%). Only Dholpur had few (2%) Christian participants.

While looking for the education level of mothers we found that almost half of our respondents (49%) completed primary education. Korail mothers had comparatively higher level of education (i.e., secondary and above) than Dholpur (Korail: 21% Vs Dholpur: 11%). Primary education level completed mothers were a little bit higher in Dholpur than Korail (Dholpur: 52% Vs Korail: 47%). Most of the Korail mothers (82.6%) were homemakers and around 20% of our total study participants were working mothers. Working mothers were more in Dholpur than Korail (Dholpur: 22.8% Vs Korail: 17.4%).

Most of the mothers (80 %) had no income. Mothers having less than 5,000 monthly income were more in Dholpur (Dholpur: 10% Vs Korail: 4.7%). Only 12.3% of total mothers had monthly income of 5,000 or more .

Mean total monthly household income was 16,761.32 BDT (95% CI: 15915.69- 17606.95) only. Korail participants' mean total monthly household income was 2,281.54 BDT more than the Dholpur dwellers [Dholpur: 15615.17 (95% CI: 14586.13-16644.2) Vs Korail: 17896.71 (95% CI: 16572.35-19221.08)]. 16.6% of total Dholpur residents earned less than 10,000 whereas the percentage of this group was 12.7% in Korail. Majority of Dholpur people (31.8% ) earned between 15,000 to < 20,000 but in Korail majority people (34.7% ) earned  $\geq 20,000$  .

74.5% of total respondents had a household size of 5 people or less. Majority (77%) of the respondents had two or less than two children. We noticed that husband played the role financial decision maker in more than half of the family of both slums (Dholpur 51.2 % , Korail 57.3%).

**From table 1.2 (added in Annex 1) we can see the behavioural and metabolic characteristics of study participants.** Only 23% respondents had more than three times food intake per day.93.4% mothers used soyabean oil. Majority of the respondents (98%) took less than 5 servings of fruits and vegetables daily. 84.2% of our study mothers added extra salt (Dholpur: 86.7 % Vs Korail: 81.7 %). Almost all participants (99.8%) performed adequate physical activity. Tobacco and alcohol consumption both were low among all though compared to alcohol the tobacco consumption was a bit higher (tobacco: 11% Vs alcohol: 5%). 7% of Korail mothers had experience of ever consuming alcohol in life while the percentage is little bit lower (4.3%)

among Dholpur mothers. Nearly half of the mothers (41.3%) had normal BMI. Underweight mothers were more in Dholpur than Korail ( Dholpur: 15.6% Vs Korail: 11.3% ). About 26.3% of Korail mothers and 31.8% of Dholpur mothers were obese.

Though majority of total population (88%) didn't have hypertension , proportion of hypertension was little bit higher among the Korail mothers (Korail: 15% Vs Dholpur: 9%).

From P (<0.05) value we can see that the difference in two slums is significant in case of religion, mother's education level, financial decision maker, type of oil used to cook food.

**Table 2.1 (added in Annex 1) describes blood pressure status of study respondents across sociodemographic characteristics.** Majority of our respondents (72 %) had normal blood pressure. Almost 20% had prehypertension, 7% were in hypertension stage 1 and only 0.7% were in hypertension stage 2. Majority of the prehypertensive mothers (56.5%) were in 20-29 years age group while 56.7% of the hypertension stage 1 patient were in 30-39 years age group and 66.7% of hypertension stage2 mothers were also in the same age group. 51.8% of the prehypertensive mothers completed primary education. Only 6.7% of hypertension stage 1 mothers had secondary or above education. 36.7% of the hypertension stage 1 mothers had monthly household income of 10,000 to < 15,000. 75.3% of prehypertensive mothers had total household members of 5 or less, 66.7% of stage 2 hypertensive mothers had more than 5 household members. 46.7% of hypertension stage 1 mothers had more than 2 children.

**Table 2.2 (added in Annex 1) shows Blood pressure status of study respondents across behavioural and metabolic characteristics.** 77.5% of normal blood pressure respondents and 82.4% of prehypertensive mothers took less than or equal to three times food a day. 94.1% of prehypertensive mothers and all hypertension stage 1 mothers (100%) took soyabean oil to cook food. All the prehypertensive , stage 1 hypertensive, stage 2 hypertensive mothers had less than 5 servings fruits and vegetables daily which is inadequate. Majority of the mothers of normal blood pressure (84.6%), prehypertension (83.5%) , hypertension stage 1 (83.3%) and hypertension stage 2 (66.7%) had the habit of extra salt intake. 16.7% of hypertension stage 1

mothers, 3.5% of prehypertensive mothers had ever consumed alcohol in life .Moreover, 11.8% of prehypertensive ,16.7% of hypertension stage 1,33.3% of hypertension stage 2 mothers had habit of any form of tobacco consumption.

Almost 56.5% of prehypertensive ,70% of stage 1 hypertensive, 33.3% of stage 2 hypertensive participants had family history of tobacco consumption. All the respondents of normal blood pressure (100%) , 98.8% of prehypertensive, 100% of hypertension stage 1, 100% of hypertension stage 2 mothers performed adequate physical activities.80% of stage 1 hypertensive mothers had daily sleep of less than 8 hours.40% of the prehypertensive,33.3% of stage 1 and 33.3% of stage 2 hypertensive mothers used oral pill for contraception. 28.2% prehypertensive and 66.7% of stage 2 hypertensive mothers had family history of stroke or heart attack.

Percentage of family history of hypertension gradually increased from prehypertensive to stage 2 hypertensive mothers .35.3% of prehypertensive, 53.3 % of stage 1 hypertensive, 66.7% of stage 2 hypertensive mothers had history of hypertension in family .

10.6% of prehypertensive, 13.3% of stage 1 hypertensive , 33.3% of stage 2 hypertensive mothers had history of pregnancy time hypertension in past. Only 6.7% of stage 1 hypertensive mothers reported of having heart diseases. 68.4% of all mothers had stress from work, household chores etc. With the increase of hypertension stage percentage of stressed mother increased (65.7% of normal blood pressure , 75.3% of prehypertensive , 73.3% of stage 1 hypertensive, 100% of stage 2 hypertensive mothers reported of having stress).

The percentage of overweight raised from 15.4% of normal blood pressure mothers to 26.7% of hypertension stage 1 mothers. Again 22.9% of normal blood pressure mothers were obese then obesity was found among 40% of prehypertensive mothers and continued to rise up to 56.7% of hypertension stage 1 and 66.7% of hypertension stage 2 mothers.

Mother's age, occupation, mother's monthly income, total children, daily food intake, hypertension during any pregnancy, BMI all were significantly associated with blood pressure status (as P value was <0.05)

**Table 3.1 (added in Annex 1) depicts the hypertension status of study respondents across sociodemographic characteristics.** Overall 12% study participants had hypertension. 47.1% of all hypertensive mothers were 20-29 years old and again 47.1% of all hypertensive mothers were 30-39 years old. There was no hypertensive mothers in 15-19 years age group. Only 5.9% of all hypertensive mothers were 40 and above years old. From the P value (0.000) of chi-square test we can see that age of mothers and hypertension status were significantly associated. 11.8% of all hypertensive mothers were Hindu. We found no Christian hypertensive mother. 49% of hypertensive mothers completed primary education whereas only 13.7% hypertensive mothers had secondary and above level education. 27.5% hypertensive cases were working mothers. 72.6% hypertensive mothers had no income, only around 17.7 % of hypertensive mothers had monthly 5,000 or more income. 37.3% of the hypertensive mothers had household income of twenty thousand or more. Near about 30% of hypertensive mothers had more than 5 household members. 39.2% hypertensive mothers had more than 2 child while only 19.8% of non-hypertensive mothers had more than 2 child .

Age of mother, religion, total monthly household income, total children had p value <0.05 which is significant statistically, so we can say that these variables had significant association with hypertension of mothers.

**Table 3.2 (added in Annex 1) demonstrates Hypertension status of study respondents across metabolic & behavioural characteristics.** We can observe that 35.3% of hypertensive mothers had more than three times food a day. Here P value 0.028 <0.05 shows statistically significant association of daily food intake and hypertension.



98% mothers with hypertension used soyabean oil to cook food. 100% of the hypertension cases took fruits and vegetables of less than five servings daily. Majority hypertensive mothers (80.4%) used to take extra salt. 9.8% of hypertensive respondents had ever experienced alcohol in life. Only 15.7% of hypertensive mothers had history of any form of tobacco (either smoking or smokeless) consumption. More than half of hypertensive mothers (56.9%) had positive history of tobacco consumption in family. About 60.8% of hypertensive mothers had daily caffeine (tea/coffee) intake habit.

Interestingly all of the hypertensive mothers (100%) did adequate physical activities. Only 20% of hypertensive mothers had daily sleep of 8 hours or more. 35.3 % of hypertensive, 33% of non-hypertensive mothers used oral pill as contraceptive method , whereas 21.6% of hypertension cases used injection for this purpose. 21.6% of hypertensive mothers had positive family history of stroke or heart attack.

Whenever we looked at hypertension history in the family found that more than half of the hypertension cases (54.9%) had family history of hypertension while 39.7% of non-hypertensive mothers had this kind of positive family history. Here P value  $0.039 < 0.05$  shows that positive family history of hypertension had significant association of developing hypertension among our study mothers.

31.4% of all hypertensive mothers had history of hypertension during any of the past pregnancy. The results also point that only 3.2% of non-hypertensive mothers had hypertension during any of their past pregnancy period. From P value of this variable we can decide that pregnancy time hypertension history in past had significant association with hypertension of mothers in later life (P value  $0.000 < 0.05$ ).

Only 3.9% of hypertensive mothers had heart disease. 100% of the hypertensive mothers didn't have diabetes.

More than two third of hypertensive mothers(78.4%) reported about stress due to work, household chores, child rearing. The hypertension cases increased with increasing BMI. Among all the hypertensive mothers we found 5.9% underweight, 15.7% normal weight, 25.5% overweight and 52.9% obese. We can also see that most of the non-hypertensive mothers

(44.8%) had normal BMI. From P value of BMI, it is clear that BMI had significant association with mothers hypertension.

From P value ( $<0.05$ ) we can conclude that age, religion, total monthly household income, total children, daily food intake, family history of hypertension, hypertension during pregnancy, BMI all had significant association with hypertension status.

**Figure 2 (added in Annex 2; Figure 2: knowledge of participants about hypertension)** shows that almost 40% of the respondents didn't know about the disease hypertension.

**Figure 3 (added in Annex 2; Figure 3: Measurement source of Blood pressure)** shows that more than 80% of the participants had measure blood pressure among them majority 54.25% mothers measured from nearby pharmacy (retail drug dispensers), only 23.58% measured their blood pressure from registered doctor of government hospitals, 3.3% from health workers like local quacks etc. About 13.92% had never measured their blood pressure.

**Figure 4 (added in Annex 2; Figure 4: Difference between actual Vs self-reported prevalence)** shows that actual hypertension prevalence (found from the study) was 12.03% which is almost two times than the self-reported prevalence of 6.84%.

**Table 4 (added in Annex 1) demonstrates the results of unadjusted and adjusted logistic regression analysis to find out the associated risk factors of hypertension of mothers of u-5 children in the slums.** From unadjusted logistic regression model, significant risk factors for mother's hypertension were total monthly household income, total children, daily food intake, family history of hypertension, hypertension during any pregnancy, BMI.

In crude analysis, we found that mothers from a family with monthly household income of 10,000 BDT to less than 15,000 BDT are associated with 5.31 times increased odds for having hypertension (COR: 5.31 ; 95% CI: 1.19 - 23.81); mothers from a family with monthly household income of 15,000 BDT to less than 20,000 BDT are associated with 3.42 times increased odds for

having hypertension (COR: 3.42; 95% CI: 0.75 -15.66); and mothers from a family with monthly household income of 20,000 BDT or more are associated with 5.53 times increased odds for having hypertension (COR: 5.53; 95% CI: 1.25- 24.59), compared to mothers from a family with monthly household income of less than 10,000 BDT.

When we adjusted the model for risk factors and potential confounders, we observed that the P values of each categories becomes  $>0.05$  rendering their association with hypertension insignificant.

In crude analysis, we found that the mothers with more than 2 children are associated with 2.61 times increased odds for having hypertension compared to the mothers with less than or equal to 2 children (COR: 2.61; 95% CI: 1.41 - 4.83). In adjusted model, we found insignificant association (P value: 0.075) between total number of children and hypertension in mothers although it was significant in unadjusted model (P value: 0.002).

In crude analysis participants having food intake of more than 3 times per day had 1.99 times increased odds for developing hypertension than the participants having less than or equal to 3 times food intake per day (COR 1.99, 95% CI 1.07 - 3.73). After adjusting the model, we found no significant association between daily food intake (P value: 0.372) and developing hypertension among the mothers of under 5 children although it was significant in unadjusted model (p value: 0.030).

In crude analysis, we observed that the mothers having hypertension history in family are associated with 1.85 times increased odds for hypertension than the mothers with no hypertension history in family (COR: 1.85; 95% CI: 1.03- 3.34). From adjusted model, we observed no significant association between hypertension history in family and developing hypertension among the mothers of under 5 children (P value: 0.126) although it was significant in unadjusted model (P value: 0.041).

In crude analysis, the mothers having history of hypertension during any of the past pregnancy periods are associated with 13.75 times increased odds for having hypertension than the mothers having no hypertension history during past pregnancy (COR: 13.75; 95% CI: 6.03 - 31.38). When we adjusted the model for risk factors and potential confounders, we observed that the odds for having hypertension in the mothers with history of hypertension during any of the pregnancy period changes to 10.51 times higher than the mothers having no hypertension history during pregnancy (AOR: 10.51; 95% CI: 4.19 - 26.36).

In crude analysis, we found that the overweight mothers are associated with 4.85 times increased odds for having hypertension than the mothers with normal BMI (COR: 4.85; 95% CI: 1.91 -12.29).In adjusted model, we observed that the odds changes to 4.26 times than the odds for having hypertension in mothers with normal BMI (AOR: 4.26; 95% CI: 1.55 - 11.72)

In crude analysis, we found that the obese mothers are associated with 5.87 times increased odds for having hypertension than the mothers with normal BMI (COR: 5.87; 95% CI: 2.57 - 13.44). Again when we adjusted the model for risk factors and potential confounders, we observed that the odds changes to 4.24 times than the odds for having hypertension in mothers with normal BMI (AOR: 4.24; 95% CI: 1.69 - 10.62).

Hypertension during any pregnancy & BMI (overweight & obesity) variables were found significant in both unadjusted & adjusted logistic regression models.

Mother's occupation, mother's monthly income, alcohol consumption, presence of heart disease, presence of stress variables were found insignificant (P value > 0.05) in both unadjusted & adjusted logistic regression models.

## Discussion:

Our research found hypertension prevalence among the mothers of under 5 children in two slums of Dhaka about 12%, Korail mothers (15%) being more hypertensive than the Dholpur mothers (9%). Prehypertension prevalence was 20%. We found that mother's age, total monthly household income, total no. of children, daily food intake, hypertension during pregnancy, hypertension history in family, and BMI had association with mother's hypertension. From adjusted logistic regression model we found that hypertension during past pregnancy, BMI (overweight and obesity) were the two significant risk factors for mothers of u-5 to become hypertensive.

The overall hypertension prevalence was 13.5% and prehypertension was 19% among 6430 individuals in Bangladesh, according to a meta-analysis (Islam et al., 2015) which is also similar to this result. Rahman et al., (2021) studied about 5394 adults of 18-34 years old and found prehypertension and hypertension prevalence 33 % and 9% consecutively. Our study prevalence is almost near about this. Various Studies revealed that the hypertension occurrence rates are not the same for all populations on the same continent, country, region, age group, sex, or race (Conen et al., 2009; Erceg et al., 2009; Levine et al., 2011). According to several research, hypertension is prevalent in Bangladesh with a rate between 16% and 34%. (Islam & Majumder, 2012). However, these variations are brought about by the various study populations, various cut-off points for calculating the hypertension prevalence, and various age categories of the study population (Islam et al., 2015). The hypertension prevalence among adult Bangladeshis was 20%, ranging from 1.10 % to 75 % discovered by a current meta-analysis from 53 surveys. Reasons for the discrepancy in prevalence may be due to the use of insufficient data that doesn't represent national scenario, and the non-standardized estimates reporting (Khan et al., 2021).

Different regions of the same country can have vastly different prevalence rates. Depending on study design and population characteristics, published estimates of hypertension prevalence in Bangladesh have varied (Rahman et al., 2017). Even though a number of researches have shown

higher prevalence in urban areas, the gap is narrowing due to rapid rise in hypertension prevalence in rural regions in recent times (Commodore-Mensah et al., 2014; Kavishe et al., 2015; Okpechi et al., 2013; Oladapo et al., 2010).

Our research also revealed that the pre-hypertensives ( 1/5<sup>th</sup> of the total participants) were highly concentrated in the 20-29 years age group. This correlates with the fact that an alarming rise in the incidence of heart disease has been observed among the young people from both Bangladesh and India. (Das et al., 2005)

In Bangladesh, common hypertensive risk factors include being overweight, living a life with sedentary behaviour, eating an unhealthy diet high in salt, having diabetes, and smoking. (Biswas et al., 2016). A cross-sectional, nationally representative study among adult population of Bangladesh found that age, female gender, higher income, and increased BMI (overweight and obesity) were associated with hypertension (Chowdhury et al., 2016) which is almost similar to our results.

Older people of both gender are more prone to have high blood pressure and risk due to age can't be modified (Al Kibria et al., 2019). Age is a crucial factor for raised BP. The chance of hypertension increases with the increase of age, more significantly in women (Dua et al., 2014). Our study results were almost similar and found significant association between age and hypertension.

The link between high blood pressure history among parents in family and hypertension in the next generation in later life may be caused by both genetic and nongenetic factors (Forman., 2009). Liu et al.(2015) studied that hypertension history in family increases the chance of having hypertension in future by 2-4 times, women are at more risk than men in this issue. A person with family history of hypertension is more susceptible to have higher BMI which increases the chance of developing hypertension (Ranasinghe et al., 2015). Our study also found close association between being hypertensive and hypertension history in family.

Wilson.(2003) found the strong relationship between hypertension during past pregnancy and developing hypertension in later life. Female with hypertension history in previous pregnancy present a 10% increase in blood pressure in long run (Paradisi et al., 2006). Marín et al. ( 2000) published that past pregnancy time hypertension leads to chronic hypertension in most of the cases. We also had similar results.

Multiple researches explained that being overweight and obese are important risk factors for hypertension (Brown et al., 2000; Jiang et al., 2016; Leggio et al., 2017). High BMI is responsible for increasing both systolic and diastolic BP (Dua et al., 2014). Shihab et al. (2012) found that an overweight person has 2 times more chance of having increased BP than a person with normal BMI. Obese persons have 3.5 times more risk of developing hypertension (Seravalle & Grassi, 2017). We also observed that increased BMI towards overweight and obesity are strongly linked with hypertension among our participants.

Almost all of our participants didn't take recommended amount of fruits and vegetables daily. A worldwide overload of disease analysis revealed that adequate fruit and vegetable consumption could have enormous impact in lowering numerous NCDs, including hypertension and cardiovascular diseases. (Mendis et al., 2011)

Rahman et al. (2018) found that almost half of the studied people didn't have knowledge of hypertension. Our study also depicts that near about half of the mothers didn't know about the disease hypertension.

We found that total child number had association with mother's hypertension. Multiple studies discovered that there is a strong association of increasing stress in mothers with the increasing number of children (Qian et al., 2021). Research is being conducted on chronic stress focusing in various perspectives, such as the workplace, the family, child rearing and the socioeconomic margins. Although there is some evidence linking these areas to BP outcomes, the link is not always strong, and chronic stress may be a more plausible contributor to BP instability and hypertension (Hu et al., 2015). Again, there are some studies addressing the possible link between stress and cardiac risk factors, especially hypertension (Rosenthal & Alter, 2012).

Increased anxiety, uncertainty, and chronic mental and emotional stress are all consequences of modernization, urbanization, sedentary behaviour, regular stress at work, inadequate physical activity, and lack of social support. It has been hypothesized that stress conduct a pivotal contribution in the emergence of high blood pressure. (V. Ushakov et al., 2016)

Unlike commonly held belief, salt is not the primary causal factor in essential hypertension; rather, it is psychological and social factors (Henry, 1988). We got a similar result from our study.

Oral contraceptives have close relation to an high risk of increased blood pressure, but this risk does not become significant until women are 35 or older. (Woods, 1988). Hypertension is about 2-3 times more common in females who take oral contraceptives than in women of same age who don't take these medicines (August.,2013). Researchers found that there was a moderate rise in blood pressure (both SBP and DBP) with longer periods of OCP use (Park & Kim, 2013). However, we didn't find any relationship with oral contraceptive use.

Many researchers found relationship of hypertension with physical inactivities, fruits and vegetable intake, tobacco consumption, alcohol consumption etc from larger samples (Al-Shoaibi et al., 2022 ; Rahman et al., 2017; Hasan et al., 2021). We hadn't found so, may be due to difference in sample population. Al-Shoaibi et al. (2022) also stated that risk factors may vary according to age, population variation.

For future direction, a longitudinal survey with routine BP checks in a young population (u-5 children's mothers) is required to clarify the causal association between pre-hypertensive blood pressure levels by age specification and the eventual development of hypertension and cardiovascular events. Clinical and public health are affected by the discovery of a high prevalence of pre-hypertension, which is especially concerning in young women (Islam et al., 2015).

Our findings also guide that increasing investments, particularly towards increased BMI (overweight, obesity) management, is crucial to have better control of high blood pressure from



the very early onset at young age at the mass level. This is indicated by the fact that this is a key area of focus for our research (Khan et al., 2021). When more risk factors are identified, public health measures can be implemented immediately, and more resources can be allocated. Understanding the recent scenario and progress in prevention measures of the NCDs, especially prehypertension and HTN in young mothers, is therefore mandatory (Sathi et al., 2022).

Overweight and obesity are almost modifiable through proper awareness strategies and lifestyle approaches. Again adequate screening programme for blood pressure measurement during pregnancy period of young mothers can be a practical consideration to have an immense result. Policy makers and respected implementing authorities will have a guide from our research findings while taking measures for hypertension prevention interventions for this specific group of people.

#### **Limitations of the study :**

We measured blood pressure of the participants on a single day for which we couldn't address the "White coat effect". This effect refers to the gap between clinic-measured blood pressure and blood pressure measured in other normal settings like home ((Celis & Fagard, 2004; Mancia et al., 2007; Ramli et al., 2008) . We couldn't measure blood glucose, serum lipid profile, waist hip circumference etc due to invasive procedures, time and resource constraints. We couldn't establish causal inferences due to cross sectional study design. We use structured questionnaire and pictorials to collect information about fruits and vegetables consumption, physical activity etc so there may be some inaccuracy in these information. We conducted our study among the mothers of two selected slums in Dhaka division. So this study result may not give us the generalizable results for whole Bangladesh perspective or the regions in which the geographical, sociodemographic characteristics are different from that of Dhaka slums. Moreover we included only mothers of under 5 children, the picture may be different for mothers who don't have any under 5 children and also for the fathers. Therefore larger studies collecting population level data along with biochemical measures may give more accurate estimation of prevalence and specific genetic and molecular level risk factors of hypertension of these young mothers.

## **Conclusion and recommendations:**

In our study we analyzed hypertension prevalence including its associated factors among the mothers of u-5 children in two slums of Dhaka metropolis. Majority of our respondents mother were young and the prehypertensive mothers need early observation and screening to keep away from further risk of developing hypertension in later period of life. Also the hypertensive mothers need care to be safe from complications of high blood pressure. The government and the policy makers should customize the hypertension control programme and life style modification interventions to address the different specific factors that are specially associated with these young mothers of under 5 children.

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## Annexes:

### Annex 1

**Table 1.1: Sociodemographic characteristics of study respondents**

Characteristics	Area name						P value
	Dholpur		Korail		Total		
	N	%	N	%	N	%	
Age of mother (years)							
15-19	18	8.5	18	8.5	36	8.5	0.209
20-29	143	67.8	143	67.1	286	67.5	
30-39	49	23.2	45	21.1	94	22.2	
40 and above	1	0.5	7	3.3	8	1.9	
Marital status							
Others <sup>1</sup>	7	3.3	8	3.8	15	3.5	0.807
Married	204	96.7	205	96.2	409	96.5	
Religion							
Muslim	196	92.9	206	96.7	402	94.8	0.045
Hindu	10	4.7	7	3.3	17	4.0	
Christian	5	2.4	0	0.0	5	1.2	
Mother's education level							
Preprimary or none	77	36.5	67	31.5	144	34.0	0.018
Primary completed	110	52.1	100	47.0	210	49.5	
Secondary completed and above	24	11.4	46	21.6	70	16.5	
Mother's occupation							
Working*	48	22.8	37	17.4	85	20.1	0.167



	Area name						
Characteristics	163	77.3	176	82.6	339	80.0	P
Mother's monthly income							value
Less than 5,000	21	10.0	10	4.7	31	7.3	0.099
5,000 or More	27	12.8	25	11.7	52	12.3	
No income	163	77.3	178	83.6	341	80.4	
Total monthly household income							
< 10,000	35	16.6	27	12.7	62	14.6	0.053
10,000 to <15,000	61	28.9	52	24.4	113	26.7	
15,000 to <20,000	67	31.8	60	28.2	127	30.0	
≥20,000	48	22.8	74	34.7	122	28.8	
Monthly average household income	15615.17 (95% CI: 14586.13-16644.2)		17896.71 (95% CI: 16572.35-19221.08)		16761.32 (95% CI: 15915.69-17606.95)		
Total household member							
5 or less	160	75.8	156	73.2	316	74.5	0.541
More than 5	51	24.2	57	26.8	108	25.5	
Total children							
≤ 2	162	76.8	168	78.9	330	77.8	0.603
>2	49	23.2	45	21.1	94	22.2	
Financial decision maker							
Father-in-law	5	2.4	10	4.7	15	3.5	0.009
Both husband and wife	44	20.9	53	24.9	97	22.9	
Herself	24	11.4	8	3.8	32	7.6	
Mother-in-law	26	12.3	14	6.6	40	9.4	
Husband	108	51.2	122	57.3	230	54.3	
Others <sup>2</sup>	4	1.9	6	2.8	10	2.4	

Others<sup>1</sup> : separated, divorced, refused to answer, widow

Others<sup>2</sup>: Father, mother, brother, brother-in-law, grandmother.

\*column percentages

\*P values describe whether the association between slums and sociodemographic characteristics are significant

\*Working: Businessman, Petty businessman, Employee, Garments worker, NGO worker, Private teacher, Shopkeeper, Unskilled day labourer.

**Table 1.2: Behavioural and metabolic characteristics of study respondents**

Characteristics	Area name						P value
	Dholpur		Korail		Total		
	N	%	N	%	N	%	
Daily food intake							
≤ 3 times per day	158	74.9	168	78.9	326	76.9	0.330
> 3 times per day	53	25.1	45	21.1	98	23.1	
Type of oil used to cook food							
Soyabean oil	189	89.6	207	97.2	396	93.4	0.001
Mustard oil	1	0.5	1	0.5	2	0.5	
Palm oil	21	10.0	5	2.4	26	6.1	
Fruits & Vegetables consumption							
≥ 5 servings per day	5	2.4	3	1.4	8	1.9	0.502
< 5 servings per day	206	97.6	210	98.6	416	98.1	
Extra salt intake							
No	28	13.3	39	18.3	67	15.8	0.155
Yes	183	86.7	174	81.7	357	84.2	
Alcohol consumption							
No	202	95.7	198	93.0	400	94.3	0.216
Yes	9	4.3	15	7.0	24	5.7	
Tobacco consumption							
No	184	87.2	192	90.1	376	88.7	0.340
Yes	27	12.8	21	9.9	48	11.3	
Caffeine intake (Tea/Coffee)							

	Area name						
No characteristics	83	39.3	88	41.3	171	40.3	0.678 value
Yes	128	60.7	125	58.7	253	59.7	
Physical activity							
Inadequate	1	0.5	0	0.0	1	0.2	0.498
Adequate	210	99.5	213	100.0	423	99.8	
Daily sleep hours							
≥ 8	57	27.0	57	26.8	114	26.9	0.953
< 8	154	73.0	156	73.2	310	73.1	
Sedentary behavior							
< 300 minutes	185	87.7	184	86.4	369	87.0	0.692
≥ 300 minutes	26	12.3	29	13.6	55	13.0	
BMI							
Underweight (<18.5)	33	15.6	24	11.3	57	13.4	0.205
Normal (18.5-22.9)	78	37.0	97	45.5	175	41.3	
Overweight (23-24.9)	33	15.6	36	16.9	69	16.3	
Obese (≥ 25)	67	31.8	56	26.3	123	29.0	
Hypertension							
No	192	91	181	85	373	88	0.057
Yes	19	9	32	15	51	12	

\*column percentages

\*P values describe whether the association between slums and sociodemographic characteristics are significant

**Table 2.1: Blood pressure status of study respondents across sociodemographic characteristics**

Characteristics	Blood Pressure Status										P-value
	Normal		Prehypertensio n		Hypertension (stage_1)		Hypertensio n (stage_2)		Total		
	N	%	N	%	N	%	N	%	N	%	
Overall	306	72.2	85	20.1	30	7.1	3	0.7	424	100	
Age of mother (years)											
15-19	29	9.5	7	8.2	0	0.0	0	0.0	36	8.5	0.000
20-29	227	74.2	48	56.5	10	33.3	1	33.3	286	67.5	
30-39	48	15.7	27	31.8	17	56.7	2	66.7	94	22.2	
40 and above	2	0.7	3	3.5	3	10.0	0	0.0	8	1.9	
Marital status											
Others <sup>1</sup>	10	3.3	2	2.4	2	6.7	1	33.3	15	3.5	0.080
Married	296	96.7	83	97.7	28	93.3	2	66.7	409	96.5	
Religion											
Muslim	291	95.1	82	96.5	26	86.7	3	100	402	94.8	0.247
Hindu	11	3.6	2	2.4	4	13.3	0	0	17	4.0	
Christian	4	1.3	1	1.2	0	0.0	0	0	5	1.2	
Mother's education level											
Preprimary or none	96	31.4	33	38.8	14	46.7	1	33.3	144	34.0	0.143
Primary completed	150	49.0	44	51.8	14	46.7	2	66.7	210	49.5	
Secondary completed and above	60	19.6	8	9.4	2	6.7	0	0.0	70	16.5	
Mother's occupation											

	Blood Pressure Status										
Characteristics	51	16.7	23	27.1	10	33.3	1	33.3	85	20.1	0.027
Homemaker	255	83.3	62	72.9	20	66.7	2	66.7	339	80.0	
Mother's monthly income											
< 5,000	19	6.2	9	10.6	3	10.0	0	0.0	31	7.3	0.048
5,000 or More	30	9.8	14	16.5	7	23.3	1	33.3	52	12.3	
No income	257	84.0	62	72.9	20	66.7	2	66.7	341	80.4	
Total monthly household income											
Less than 10,000	48	15.7	13	15.3	1	3.3	0	0.0	62	14.6	0.519
10,000 to <15,000	81	26.5	20	23.5	11	36.7	1	33.3	113	26.7	
15,000 to <20,000	90	29.4	29	34.1	8	26.7	0	0.0	127	30.0	
≥ 20,000	87	28.4	23	27.1	10	33.3	2	66.7	122	28.8	
Total household member											
5 or less	229	74.8	64	75.3	22	73.3	1	33.3	316	74.5	0.445
More than 5	77	25.2	21	24.7	8	26.7	2	66.7	108	25.5	
Total children											
≤ 2	251	82.0	61	71.8	16	53.3	2	66.7	330	77.8	0.001
>2	55	18.0	24	28.2	14	46.7	1	33.3	94	22.2	

\* Normal: Systolic blood pressure: < 120 mmHg

Diastolic blood pressure: < 80 mmHg

\* Prehypertension: Systolic blood pressure: 120 – 139 mmHg

Diastolic blood pressure: 80 – 89 mmHg

\* Hypertension (stage\_1): Systolic blood pressure: 140 – 159 mmHg

Diastolic blood pressure : 90 – 99 mmHg

\* Hypertension (stage\_2): Systolic blood pressure : ≥ 160 mmHg

Diastolic blood pressure : ≥ 100 mmHg

\*Working: Businessman, Petty businessman, Employee, Garments worker, NGO worker, Private teacher, Shopkeeper, Unskilled day labourer.

\*Others<sup>1</sup> : separated, divorced ,refused to answer ,widow

\*Column percentage

**Table 2.2: Blood pressure status of study respondents across behavioural and metabolic characteristics**

Characteristics	Blood Pressure Status										P-value
	Normal		Prehypertension		Hypertension (stage_1)		Hypertension (stage_2)		Total		
	N	%	N	%	N	%	N	%	N	%	
Daily food intake											
≤ 3 times per day	237	77.5	70	82.4	17	56.7	2	66.7	326	76.9	0.03
> 3 times per day	69	22.6	15	17.7	13	43.3	1	33.3	98	23.1	
Type of oil used to cook food											
Soyabean oil	283	92.5	80	94.1	30	100.0	3	100.0	396	93.4	0.47
Mustard oil	1	0.3	1	1.2	0	0.0	0	0.0	2	0.5	
Palm oil	22	7.2	4	4.7	0	0.0	0	0.0	26	6.1	
Fruits & Vegetables consumption											
≥ 5 servings per day	8	2.6	0	0.0	0	0.0	0	0.0	8	1.9	0.37
<5 servings per day	298	97.4	85	100.0	30	100.0	3	100.0	416	98.1	
Extra salt intake											
No	47	15.4	14	16.5	5	16.7	1	33.3	67	15.8	0.70
Yes	259	84.6	71	83.5	25	83.3	2	66.7	357	84.2	
Alcohol consumption											
No	290	94.8	82	96.5	25	83.3	3	100.0	400	94.3	0.07
Yes	16	5.2	3	3.5	5	16.7	0	0.0	24	5.7	
Tobacco consumption											
No	274	89.5	75	88.2	25	83.3	2	66.7	376	88.7	0.29
Yes	32	10.5	10	11.8	5	16.7	1	33.3	48	11.3	
Family history of tobacco consumption											

	Blood Pressure Status										
No	132	43.1	37	43.5	9	30.0	2	66.7	180	42.5	0.43
Yes	174	56.9	48	56.5	21	70.0	1	33.3	244	57.6	0
Caffeine intake (Tea/Coffee)											
No	130	42.5	28	32.9	11	36.7	2	66.7	171	40.3	0.29
Yes	176	57.5	57	67.1	19	63.3	1	33.3	253	59.7	8
Physical activity											
Inadequate	0	0.0	1	1.2	0	0.0	0	0.0	1	0.2	0.27
Adequate	306	100.0	84	98.8	30	100.0	3	100.0	423	99.8	8
Daily sleep hours											
≥ 8 hours	79	25.8	29	34.1	6	20.0	0	0.0	114	26.9	0.27
<8 hours	227	74.2	56	65.9	24	80.0	3	100.0	310	73.1	2
Sedentary behavior											
< 300 minutes	263	86.0	75	88.2	29	96.7	2	66.7	369	87.0	0.26
≥ 300 minutes	43	14.1	10	11.8	1	3.3	1	33.3	55	13.0	2
Birth control method											
Condom	8	2.6	0	0.0	1	3.3	0	0.0	9	2.1	0.82
Copper T/IUD	5	1.6	0	0.0	0	0.0	0	0.0	5	1.2	3
Don't use	75	24.5	21	24.7	6	20.0	2	66.7	104	24.5	
Injection	81	26.5	20	23.5	7	23.3	0	0.0	108	25.5	
Norplant/subdermal implant	2	0.7	0	0.0	0	0.0	0	0.0	2	0.5	
Others <sup>3</sup>	39	12.8	10	11.8	6	20.0	0	0.0	55	13.0	
Pill	96	31.4	34	40.0	10	33.3	1	33.3	141	33.3	
Family history of stroke / heart attack											

	Blood Pressure Status										
No characteristics	241	78.8	61	71.8	25	83.3	1	33.3	328	77.4	0.12
Yes	65	21.2	24	28.2	5	16.7	2	66.7	96	22.6	3
Family history of hypertension											
No	178	58.2	55	64.7	14	46.7	1	33.3	248	58.5	0.26
Yes	128	41.8	30	35.3	16	53.3	2	66.7	176	41.5	2
Hypertension during any pregnancy											
No	292	95.4	76	89.4	26	86.7	2	66.7	396	93.4	0.01
Yes	14	4.6	9	10.6	4	13.3	1	33.3	28	6.6	6
Presence of heart disease											
No	303	99.0	84	98.8	28	93.3	3	100.0	418	98.6	0.13
Yes	3	1.0	1	1.2	2	6.7	0	0.0	6	1.4	5
Presence of diabetes											
No	305	99.7	84	98.8	30	100.0	3	100.0	422	99.5	0.48
Yes	1	0.3	1	1.2	0	0.0	0	0.0	2	0.5	0
Presence of child sickness											
No	124	40.5	36	42.4	11	36.7	2	66.7	173	40.8	0.78
Yes	182	59.5	49	57.7	19	63.3	1	33.3	251	59.2	9
Presence of stress											
No	105	34.3	21	24.7	8	26.7	0	0.0	134	31.6	0.23
Yes	201	65.7	64	75.3	22	73.3	3	100.0	290	68.4	3
BMI											
Underweight (<18.5)	52	17.0	3	3.5	1	3.3	1	33.3	57	13.4	0.00
Normal (18.5-22.9)	137	44.8	34	40.0	4	13.3	0	0.0	175	41.3	0
Overweight (23-24.9)	47	15.4	14	16.5	8	26.7	0	0.0	69	16.3	
Obese (≥ 25)	70	22.9	34	40.0	17	56.7	2	66.7	123	29.0	

\* Normal: Systolic blood pressure: < 120 mmHg

Diastolic blood pressure: < 80 mmHg

\* Prehypertension: Systolic blood pressure: 120 – 139 mmHg

Diastolic blood pressure: 80 – 89 mmHg



\* Hypertension (stage\_1): Systolic blood pressure: 140 – 159 mmHg

Diastolic blood pressure : 90 – 99 mmHg

\* Hypertension (stage\_2): Systolic blood pressure :  $\geq$  160 mmHg

Diastolic blood pressure :  $\geq$  100 mmHg

\*column percentages

\* Others<sup>3</sup>: Ligation, safe period, withdrawal, lactational amenorrhoea, menopause.

**Table 3.1: Hypertension status of study respondents across sociodemographic characteristics**

Characteristics	Hypertension Status						P-value
	No		Yes		Total		
	N	%	N	%	N	%	
Overall	373	88.0	51	12	424	100	
Age of mother (years)							
15-19	36	9.7	0	0.0	36	8.5	0.000
20-29	262	70.2	24	47.1	286	67.5	
30-39	70	18.8	24	47.1	94	22.2	
40 and above	5	1.3	3	5.9	8	1.9	
Marital status							
Others <sup>1</sup>	12	3.2	3	5.9	15	3.5	0.406
Married	361	96.8	48	94.1	409	96.5	
Religion							
Muslim	357	95.7	45	88.2	402	94.8	0.026
Hindu	11	3.0	6	11.8	17	4.0	
Christian	5	1.3	0	0.0	5	1.2	
Mother's education level							
Preprimary or none	125	33.5	19	37.3	144	34.0	0.794
Primary completed	185	49.6	25	49.0	210	49.5	

Characteristics	Hypertension Status						P-value
Secondary completed and above	63	16.9	7	13.7	70	16.5	
Mother's occupation							
Working*	71	19.0	14	27.5	85	20.0	0.159
Homemaker	302	81.0	37	72.6	339	80.0	
Mother's monthly income							
Less than 5,000	26	7.0	5	9.8	31	7.3	0.315
5,000 or More	43	11.5	9	17.7	52	12.3	
No income	304	81.5	37	72.6	341	80.4	
Total monthly household income							
< 10,000	60	16.1	2	3.9	62	14.6	0.043
10,000 to <15,000	96	25.7	17	33.3	113	26.7	
15,000 to <20,000	114	30.6	13	25.5	127	30.0	
≥ 20,000	103	27.6	19	37.3	122	28.8	
Total household member							
5 or less	280	75.1	36	70.6	316	74.5	0.491
More than 5	93	24.9	15	29.4	108	25.5	
Total children							
≤ 2	299	80.2	31	60.8	330	77.8	0.002
>2	74	19.8	20	39.2	94	22.2	

\*Column percentages

Others<sup>1</sup> : separated, divorced ,refused to answer ,widow

\*Working: Businessman, Petty businessman, Employee, Garments worker, NGO worker, Private teacher, Shopkeeper, Unskilled day labourer.

**Table 3.2 : Hypertension status of study respondents across behavioural and metabolic characteristics**

Characteristics	Hypertension Status						P-value
	No		Yes		Total		
	N	%	N	%	N	%	
<b>Daily food intake</b>							
≤ 3 times per day	293	78.6	33	64.7	326	76.9	0.028
> 3 times per day	80	21.5	18	35.3	98	23.1	
<b>Type of oil used to cook food</b>							
Soyabean oil	346	92.8	50	98.0	396	93.4	0.493
Mustard oil	2	0.5	0	0.0	2	0.5	
Palm oil	25	6.7	1	2.0	26	6.1	
<b>Fruits &amp; Vegetables consumption</b>							
≥ 5 servings per day	8	2.1	0	0.0	8	1.9	0.604
<5 servings per day	365	97.9	51	100.0	416	98.1	
<b>Extra salt intake</b>							
No	57	15.3	10	19.6	67	15.8	0.427
Yes	316	84.7	41	80.4	357	84.2	
<b>Alcohol consumption</b>							
No	354	94.9	46	90.2	400	94.3	0.190
Yes	19	5.1	5	9.8	24	5.7	
<b>Tobacco consumption</b>							
No	333	89.3	43	84.3	376	88.7	0.294
Yes	40	10.7	8	15.7	48	11.3	
<b>Family history of tobacco consumption</b>							
No	158	42.4	22	43.1	180	42.5	0.916
Yes	215	57.6	29	56.9	244	57.6	

Characteristics	Hypertension Status						P-value
Caffeine intake (Tea/Coffee)							
No	151	40.5	20	39.2	171	40.3	0.863
Yes	222	59.5	31	60.8	253	59.7	
Physical activity							
Inadequate	1	0.3	0	0.0	1	0.2	1.000
Adequate	372	99.7	51	100.0	423	99.8	
Daily sleep hours							
≥ 8 hours	104	27.9	10	19.6	114	26.9	0.211
< 8 hours	269	72.1	41	80.4	310	73.1	
Sedentary behavior							
< 300 minutes	323	86.6	46	90.2	369	87.0	0.656
≥ 300 minutes	50	13.4	5	9.8	55	13.0	
Birth control method							
Condom	6	1.6	3	5.9	9	2.1	0.506
Copper T/IUD	5	1.3	0	0.0	5	1.2	
Don't use	93	24.9	11	21.6	104	24.5	
Injection	97	26.0	11	21.6	108	25.5	
Norplant/ subdermal implant	2	0.5	0	0.0	2	0.5	
Pill	123	33.0	18	35.3	141	33.3	
Others <sup>3</sup>	47	12.6	8	15.7	55	13.0	
Family history of stroke / heart attack							
No	288	77.2	40	78.4	328	77.4	0.845
Yes	85	22.8	11	21.6	96	22.6	
Family history of hypertension							
No	225	60.3	23	45.1	248	58.5	0.039
Yes	148	39.7	28	54.9	176	41.5	

Characteristics	Hypertension Status						P-value
Hypertension during any pregnancy							
No	361	96.8	35	68.6	396	93.4	0.000
Yes	12	3.2	16	31.4	28	6.6	
Presence of heart disease							
No	369	98.9	49	96.1	418	98.6	0.155
Yes	4	1.1	2	3.9	6	1.4	
Presence of diabetes							
No	371	99.5	51	100.0	422	99.5	1.000
Yes	2	0.5	0	0.0	2	0.5	
Presence of child sickness							
No	153	41.0	20	39.2	173	40.8	0.806
Yes	220	59.0	31	60.8	251	59.2	
Presence of stress							
No	123	33.0	11	21.6	134	31.6	0.100
Yes	250	67.0	40	78.4	290	68.4	
BMI							
Underweight (<18.5)	54	14.5	3	5.9	57	13.4	0.000
Normal (18.5-22.9)	167	44.8	8	15.7	175	41.3	
Overweight (23-24.9)	56	15.0	13	25.5	69	16.3	
Obese (≥ 25)	96	25.7	27	52.9	123	29.0	

\* Others<sup>3</sup>: Ligation, safe period, withdrawal, lactational amenorrhoea, menopause.

\*Column percentages

**Table 4 : Associated risk factors of hypertension with crude Odds ratio (COR) and adjusted Odds ratio (AOR)**

Characteristics	Unadjusted			Adjusted		
	Crude Odds Ratio	[95% Conf. Interval]	P-value	Adjusted Odds Ratio	[95% Conf. Interval]	P-value
<b>Marital status</b>						
Married (Ref)	1					
Others <sup>1</sup>	1.880208	0.5121645 to 6.902437	0.341	N/A	N/A	N/A
<b>Mother's education level</b>						
Preprimary or none	1.368	0.5462818 to 3.425748	0.503	N/A	N/A	N/A
Primary completed	1.216216	0.5016795 to 2.94846	0.665	N/A	N/A	N/A
Secondary completed and above (Ref)	1					
<b>Mother's occupation</b>						
Working	1.609441	0.8259468 to 3.136159	0.162	1.06785	0.1139162 to 10.01002	0.954
Homemaker (Ref)	1					
<b>Mother's monthly income</b>						
Less than 5,000	1.580042	0.5719701 to 4.364795	0.378	1.100774	0.0992257 to 12.2116	0.938
5,000 or More	1.719675	0.7762803 to 3.809554	0.182	1.063281	0.1036203 to 10.91068	0.959

Characteristics	Unadjusted			Adjusted		
No income (Ref)	1					
Total monthly household income						
< 10,000 (Ref)	1					
10,000 to <15,000	5.31249 8	1.185088 to 23.81481	0.029	2.93335 9	0.5926393 to 14.51911	0.187
15,000 to <20,000	3.42105 2	0.7473525 to 15.66007	0.113	1.78181 7	0.3557501 to 8.924442	0.482
≥ 20,000	5.53397 9	1.245481 to 24.58884	0.025	3.48293 2	0.7213087 to 16.81779	0.12
Total household member						
5 or less (Ref)	1					
More than 5	1.25448	0.6572595 to 2.394367	0.492	N/A	N/A	N/A
Total children						
≤ 2 (Ref)	1					
>2	2.6068	1.406457 to 4.831578	0.002	1.98172 7	0.9342044 to 4.203837	0.075
Daily food intake						
≤ 3 times per day (Ref)	1					
> 3 times per day	1.99772 7	1.069027 to 3.73322	0.03	1.40588 7	0.6650549 to 2.971961	0.372
Extra salt intake						
Yes (Ref)	1					
No	1.35216 1	0.6408999 to 2.852768	0.428	N/A	N/A	N/A
Alcohol consumption						
Yes	2.02517 2	0.7216218 to 5.683476	0.18	2.37469 8	0.7406795 to 7.613538	0.146

Characteristics	Unadjusted			Adjusted		
No (Ref)	1					
Tobacco consumption						
Yes	1.54883 8	0.6802122 to 3.526691	0.297	N/A	N/A	N/A
No (Ref)	1					
Family history of tobacco consumption						
Yes (Ref)	1					
No	1.0323	0.5716723 to 1.864082	0.916	N/A	N/A	N/A
Caffeine intake (Tea/Coffee)						
Yes	1.05427 9	0.5792115 to 1.918996	0.863	N/A	N/A	N/A
No (Ref)	1					
Daily sleep hours						
< 8 hours	1.58513	0.7659051 to 3.280612	0.214	N/A	N/A	N/A
≥ 8 hours (Ref)	1					
Sedentary behavior						
< 300 minutes	1.42414 9	0.5399752 to 3.756097	0.475	N/A	N/A	N/A
≥ 300 minutes (Ref)	1					
Family history of stroke / heart attack						
Yes (Ref)	1					
No	1.07323 2	0.5277627 to 2.18247	0.845	N/A	N/A	N/A
Family history of hypertension						
Yes	1.85076 4	1.026674 to 3.336334	0.041	1.70441 3	0.8613586 to 3.372607	0.126
No (Ref)	1					
Hypertension during any pregnancy						

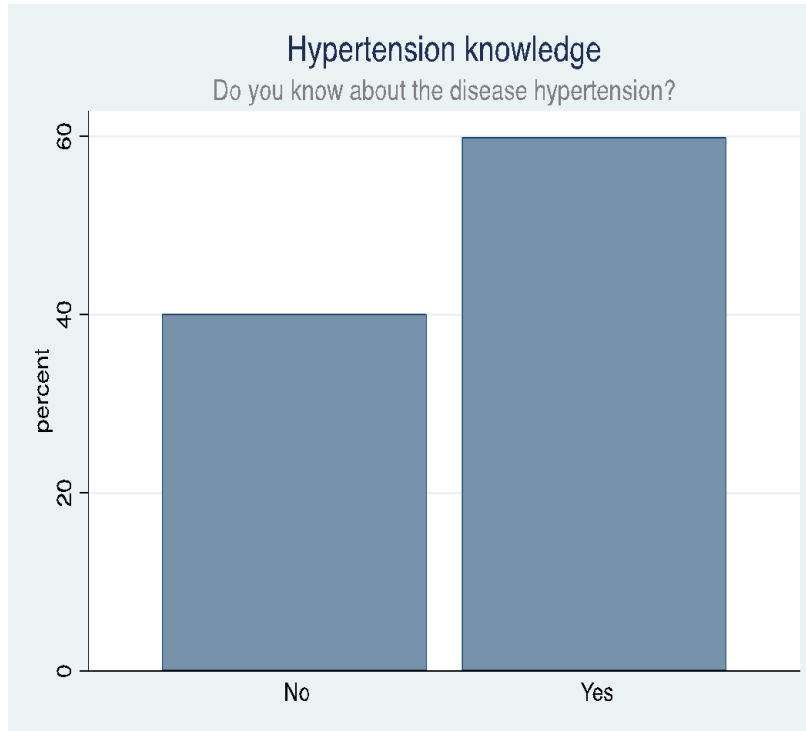


Characteristics	Unadjusted			Adjusted		
Yes	13.7523 8	6.02683 to 31.38101	0	10.5120 2	4.192345 to 26.35818	0
No (Ref)	1					
Presence of heart disease						
Yes	3.76530 6	0.6719905 to 21.09781	0.132	1.09066 6	0.1233121 to 9.646683	0.938
No (Ref)	1					
Presence of child sickness						
Yes	1.07795 4	0.5923051 to 1.961802	0.806	N/A	N/A	N/A
No (Ref)	1					
Presence of stress						
Yes	1.78909 1	0.8872596 to 3.607565	0.104	1.27692 6	0.562208 to 2.900245	0.559
No (Ref)	1					
BMI						
Underweight (<18.5)	1.15972 2	0.2970861 to 4.527158	0.831	1.25937	0.296123 to 5.355928	0.755
Normal (18.5-22.9) (Ref)	1					
Overweight (23-24.9)	4.84598 2	1.909558 to 12.2979	0.001	4.25603 5	1.545781 to 11.71824	0.005
Obese (≥ 25)	5.87109 4	2.565378 to 13.43652	0	4.24285 3	1.695865 to 10.61511	0.002

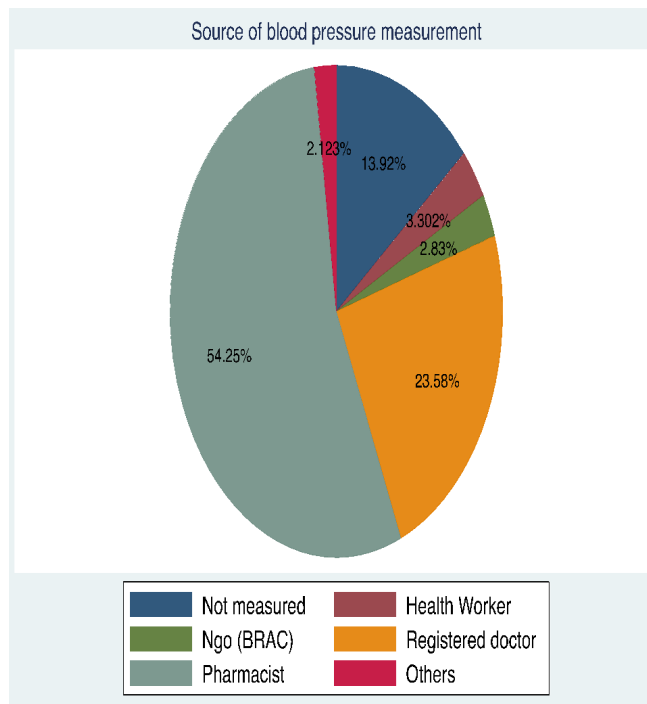
\*NA (Not Applicable)

\*Working: Businessman, Petty businessman, Employee, Garments worker, NGO worker, Private teacher, Shopkeeper, Unskilled day labourer.

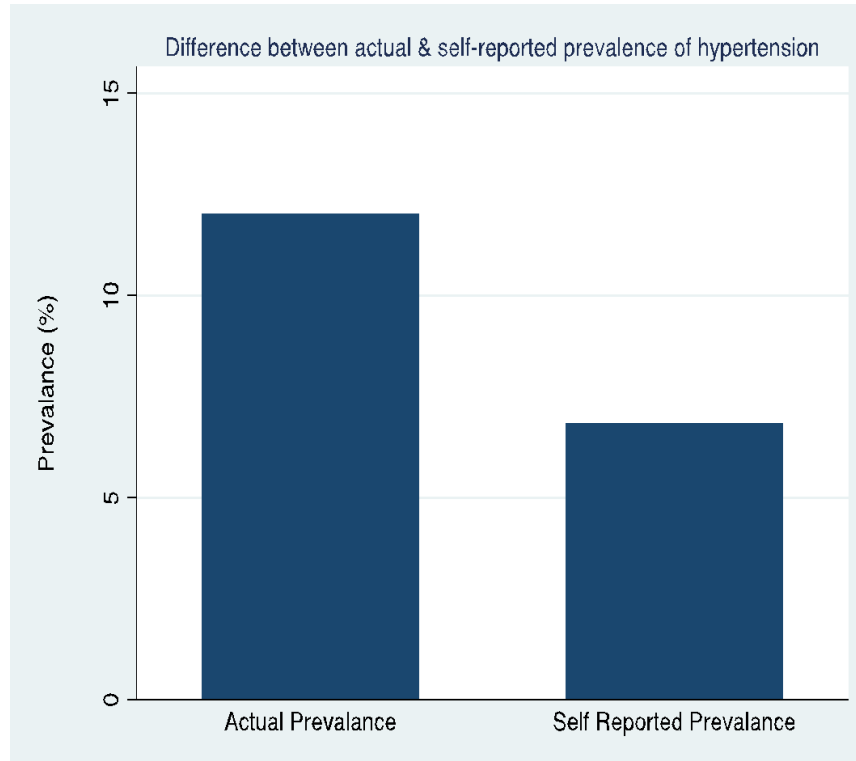
## Annex 2



**Figure 2 : knowledge of participants about hypertension**



**Fig 3: Measurement source of Blood pressure**



**Fig 4: Difference between actual Vs self-reported prevalence**

### **Annex 3**

#### **Informed Consent Form**

**Title of the study:**

Prevalence of and factors associated with hypertension among the mothers of under 5 children: A cross-sectional study in the slums of Dhaka city

**Investigator’s Name:**

Dr. Nurunnahar Nura

**Organization:**

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

**Purpose of the Research:**

We are students of Batch 18 of the MPH program at James P. Grant School of Public Health, BRAC University. As a part of our Master of Public Health (MPH) academic curriculum, we are conducting group research known as a “Summative Learning Project” and our group is working on the nutrition aspect along with hypertension of mothers of under 5 children.

The purpose of this study is to know the current blood pressure status, determine the prevalence of the hypertension among the mothers who have children under five years of age and also the associated factors with this hypertension of under-five children mother within the informal setting of Dhaka city.

**Why are you asked to participate?**

We are requesting all the mothers who have children under five years old living in the slum of Dhaka city (Dholpur and Korail) to participate in our study.

**What we will ask to do our participants for this study?**

If you agree we would like to take your permission before proceeding. We will ask you some questions and take measurements of you (e.g: height and weight). We will also measure your blood pressure. The interview will take approximately 45 minutes.

**Risk:**

As this is an exploratory study, there will be no potential risks to the study participants. We will strictly maintain all the Covid 19 related protective measures. We will wear masks and will also provide masks to our participants. We will sanitize our hands and measuring devices with hexisol before and after the procedure is conducted and also will maintain a safe distance from our participants.

**Benefits:**

From this study, your valuable information will be extremely important for us to get an overview of the current raised blood pressure status of the mothers and the determinants behind this in this region. We will keep it as evidence and use it in the future if needed for the further benefit of the people of this area.

**Compensation:**

There is no financial binding for your participation in the study.

**Privacy, anonymity, and confidentiality:**

Your responses will remain confidential and anonymous and will be used for the purpose of the study only. The information collected from the study will be kept covert by the research group. All documents will be stored carefully and will not be shared with people beyond those, who are closely involved with this research. The information gained from this research will be used in summarized form without your name and identity

**Right not to participate and withdraw:**

Your participation will be completely voluntary. You can withdraw from the interview/discussion at any moment if you want to, even after signing the consent or beginning the interview. Moreover, you are not obliged to answer any question that makes you feel uncomfortable. There are no restrictions and risks to answering our questions. We will abide by your decision and appreciate your concern.

**For general queries about this study:**

To know about your further safety and rights you can contact on the following address

BRAC James P Grant School of Public Health, BRAC University, 7<sup>th</sup> floor Medona Tower, 28 Mohakhali Industrial Area, Bir Uttam A K Khandokar Road, Dhaka-1213, Bangladesh, Mobile: +88 01993379512.

For your further queries and necessary clarifications about our study you can reach us anytime at the following designated contact numbers:

Dr. Nurunnahar Nura, BRAC James P Grant School of Public Health, BRAC University, 7<sup>th</sup> floor Medona Tower, 28 Mohakhali Industrial Area, Bir Uttam A K Khandokar Road, Dhaka-1213, Bangladesh, Mobile: +8801727559257.

**If you choose to participate in our study and agree to all the points above, please put your signature or your left thumbprint in the specified space below:**

*I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions. I have been answered to my satisfaction. I consent voluntarily to be a participant in this study.*

Participant	Interviewer
<b>Name:</b>  <b>Signature/Thumbprint:</b>  <b>Date:</b>	<b>Name:</b>  <b>Signature:</b>  <b>Date:</b>

**Thank you for your Co-operation**

#### **Annex 4**

#### **Questionnaire**

**Topic: Prevalence and factors associated with hypertension among mothers of under 5 children in the selected slums of Dhaka**

#### **Part-1: General information**

Sl. no	Question	Response	Code	instructions
1	Interviewer's name:			
2	Interviewer's Id:			

3	Date of the interview	_ _ / _ _ /2022 DD MM YR		
4	Household Id:			
5	Interview start time (in 24-hours format)	_ _ : _ _  Hour Minute		
6	Who is the head of your household?	1= herself 2= husband 3=both husband and wife 4=father in law 5=mother in law 6=father 7=Mother 99=others (please specify)		
7	What is the name of the head of the household?			
8	What is your (mother's) name?			
9	Mother's Id			
10	What is your (mother's) date of birth?	_ _ / _ _ / DD MM YR		
11	Age of mother	_ _  :  _ _  Years months		
12	How many children do you have ?			
13	How many children do you have under five years of age?			
14	Name of the children under five years of age:	_____		

15	Id of the children under five years of age:	_____		
16	Date of birth of your children	_ _ _ / _ _ _ / DD MM YR		
17	Age of your children	_ _ _  :  _ _ _  YR Months		
18	For how many years have you been living in this slum?	_____ months _____ years		
19	Address and contact number of the participant:			
20	Slum name:	1=Korai 2=Dholpur		

## Part 2: Socio-demographic and economic

Serial no.	Questions	Response	Code	Instruction
1	How many members are there in your family?	1. =<5 2. >5		
2	What is your <b>marital status</b> ?	1=Married 2=Widowed 3=Separated 4=Divorced 5=Refused to answer		
3	What is your <b>religion</b> ?	1=Muslim 2=Hindu 3=Christian 4=Buddhist 99=Others (specify)		



4	<p>What is your <b>completed level of education?</b></p>	<p>1= Class 1  2=Class 2  3=Class 3  4= Class 4  5=Class 5  6=Class 6  7=Class 7  8=Class 8  9=Class 9  10=Class 10  11=SSC/Dakhil  12=HSC/Alim  13=Diploma/vocational  14=BA/ BSc/BCom/Fazil/graduate/  BA (honours)  15=MA/Phd/Kamil  16=Hafezi/Qawmi/Kharizi  77=N/A, because never went to  school  97=don't know</p>		
5	<p>What is your <b>husband's completed level of education?</b></p>	<p>1= Class 1  2=Class 2  3=Class 3  4= Class 4  5=Class 5  6=Class 6  7=Class 7  8=Class 8  9=Class 9  10=Class 10  11=SSC/Dakhil  12=HSC/Alim  13=Diploma/vocational  14=BA/ BSc/BCom/Fazil/graduate/  BA (honours)  15=MA/Phd/Kamil  16=Hafezi/Qawmi/Kharizi  77=N/A, because never went to  school  97=don't know</p>		

6	<p>What is your main occupation for the last six months? ( if were involved in more than one occupation please mention the occupation in which you were maximum time involved)</p>	<p>1=Unskilled day laborer  2=Skilled day laborer  3=Garments worker  4=Employee  5=Professionals (Doctor, Engineer, Nurse, Advocate)  6=Businessman  7=Petty businessman  8=Housemaid  9=Beggar  10=Homemaker  11=Student  99=Others (specify below) ____</p>		
7	<p>What is your husband's main <b>occupation for the last six months?</b></p> <p>( if were involved in more than one occupation please mention the occupation in which were maximum time involved)</p>	<p>1=Unskilled (day laborer)  2=Skilled (Plumber, mechanic, electrician, hairdresser, blacksmith, goldsmith, cook)  3= Rickshaw puller/  van/Wheelbarrow/Baby taxi/ Boatman  4=Security guard  5=Garments worker  6=Employee  7=Professionals (Doctor, Engineer, Nurse, Advocate)  8=Businessman  9=Petty businessman  10=Housemaid  11=Beggar  12=Hawker  13=Student  99= Others (specify below) ____</p>		
8	<p>What is your monthly average household income for the last six months? (TK)</p>	<p>_____ Taka</p>		
9	<p>What is your monthly average income for the last six months? (TK)</p>	<p>_____ Taka</p>		

10	Who take financial <b>decisions</b> in your family?	1= Herself 2=Husband 3=Both husband and wife 4=Father in law 5=Mother in law 6=father 7=mother 99= Others (specify below) ____				
11	Who take healthcare <b>decisions</b> in your family?	1= Herself 2=Husband 3=Both husband and wife 4=Father in law 5=Mother in law 6=father 7=mother 99= Others (specify below) ____				
12	Which of the following product is active in your household?	Electricity	1= Yes	2= No		
		Solar electricity	1= Yes	2= No		
		Radio	1= Yes	2= No		
		Television	1= Yes	2= No		
		Mobile telephone	1= Yes	2= No		
		Non-mobile telephone	1= Yes	2= No		
		Computer	1= Yes	2= No		
		Refrigerator	1= Yes	2= No		
		Almirah/wardrobe	1= Yes	2= No		
		Electric fan	1= Yes	2= No		
		DVD/VCD player	1= Yes	2= No		
		Water pump	1= Yes	2= No		
		IPS/generator	1= Yes	2= No		
		Air conditioner	1= Yes	2= No		
		Car/truck/minibus	1= Yes	2= No		

		Autobike/tempo/CNG	1= Yes	2= No		
		Rickshaw/van	1= Yes	2= No		
		Bicycle	1= Yes	2= No		
		Motorcycle or scooter	1= Yes	2= No		
		Boat with a motor	1= Yes	2= No		
		Canoe/boat without motor	1= Yes	2= No		
		<b>Main floor material</b>				
		Earth/sand	1= Yes	2= No		
		Dung	1= Yes	2= No		
		Wood planks/Palm, bamboo	1= Yes	2= No		
		Parquet or polished wood	1= Yes	2= No		
		ceramic tiles	1= Yes	2= No		
		Cement	1= Yes	2= No		
		Carpet	1= Yes	2= No		
		Other	1= Yes	2= No		
		<b>Main roof material:</b>				
		Thatch/palm leaf	1= Yes	2= No		
		Sod	1= Yes	2= No		
		Rustic mat	1= Yes	2= No		
		Palm/bamboo	1= Yes	2= No		
		Cardboard/Wood planks	1= Yes	2= No		

		Metal	1= Yes	2= No		
		Wood	1= Yes	2= No		
		Calamine/cement fiber	1= Yes	2= No		
		Ceramic tiles	1= Yes	2= No		
		Cement	1= Yes	2= No		
		Roofing shingles	1= Yes	2= No		
		Other	1= Yes	2= No		
		<b>Main wall material:</b>				
		Cane/palm/trunks	1= Yes	2= No		
		Dirt	1= Yes	2= No		
		Bamboo with mud	1= Yes	2= No		
		Stone with mud	1= Yes	2= No		
		Uncovered adobe	1= Yes	2= No		
		Cardboard	1= Yes	2= No		
		Reused wood	1= Yes	2= No		
		Cement	1= Yes	2= No		
		Stone with lime/cement	1= Yes	2= No		
		Bricks	1= Yes	2= No		
		Cement blocks	1= Yes	2= No		
		Covered adobe	1= Yes	2= No		
		Wood planks/shingles	1= Yes	2= No		
		Other	1= Yes	2= No		

**Part 3: Maternal characteristics**

Serial no	Questions	Response	Code	Instruction
1	What was your age when you <b>first got pregnant</b> ?	_____ Years		
2	How many times did you get <b>pregnant in your life</b> (Including abortion, MR, stillbirth and live birth)?	_____ times		
3	How many alive children have you <b>ever given birth to</b> ?	_____ times		
4	Did you have any <b>bad health status</b> during pregnancy? (Anemia, burning sensation during urination, morning sickness, leg swelling, hypertension, diabetes, obesity, weight gain, anxiety, depression )	1=Yes 2=No		
5	In which month of your pregnancy did you give birth to child? (study child)	_____ month		
6	How many vaginal delivery did you have?	_____		
7	How many caesarian section did you have?	_____		
8	Did you face any <b>complications during any of your delivery</b> ?	1=Yes 2=No		If No go to 10
9	Which type of complications did you	1=Excessive bleeding		

	face during delivery ? (multiple answer)	2=High fever 3=Eclampsia 4=Blurry vision 5=Severe headache 6=Obstructed labor 7=Prolong labor 8=Early water breaking 9= Injury of the birth canal 10=Umbilical cord-related complications 11=Perinatal asphyxia 99=Other (specify)		
10	Which birth control method are you currently using?	1=Pill 3=Injection 4= Copper T/IUD 5=Norplant/ subdermal implant 6= Emergency contraceptive pill 7=Ligation/ tubectomy 8=Vasectomy 9=Safe period 10=Withdrawal 11=Lactational amenorrhoea 99=Others _____ (specify)		

**Part 4: child characteristics**

Serial no.	Questions	Response	Code	Instruction
1	What is the sex of your child ? (study child)	1=male 2=female 99=others (specify)		

### Part 5: Maternal disease history

Serial no.	Questions	Response	Code	Instruction
1	Are you suffering from any kind of health problems from last 30 days ?	1=Yes 2=No		If no go to question 3
2	Which type of health problems? (multiple answers)			
3	Has a health care provider ever told you that you have the following diseases? ( Chronic liver disease, Hypertension, Heart disease, Stroke, Diabetes, Chronic kidney disease, Cancer, Chronic respiratory disease (asthma/ COPD), mental health problem, Low back pain, Eye health problem)	1=Yes ( If yes go to next question) 2=No		
4	Which disease do you have ?	Hypertension	1=Yes 2=No	
		Heart attack	1=Yes 2=No	
		Other heart disease	1=Yes 2=No	
		stroke	1=Yes 2=No	



		Diabetes	1=Yes 2=No		
		Chronic liver disease	1=Yes 2=No		
		Chronic Kidney disease	1=Yes 2=No		
		Asthma/COPD	1=Yes 2=No		
		cancer	1=Yes 2=No		
		Mental health problem	1=Yes 2=No		
		Low back pain	1=Yes 2=No		
		Eye problem	1=Yes 2=No		

**Part 6 :Maternal mental health related information**

Serial no.	Questions	Response	Code	Instructions
1	What is your <b>current working status?</b> ( here any kind of formal and informal job included except housewife)	1=Doing job 2=Jobless		If ans 2=Jobless then go to 3
2	Do you feel stressed due to your current job? (ask if mother is working)	1=Yes 2=No		
3	Do you feel stressed due to your household chores? (self reported)	1=Yes 2=No		

4	Do you feel stressed due to child rearing? (self reported)	1=Yes 2=No		
5	Do you feel stressed due to your child's health problems ?	1=Yes 2=No		

### Part 7: Knowledge about hypertension

Serial no.	Questions	Response	Code	Instruction
1	Do you know about the disease hypertension?	1=Yes 2=No		
2	Have you ever had <b>blood pressure measured</b> by doctor or health care provider?	1=Yes 2=No		If ans "no" then go to next part
3	How many days ago ?	1= more than one month 2=within one month		
4	From whom did you measure blood pressure?	1=Registered doctor 2=Nurse 3=Pharmacist 4=cant remember 99=Other (specify)		
5	Have you ever been <b>told that you have raised blood pressure</b> by a doctor or health care provider? (self reported)	1=Yes 2=No		If no please go to next part
6	Who told that your blood pressure was raised?	1=Registered doctor 2=Nurse 3=Pharmacist 4=cant remember 99=Other (specify)		
7	Are you currently taking <b>regular treatment /medicine</b> for raised blood pressure prescribed by a doctor or health worker	1=Yes 2=No		

	?(drugs /medication that you have taken in past 2 weeks or more than 2 weeks )?			
8	Are you currently following <b>regular advice</b> for raised blood pressure by a doctor or health worker ? (advised to loose weight/stop smoking/reduce salt intake )	1=Ye 2=No		
9	What is your <b>source of treatment</b> or care for this raised BP? ( avoid this question if both 7 and 8 are no)	1=government hospital 2=private hospital 3=both govt and private 4=traditional kobiraj 5=pharmacist 99=others (please specify)		

#### Part 8 : Pregnancy time HTN history

Serial no	question	Response	Code	Instruction
1	Do you have <b>history of raised blood pressure</b> during any of your pregnancy period?	1=yes 2=No		<b>If no go to next part</b>
2	What was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup> 99=Others ____(please specify)		
3	Did you need to take any medicine for raised Blood pressure during any of your pregnancy period?	1=yes 2=No		<b>If no go to 5</b>
4	What was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup>		

		99=Others _____(please specify)		
<b>5</b>	Do you have history of severe headache due to raised blood pressure during any of your pregnancy?(self reported)	1=yes 2=No		<b>If no go to 7</b>
<b>6</b>	What was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup> 99=Others _____(please specify)		
<b>7</b>	Do you have history of vision problem due to raised blood pressure during any of your pregnancy?(self reported)	1=yes 2=No		<b>If no go to 9</b>
<b>8</b>	What was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup> 99=Others _____(please specify)		
<b>9</b>	Do you have <b>history of swelling of leg ,body</b> during any of your pregnancy?	1=yes 2=No		<b>If no go to 11</b>
<b>10</b>	What was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup> 99=Others _____(please specify)		
<b>11</b>	Do you have history of convulsion during any of your pregnancy ?	1=yes 2=No		<b>If no go to 13</b>

12	What was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup> 99=Others _____(please specify)		
13	Did you need <b>hospital admission</b> for raised BP or complications ( haedache ,vision problem,body leg swelling, convulsion etc )of raised blood pressure during any of your pregnancies?	1=yes 2=No		<b>If no go to 15</b>
14	What was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup> 99=Others _____(please specify)		
15	Did you need any <b>caesarian section</b> for raised blood pressure or complications of it ?	1=yes 2=No		<b>If no go to next part</b>
16	what was the order of that pregnancy? (multiple answer)	1=1 <sup>st</sup> 2=2 <sup>nd</sup> 3=3 <sup>rd</sup> 4=4 <sup>th</sup> 99=Others _____(please specify)		

### Part 9: Family history of hypertension

Serial	Question	Response	Code	instruction
1	Is any of your <b>blood related family member is suffering from hypertension?</b> ( father ,mother,	1=yes 2=No		<b>If no go to 3</b>

	sister,brother,grandfather,grandmother,uncle ,aunt, children )			
2	Who is suffering from hypertension?	1=father 2=mother 3=brother 4=sister 99=others (specify)		
3	Did any of your parents /paternal/maternal relatives die due to hypertension ?(parents,siblings,uncle,aunt)	1=yes 2=No		
4	Did any of your parents /paternal/maternal relatives die due to stroke/heart attack ? (parents,siblings,uncle,aunt,children)			

**Part 10: Behavioural factors ( fruits and vegetable intake, salt intake, processed food habit , oil consumption, physical activity, sedentary behaviour , tobacco use ,caffeine use )**

Serial no	Questions	Response	Code	Instruction
1a	In a typical week, on how many days do <b>you eat fruits?</b> (show card )  <i>Instruction: Demonstrate fruit's show card and ask the participant to think about it. Do not consider packaged fruit juice but consider fruit juice prepared at home using fresh fruits. A typical week refers to "A usual week except religious event or any other festival. If 1-2 times/month then record it as "00."</i>	Number of days  _ _ _ _  77 = Don't Know		<b>If 00 day then go to 2a</b>
1b	How many servings of fruit do you eat on one of those days? (showcard and serving bowl)  <i>Instruction: Ask the participant to think about any one of those days of a typical week. Use supplied bowl and show card to measure servings.</i>	Number of servings  _ _ _ _ . _ _ _ _  77.7 = Don't Know		

2a	<p>In a typical week, on how many days <b>do you eat vegetables?</b> (show card )</p> <p><i>Instruction: Demonstrate vegetable's show card and ask the participant to think about it. Do not consider potato as vegetables. Demonstrate serving with the help of supplied cup and show card as cooked and uncooked vegetables. Consider only vegetables serving in case of cooked vegetables with fish. A typical week refers to "A usual week except religious event or any other festival. If 1-2 times/month then record it as "00."</i></p>	<p>Number of days</p> <p>____ ____ </p> <p>77 = Don't Know</p>		<p><b>If 00 day then go to next part</b></p>
2b	<p>How many servings of vegetables do you eat on one of those days?(showcard and serving bowl)</p> <p><i>Instruction: Ask the participant to think about any one of those days of a typical week. Use supplied cup and show card to measure serving</i></p>	<p>Number of servings</p> <p>____ ____ .____ </p> <p>77.7 = Don't Know</p>		
3a	<p>How often do you <b>add salt</b> to your food right before you eat or as you are eating one ?select only one (show card )</p>	<p>1=Always 2=Often 3=Sometimes 4=Rarely 5=Never 77 =Don't know</p>		<p><b>If ans never or don't know go to 4</b></p>
3b	<p>How much <b>extra salt</b> do you take in a typical day?(show card )</p>	<p>_____T ea spoonful 77=don't know</p>		

4	How often do u eat <b>processed food</b> high in salt ?(chips,chanachur,jhalmuri,canned salty foods,fast food, cheese ,processed meat,dried fish,salty fish ,fast food, singara, somucha, puri, fuchka, chotpoti, salted biscuits,jhalmuri,) (showcard )	1=Always 2=Often 3=Sometimes 4=Rarely 5=Never 77 =Don't know		
5	What <b>type of oil</b> is most often used to cook food in your house?	1=Soyabean oil 2=mustard oil 3=ghee/butter 4=palm oil 5=sunflower oil 99=others( please specify _____ )		
6	Does your daily work / professional work, sports, fitness or recreational(leisure) activities 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, running, football, Kabaddi, Dariabandha, Gollachut etc.] for at least 10 minutes continuously?(showcard )  <i><b>Instruction:</b> Ask participant to think about those vigorous-intensity activities performed as a part of professional work/ recreational activities. Those activities will be considered as vigorous-intensity activities that causes large increase in breathing or heart rate</i>	1=yes 2=No		<b>If no go to 7</b>
6a	In a typical week, on how many days do you do vigorous- intensity activities/sports/fitness as part of daily work / professional work/ recreational activities?	____ Day 77 = Don't know		



	<i><b>Instruction:</b> In a typical week refers to “activities performed by respondent in a typical week”. Valid response range is 1-7 days</i>			
6b	<p>How much time do you spend doing vigorous-intensity activities/sports/fitness at daily work / professional work/recreational activities on a typical day?</p> <p><i><b>Instruction:</b> Ask respondent to think about a single day (which can be remembered easily) s/he performed vigorous-intensity activities as part of professional work/ recreational activities. Respondent will consider only those activities that are performed for at least 10 minutes or more continuously. Check unusual (more than 04 hours) values.</i></p>	_____ Minutes		
7	<p>Does your daily work / professional work/ spots/fitness/ recreational (leisure) work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads, cycling, swimming, washing clothes volleyball] for at least 10 minutes continuously? (showcard )</p> <p><i><b>Instruction:</b> Ask participant to think about those moderate-intensity activities performed as a part of professional work/ recreational activities. Those activities will be considered as moderate-intensity activities that causes small increase in breathing or heart rate</i></p>	<p>1=yes</p> <p>2=no</p>		<b>If no go to next part</b>
7a	In a typical week, on how many days do you do moderate- intensity activities as part of your daily work / professional work/sports/fitness or recreational work?	<p>_____ Day</p> <p>77 = Don't know</p>		

	<i><b>Instruction:</b> In a typical week refers to “activities done by respondent in a typical week”. Valid response range is 1-7 days.</i>			
7b	<p>How much time do you spend doing moderate-intensity activities at daily work / professional work/ sports/fitness or recreational work on a typical day?</p> <p><i><b>Instruction:</b> Ask respondent to think about a single day (which can be remembered easily) s/he performed moderate-intensity activities as part of professional work/recreational activities. Respondent will consider only those activities that are performed for at least 10 minutes or more continuously. Check unusual (more than 04 hours) values</i></p>	_____ Minutes		
8	<p>How much time do you usually spend sitting or reclining on a typical day?(showcard )</p> <p><i><b>Instruction:</b> Ask respondent to think about time spent on sitting or reclining at work, office, study, watching television, computer use, at kitchen, during rest. Do not include time spent during sleeping.</i></p>	_____ Minutes		
9	<p>Do you currently smoke any tobacco products, such as cigarettes, bidis, hookah, cigars or pipes (showcard )</p> <p><i>Instruction: Demonstrate show card to the participant and ask which smoke tobacco products/he use</i></p>	<p>1=yes</p> <p>2=no</p>		<b>If no go 10</b>

9a	<p>Do you currently smoke tobacco products daily?</p> <p><b>Instruction:</b> This question is applicable for those respondents who smoke tobacco product daily.</p> <p>Daily means: tobacco smoking is at least one time/day for almost one month or more than that If that is the case respondent started smoking from 25 days and still running, that is regarded as every day.</p>	<p>1=yes 2=no</p>		
9b	<p>How old were you when you <b>first started</b> smoking?</p>	<p>Age <input type="text"/> <input type="text"/> years 77 = Don't know</p>		
10	<p>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?</p> <p><b>Instruction:</b> Ask respondent to think and answer whether h/she 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. Here, only betel quid, supari and lime will not be considered. It will be considered as smokeless tobacco if respondent use Betel quid with zarda, zarda only or zarda with supari, Betel quid with sadapata, pan masala with tobacco, sadapata chewing, gul, Khoinee, Nossi, gutka.</p>	<p>1 = Yes; 2= No</p>		<p><b>If no go to 11</b></p>
10a	<p>Do you currently use smokeless tobacco daily?</p> <p><b>Instruction:</b> Daily means “using smokeless tobacco is at least one time/day for almost one month or more than that. If that is the case respondent started smoking from 25 days and still running, that is regarded as every day.</p>	<p>1 = Yes; 2= No</p>		

10b	How old were you when you started smokeless tobacco?	Age <input type="text"/> <input type="text"/> years 77 = Don't know		
11	Which of your parents or guardians use any form of tobacco?	1= Neither 2= My father or male guardian 3= My mother or female guardian 4= Both 5= I do not know 99= Others (Specify)_____		
12	Have you ever consumed any alcohol such as beer,wine,spirits,tari,cholai,ram,bangla,chuani,keru,vodka,jeen etc? (showcard )	1=yes 2=no		<b>If no go to 15</b>
13	Have you consumed any alcohol within the past 12 months?	1=yes 2=no		
14	Have you consumed any alcohol within the past 30 days?	1=yes 2=no		
15	Do you drink <b>tea or coffee</b> ?	1=yes 2=no		<b>If no go to 18</b>
16	How many times do you drink tea/coffee in a typical day?	1=once a day 2= >once a day		

17	How much of tea/coffee do you drink on a typical day ?	1. <3 cup a day 2. >=3 cup a day		
18	How many hours do you <b>sleep</b> everyday?	1.<8 hours 2.>=8 hours		

**Physical measurements: Blood pressure**

Reading 1	Systolic (mmHg)- Diastolic (mmHg)-		
Reading 2	Systolic (mmHg)- Diastolic (mmHg)-		
Reading 3	Systolic (mmHg)- Diastolic (mmHg)-		
Average of reading 2 & 3	Systolic (mmHg)- Diastolic (mmHg)-		
<b>Height and weight</b>			
Height	In centimeters_____		
Weight	In kg_____		
BMI	Weight in kg /(Height in m)^2		

--	--	--	--

## Annex 5

### Timeline Chart

Activity	Timeline
SLP Students Orientation	October 15, 2022
Systematic Review Workshop	October 30 & 31, 2022
Refresher-I (Research Question Formulation, Literature Review, Conceptual Framework, Methodology, concept note)	November 2, 2022
Tutorial-1 (Introduction & Theme Specification, Research Question Formulation, Literature Review, Concept Note)	November 3, 2022
Draft Individual Concept notes submission	November 6, 2022
Tutorial- 2 (Concept note feedback)	November 10, 2022
Final Submission of Concept note	November 12, 2022
Refresher-II (Tools Development & Ethical Compliance)	November 13, 2022
Draft Tools and Consent form Submission	November 14, 2022
Tutorial-3 (Tool Feedback)	November 15, 2022
Tools and Consent form submission of Final Tools and Consent forms	November 16, 2022
Review of Ethical Compliance by ERC	November 17, 2022
Tutorial-4 (Addressing Ethical Compliance Feedback)	November 20, 2022
Tools Pretest and Finalization	November 21-22, 2022
Submission of Final Tools and Consent forms	November 23, 2022
Meeting with Research RA - Disbursement of SLP Grant	November 24, 2022
Pre-testing	November 25, 2022
Data collection	November 24- December 10, 2022
Refresher-III (Data Analysis)	December 08, 2022 December 11, 2022
Scientific Writing Workshop	December 12, 2022
Data analysis	December 10-17, 2022
Tutorial- 5: Data analysis (Progress and Initial Feedback)	December 18, 2022

Tutorial- 6: Data Analysis (Final Feedback)	December 22, 2022
Tutorial –7: SLP Final Report	December 27, 2022
<b>Final Draft SLP Final Submission</b>	<b>January 4, 2023</b>
Tutorial- 8: (Feedback on Final Draft Report)	January 8, 2023
<b>Individual resubmission</b>	<b>January 11, 2023</b>

## Annex 6

### Do file

\* Data Import \*

```
import excel "C:\Users\User\Downloads\SLP\ Dataset FINAL.xlsx", sheet("Form Responses 1")
firstrow
```

\*Remove variable\*

```
drop act_elec act_solar act_radio act_television act_mobile act_telephone act_computer
act_refrigerator act_almira act_fan act_dvd act_pump act_ips act_ac act_car act_cng
act_rickshaw act_bicycle act_motorboat act_boat act_motorcycle floor_sand floor_dung
floor_bamboo floor_wood floor_tiles floor_cement floor_carpet floor_other roof_leaf roof_sod
roof_mat roof_bamboo roof_cardboard roof_metal roof_wood roof_calamine roof_tiles
roof_cement roof_shingles roof_tin wall_cane wall_dirt wall_bamboomud wall_stonemud
wall_cardboard wall_wood wall_cement wall_stonement wall_bricks wall_cementblocks
wall_shingles wall_tin wall_other
drop if sys_bp ==.
```

\*Variable values\*

```
la var Timestamp "Timestamp"
la var Intv_name "Interviewer's name"
la var Intv_ID "Interviewer's Id"
la var Intv_date "Date of the interview"
la var Intv_time "Interview start time"
la var hhid "Household Id"
```

la var hh\_head "Head of your household"  
la var name\_hhhead "Household head name"  
la var mname "Mother's name"  
la var m\_id "Mother's ID"  
la var mdob "Mother's date of birth"  
la var mage "Age of mother (years)"  
la var hhemem "Number of household members"  
la var tchild "Total Children"  
la var tchild\_5 "Number of children under five years of age"  
la var cname "Under five children's Name"  
la var child\_id "Under five children's ID"  
la var cdob "Date of birth of under five years of age"  
la var cage "Age of children (months)"  
la var c\_sex "Sex of study child"  
la var yofliving "Slum living duration(years)"  
la var address "Address and contact"  
la var area\_name "Slum name"  
la var total\_hhemem "Total members live in household"  
la var mstat "Marital status"  
la var rel "Religion"  
la var m\_edu "Mother's educational level"  
la var hus\_edu "Husband's completed level of education"  
la var m\_occ "Mother's occupation"  
la var hus\_occ "Husband's occupation"  
la var hh\_income "Monthly household income (taka)"  
la var m\_income "Mother's monthly income(taka)"  
la var fn\_demak "Financial decision maker"  
la var hc\_demak "Healthcare decision maker"  
la var first\_pregage "Age of first pregnancy"



la var t\_preg "Total number of pregnancy Including abortion, MR, stillbirth and live birth"  
la var livebirth " Total number of live birth"  
la var preg\_com "Pregnancy time complications"  
la var g\_age "Gestational age of giving birth of study child"  
la var normal\_d "Number of vaginal delivery"  
la var c\_section "Number of caesarian section"  
la var dcom "Presence of complications during delivery"  
la var dcom\_type "Type of complications during delivery"  
la var bcm "Birth control method "  
la var hprob\_30d "Presence of health related problem of mother within last 30 days"  
la var hprob\_30d\_type "Type of health related problems of mother within last 30 days"  
la var d\_history "Presence of disease told by healthcare providers"  
la var d\_htn "Name of Diseases Hypertension"  
la var d\_hattack "Diseases Heart attack"  
la var d\_heart "Diseases Other heart diseases"  
la var d\_stroke "Diseases Stroke"  
la var d\_dm "Diseases Diabetes"  
la var d\_cld "Diseases Chronic liver disease"  
la var d\_ckd "Diseases Chronic kidney disease"  
la var d\_copd "Diseases Chronic respiratory disease"  
la var d\_can "Diseases Cancer"  
la var d\_mental "Diseases Mental health problem"  
la var d\_lbp "Diseases Low back pain"  
la var d\_eye "Diseases Eye problem"  
la var stress\_job "Job related stress if mother is doing any job/working mother"  
la var stress\_hchore "Stress due to household chores"  
la var stress\_chrearing "Stress due to child rearing"  
la var pr\_chsickness "Presence of child sickness"  
la var stress\_chhprob "Stress due to child's health problems"

la var know\_htn "Do you know about the disease hypertension?"

la var measurehis\_bp "Measurement history of blood pressure by doctor or health care provider"

la var measuretime\_bp "How many days ago did you measure your blood pressure?"

la var measuresource\_bp "Source of blood pressure measurement"

la var evertold\_htn "Have you ever been told that you have raised blood pressure or hypertension by a doctor or health care provider? (self reported)"

la var sourcetold\_hbp "Source that told that your blood pressure was high"

la var reg\_med\_hbp "Currently taking of regular treatment /medicine for high blood pressure"

la var reg\_adv\_hbp "Currently following of regular advice for raised blood pressure"

la var source\_treat\_adv\_hbp "Source of treatment or advice for raised blood pressure"

la var preghis\_hbp "History of high blood pressure during any of pregnancy period"

la var totpreg\_hbp "Total number of pregnancies having high blood pressure"

la var ord\_preg\_hbp "Order of pregnancy having high blood pressure"

la var medpreg\_hbp "History of need for medicine taking for high blood pressure during any of pregnancy period"

la var ord\_medpreg\_hbp "Order of pregnancy for medicine taking for high blood pressure"

la var sevheadpreg\_hbp "History of severe headache due to high blood pressure during pregnancy"

la var ord\_sevheadpreg\_hbp "Order of pregnancy of severe headache due to high blood pressure"

la var visprobpreg\_hbp "History of vision problem due to high blood pressure during pregnancy"

la var ord\_visprobpreg\_hbp "Order of pregnancy of vision problem due to high blood pressure"

la var swellpreg\_hbp "History of swelling of leg, body due to high blood pressure during pregnancy"

la var ord\_swellpreg\_hbp "Order of pregnancy of swelling of leg, body due to high blood pressure"

la var convpreg\_hbp "History of convulsion due to high blood pressure during pregnancy"

la var ord\_convpreg\_hbp "Order of pregnancy of convulsion due to high blood pressure"

la var hosadpreg\_hbp "History of hospital admission due to high blood pressure or its complications during pregnancy"

la var tothosadpreg\_hbp "Total number of hospital admissions due to high blood pressure or its complications during all pregnancies"

la var ord\_hosadpreg\_hbp "Order of pregnancy that need hospital admission for high blood pressure or its complications"

la var cspreg\_hbp "History of caesarean section for high blood pressure or complications of it"

la var totcspreg\_hbp "Total number of caesarean sections for high blood pressure or its complications"

la var ord\_cspreg\_hbp "Order of pregnancy of having caesarean sections for high blood pressure or its complications"

la var famhis\_htn "Family history of hypertension"

la var fammem\_htn "Affected family member with hypertension"

la var fammemdeath\_htn "History of family members death due to hypertension"

la var fammemdeath\_stroke\_hattack "History of family members death due to stroke or heart attack"

la var frt\_days "In a typical week, number of days of eating fruits"

la var frt\_serv "Number of servings of fruit on one of those days"

la var veg\_days "In a typical week, number of days of eating vegetables"

la var veg\_serv "Number of servings of vegetables on one of those days"

la var freq\_exsalt "Frequency of extra salt intake"

la var amnt\_exsalt "Amount of extra salt intake per day"

la var freq\_prcsdfod "Frequency of processed food high in salt intake"

la var typ\_oil "Type of oil used to cook food"

la var vig\_act "Involvement to daily vigorous-intensity activity"

la var vigact\_days "Total number of days of vigorous-intensity activities involvement per week"

la var vigact\_du "Duration of doing vigorous-intensity activities on a typical day(minutes)"

la var mod\_act "Involvement to daily moderate-intensity activity"

la var modact\_days "Total number of days of moderate- intensity activities involvement per week"  
la var modact\_du "Duration of doing moderate-intensity activities on a typical day (minutes)"  
la var sed\_ddu "Duration of sedentary behaviour on a typical day"  
la var smok\_toba "Presence of curently smoking tobacco products use"  
la var dsmok\_toba "Presence of use of smoke tobacco products daily"  
la var fage\_smok "Age of starting first smoking"  
la var smokeless\_toba "Presence of current use of any smokeless tobacco products"  
la var dsmokeless\_toba "Presence of current use of smokeless tobacco daily"  
la var fage\_smokeless\_toba "Age of starting smokeless tobacco"  
la var famem\_toba "Family member's use of any form of tobacco"  
la var alc\_life "History of ever consuming any alcohol in life"  
la var alc\_12m "Alcohol consumption within the past 12 months"  
la var alc\_30d "Alcohol consumption within the past 30 days"  
la var drnk\_tea\_cf "Presence of drinking tea or coffee"  
la var frq\_tea\_cf\_pd "Frequency of drinking tea/coffee in a typical day"  
la var amnt\_tea\_cf\_pd "Amount of tea/coffee drinking on a typical day"  
la var slp\_pd "Daily sleep hours"  
la var dfood\_freq "Frequency of daily food intake"  
la var m\_wt "Mother's weight"  
la var m\_ht "Mother's height"  
la var c\_wt "Child's weight"  
la var c\_ht "Child's height/length"  
la var sys\_bp "Systolic blood pressure (mmHg)"  
la var dia\_bp "Diastolic blood pressure (mmHg)"

\*Removing Space\*

replace evertold\_htn = strtrim(evertold\_htn)

replace reg\_med\_hbp = strtrim(reg\_med\_hbp)

```
replace stress_job = strtrim(stress_job)
replace stress_hchore = strtrim(stress_hchore)
replace stress_chrearing = strtrim(stress_chrearing)
replace stress_chhprob = strtrim(stress_chhprob)
replace alc_life= strtrim(alc_life)
replace dsmok_toba = strtrim(dsmok_toba)
replace dsmokeless_toba = strtrim(dsmokeless_toba)
replace mstat = strtrim(mstat)
replace fn_demak = strtrim(fn_demak)
replace rel = strtrim(rel)
replace m_occ = strtrim(m_occ)
replace measurehis_bp = strtrim(measurehis_bp)
replace measuresource_bp = strtrim(measuresource_bp)
replace famem_toba = strtrim(famem_toba)
replace pr_chsickness = strtrim(pr_chsickness)
replace fammemdeath_stroke_hattack = strtrim(fammemdeath_stroke_hattack)
replace famhis_htn = strtrim(famhis_htn)
replace preghis_hbp = strtrim(preghis_hbp)
replace d_heart = strtrim(d_heart)
replace d_dm = strtrim(d_dm)
replace bcm = strtrim(bcm)
replace drnk_tea_cf = strtrim(drnk_tea_cf)
replace typ_oil = strtrim(typ_oil)
```

\* Creating dependent variables \*

\*binary\*

```
tab evertold_htn
```

```
replace evertold_htn = "No" if evertold_htn != "Yes"
```

```
tab evertold_htn
```

```

tab reg_med_hbp
replace reg_med_hbp = "No" if reg_med_hbp != "Yes"
tab reg_med_hbp
gen ht_binary =.
replace ht_binary = 0 if (sys_bp < 140 & dia_bp < 90 & evertold_htn == "No" & reg_med_hbp ==
"No")
replace ht_binary = 1 if sys_bp >= 140
replace ht_binary = 1 if dia_bp >= 90
replace ht_binary = 1 if evertold_htn == "Yes"
replace ht_binary = 1 if reg_med_hbp == "Yes"
la var ht_binary " Hypertension Status"
label define ht_b 0 "No" 1 "Yes"
label value ht_binary ht_b
ta ht_binary

```

\*Categorical\*

```

generate Blood_pressure =.
replace Blood_pressure = 0 if (sys_bp < 120 & dia_bp < 80)
replace Blood_pressure = 1 if ((sys_bp >=120 & sys_bp <140) | (dia_bp >= 80 & dia_bp <90))
replace Blood_pressure = 2 if ((sys_bp >=140 & sys_bp <160) | (dia_bp >= 90 & dia_bp <100))
replace Blood_pressure = 3 if ((sys_bp >=160 & sys_bp <198) | (dia_bp >= 100 & dia_bp <115))
la var Blood_pressure " Blood Pressure Status"
la de Blood_pressure 0 "Normal" 1 "Prehypertension" 2 "Hypertension: stage_1" 3
"Hypertension: stage_2"
la val Blood_pressure Blood_pressure
tab Blood_pressure

```

\* Creating independent variables \*

\* Slum name \*

```

encode area_name, gen(Slum)

* Mother age *
generate mother_age =.
replace mother_age =0 if mage <= 19
replace mother_age = 1 if mage > 19 & mage <= 29
replace mother_age = 2 if mage >29 & mage <= 39
replace mother_age = 3 if mage >39
la de mother_age 0 "15-19" 1 "20-29" 2 "30-39" 3 "40 and above "
la val mother_age mother_age
tab mother_age

recode mother_age (0 1=0 "Less than or equal to 29") (2= 1 "30-39") (3= 2 "40 and above"), gen
(mother_age2)
ta mother_age2

* Marital status *
tab mstat
gen marital_status =.
replace marital_status = 0 if mstat != "Married"
replace marital_status = 1 if mstat == "Married"
label define mar 0 "Others" 1 "Married"
label value marital_status mar

* religion *
encode rel, gen (rel2)
numlabel, add
recode rel2(1 4 =3 "Christian") (2=2 "Hindu") (3= 1 "Muslim"), gen (religion)
ta religion
recode rel2(1 2=0 "Other") (3= 1 "Muslim"), gen (religion2)

```

```
ta religion2
```

```
* Mothers education *
```

```
encode m_edu, gen (m_edu2)
```

```
numlabel, add
```

```
ta m_edu2
```

```
recode m_edu2 (14 17 =0 "Never went to school") (1 5/7 =1 "Preprimary") (2 4 8/10 16 = 2  
"Primary completed") (15 = 3 "Secondary completed") (3 11/13 =4 "Higher Secondary and  
above"), gen (mothers_education)
```

```
ta mothers_education
```

```
recode mothers_education (0 1 =0 "Up to Preprimary") (2 = 1 "Primary completed") (3 4 = 2  
"Secondary completed and above"), gen (mothers_education2)
```

```
ta mothers_education
```

```
ta mothers_education2
```

```
* Mothers Occupation *
```

```
gen mothers_occupation =.
```

```
replace mothers_occupation = 1 if m_occ == "Homemaker"
```

```
replace mothers_occupation = 0 if m_occ != "Homemaker"
```

```
label define ocu 0 "Working" 1 "Homemaker"
```

```
label value mothers_occupation ocu
```

```
tab mothers_occupation
```

```
* Mothers monthly income *
```

```
gen mothers_monthly_income =.
```

```
replace mothers_monthly_income = 0 if m_income == 0
```

```
replace mothers_monthly_income = 1 if m_income > 1 & m_income <=4999
```

```
replace mothers_monthly_income = 2 if m_income > 4999
```

```
la de m_income 0 "No income" 1 "Less than 5000" 2 "5000 or More"
```



```
la val mothers_monthly_income m_income
```

```
tab mothers_monthly_income
```

```
* Household monthly income *
```

```
generate household_monthly_income =.
```

```
replace household_monthly_income =0 if hh_income <= 9999
```

```
replace household_monthly_income = 1 if hh_income > 9999 & hh_income <= 14999
```

```
replace household_monthly_income = 2 if hh_income > 14999 & hh_income <=19999
```

```
replace household_monthly_income = 3 if hh_income > 19999 & hh_income <=24999
```

```
replace household_monthly_income = 4 if hh_income > 24999 & hh_income <=60000
```

```
la var household_monthly_income "Household Monthly income"
```

```
la de hh_income 0 "Less than 10,000" 1 "10,000 to <15,000" 2 "15,000 to <20,000" 3 "20,000 to  
<25,000" 4 "≥25,000"
```

```
la val household_monthly_income hh_income
```

```
tab household_monthly_income
```

```
generate household_monthly_income2 = household_monthly_income
```

```
replace household_monthly_income2 = 3 if hh_income > 24999 & hh_income <=60000
```

```
la var household_monthly_income2 "Household Monthly income"
```

```
la de hh_income2 0 "Less than 10,000" 1 "10,000 to <15,000" 2 "15,000 to <20,000" 3  
"≥20,000"
```

```
la val household_monthly_income2 hh_income2
```

```
tab household_monthly_income
```

```
tab household_monthly_income2
```

```
mean hh_income
```

```
mean hh_income , over (Slum)
```

```
* Household member *
```

```
gen household_member =.
```

```
replace household_member = 0 if hmem <= 5
```

```
replace household_member = 1 if hmem > 5
label define mem 0 "5 or less" 1 "More than 5"
label value household_member mem
```

```
* Total children *
```

```
gen total_child =.
replace total_child = 0 if tchild <=2
replace total_child = 1 if tchild >2
label define ch 0 "2 or less" 1 "More than 2"
label value total_child ch
tab total_child
```

```
* Financial decision maker *
```

```
gen financial_decision_maker =.
replace financial_decision_maker = 0 if fn_demak == "Father-in-law"
replace financial_decision_maker = 1 if fn_demak == "Both husband and wife"
replace financial_decision_maker = 2 if fn_demak == "Herself"
replace financial_decision_maker = 3 if fn_demak == "Mother-in-law"
replace financial_decision_maker = 4 if fn_demak == "Husband"
replace financial_decision_maker = 5 if fn_demak == "Others"
label define fn 0 "Father-in-law" 1 "Both husband and wife" 2 " Herself" 3 "Mother-in-law" 4
"Husband" 5 "Others"
label value financial_decision_maker fn
```

```
* Daily food intake *
```

```
gen daily_food_intake =.
replace daily_food_intake = 0 if dfood_freq <= 3
replace daily_food_intake = 1 if dfood_freq > 3
label define fo 0 "3 times or less per day " 1 "More than 3 times per day"
```

```
label value daily_food_intake fo
```

```
* Fruits and Vegetables consumption *
```

```
gen fruit=(frt_days*frt_serv)/7
```

```
gen veg=(veg_days*veg_serv)/7
```

```
egen fruitveg= rsum(fruit veg)
```

```
tab fruitveg
```

```
gen fruits_vegetables_consumption = 0 if fruitveg >= 5 & fruitveg !=.
```

```
replace fruits_vegetables_consumption = 1 if fruitveg < 5
```

```
lab var fruits_vegetables_consumption "Fruits and vegetables consumption"
```

```
lab def fruitveg_cat 0 ">=5 servings" 1 "<5 servings"
```

```
lab values fruits_vegetables_consumption fruitveg_cat
```

```
tab fruits_vegetables_consumption
```

```
*Extra salt intake*
```

```
gen extra_salt_intake = 0
```

```
replace extra_salt_intake = 1 if amnt_exsalt >= 1
```

```
label define esi 0 "No" 1 "Yes"
```

```
label value extra_salt_intake esi
```

```
tab extra_salt_intake
```

```
* Tobacco User *
```

```
gen tobacco_user = 0
```

```
replace tobacco_user = 1 if (dsmok_toba == "Yes" | dsmokeless_toba == "Yes")
```

```
label define tu 0 "No" 1 "Yes"
```

```
label value tobacco_user tu
```

```
*Alcohol intake*
```

```
gen alcohol_intake =.
```

```
replace alcohol_intake = 0 if alc_life == "No"
replace alcohol_intake = 1 if alc_life == "Yes"
label define alc 0 "No" 1 "Yes"
label value alcohol_intake alc
tab alcohol_intake
```

**\*Physical activity\***

```
gen vigorous_physical_activity = 2*(vigact_days * vigact_du)
gen moderate_physical_activity = (modact_days * modact_du)
gen physical_activity =.
replace physical_activity = 1 if (vigorous_physical_activity >= 150 | moderate_physical_activity
>= 150)
replace physical_activity = 0 if (vigorous_physical_activity < 150 & moderate_physical_activity <
150)
tab physical_activity
label define phy 0 "Indequate" 1 "Adequate"
label value physical_activity phy
tab physical_activity
```

**\*BMI\***

```
gen bmi= m_wt/(m_ht/100)^2
gen bmi_cat=0
replace bmi_cat=1 if bmi >=18.5 & bmi < 23
replace bmi_cat=2 if bmi >= 23 & bmi < 25
replace bmi_cat=3 if bmi >= 25
la de bmi_cat 0 "Underweight" 1 "Normal" 2 "Overweight" 3 "Obesity"
la val bmi_cat bmi_cat
tab bmi_cat
```

\* Type of oil used to cook food \*

```
gen oil_used = .
replace oil_used = 0 if typ_oil == "Soyabean oil"
replace oil_used = 1 if typ_oil == "Mustard oil"
replace oil_used = 2 if typ_oil == "Palm oil"
label define oil 0 "Soyabean oil" 1 "Mustard oil" 2 "Palm oil"
label value oil_used oil
tab oil_used
```

\* Caffeine intake (Tea/Coffee) \*

```
label define case_notcase 1 "Yes" 0 "No"
encode drnk_tea_cf, gen(caffeine_intak) label(case_notcase)
```

\* Family history of tobacco consumption \*

```
tab famem_toba
gen family_tobacco_consumption = 1
replace family_tobacco_consumption = 0 if famem_toba == "None"
label value family_tobacco_consumption case_notcase
```

\*Sedentary behavior\*

```
tab sed_ddu
gen sedentary_behavior = 0
replace sedentary_behavior = 1 if sed_ddu > 0 & sed_ddu < 300
replace sedentary_behavior = 2 if sed_ddu >= 300
label define sedentary_behavior 0 "0 minutes" 1 "< 300 minutes" 2 "≥ 300 minutes"
label value sedentary_behavior sedentary_behavior
gen sedentary_behavior2 = 0
replace sedentary_behavior2 = 1 if sed_ddu >= 300
label define sedentary_behavior2 0 "< 300 minutes" 1 "≥ 300 minutes"
```

```
label value sedentary_behavior2 sedentary_behavior2
```

```
*Daily sleep hours*
```

```
tab slp_pd
```

```
label define daily_sleep_hours 1 "<8 hours" 0 ">=8 hours"
```

```
encode slp_pd, gen(daily_sleep_hours) label(daily_sleep_hours)
```

```
*Presence of child sickness*
```

```
encode pr_chsickness, gen(presence_child_sickness) label(case_notcase)
```

```
*Presence of diabetes*
```

```
encode d_dm, gen(presence_diabetes) label(case_notcase)
```

```
*Presence of heart disease*
```

```
encode d_heart, gen(presence_heart_disease) label(case_notcase)
```

```
*Hypertension during any pregnancy*
```

```
encode preghis_hbp, gen(hypertension_during_pregnancy) label(case_notcase)
```

```
*Family history of hypertension*
```

```
encode famhis_htn, gen(family_history_hypertension) label(case_notcase)
```

```
*Family history of stroke / heart attack *
```

```
replace fammemdeath_stroke_hattack = "Yes" if fammemdeath_stroke_hattack == "yes"
```

```
encode fammemdeath_stroke_hattack, gen(family_history_stroke) label(case_notcase)
```

```
*Birth control method*
```

```
encode bcm, gen(birth_control_method)
```

\* Stress\*

gen stress= 0

replace stress = 1 if stress\_job == "Yes"

replace stress = 1 if stress\_hchore == "Yes"

replace stress = 1 if stress\_chrearing == "Yes"

replace stress = 1 if stress\_chhprob == "Yes"

label define str 0 "No" 1 "Yes"

label value stress str

\*Source of blood pressure measurement\*

gen source\_pressure\_measurement = 0

replace source\_pressure\_measurement = 1 if measuresource\_bp == "Health Worker"

replace source\_pressure\_measurement = 2 if measuresource\_bp == "Ngo\_Brac"

replace source\_pressure\_measurement = 3 if measuresource\_bp == "Registered doctor"

replace source\_pressure\_measurement = 4 if measuresource\_bp == "Pharmacist"

replace source\_pressure\_measurement = 5 if measuresource\_bp == "Others"

label define source\_measurement 0 "Not measured" 1 "Health Worker" 2 "Ngo (BRAC)" 3

"Registered doctor" 4 "Pharmacist" 5 "Others"

label value source\_pressure\_measurement source\_measurement

\*\*\*\*\*Bivariate analysis\*\*\*\*\*

\*\*\*\* Cross tabulation with column percentages (Slum) \*\*\*\*\*

tab ht\_binary Slum, col ch

tab mother\_age Slum, col ch exact

tab marital\_status Slum, col ch

tab religion Slum, col ch exact

tab mothers\_education2 Slum, col ch

tab mothers\_occupation Slum, col ch  
tab mothers\_monthly\_income Slum, col ch  
tab household\_monthly\_income Slum, col ch  
tab household\_monthly\_income2 Slum, col ch  
tab household\_member Slum, col ch  
tab total\_child Slum, col ch  
tab daily\_food\_intake Slum, col ch  
tab oil\_used Slum, col ch  
tab fruits\_vegetables\_consumption Slum, col ch exact  
tab extra\_salt\_intake Slum, col ch  
tab caffeine\_intak Slum, col ch  
tab tobacco\_user Slum, col ch  
tab family\_tobacco\_consumption Slum, col ch  
tab alcohol\_intake Slum, col ch  
tab physical\_activity Slum, col ch exact  
tab sedentary\_behavior Slum, col ch  
tab daily\_sleep\_hours Slum, col ch  
tab stress Slum, col ch  
tab presence\_child\_sickness Slum, col ch  
tab presence\_diabetes Slum, col ch  
tab presence\_heart\_disease Slum, col ch  
tab hypertension\_during\_pregnancy Slum, col ch  
tab family\_history\_hypertension Slum, col ch  
tab family\_history\_stroke Slum, col ch  
tab birth\_control\_method Slum, col ch  
tab bmi\_cat Slum, col ch  
tab household\_monthly\_income2 Slum, col ch  
tab mothers\_education2 Slum, col ch  
tab oil\_used Slum, col ch exact



tab sedentary\_behavior2 Slum, col ch exact  
tab caffeine\_intak Slum, col ch exact  
tab daily\_sleep\_hours Slum , col ch exact

\*\*\*\* Cross tabulation with column percentages (Blood pressure status) \*\*\*\*

tab ht\_binary Blood\_pressure, col ch exact  
tab mother\_age Blood\_pressure, col ch exact  
tab marital\_status Blood\_pressure, col ch exact  
tab religion Blood\_pressure, col ch exact  
tab mothers\_education2 Blood\_pressure, col ch exact  
tab mothers\_occupation Blood\_pressure, col ch exact  
tab mothers\_monthly\_income Blood\_pressure, col ch exact  
tab household\_monthly\_income2 Blood\_pressure, col ch exact  
tab household\_member Blood\_pressure, col ch exact  
tab total\_child Blood\_pressure, col ch exact  
tab daily\_food\_intake Blood\_pressure, col ch exact  
tab oil\_used Blood\_pressure, col ch exact  
tab fruits\_vegetables\_consumption Blood\_pressure, col ch exact  
tab extra\_salt\_intake Blood\_pressure, col ch exact  
tab caffeine\_intak Blood\_pressure, col ch exact  
tab tobacco\_user Blood\_pressure, col ch exact  
tab family\_tobacco\_consumption Blood\_pressure, col ch exact  
tab alcohol\_intake Blood\_pressure, col ch exact  
tab physical\_activity Blood\_pressure, col ch exact  
tab sedentary\_behavior2 Blood\_pressure, col ch exact  
tab daily\_sleep\_hours Blood\_pressure, col ch exact  
tab stress Blood\_pressure, col ch exact  
tab presence\_child\_sickness Blood\_pressure, col ch exact

tab presence\_diabetes Blood\_pressure, col ch exact  
tab presence\_heart\_disease Blood\_pressure, col ch exact  
tab hypertension\_during\_pregnancy Blood\_pressure, col ch exact  
tab family\_history\_hypertension Blood\_pressure, col ch exact  
tab family\_history\_stroke Blood\_pressure, col ch exact  
tab birth\_control\_method Blood\_pressure, col ch exact  
tab bmi\_cat Blood\_pressure, col ch exact

\*\*\*\* Cross tabulation with column percentages (Hypertension status) \*\*\*\*

tab mother\_age ht\_binary , col ch exact  
tab marital\_status ht\_binary , col ch exact  
tab religion ht\_binary , col ch exact  
tab mothers\_education2 ht\_binary , col ch exact  
tab mothers\_occupation ht\_binary , col ch exact  
tab mothers\_monthly\_income ht\_binary , col ch exact  
tab household\_monthly\_income2 ht\_binary , col ch exact  
tab household\_member ht\_binary , col ch exact  
tab total\_child ht\_binary , col ch exact  
tab daily\_food\_intake ht\_binary , col ch exact  
tab oil\_used ht\_binary , col ch exact  
tab fruits\_vegetables\_consumption ht\_binary , col ch exact  
tab extra\_salt\_intake ht\_binary , col ch exact  
tab alcohol\_intake ht\_binary , col ch exact  
tab tobacco\_user ht\_binary , col ch exact  
tab family\_tobacco\_consumption ht\_binary , col ch exact  
tab caffeine\_intak ht\_binary , col ch exact  
tab physical\_activity ht\_binary , col ch exact  
tab daily\_sleep\_hours ht\_binary , col ch exact

tab sedentary\_behavior2 ht\_binary , col ch exact  
tab birth\_control\_method ht\_binary , col ch exact  
tab family\_history\_stroke ht\_binary , col ch exact  
tab family\_history\_hypertension ht\_binary , col ch exact  
tab hypertension\_during\_pregnancy ht\_binary , col ch exact  
tab presence\_heart\_disease ht\_binary , col ch exact  
tab presence\_diabetes ht\_binary , col ch exact  
tab presence\_child\_sickness ht\_binary , col ch exact  
tab stress ht\_binary , col ch  
tab bmi\_cat ht\_binary , col ch exact

\*Unadjusted model\*

logistic ht\_binary ib(1).marital\_status  
logistic ht\_binary ib(2).mothers\_education2  
logistic ht\_binary ib(1).mothers\_occupation  
logistic ht\_binary i.mothers\_monthly\_income  
logistic ht\_binary i.household\_monthly\_income2  
logistic ht\_binary i.household\_member  
logistic ht\_binary i.total\_child  
logistic ht\_binary i.daily\_food\_intake  
logistic ht\_binary ib(1).extra\_salt\_intake  
logistic ht\_binary i.alcohol\_intake  
logistic ht\_binary i.tobacco\_user  
logistic ht\_binary ib(1).family\_tobacco\_consumption  
logistic ht\_binary i.caffeine\_intak  
logistic ht\_binary i.daily\_sleep\_hours  
logistic ht\_binary ib(1).sedentary\_behavior2  
logistic ht\_binary i.family\_history\_stroke  
logistic ht\_binary i.family\_history\_hypertension

```

logistic ht_binary i.hypertension_during_pregnancy
logistic ht_binary i.presence_heart_disease
logistic ht_binary i.presence_child_sickness
logistic ht_binary i.stress
logistic ht_binary ib(1).bmi_cat

```

**\*Adjusted model\***

Taking significant variables of unadjusted model\*

```

logistic ht_binary ib(1).mothers_occupation i.mothers_monthly_income
i.household_monthly_income2 i.total_child i.daily_food_intake i.alcohol_intake
i.family_history_hypertension i.hypertension_during_pregnancy i.presence_heart_disease
i.stress ib(1).bmi_cat

```

**\*Graphs\***

```

graph bar (percent),over(know_htn,gap(*0.2))intensity(*0.6)
graph bar (percent),over(measurehis_bp,gap(*0.2))intensity(*0.6)

```

drop medium value

input str50 medium float value

"Self Reported Prevalance" 6.84

"Actual Prevalance" 12.03

end

```

graph bar (asis) value, over(medium) title(Difference between actual & self-reported prevalence
of hypertension, size(10-pt)) ytitle("Prevalance (%)", height(10))

```

```

graph pie, over(source_pressure_measurement) title(Source of blood pressure measurement,
size(10-pt)) plabel(_all percent)

```

