SUMMER INTERNSHIP REPORT

Lifestyle Intervention to reduce the risk and prevalence of hypertension among Urban Poor of Delhi: Quasi-experimental study

Implemented by IIHMR Delhi, supported by ICMR Delhi

(18th May 2022-18th June 2022)

A Report On

Stress and depression as risk factors for hypertensive diseases: A cross-sectional study

By

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Acknowledgement

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

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Table of contents

Abbreviations

- PHC- Primary Health Centre
- ANM- Auxiliary Nurse Midwifery
- ASHA- Accredited Social Health Activist
- MAS- Mahila Arogya Samiti
- SMS- Short Message Service
- SPSS- Statistical Package for the Social Sciences
- RHTC- Regional Health Training Centre
- NGO- Non-Governmental Organization
- BP- Blood Pressure

1. Project report

a. Overview about the organization:

The Indian Council of Medical Research (ICMR), New Delhi, the apex body in India for the formulation, coordination and promotion of biomedical research, is one of the oldest medical research bodies in the world. The ICMR has always attempted to address itself to the growing demands of scientific advances in biomedical research on the one hand, and to the need of finding practical solutions to the health problems of the country, on the other. The ICMR has come a long way from the days when it was known as the IRFA, but the Council is conscious of the fact that it still has miles to go in pursuit of scientific achievements as well as health targets. In 1949 IRFA was redesignated as the Indian Council of Medical Research (with Dr. C.G. Pandit as its first Director). The ICMR is funded by the Government of India through the Department of Health Research, Ministry of Health & Family Welfare.

Vision : Translating Research into Action for Improving the Health of the Population.

Mission:

- **Generate**, manage and disseminate new knowledge.
- **Increase** focus on research on the health problems of the vulnerable, the disadvantaged and marginalized sections of the society.
- **Harness** and encourage the use of modern biology tools in addressing health concerns of the country.
- **Encourage** innovations and translation related to diagnostics, treatment, methods/ vaccines for prevention.
- **Inculcate** a culture of research in academia especially medical colleges and other health research institutions by strengthening infrastructure and human resource.

b. About the project

Lifestyle Intervention to reduce the risk and prevalence of hypertension among Urban Poor of Delhi: Quasi-experimental study

Implemented by IIHMR Delhi and supported by ICMR Delhi

Implemented in New Delhi in the slums

In the above locations the project will cover at least 4000 household with intervention area of 2000 household.

The project for a period of 24 months

Interventions: Lifestyle Intervention to reduce the risk and prevalence of hypertension.

Target Group:

- All men and women aged 15 years and above and who are not currently undergoing treatment for any disease other than Cardio- vascular disorders
- those staying in the study area since past 1 year and intend to stay for at least next 1 year

Activities to be done under this project:

Lifestyle intervention: High Blood pressure education program on the primary prevention of hypertension to emphasize the importance of non-pharmacological treatment approaches such as weight loss, sodium reduction, increased physical activity, decreased alcohol and tobacco use – smoking and chewable.

Information Access by Urban Poor : Providing information U-PHC services ,Use of New Media (Social media, blogging etc) ,Use of Mobile (SMS) ,Change agent such as Youth/Patient ,Students & Faculty of IIHMR Delhi/ project staff ,Community meeting by MAS/ASHA/ANM/Project Staff, Private doctor from Private clinic/Hospital/Mohalla clinic nearby Slum ,Helpdesk at IIHMR Delhi ,Any other (exit in Slum) ,Access to public health facility, Promote the use of nearby Urban PHC

with the help of technology as well as community meeting for Referral to NCD clinic based at District screening and treatment of high blood pressure Hospital ,Referral to available 4 Tobacco cessation centres in the district Elderly patient referral to district hospital for receiving geriatric health care services Patient referral to district hospital/U- PHC for mental Health Services

Approach to providing Information access by urban poor through the use of technology:

During the baseline survey, as a part of the demographic details to be collected contact number and the type of mobile phone available with the user will be collected.

- The following Information will be provided during intervention period through mobile to all respondents
- IEC material regarding hypertension, prevention (including harmful effects of alcohol, tobacco, importance of diet, physical activity etc) and treatment
- Info regarding walking, simple exercises, low fat, low sodium diet, etc will be provided
- Details of the hospitals/ private clinics/ health centres offering preventive check- up, treatment related to hypertension – location, working ours, doctor/service provider name.
- Help Desk will be hosted on a server at IIHMR with a dedicated person trained to handle queries related to information about hypertension prevention, treatment etc.

To those identified as hypertensive

- The information sent will be customized to manage hypertension and its complications.
- They will be referred to the nearby health centre in their area for further services
- All the respondents will be sent group based individually customized messages

- All the above interventions will be provided through WhatsApp for android based phones and short messaging services for non-android phones based on the availability of the phone with the respondents.

2. Research study

Stress and depression as risk factors for hypertensive diseases: A cross-sectional study

a. Introduction:

Hypertension is a leading cause of death in the globe, affecting 1 in every 4 men and 1 in every 5 women – more than a billion people. with the majority (two-thirds) residing in low- and middle-income nations.[1] In India, hypertension is one of the most frequent non-communicable diseases, accounting for the majority of disease burden and mortality. It is responsible for an estimated 1.6 million fatalities in India , with a prevalence of 29.8% among adults and a greater prevalence in urban regions (33.8 percent vs. 27.6%).

Awareness of hypertension in India is low while awareness about its risk factors are even lower. [2]

Depression has been suggested as a possible risk factor for high blood pressure and heart disease (CHD) and vice versa. [3]Approximately 280 million people in the world have depression disorders In India, depression is the most frequent mental disorder, affecting 45.7 million people.[4]

Given the high prevalence of both hypertension and depression, a better understanding of their interaction is critical. Many studies suggest that both depressive and hypertensive individuals have elevated sympathetic tone and release of adrenocorticotropic hormone and cortisol, it's possible that depression and hypertension interact pathophysiologically, however the relationship between hypertension and depression is mainly unknown. The study attempted to solve this knowledge gap .[5]

b. Objective of the study

The objective of this study is to determine the stress and Depression as a possible risk factor for high blood pressure.

c. Literature Review

[1] Dr Alberto Francisco Rubio-Guerra[2013] conducted a study of 40 hypertensive patient. The study design, included patients using simple, validated, semiautomatic blood pressure monitoring equipment and a self-administered, validated and accurate screening test for depression at home, without the intervention of the investigator Of the 40 patients included in the study, 23 were depressed (57.5%), of whom two had good blood pressure control and 21 had poor blood pressure control and thus concluded that Depression is common in patients with uncontrolled hypertension and may interfere with blood pressure control[5]

[2] Prathibha MT et al [2017] conducted The study in Medical College health unit area of urban Trivandrum as a cross sectional survey among adults >18 years who were diagnosed to have hypertension. The subjects were interviewed using a semi structured questionnaire to collect the socio-demographic variables and the 9 item Patient Health Questionnaire (PHQ 9) to capture depression. Data from a sample of 432 hypertensive individuals collected were analyzed and Chi square, t test, was done to find the associated factors Among the study subjects the blood pressure was under control among only 33.8% of the study population. The prevalence of depression was found to be 33.3% (144) with 95% C.I (27.98-39.14). Gender, Socio economic status, marital status, low educational status, regular physical activity, duration of hypertension, uncontrolled BP, were found to be significantly associated with depression.[6]

[3]Zhanzhan Li(2015) conducted a systematic review and meta-analysis of observational studies to summarize the point prevalence of depressive symptoms in adults with hypertension. they identified 41 studies with a total population of 30,796 in the present meta-analysis. Prevalence estimates of depression in hypertensive patients varied widely in existing studies. The summarized prevalence of depression among hypertensive patients is 26.8% (95% confidence interval (CI): 21.7%-32.3%).[7]

[4]Collazos-Perdomo D(2020) conducted aRetrospective cohort study. People between 18 and 65 years old with high blood pressure, depression or use of medications for their management were included. To analyze the antecedent, a comorbidity model was performed. A bivariate analysis was performed and then a multivariate logistic regression.

The association was estimated using the Chi-square test and the odds ratios . Depression was found as a risk factor for high blood pressure, with a 2-way risk relationship between depression and high blood pressure.[8]

[5]Takita Y (2021)A mixed-methods study was conducted to collect and analyse quantitative and qualitative data. they administered questionnaires (Patient Health Questionnaire (PHQ-9) and Generalised Anxiety Disorder-7) and then conducted interviews with participants who reported moderate to severe depressive symptoms .Seventy-four participants were enrolled in the study, 25 with idiopathic PAH and 49 with CTEPH. The study found that PH patients are prone to depression[9]

[6]Rantanen AT (2018) conducted a Cross-sectional study in a primary care population in two semi-rural towns in Finland. They investigated the association of hypertension awareness and depressive symptoms, and analysed factors predisposing aware hypertensives to depressive symptoms.
Depressive symptoms are common in hypertensive persons even without comorbidities, if the person is already aware of his/her hypertension.[10]

[7]A Grimsrud (2009) conducted a cross-sectional survey of mental health in the South African adult population. The study was part of the World Health Organization World Mental Health Survey Initiative It was the first population-based study from sub-Saharan Africa to document an association between anxiety and depressive disorders and hypertension. hypertension diagnosis without another chronic physical condition (hypertension only) was not associated with any of the mental health outcomes (anxiety, depression, and comorbid anxiety-depression) in multivariate models. Hypertension diagnosis and another chronic condition were consistently associated with anxiety disorders, depressive disorders and comorbid anxiety-depression after adjustment for various confounding variables.[11]

[8]Michal, Matthias (2013) conducted a cross-sectional population-based study (N = 5000) analyzed the association of depression and HTN in persons with different conditions of HTN (unaware of HTN, controlled HTN, uncontrolled HTN) as compared to persons without HTN. Furthermore, the relationships of depressive symptoms with antihypertensive drugs and blood pressure were examined. they found that

Unawareness of HTN was inversely associated with burden of depression. Controlled HTN was positively associated with depression. However, this association was due to generally increased disease burden (e.g. stroke, diabetes). Severity of cognitive symptoms of depression was negatively associated with SBP in persons free of antihypertensive drugs.[12]

[9]Maatouk, Imad(2016)conducted a study to find Association of hypertension with depression and generalized anxiety symptoms in a large population-based sample of older adults. data were derived from the 8-year follow-up (2008–2010) of the epidemiological ESTHER-cohort study. A total of 3124 randomly chosen participants aged 57–84 were visited at their homes by trained study doctors. Data were derived from the 8-year follow-up (2008–2010) of the epidemiological ESTHER-cohort study. A total of 3124 randomly chosen participants aged 57–84 were visited at their homes by trained study doctors. [13]

[10]Carmilla M.M Licht(2009) conducted a large-scale cohort study by showed that, when compared with healthy controls, subjects with depression have a significantly lower mean SBP and are less likely to have isolated systolic hypertension.[14]

d. Methodology

A cross-sectional data was obtained from a survey of adults over the age of 15 was undertaken for a period of at least 2 month residing in Goyla Vihar area of urban Delhi. The study was conducted during May 2021 to June 20. Survey was conducted using Kobo app.

Two independent groups (hypertensive and normotensive) were formed under this study and testing variable was stress. Socio demographic variables, history of hypertension, its duration, treatment undertaking, compliance to treatment etc. were documented. Blood pressure was recorded after completing the interview, thrice for a person 2 minutes apart on the left arm, and the average value was taken as the person's BP expressed in terms of mm of mercury.

Stress was assessed using the local language (hindi).PSS (perceived stress scale-10 questions) and few question (6 questions) from PHQ 9 were used to assess stress and depression. Each of the 16 items of the questionnaire (except question 4^{th} ,5^{th} ,7^{th} ,8^{th}), can be scored from 0 ("not at all") to 4 ("nearly every day") depending on the severity of symptoms. Scores of question 4^{th} ,5^{th} ,7^{th} & 8^{th} were reversed. Scores ranging from 0-21was considered no stress/low stress, scores ranging from 22-42 is moderate stress and scores from 43-64 was considered high stress.

Each house was visited with the help of a community volunteer (ASHA) and all the participants were interviewed in local language. Informed consent was obtained from the participants before the start of the study and Institutional ethical committee clearance was obtained.

The data was analysed using Statistical Package for Social Sciences (SPSS) software. The statistical significance of association was tested using independent sample t - test with 95% Confidence Intervals.

e. Result

The study included 291 individuals above 15 years of age. Mean age of the study subjects was 41.9 years and 63.6% of the study population were females. 44.7% of the study subjects had different types of health insurance. 96% people had knowledge about hypertension. 22% hypertensive patients had familial history of hypertension.

63.2% of hypertensive patients did not have awareness about their hypertension or had undetected hypertension as shown in Figure 1.

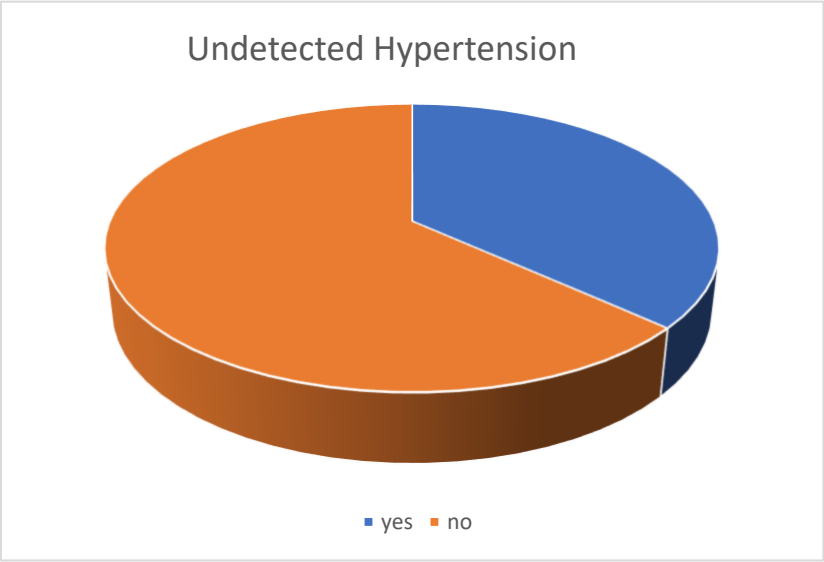

Figure 1: Undetected Hypertension

Severity of depression in the study sample was assessed based on PSS and PHQ 9 score. The classification includes severe (score 43-64), moderate depression (score 22-42), mild/no depression (score 0-21). The percentages in each category are shown in Table 1.

Stress severity	Percentage
High stress	1.7%
Moderate stress	30.6%
No stress/low stress	67.7%

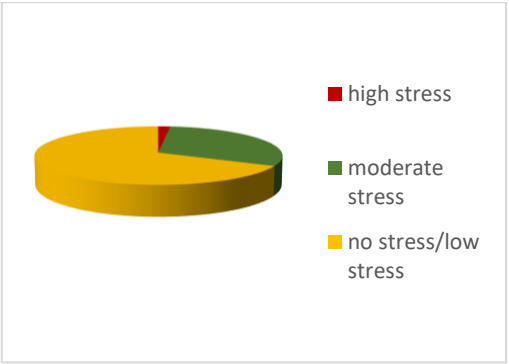

Table 1: Stress Severity

The hypertension and stress were assessed by independent sample t – test. The results are given in Table no. 2

		MEAN	SD	N	t-value	REMARKS
SYSTOLIC BP	STRESS	129.5	20.121	94	2.994	**0.003**
	NO STRESS	123.4	14.4	197		
DIASTOLIC BP	STRESS	82.9	8.98	94	2.420	**0.008**
	NO STRESS	80.3	8.39	197		

Table 2: Independent sample t – test result

From the table no.2, it is evident that the t-value is 2.994(systolic BP) and 2.420(diastolic BP), which is significant at 0.05 level with df equal 289. It reflects that, mean course of BP of stressed and non-stressed patients differ significantly.

f. Discussion

In the present study, Stress was found to be risk factors for hypertension among the study subjects ($p<0.05$). In the context the Null hypothesis "there is no significant differences in mean course of BP of stressed and non-stressed patients" is rejected.

In a crosssectional study by Prathibha MT et al found high association between depression and hypertension.[6] A study conducted by Dr Alberto Francisco Rubio-Guerra consisted of 40 patients, found that depression was a risk factor for poor blood pressure.[5]

However, a large-scale cohort study by Carmilla M.M. Licht showed that, when compared with healthy controls, subjects with depression have a significantly lower mean SBP and are less likely to have isolated systolic hypertension.[14] We do not have explanation for this finding.

Depression is a risk factor for poor blood pressure Because depression and hypertension share a common pathway, it is reasonable to consider depression in hypertensive patients (and hypertension in depressive patients)[5]

We found that 63.2% of hypertensive patients were not aware about there condition this showed hypertension as "iceberg disease and "silent killer". WHO facts on hypertension also emphasis that 46% of adults with hypertension are unaware that they have the condition. Another study done in Nepal shows that a vast majority of the hypertensive population was not aware of their high blood pressure status

LIMITATION

Limitation of our study were continuous bp was not monitored, the presence of depression was based on a screening tool rather than diagnosis by a psychiatrist, influence of salt intake ,physical activity, fat consumed, diabetes mellitus and other risk factor was not considered in this study.

This study limitations were balanced by strong points: BP was measured thrice at the gap of 2 minutes and average value was calculated as repeated BP measurements have been shown to be more representative of the true BP status of the individual it reduces the misinterpretation of the true prevalence of hypertension, BP was measured by medical practitioner, PSS which is highly recommended stress scale and few questions from PHQ-9 by DSM-5 was used to overcome the failure of one screening test.

g. Conclusion

The study provided insight into the association between hypertension and depression, finding that blood pressure control and proper depression treatment are both required in individuals. A multidisciplinary approach to the problem, involving physicians, psychiatrists, clinical psychologists, and community volunteers, will result in a significant reduction in the burden of both diseases.

3. Observational learning

a. About project activities: Learnt how a intervention project can bring change in people lives and is good for prevention of diseases at primary level.
b. Gain a deep understanding about research topic(hypertension) it causes, risk factors, prevalence, and prevention strategies needed to be adopted.
c. Gain knowledge how ASHA worker is functioning in community and how they are mobilising the community and facilitate them in accessing health and health related services available at the Anganwadi/sub-centre/primary health centres
d. Learned how to interact in community and win their confidence. We gain a deep understanding into the research subjects due to proximity to them due to which research become extensive, thorough, and accurate.
e. Related research: During my research study, I have learnt
    - Preparation of tools (questionnaire) for quantitative study
    - Inserting questionnaire in kobo app.
    - Writing review of literature (Desk review)
    - Data collection through kobo app
    - Data analysis in Microsoft Excels and SPSS.
    - Structural writing of a research paper including references.

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