DISSERTATION INTERNSHIP

AT

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT AND RESEARCH, NEW DELHI

"TO ESTIMATE THE PREVALENCE OF OBESITY AND HYPERTENSION AMONG ADULTS LIVING IN URBAN SLUMS IN DELHI: A CROSS- SECTIONAL STUDY"

BY

Dr. MANIKA KHAJURIA

PG/20-22/108

UNDER THE GUIDANCE OF

Dr. SUMANT SWAIN

PGDM (Hospital & Health Management)

2020-22

International Institute of Health Management

And Research, New Delhi

Certificate of Dissertation Completion

The certificate is awarded to

Dr. Manika Khajuria
in recognition of having successfully completed her
Internship in the department of

PUBLIC HEALTH

and has successfully completed her Project on

TO ESTIMATE THE PREVALENCE OF OBESITY AND HYPERTENSION AMONG ADULTS LIVING IN URBAN SLUMS IN DELHI: A CROSS-SECTIONAL STUDY

AT

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INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT AND RESEARCH, NEW DELHI

She comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning.

We wish her all the best in future endeavors.

Certificate of Approval

Training & Development

Zonal Head-Human Resources

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Manika Khajuria** student of PGDM (Hospital & Health Management) from the International Institute of Health Management Research, New Delhi has undergone internship training at **IIHMR, Delhi** from **1st April to 30 June 2022.**

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

29/6/2022

Dr. Sumesh Kumar
Associate Dean, Academic and Student Affairs
IIHMR, New Delhi

Dr. Sumanti Swain
(Assistant Professor
IIHMR, New Delhi)

IIHMR, New Delhi

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Certificate of Approval

The following dissertation titled "**To estimate the prevalence of hypertension and obesity among adults living in urban slums in Delhi : A cross-sectional study**" at "**IIHMR Delhi**" is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted. Dissertation Examination Committee for evaluation of dissertation.

Name

Dr. Dharmesh Lal

Vinay

Rohini

Signature

Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Manika Khajuria,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting this dissertation titled "**TO ESTIMATE THE PREVALENCE OF OBESITY AND HYPERTENSION AMONG ADULTS LIVING IN URBAN SLUM IN DELHI: A CROSS-SECTIONAL STUDY**" at "IIHMR, Delhi" in partial fulfilment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge, no part of it has been reproduced from any other dissertation, monograph, report or book.

Dr. B.S Singh
Associate Professor
IIHMR, New Delhi

Dr. Sumant Swain
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IIHMR, New Delhi

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "**To Estimate the Prevalence of Obesity and Hypertension among adults living in an urban slum in Delhi: A Cross sectional study**" and submitted by **Dr. Manika Khajuria,** Enrollment No. **PG/20-22/108** under the supervision of Dr.sumant swain for the ward of PGDM (Hospital & Health Management) of the Institute carried out during the period from 1st April to 330 June 2022 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Manika

Signature

FEEDBACK FORM

Name of the Student: Dr. Manika Khajuria

Name of the Organisation : IIHMR, Delhi

Area of Dissertation: Public Health

Attendance: 99%

Objectives achieved: She has completed all the given tasks

Deliverables: Formed Questionnaire on Kobo Toolbox, pre-testing of Questionnaire, Data collection, Data analysis, project related work, Dissertation Report on " to estimate the prevalence of obesity and hypertension among adults living in urban slums in Delhi"

Strengths: Good communication and technical skills, dedication towards work and hard working

Suggestions for Improvement: keep doing the good work

Signature of the Officer-in-Charge/ Organisation Mentor (Dissertation)

Date: 28/06/2022
Place: New Delhi

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CERTIFICATE ON PLAGIARISM CHECK

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Name of Guide/Supervisor	Dr./ Prof.:		
Title of the Dissertation/Summer Assignment	'To estimate the prevalence of obesity and hypertension among adults living in urban slums in Delhi: a cross-sectional study'.		
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Signature: Manika

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Acknowledgement

First and foremost, praises and thanks to the God, the Almighty for his showers of blessings throughout my Dissertation.

The training period is always a great chance for learning and professional development. I would like to express my sincere gratitude to **IIHMR, Delhi** for giving me this opportunity to do my dissertation and project work in their organisation and for sharing generously their valuable insight and precious time which motivated me to do my best during dissertation period.

I am greatly thankful to my project mentors **Dr. B.S Singh, Dr. Pankaj Talreja and Dr. Anandhi Ramachandran** for their utmost guidance and help to complete my dissertation.

Finally, I would like to thank my mentor from IIHMR, Delhi **Dr. Sumant Swain** for his support and encouragement throughout my Dissertation and project work. Without his cooperation and guidance, it would not have been possible to conduct my study and complete my dissertation successfully.

CONTENTS:

LIST OF ABBREVIATIONS:

1) NCD: - Non-communicable diseases
2) BMI: - Body mass index
3) NIHFW: - National Institute of Health and family Welfare
4) STAC: - SAARC Tuberculosis and HIV/AIDS centre
5) NHSRC: National Health Systems Resource centre
6) WHO: World Health Organization
7) ASHA: Accredited Social Health Activist
8) NFHS: - National Family Health Survey

OVERVIEW ABOUT THE ORGANIZATION

The International Institute of Health management Research, New Delhi was setup in the year 2008. The institute mainly provides post graduate programs in health, hospital and information technology in health care and management development programs. The institute also focus on the research projects which help in policy analysis, policy formulation and also help in the implementation of the policies for the health care sectors. It has emerged as a reputed institute for providing good health care management professionals nationally as well as globally. It is an autonomous institute performing well for several years to improve health care by training the students and making them good professionals for future. The institute also made an effort to promote the success for the 17 sustainable Development Goals. The IIHMR is involved in various research projects which act as a support for health policy and planning.

MISSION AND VISSION OF IIHMR:

- **MISSION:** this institution is dedicated in the improvement of standards of health through proper and better management of health care and its programs with the help of management research, training, education and proper networking of the institute at global level
- **VISION:** the main objective and vision of the institute is to give its contribution in health care sector for social equity with the help of its commitment to support health programs for improving healthcare sectors

CAPABILITIES AND THRUST AREAS:

- AICTE approved two-year PGDHM
- Management development programs
- Research projects
- Quality assurance and accreditation
- Insurance related to healthcare
- E-learning

CORE ACTIVITIES:

- Research
- Training

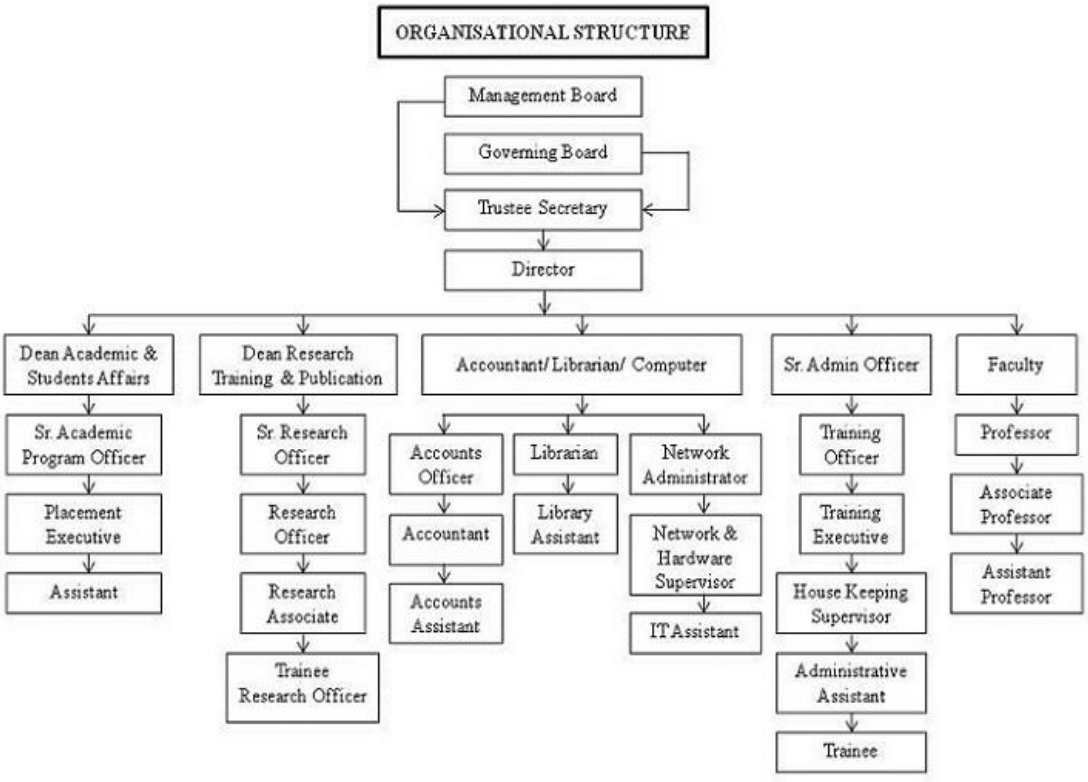
- Teaching

GLOBAL NETWORKING:

IIHMR, Delhi has collaborations with various reputed institutions and organizations. Some of them are given below:

- ✓ World Health organization (WHO)
- ✓ South-east Asia Public Education Institution network (SEAPHEIN)
- ✓ National Institute of Health and family Welfare (NIHFW)
- ✓ SAARC Tuberculosis and HIV/AIDS centre (STAC)
- ✓ National Health Systems Resource centre (NHSRC)
- ✓ The union South East Asia (USEA)

ORGANIZATION STRUCTURE:



ABSTRACT

INTRODUCTION: It is a life-threatening disease as it is a major cause of premature deaths globally. The overall prevalence of hypertension in India is 29.8% with higher prevalence in urban parts i.e., 33.8%.

METHODS: it was a cross-sectional study conducted in Goyla dairy which is a urban slum in Delhi. Structured questionnaire was formed and face to face interviews were taken. Anthropometric measurements like height and weight were taken to calculate BMI. Blood pressure was taken three times with the time interval of one minute in every reading.

RESULTS: the overall prevalence of hypertension was 15.3%. This was more in females (8.7%) as compared to males (6.6%) and this difference was statistically significant ($p<0.001$). The prevalence of hypertension is more in the population comes under 55-64, prevalence of pre-hypertension is more in population comes under 35-44 years and the prevalence of non-hypertensive is more in population comes under 25-34 years. prevalence of overweight and obesity is more in female (33.7%) as compared to male (19.4%) and this difference was statistically significant ($p<0.001$).

CONCLUSION: hypertension and obesity are highly prevalent among the adults of urban poor of Delhi in the study. It highlights the rising burden of NCDs like hypertension among urban poor.

PROJECT REPORT

TO ESTIMATE THE PREVALENCE OF OBESITY AND HYPERTENSION AMONG ADULTS LIVING IN URBAN SLUM IN DELHI: A CROSS-SECTIONAL STUDY

BACKGROUND:

Obesity is one of the serious problems now a days. People in today's world do not understand the value of exercise and healthy food. Obesity has emerged as a bigger health problem and has nearly tripled worldwide since 1975. [1] According to the WHO, in 2016, 39% of adults were overweight and 13% of adults of same age group were obese and over 340 million children and adolescent of age group of 5yrs to 19 yrs. were obese. obesity occurs when there is an imbalance of energy between calories consumed, and calories expended which leads to an abnormal or excessive accumulation of fat in the body. The simple index i.e., BMI (body mass index) is used to classify weight. According to WHO, BMI more than or equal to 25 is considered as overweight and BMI more than or equal to 30 is considered as obesity in adults. .[2]. There are various causes of obesity like poor diet, lack of exercise, genetics, and underlying medical conditions.) [3]

Hypertension is a condition in which the blood pressure in the arteries is persistently elevated. According to WHO, its silent in 46% of adults as they are unaware of the condition and 42% of the adults know about it and treated and 21% of adults have it under control. It is a life-threatening disease as it is a major cause of premature deaths worldwide.[4].. Hypertension leads to ischemic heart diseases and stroke which results in estimated 1.6 million deaths annually in India.[5] The overall prevalence of hypertension in India is 29.8% with higher prevalence in urban parts i.e., 33.8%.[6] The people with obesity are more at risk of getting hypertension comparatively non-obese people. [7]

REVIEW OF LITERATURE:

Avita Rose Johnson et al. (2021) have done a study among adults living in a Bengaluru city of India to find the prevalence of obesity and they have found a high prevalence of obesity and abdominal obesity among them, with three fourth of the population was overweight or obese. [8]

Rajeev Ahirwar et al. (2018) have done a study on the prevalence of obesity in India and concluded that the prevalence of obesity varies with factors like gender, age, , socio-economic factors etc and found abdominal obesity as one of the risk factors for cardiovascular diseases.[9]

Abdhalah K Ziraba et al. (2009) have studied on overweight and obesity in urban Africa and found that the prevalence of obesity has been increased by almost 35% during the covered period and found the prevalence more in poor population as compared to richer population and also concluded that it might become epidemic in the future. [10]

ShammiLuhar et al. (2020) have done a study on the forecasting the prevalence of overweight and obesity in India to 2040 and estimated that the prevalence of overweight will more than double, and prevalence of obesity will triple among Indians aged 20-69 years between 2010-2040. [11]

Teferi Mekonnen et al. (2018) in their community based cross sectional study on overweight/obesity among adults in North-western Ethiopia conclused that overweight/obesity is emerged as a public health problem among adults in Ethiopia and the higher odds of being overweight/obese were noted among urban residents, females and older age. [12]

Vinod K Ramani et al. (2020) have done a cross-sectional study on the prevalence of hypertension and diabetes morbidity among adults in a few urban slums of Bangalore city, determinants of its risk factors and opportunities for control and they found 21.5% prevalence proportion for hypertension with 32.4% of overweight and 20.0% of obesity among study subjects [13]

Suvro Banerjee et al. (2015) have found the overall prevalence of hypertension was 42% which was quite high in their population based cross-sectional study on the prevalence, awareness and control of hypertension which was conducted in the slums of Kolkata, and they concluded that although the awareness of the condition is high but the control of hypertension is poor [14]

Abhijit P Pakhare et al. (2021) have done a prospective cohort study to find the incident hypertension in urban slums of central India and found higher incidence with increasing age and more in men and people with prehypertension have increased risk of developing hypertension. [15]

Ajeet s Bhadoria et al. have done a cross-sectional study to find the difference among rural and urban population in the terms of prevalence of hypertension and its association with various factors and found the prevalence of hypertension higher in both the communities.[16]

Jinyu sun Qu et al. (2022) conducted a cross-sectional survey to examine the association between abdominal obesity and hypertension in normal weight adults and found the positive correlation of waist circumference with hypertension and concluded that the measuring abdominal obesity helps in the Improvement of the evaluation of hypertension and helps in the management of the same. [17]

Sung-Hee Lee et al. (2005) conducted a retrospective cohort study on obesity and hypertension risk among Korean adults to find out the level of BMI at which the risk for hypertension increases and they confirmed in their study that obesity is a strong risk factor for hypertension among Korean adults. [18]

Miguel Gus et al. (2004) found that obesity a risk for hypertension is better identifiable by measuring waist circumference rather than measuring only BMI in their study done on the association between different measurements of obesity and the incidence of hypertension. [19]

Yasin I. Tayem et al. (2012) in their cross-sectional study detected a high prevalence of hypertension and obesity among students at central university in the west bank and prevalence was more in males than females.[20]

MT Guagnano et al. (2001) conducted a cross-sectional study among outpatients at the obesity research centre and found the strong association between waist circumference and higher blood pressure.[21]

Bishav Mohan et al. have done a study in the urban and rural areas of Ludhiana and found out the high prevalence of hypertension and obesity among school going children and adolescents in a northern state in India and found that the hypertension was positively associated with overweight and obesity [22]

Salvi shah et al. (2013) have done a study to assess the association of obesity and hypertension in school going children and found that 8.94% of children were obese and 20.09% were hypertensive and concluded the positive association between them among children and later on both may act as a risk factor for heart diseases.[23]

Subhija Praso et al. (2012) have done a study to assess BMI and to find out the correlation of obesity and arterial hypertension.[24]

Onoja M. Apka et al. (2020) have done study to find out the patterns of association between obesity and hypertension and found hypertension more in obese people comparatively non-obese persons.[25]

STUDY OBJECTIVE:

General objective:

The study aimed to estimate the prevalence of obesity and hypertension among adult population between age group 15-65 years of age in urban slum in Delhi

Specific objectives:

- To determine the prevalence of hypertension among adults
- To determine the prevalence of obesity among adults
- To assess the associated factors with obesity and hypertension

METHODOLOGY:

Study Design:

cross-sectional survey

Study period: the study was conducted from 25th march to 5th June 2022.

Study Area: Goyla dairy, Delhi

Study Participants: Study population were males and females aged between 15-65years of age.

Eligibility Criteria:

A. Inclusion criteria:
    - All males and females aged between 15-65 years of age

B. Exclusion Criteria:
    - Pregnant Women
    - All participants who were currently undergoing treatment for any disease other than Cardio-vascular disorders

Sampling Technique: As per the register of the ASHA of block, there was a total of 278 houses in the selected community. The first house was chosen randomly. Then every alternate house was selected by using systematic random sampling.

Sample size: A sample size of 202 was calculated considering a prevalence of hypertension as 32.8% as per NHFS-5 report.

Study tool and data collection:

- A structured questionnaire was made on kobo toolbox application. The questionnaire included questions related to socio-demographic details, questions related to related risk factors like alcohol, smoking, tobacco, stress and physical activities.
- Data was collected through house-to-house survey.
- Anthropometric measurements like height, weight was recorded as per the standard guidelines laid down by NFHS-5. Using height and weight, BMI was calculated and subjects were classified into four categories of underweight, normal, overweight and obese.
- Blood pressure was measured three times with the time interval of one minute in each measurement. The average of the last two readings was taken as per the guidelines of the NFHS-5. The systolic Blood pressure equal to more than 140mmHg and diastolic blood pressure of more than 90mmHg was taken as hypertensive as per the guidelines of the WHO.

Data Analysis: Data analysis was done using SPSS version 22. Descriptive statistics were applied to calculate frequency and percentage of each variable. Difference between different variables was assessed using the chi square test for their statistical significance and value of p less than 0.05 was considered significant.

Ethical consideration: Informed Consent from participants were taken. The study involves no risk and the study did not conduct any intervention/ experiment on human subjects. Anthropometric measurements and Blood pressure measurements were taken after taking the consent from the participants as per the standard guidelines laid down by NFHS-4 The study was submitted for ethical review to the IIHMR student research review board and the tools and protocol were cleared through the committee

Results:

Table 1 shows the socio-demographic characteristics such as age, gender, education, religion, caste/tribe, occupation and coverage of health insurance. Female population is more which is 44.4% as compared to male population which is 55.6.

Characteristics	Number(n=196)	Percentage (%)
Age (in years)		
15-24	25	12.8
25-34	58	29.6
35-44	52	26.5
45-54	31	15.8
55-64	30	15.3
Gender		
Male	87	44.4
Female	109	55.6
Education		
Illiterate	62	31.6
primary education	3	1.5
middle school	5	2.6
high school	18	9.2
above high school	108	55.1
Religion		
Hindu	195	99.5
Muslim	1	0.5
Others	0	0
Caste/Tribe		
schedule caste	14	7.1
schedule tribe	3	1.5
OBC	75	38.3
Others	104	53.1
Occupation		
Student	17	8.6

unemployed	99	50.5
employed	67	34.2
Retired	11	5.6
unable to work	2	1.1
covered by health insurance		
Yes	79	40.3
No	117	59.7

Figure 1 shows the gender wise prevalence of different stages of hypertension with prevalence of hypertensive stage is more in female (8.7%) compared to male (6.6%), prevalence of pre-hypertensive stage is more in males (26%) compared to female (16.3) and prevalence of non-hypertensive stage is more in females (30.6) as compared to male (11.7%).

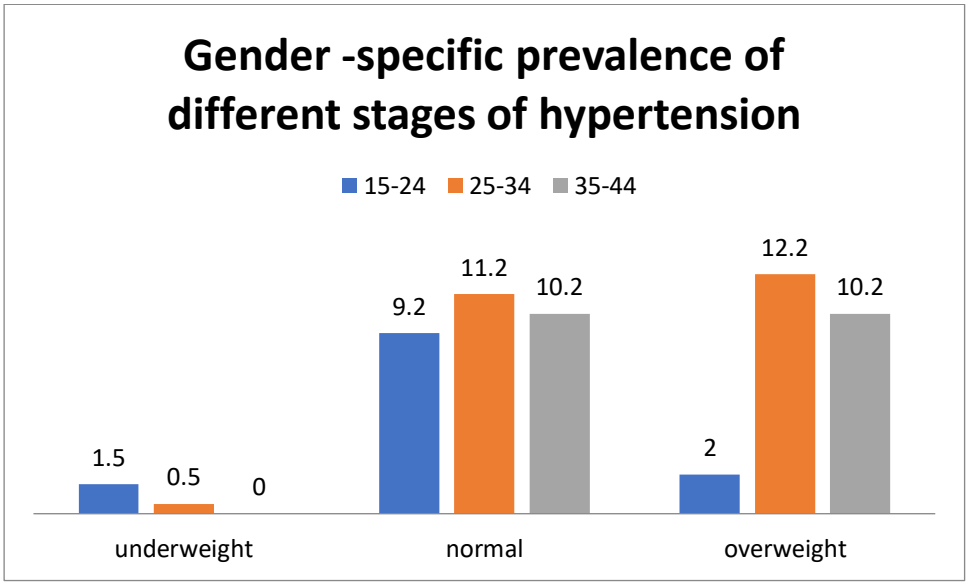
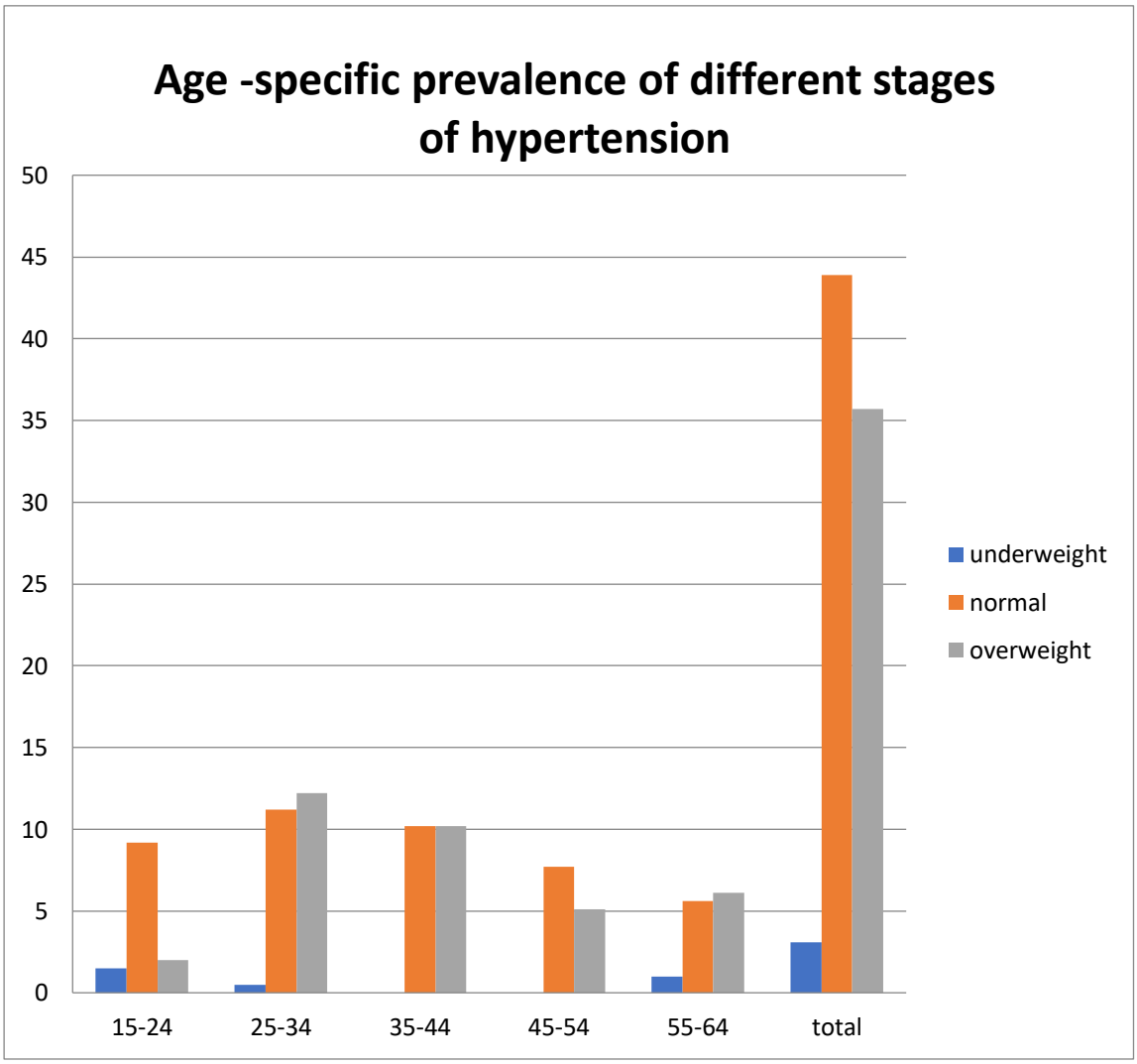


Figure 2 shows age-specific prevalence of different stages of hypertension. The prevalence of hypertension is more in the population comes under 55-64, prevalence of pre-hypertension is more in population comes under 35-44 years and the prevalence of non-hypertensive is more in population comes under 25-34 years



In the present study, we found that the overall prevalence of hypertension was 15.3%. This was more in females (8.7%) as compared to males (6.6%) and this difference was statistically significant ($p<0.001$). Gender wise and age wise prevalence of hypertension is shown in Table 2. A total of 42.3% of population comes under non-hypertensive stage, 42.3% comes under pre-hypertensive stage and 15.3comes under hypertensive stage. The prevalence of hypertension is more in the population comes under 55-64, prevalence of pre-hypertension is more in population comes under 35-44 years and the prevalence of non-hypertensive is more in population comes under 25-34 years when compared to other age groups and this difference was also statistically significant ($p<0.001$).

Table 2: Age and Sex wise prevalence of hypertension

		Non-hypertensive		**Pre-hypertensive**		**Hypertensi-ve**		**total**	**total**
Sex		N	%	N	%	N	%	N	%
	Male	23	11.7	51	26	13	6.6	87	44.4
	Female	60	30.6	32	16.3	17	8.7	109	55.6
	Total	83	42.3	83	42.3	30	15.3	196	100
Age (in years)									
	15-24	14	7.1	11	5.6	0	0	25	12.8
	25-34	30	15.3	20	10.2	8	4.1	58	29.6
	35-44	17	8.7	30	15.3	5	2.6	52	26.5
	45-54	12	6.1	11	5.6	8	4.1	31	15.8
	55-64	10	5.1	11	5.6	9	4.6	30	15.3
	total	83	42.3	83	42.3	30	15.3	196	100

Chi Square (gender): df-2, $p<0.001$; Chi Square (age): df-8 , $p<0.5$

Figure 3 shows gender-specific prevalence of BMI and it clearly shows the prevalence of Overweight and obesity is more in females compared to males.

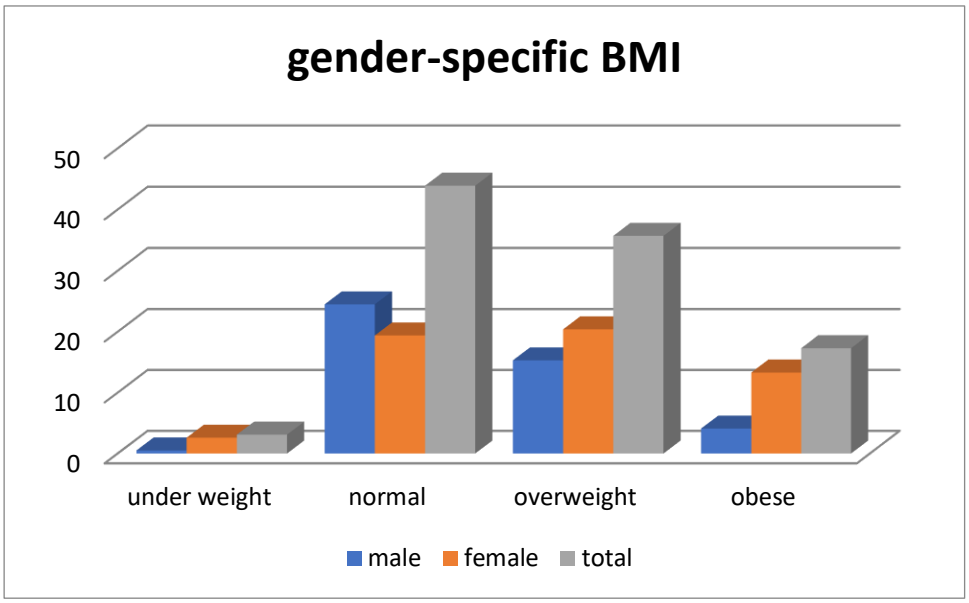


Figure 4 shows the age-specific prevalence of BMI and shows that the prevalence of overweight is maximum in the population of age group 25-34 years and the prevalence of obesity is maximum in the population of age group 35-44 years

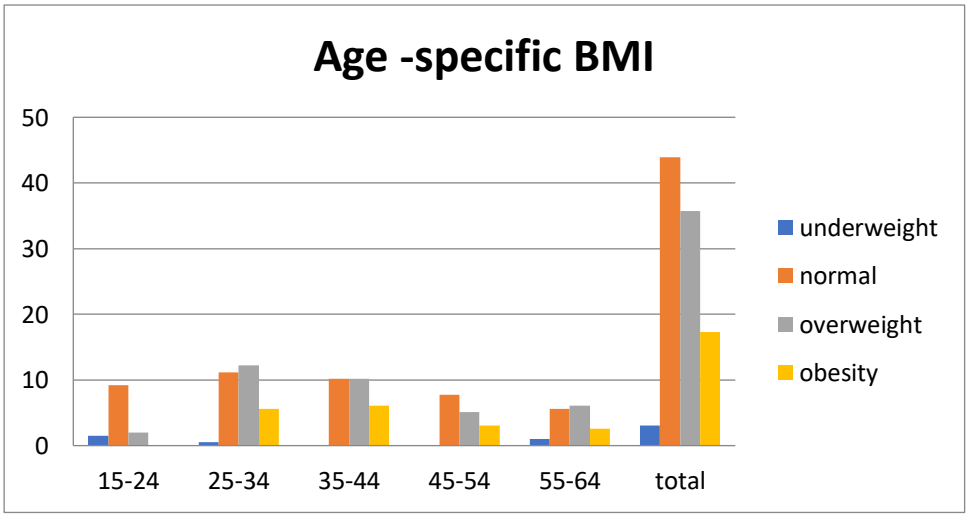


Table 3 shows the gender and age specific BMI which in turn is showing the prevalence of underweight, normal weight, overweight and obesity among study population and prevalence of overweight and obesity is more in female (33.7%) as compared to male (19.4%) and this difference was statistically significant (p<0.001).

Table 3: Gender and age wise BMI

		Under-weight		normal		Over-weight		Obese		TOTAL	TOTAL
Gender		N	%	N	%	N	%	N	%	N	%
	Male	1	0.5	48	24.5	30	15.3	8	4.1	87	44.4
	Female	5	2.6	38	19.4	40	20.4	26	13.3	109	55.6
	total	6	3.1	86	43.9	70	35.7	34	17.3	196	100
Age (yrs)											
	15-24	3	1.5	18	9.2	4	2	0	0	25	12.8
	25-34	1	.5	22	11.2	24	12.2	11	5.6	58	29.6
	35-44	0	0	20	10.2	20	10.2	12	6.1	52	26.5
	45-54	0	0	15	7.7	10	5.1	6	3.1	31	15.8
	55-64	2	1	11	5.6	12	6.1	5	2.6	30	15.3
		6	3.1	86	43.9	70	35.7	34	17.3	196	100

Chi square (gender): df-3, p<0.05: Chi square (age): df-8,p<0.05

Table 4 shows the association of risk factors with hypertension. Factors like alcohol and BMI were significantly associated with hypertension ($p<0.05$) but there was no significant association between smoking, tobacco use, stress and physical activity with hypertension ($p>0.05$).

Table4: Association of various risk factors with hypertension

Risk factors	**Non-hypertensive**		**Pre-hypertensive**		**hypertensive**		**P value**
Smoking	N(196)	%	N(196)	%	N(196)	%	
Yes	76	38.8	76	38.8	29	29	>0.05
No	7	3.6	7	3.6	1	0.5	
Alcohol							
Yes	2	1	7	3.6	5	2.6	
No	81	41.3	76	38.8	25	12.8	<0.05
Tobacco							
Yes	6	3.1	10	5.1	5	2.6	
No	77	39.3	73	37.2	25	12.8	>0.05
BMI							
Underweight	5	2.6	1	0.5	0	0	
Normal	36	18.4	40	20.4	10	5.1	
Overweight	24	12.2	35	17.9	11	5.6	<0.05
obese	18	9.2	7	3.6	9	4.6	
Stress							
Low	22	11.2	16	8.2	5	2.6	
Moderate	47	24	44	22.4	15	7.7	>0.05
severe	14	7.1	23	11.7	10	5.1	
Physical activity							
Strenuous activities	14	7.1	8	4.1	4	2	
Sedentary activities	69	35.2	75	38.3	26	13.3	>0.05

DISCUSSION:

The present study showed that the prevalence of hypertension was higher in female as compared to male and the prevalence of pre-hypertension was higher in males as compared to females. Prashant R Kokiwar et al reported a high prevalence of hypertension in females in comparison to males. Jugal Kishore et al. also reported high prevalence of hypertension in females when compared to males. Ajeet S. Bhadoria et al in contrast to this study found more prevalence of hypertension in males in comparison to females.[26] There was significant gender-specific difference found in the prevalence of hypertension as p value was less than 0.05. [27] This study showed the prevalence of obesity and overweight is more in females than males. Avita Rose Johnson et al. found more prevalence of obesity in females as compared to males. The study showed that the BMI is associated with hypertension and it is the risk factor of hypertension. People who are obese are at more risk of getting hypertension compared to those with normal weight. Sung-Hee Lee et al in their study have found that there is strong association between Obesity and hypertension. [28]

Among modifiable factors, there was no association seen with smoking, tobacco, stress and physical activity. This is inconsistent with findings of other studies where these factors are found to be associates with hypertension. This may be due to the less use of smoking and tobacco in this population. In this study Alcohol was found to be associated with hypertension as alcohol was statistically significant with hypertension. Sushil K. Bansal et al. have shown the association of Alcohol with hypertension in their study.

CONCLUSION:

It can be concluded that hypertension and obesity are prevalent among the adults of urban poor of Delhi in the study but this prevalence is quite lesser than the prevalence of hypertension and obesity given in NFHS-5 data. The prevalence of hypertension is significantly associated with obesity and overweight. The people who are overweight and obese are at more risk of getting hypertension comparatively to non-obese persons.

RECOMMENDATIONS:

- ✓ It highlights the rising burden of NCDs like hypertension among urban poor. As hypertension is a life-threatening disease so proper awareness of the disease among urban poor is very important and measures should be taken by the government of the country for prevention and control of hypertension in this urban poor population.
- ✓ Information, education and communication activities (IEC) should be started to increase the awareness of people to adopt healthy life style.

REFRENCES:

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ANNEXURE:

ANNEX A- Consent Form

Namaste. My name is Dr. Manika Khajuria. I am working with International Institute of Health Management (IIHMR Delhi. You have been randomly selected based to participate in this survey and we would therefore like to interview you. The title of the study is "TO ESTIMATE THE PREVALENCE OF OBESITY AND HYPERTENSION AMONG ADULTS LIVING IN URBAN SLUM IN DELHI: A CROSS-SECTIONAL STUDY"

We are trying to assess the prevalence of hypertension and obesity among adults living in urban slum in Delhi. The interview will take approximately 20-25 minutes. I will ask you questions about:

- Some personal details
- Your lifestyle activities including diet and physical activity that you generally carry out
- Some stress related questions

The information you provide is totally confidential and will not be disclosed to anyone. It will only be used for research purposes. Your name, address, and other personal information will be removed from the questionnaire, and only a code will be used to connect your name and your answers without identifying you.

Your participation in the survey is voluntary. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

Also, if you consent, we will be measuring your Blood Pressure, pulse rate. Height, Weight, and Waist and hip circumference. We will not be recording this interview or taking any photographs without your permission.

If you have any questions about this survey, you may ask me or

If you have any further questions about this survey, you may contact me
SHARE CONTACT INFORMATION

Do you agree to participate in this survey? Signing this consent indicates that you understand what will be expected of you and are willing to participate in this survey.

Read by the Respondent [ ] Read by the Interviewer [ ]

Agreed [ ] Refused [ ]

Code of the respondent:

ANNEX B- Questionnaire used for the study

1: **Background**			
1.1	In what month and year, you were born?	Month…… ☐☐ Do not know month…… Year……..☐☐☐☐ Do not know year……...	 98 99
1.2	How old were you at your last birthday?	Age in completed years...……. ☐☐	
1.3	What is the highest grade you completed?	Grade _____☐☐ Do not Know …….	 98
1.4	What is your religion?	Hindu …… Muslim …… Sikh …… Other (Specify) …….	1 2 3 4
1.5	What is your caste or tribe?	Caste ……. (specify) Tribe ……. (specify) No caste /Tribe…… Do not Know…… … _____	1 2 8 9
1.6	Do you belong to a scheduled caste, a scheduled tribe, other backward class, or none of these?	Scheduled Caste ……. Scheduled Tribe ……. OBC …… None of Them …….....	1 2 3 4
1.7	What is your occupation, that is, what kind of work do you do?	 Going to school…… Studying……. Looking for work……... Retired …… Unable to work……. Ill/handicapped…… Housework/childcare……. Other specify …….	 1 2 3 4 5 6 7 98
1.8	Are you covered by any health scheme or any health insurance?	Yes ……... No…….……	1 2
1.9	What type	Employees State Insurance Scheme	A

	of health scheme or health insurance? Any other type?	(ESIS)…….....	
		Central Government Health Scheme (CGHS)…….	B
		State Health Insurance Scheme.....	C
		Rashtriya Swasthya Bima Yojana (RSBY) …….	D
		Community Health Insurance Program …….....	E
		Other Health Insurance (Through Employer) ..……	F
		Medical Reimbursement (Through Employer) ….…….	G
		Other Privately Purchased Commercial Health Insurance…	H
		Other _____ (Specify)	X
2. Tobacco and Alcohol			
2.1	Do you smoke cigarettes?	yes ……... no …….	1 2
2.2	Do you smoke bidis ?	yes ……... no …….	1 2
2.3	Do you currently smoke or use tobacco in any other form?	Yes ……. No…….…….	1 2
2.4	Do you drink alcohol?	Yes ……. No…….…….	1 2
3. **Physical Activity : Work Related**			
3.1	How physically demanding is your work? **[Hint: Intense Activities**: Those that cause rapid breathing like running, walking briskly up a hill, moving heavy loads, heavy shoveling, digging ditches, fast	Strenuous or has intense activities…… Sedentary or has moderate activities……	1 2

	swimming and competitive sports **Moderate Activities:** Slightly accelerates breathing like brisk walking, gardening, dancing, household chores, involvement in games, construction, carrying loads]		
3.2	In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	……. days	
4. **Stress**			
Introduction: Now I am going to ask few questions about how you spent your time and how you felt yesterday, [yesterday's sunrise to sunset]. Please try to answer as honestly as you can.			
Perceived Stress Scale (PSS)			
4.1	In the last month, how often have you been upset because of something that happened unexpectedly?	Never…… Almost Never…… Sometimes…… Fairly often…… Very often……	0 1 2 3 4
4.2	In the last month, how often have you felt that you were unable to control the important things in your life?	Never…….. Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4
4.3	In the last month, how often have you felt nervous and stressed?	Never…… Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4
4.4	In the last month, how often have you felt confident about your ability to handle your personal problems?	Never…… Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4
4.5	In the last month, how often have you felt that things were going your way?	Never…….. Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4
4.6	In the last month, how often have you found that you could not cope with	Never…… Almost Never…… Sometimes ……	0 1 2

	all the things that you had to do?	Fairly often…… Very often……	3 4
4.7	In the last month, how often have you been able to control irritations in your life?	Never…….. Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4
4.8	In the last month, how often have you felt that you were on top of things?	Never…… Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4
4.9	In the last month, how often have you been angered because of things that happened were outside of your control?	Never…… Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4
4.10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	Never…… Almost Never…… Sometimes …… Fairly often…… Very often……	0 1 2 3 4

5. **Blood Pressure Measurement**

Ask consent for Blood pressure measurement

Instructions: First I would like to measure your blood pressure and pulse rate. Stay seated, and once I put this (cuff) on your wrist, keep it steady and at the level of your heart. We will need to take the blood pressure reading three times. It will squeeze your wrist a bit but won't hurt. Relax.

INTERVIEWER: respondent should remain seated. Demonstrate to the respondent how to hold their arm while the machine is measuring. Place the monitoring device on the wrist and have the respondent hold it at heart level against his/her chest. When the device is in the correct position and respondent is relaxed, press the button to start. Check to make sure it is working. Collect the blood pressure and pulse three times with one minute between each measurement. You do not need to remove the device between measurements.

5.1	Time 1	Systolic ☐☐☐ mm of Hg Diastolic ☐☐☐ mm of Hg Pulse rate ☐☐☐ / minute	

INTERVIEWER: Ask the respondent to release the arm and relax. Wait for one minute before time 2. Okay, now we can get your second measurement for your blood pressure.

5.2	Time 2	Systolic ☐☐☐ mm of Hg Diastolic ☐☐☐ mm of Hg Pulse rate ☐☐☐ / minute	
INTERVIEWER: Again, remind the respondent to relax. Okay, now we can get your third measurement for your blood pressure.			
5.3	Time 3	Systolic ☐☐☐ mm of Hg Diastolic ☐☐☐ mm of Hg Pulse rate ☐☐☐ / minute	
6. **Anthropometric Measurements for BMI / WHR**			
Instructions: I would now like to measure how tall you are. To measure your height, I need you to please take off your shoes. Put your feet and heels close together, stand straight and look forward standing with your back, head and heels touching the wall. Look straight ahead.			
6.1	Measured **height** in centimeters	☐☐☐.☐ centimeters ☐ Refused ☐ Not able	
Instructions: Now we want to measure your weight - could you please step on this scale. We will also measure your waist and hips using a tape measure.			
6.2	Measured **weight** in kilograms	☐☐☐.☐ centimeters ☐ Refused ☐ Not able	

ANNEX C- PICTORIAL JOURNEY