PROPOSAL
ON
PREVALENCE OF HYPERTENSION AMONG THE GARMENTS WORKERS IN DHAKA

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Course Name: Non-Communicable Disease
Submission date: 03-05-2021

I. INTRODUCTION

Non-communicable diseases (NCD's) are now one of the major concerns for the developing countries due to the transition from low-income to middle-income status in current globalization and urbanization. Globally each year about 41 million people died due to NCD's which is equivalent to 71% of all deaths. Cardiovascular diseases (CVD) are responsible for most of the NCD deaths(1). In Bangladesh the CVD is expecting to double in next two decades(2). High Blood pressure (Hypertension), Obesity and Diabetes are the most important risk factors of Cardiovascular disease. About 1 billion people are living with hypertension as of today and according to the World Health Organization (WHO), this number expected to reach 1.56 billion people by 2025, covering 29.2% of the world's population(3).

The ready-made garments (RMG) earning, and foreign investment is playing an important role in Bangladesh economy. According to Statista, in 2019 there were about 4.62 thousand garments factories in Bangladesh(4). The RMG workers has relocated from rural to urban areas so that their dietary habits and lifestyle were changed. Garment factory workers work for very low wages which is not enough for their survival. This is almost impossible to maintain and afford minimum health care, medical services, and hygienic food and accommodation. Previous studies showed that garments created various types of health hazards among the workers such as headache, malnutrition, musculoskeletal pain, eye strain, less appetite, chest pain, fainting, diarrhea, hepatitis (jaundice), food poisoning, asthma, fungal infection, helminthiasis, and dermatitis(5).

The objective of this study is to estimate the prevalence of hypertension among the garment workers in Saver, Dhaka. We want to see the risk factors of hypertension by performing statistical analysis that may help to develop strategies and policies for effective prevention and control for the ready-made garment industries.

II. JUSTIFICATION, OBJECTIVES AND HYPOTHESIS:

Justification

Hypertension is an increasing problem in Southeast Asia, particularly in Bangladesh. Although some epidemiological studies on hypertension have been conducted in Bangladesh, the factors associated with hypertension in this nation remain unclear (7). We didn't find any good study for this particular area. The study results may have a range of public health implications for hypertensive patients in garments factories. It will also help to the garments decision makers for developing health policies and strategies for the workers.

Research question

What are the potential risk factors associated with hypertension among the garment workers?

General Objective: To estimate the prevalence of hypertension among the garment workers in Saver, Dhaka.

Specific objectives

- To find-out the association between the Socio-demographic information and hypertension among the garment's workers.
- To assess the relationship between the BMI and Hypertension among the garment's workers.
- To explore the association between Diabetes and Hypertension among the garment's workers.

Hypothesis: There is strong association between the socio-demographic factors, BMI, diabetes and hypertension in ready-made garment workers.

III. METHODS

Study site and settings

The study will be conducted in GK Garments Limited, Savar, Dhaka which is a registered garment in BGMEA with registration number 1512. In GK, there is a health center with enough facilities for their workers for regular checkup and treatment. We have prepared a data capture manual registry where the assistants of doctors (or our designated trained personnel) will keep records for individual patients' information, complication detail and follow-up history.

Dependent and Independent variables

We have identified the list of variables for this study. The dependent variable is Hypertension Status. The independent variables are age, gender, height, weight, level of education, income level, daily physical activity, dietary plan, smoking, alcohol consumption status, and diabetes status.

Conceptual framework:

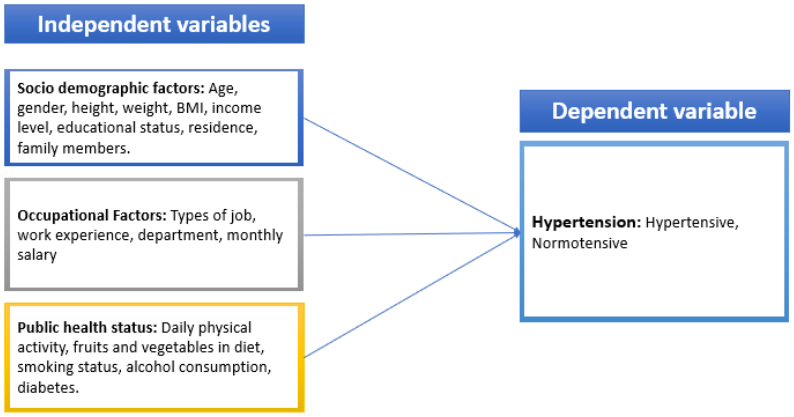

Figure: Conceptual framework

Study type and sample size calculation

We will conduct an analytical cross-sectional study where linear regression model will be used to estimate BMI, logistics regression will be used for hypertension status. We will calculate the sample size by using the following formula (STEPS Survey):

$$n = Z^2 \frac{P(1-P)}{e^2}$$

Where,

- Z = Level of confidence (Z=1.96)
- P = Baseline level of indicators (P=0.5)
- e = Margin of error (e=0.05)

Based on this formula, our estimated sample size will be 384.

Data collection tool

Primarily, the data will be recorded in manual registers during patient consultation. We will develop a data collection web-based application where a data entry person will enter the data from the registers at end of the data collection period. A data export option will be developed so that we can easily extract data as excel format and import it into Stata software version-16.

Inclusion and exclusion criteria

The male and female workers will be included this study. With minimum one year work experiences in garment factory will be prioritized. Known chronic medical condition, mental illness patients will be excluded for this study.

IV. DATA COLLECTION

Database

Data will be stored in a central online based custom application. This application will be used only for data collection tool.

Quality assurance

The results of hypertension will be verified by the doctors after converting the manual data to software. Regular internal quality control will be undertaken and routinely crosschecked. Data collectors, supervisors and related manpower will be trained extensively.

Data management and analysis

Data will be extracted from the proposed application and imported to Stata. We will prepare the dataset by dropping missing observations from exposure, outcome, confounders, and covariates.

The data will be recoded, as necessary and frequencies will be analyzed. We will change the variables to a meaningful name, categorized age as age groups, generated new variables for the average of systolic and diastolic. The average systolic and diastolic blood pressure are indicating the measurement of the hypertension status. By summarizing these we will measure hypertension. We will also recode BMI as underweight, ideal, overweight, and obese.

While the outcome variable is continuous, we will perform bivariate linear regression among the exposure BMI and blood pressure. We will consider age, education, residence type, marital and smoking status as confounders. These variables are associated with both the exposure and outcome. We will adjust the confounders by using the multivariate linear regression. We will do multiple linear regressions between average systolic blood pressure and bmi, age, residence type, educational level, marital and smoking status. We will also do a logistic regression to see the association between the BMI and hypertension. We will adjust the confounders by using the multivariate logistic regression. We will calculate Odds Ratio and 95% confidence interval by using binary logistic regress (age, gender) and multinominal logistic regression (lifestyle factors).

Measurements

Blood pressure (BP) will be classified as normal, prehypertension or hypertension based on criteria used in the WHO international Society of Hypertension (6). A patient will be considered to have normal BP if SBP will <120 mm Hg and the DBP will <80 mm Hg and not taking antihypertensive drugs. An SBP of 120–139 mm Hg or a DBP of 80–89 mm Hg with no history of taking antihypertensive medication during survey will be classified as prehypertension. A participant will be considered having hypertension if the SBP was ≥140 mm Hg or DBP was ≥90 mm Hg or the BP was below these cut-offs, but the study participant reported taking antihypertensive medication.

Ethical consideration

The study objectives and outcomes will be shared with the higher authority of the garments factory and to collect a written consent. All participants in this study will be asked for their consent before recording their treatment information. This study protocol will be submitted to get approval from the Ethical Review Committee of Bangladesh Medical Research Council (BMRC), Dhaka, Bangladesh.

Methods of confidentiality

Patients individual data will be restricted to access by others except the researcher and review board. Since it will be patient sensitive information, we will not collect patient personal identifiers (PIIs). For safeguarding confidentiality and protecting anonymity, each of the patients will be given a special ID number which will be followed in every step of data collection, editing, storage and analysis.

Workplan and study period

Gran-Chart/ Task name	Study Period (May to August 2021)									
	Week-1	Week-2	Week-3,4	Week-5	Week-6,7	Week-8	Week-9,10	Week-11,12	Week-13,14	Week-15,16
Selection of topic										
Selection of study area										
Planning and Designing										
Literature review										
Protocol writing										
Acceptance of protocol										
Preparation of questionnaire										
Data collection										
Data procession and analysis										
Report writing										
Typing and binding										
Proposal submission										

Dissemination

Our findings on the hypertension and potential risk factors will be shared with the authority of the Garments by arranging a dissemination program. We will also share the results with the medical practitioners as printed versions so that they can utilize the results for patients' clinical aspects.

V. CONCLUSION

We are expecting that our study results will be comparable with other similar studies in garments factories in Bangladesh and other neighboring countries. The results may help to promote healthy lifestyles and emphasize early diagnosis and treatment of hypertension among the garments workers.

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Appendix:

List of data collection variables:

Variables	Type of variable
Age	**Continuous**
Gender	**Binary**
Height	**Float/ Integer**
Weight	**Float/ Integer**
Level of education	**String**
Department	**String**
Income level	**String**
Daily Physical Activity	**Time**
Fruits and vegetables in diet	**Number**

Type of residence	**String**
Marital Status	**String**
Smoking status	**String**
Alcohol consumption	**String**
Obesity	**Number**
Diabetes status	**String**
SBP-1	**Number**
DBP-1	**Number**
SBP-2	**Number**
DBP-2	**Number**
SBP-3	**Number**
DBP3	**Number**
Hypertension	**Number**