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Effectiveness of Breathing Exercise On Blood Pressure Among Hypertensive Patients at Selected Community Area at Agartala West Tripura

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Abstract

The researcher conducted a study on effectiveness of breathing exercise on blood pressure among hypertensive patients in Dukli Urban Health Training Centre, Agartala, West Tripura. The objectives of the study were to assess the pre-existing level of blood pressure among the hypertensive patients, to evaluate the effectiveness of breathing exercise on blood pressure among the hypertensive patients, and to find out the association between pre-existing level of blood pressure among hypertensive patients with their selected demographic variables. The present study's conceptual framework was based on Modified Wiedenbach's Helping Art of Clinical Nursing Theory (1964). A quantitative evaluative research approach, time series experimental research design and purposive sampling technique were used for the study. Data collection: Data were collected from 30 hypertensive patients through interview and direct observation method by administering the socio-demographic proforma and American Heart Association blood pressure category table (2023). Breathing exercise were provided as an intervention for 21 minutes for 15 consecutive days. Everyday, 2 times pre-test and 2 times post-test was done.

Keywords: Effectiveness, Breathing exercise, Blood pressure, Hypertensive patients.

1. Introduction

1. 1 BACKGROUND OF THE STUDY:

Hypertension is a major risk factor for cardiovascular disease globally and a leading cause of premature death and disability. It is also called “the silent killer”. The causes of the hypertension in India are age, alcohol, smoking and chewing tobacco, BMI, central obesity (defined as waist circumference>90cm in men and >80cm in women), consumption of low vegetables/ fruits, high consumption of dietary fat and salt and sedentary activity were the significant risk factors for HTN among Indian patients. The pathophysiology of hypertension involves the impairment of renal pressure natriuresis, the feedback system in which high blood pressure induces an increase in sodium and water excretion by the kidney that

leads to reduction of the blood pressure. Pressure natriuresis can result from impaired renal function, inappropriate activation of hormones that regulate salt and water excretion by the kidney (such as those in the rennin-angiotensin-aldosterone system), or excessive activation of the sympathetic nervous system.[1]

Anchala R, et.al (2014) was conducted a study on Hypertension in India: a systematic review and meta-analysis of prevalence, awareness and control of hypertension. The data was collected from medline, web of science and scopus database from 1950 to 30 April 2013 were search for prevalence, burden, awareness and control of blood pressure of the total 3047 articles, 142 were included among Indian adults. The result was overall prevalence for hypertension in India was 29.8%(95% confidence interval:26.7-33.0). Significant differences in hypertension prevalence were noted between rural and urban parts[27.6% (23.2-32.0) and 33.8% (29.7-37.8); p=0.05]. Overall estimates for the prevalence of awareness, treatment and control of BP were 25.3%(21.4-29.3), 25.1%(17.0-33.1), and 10.7%(6.5-15.0) for rural Indians; and 42.0%(35.2-48.9), 37.6%(24.0-51.2) and 20.2%(11.6-28.7) for urban Indians.[2]

According to WHO (World Health Organization) (2017), Indian people difficult to control hypertension may occur because of patients habits that were consumption of dietary sodium, excessive water consumption, alcohol consumption, caffeine consumption, nicotine use, nonsteroidal anti-inflamatory drug use and lack of physical activity.[3]

Shim JS, et al (2018) was conducted a study on comparison between right and left upper arms in detection of hypertension. The objectives of the study aimed to investigate the right-left arm difference in detection of hypertension in the general Korean population. A cross sectional analysis for 2103 people are participates from the Cardiovascular and Metabolic Disease Etiology Research Center (CMERC) cohort, which began in 2013. All study participants were interviewed using standardized questionnaires to acquire information about their demographics, medical history and health behaviors. The results showed that overall 8.6% of the population had hypertension at either arm, while 7.8% had right-arm hypertension, 7.2% had left-arm hypertension and 6.4% had both arms hypertension. The sensitivity for the detection of hypertension was 90.6% when BP was measured only at right arm, and 83.4% when measured only at right arm, and 83.4% when measured only at left arm. Single-arm measurements compared to double-arm measurements, may underestimate the prevalence of hypertension. However, if double-arm measurements are unavailable. So, right arm is preferred for measurement of BP.[4]

Marbaniang S P, et.al, (2022) was conducted a study on structured additive modeling of diabetes and hypertension in Northeast India. A Bayesian geo-additive model was used to determine the risk factors of diabetes and hypertension. Data was used from the Indian Demographic Health Survey, which was conducted across the country between 2015 and 2016. All male and female between the ages of 15 and 49 years were tested for diabetes and hypertension as the part of the survey. The result of the study was that the prevalence rates of diabetes and hypertension in Northeast India were 6.38% and 16.21% respectively. The prevalence was higher among males, urban residents and those who were widowed/divorced/separated.[5]

Kifle Z D, et.al, (2022) was conducted a study on Prevalence and associated factors of hypertension complication among hypertensive patients at University of Gondar Comprehensive Specialized Referral Hospital. A cross sectional study was conducted to identify the major risk factors inducing hypertensive complication at the University of Gondar Comprehensive Specialized Referral Hospital, Northwest

Ethiopia. The study was conducted at the University of Gondar Comprehensive Specialized Hospital, Chronic ambulatory care clinic from 1st June 2020 to 30th August 2020. All adult hypertensive patients (age≥18 years) who visited the hypertensive care services of University of Gondar Comprehensive Specialized Hospital through the study period were included. The sample size was 428. Interview-directed self-administered questionnaire and chart review were employed for data collection. The results showed that out of 428 hypertensive patients, 261 (61.0%) were males. They were from 19-84 years age group and the mean age of participants was 53.55 ± 16.65 years. Nearly two half of the participants (61.0%) were urban residence and 73.4% had orthodox religion with near to half participants were self-employed. (91.3%) were living with extended family. Of the participants, 123(28.7%) had hypertension for a duration of greater than 20 years.[6]

According to WHO (16 March 2023), complication due to hypertension were ventricular hypertrophy affects an estimated 15% to 20% of the Indian population, nearly 1 in 5 people. It may have high risk of obesity elderly and high blood pressure. Hypertension may contribute heart failure in as many as 50-60% of patients. Due to atherosclerosis 48% of stroke and 18% of coronary events. Due to cardiovascular disease around 70% in both ischemic and hemorrhagic patients. Due to renal failure 40-60% is affected of the population in India due to hypertension.[7]

1.2 NEED OF THE STUDY:

Breathing exercise influence both physiological factor by stimulating the parasympathetic nervous system and psychological factor by diverting attention from thoughts, effective technique against insomnia and anxiety. Breathing exercise helps to increase more oxygenation in the brain and provide relaxation. Various research study shows that the urban community people have more hypertension then the rural community people. Whereas, various study shows that from the age group of 15 yrs both male and females where affected with hypertension.

Deep breathing exercise is one of the non-pharmacological, successful methods to use in maintain the normal blood pressure among patients with hypertension and also continuous practicing of deep breathing exercise can reduce medicine usages thereby it can used routinely as a corresponding method of treatment for hypertension.[8]

Dr. **Premila E** (**2017**) was conducted a study on effectiveness of deep breathing exercise on blood pressure among patients with hypertension. The objectives of the study was to determine the effectiveness of deep breathing exercise on blood pressure among patients with hypertension. A pre-experimental research design was used to conducted this study at Government General Hospital, Karaikal, Puducherry. The target population was patients with hypertension of both sex (male and female) aged with 40-60 years who were under the treatment of hypertension. The sample size was 30, selected with convenient sampling technique. The result of the study was out of 30 samples during pretest 25(83.3%) were in pre-hypertension and 05(16.7) were in stage-1 hypertension with the mean score of systolic blood pressure was 136.5 ± 8.98 and mean score of diastolic blood pressure was 95.32 ± 7.05. In post test 7(23.3%) were in normal, 21 (70%) were in pre hypertension and 2 (6.7%) were in stage-1 hypertension. The mean score of systolic blood pressure was 126.66 ± 9.74 and mean score of diastolic blood pressure was 87.32 ± 7.97. So, the calculated 't' value for systolic blood pressure in experimental group was t=1.580 which was found to be statistically significant at p<0.005 level. Then, the calculated 't' value for diastolic blood pressure was

t=0.0294 which was found to be statistically significant at p<.005 level. So, deep breathing exercise was effective on blood pressure among patient with hypertension in experimental group.[9]

Dr. **Mohammad E E H**, **et.al** (**2018**) was conducted a study to assess the effectiveness of breathing exercise in lowering high blood pressure among hypertensive patients at General Hospital, Alnamas, Kingdom of Saudi Arabia.The objective of the study was to evaluate the effectiveness of breathing exercise among hypertensive patients.The research design selected for the present study was quasi experimental one group pre-test pot-test design. Sample consisted of 80 hypertensive patients who attended in medical OPD and ward at general hospital. Patient were selected by convenient sampling method. The study finding that level of significance (t value=8.603, P- value <0.001) as suggested by "Paired t test". The mean pre-test total level of hypertension score before breathing exercise was 40 and mean post-test level of hypertension score was observed to be 26.66 and difference was 13.34. So, the breathing exercise was effective on hypertensive patient.[10]

Kalra A, et.al (2022) was conducted a study on urban-rural differences in hypertension prevalence in low-income and middle-income countries, 1990-2020. The objective of the study was to assess the difference in hypertension prevalence between urban and rural areas in low-income and middle-income countries (LMICs). The data was searched from PubMed, web of science, scopus and Embase from 01/01/1990 to 10/03/2022. Total population-based studies with ≥ 400 participants 15 years and older , selected by using a valid sampling technique, from LMICs that reported the urban-rural difference in hypertension prevalence using similar blood pressure measurements. The results of the study was the pooled prevalence of hypertension was 30.5%(95%CI,28.9,32.0) in urban areas and 27.9%(95%CI,28.3,29.6) in rural areas, resulting in a pooled urban-rural difference of 2.45%(95%CI,1.57,3.33,I-square:99.71%,tau-square:0.00524, P<0.001).[11]

In various research study shows that the urban community people have more hypertension than the rural community people. Whereas, various study shows that from the age of 15 years both males and females where affected with hypertension. As the breathing exercise helps to provide more oxygenation in the brain. And also various research study reveal that breathing exercise can helps to reduce the blood pressure. That's why as a research choose this study to prevent hypertensive complication of the urban community people.

1.3 STATEMENT OF THE PROBLEM:

Effectiveness of breathing exercise on blood pressure among hypertensive patients at selected urban community area at Agartala, West Tripura.

1.4 AIM OF THE STUDY:

Breathing exercise may helps to reduce blood pressure among the hypertensive patients.

1.5 OBJECTIVES:

1. To assess the pre existing blood pressure among hypertensive patients .
2. To evaluate the effectiveness of breathing exercise on blood pressure among hypertensive patients.

3. To find the association between the pre test score of blood pressure among hypertensive patients with their selected demographic variables.

1.6 VARIABLES:

Independent variables:

- Breathing exercise.

Dependent variables:

- Blood pressure among hypertensive patients.

Demographic variables:

- Age, Gender, Type of family, Number of family members, Marital status, Occupational status, Family monthly income (Rs/month), Daily working hours, duration of hypertension, Do you have any other associated diseases along with hypertension, If yes, mention it, Are you taking any other alternative therapy to reduce hypertension, If yes, mention it, Family history of hypertension, If yes, relationship with that family members, B.M.I, Dietary pattern, Do you have any prior information regarding breathing exercise, If yes, source of information, Do you have any habits, if yes, tick the following, Sleeping hours/day.

1.7 OPERATIONAL DEFINITION:

Effectiveness:

In this study, it refers to the extent to which the outcome measure at difference of blood pressure between pretest and post test in hypertensive patient which was measured by American Heart Association recommended blood pressure category table (2023).

Breathing Exercise:

In this study, it refers to the demonstration of breathing exercises such as diaphragmatic breathing, glossopharyngeal breathing, pursed lip breathing, segmental breathing (apical breathing, lateral costal expansion, posterior costal expansion) for 21 mins and for 15 consecutive days.

Blood Pressure:

It refers to systolic pressure & diastolic pressure from normal high to hypertensive stage-2**,** male and female hypertensive patients from Dukli Urban Health Training Centre who diagnosed with hypertension under regular medication.

1.8 ASSUMPTIONS:

- Breathing exercise may be one of the effective measures to reduce blood pressure among hypertensive patients

1.9 HYPOTHESES:

All hypotheses were tested at 0.05 level of significance.

- **H_1**: There is a significant differences between the pre and post test level of blood pressure among the hypertensive patients .

- **H_2**: There is a significant association between pre test score of high blood pressure with their selected demographic variables.

CONCEPTUAL FRAMEWORK:

A conceptual framework lives at the center of an empirical study. The conceptual framework serves as a guide and ballast to research, functioning as an integrating ecosystem that helps the researchers intentionally bring all aspects of a study together through a process that explicates their connections, disjuncture, overlaps, tensions, and the contexts shaping research setting and the study of phenomena in that setting.

As a researcher, it is vital to understand what a conceptual framework is, what its component parts are and how they interact, and how it is used to guide high-quality, rigorous research study.

A conceptual framework makes the case for why a study is significant and relevant and for how the study design appropriately and rigorously answers the research questions. In addition, a conceptual framework situates a study within multiple contexts, including the overall methodological approach research work from, and how the researcher is located in relation to the research.

The conceptual framework consists of multiple parts and serves a variety of intersecting and ongoing functions for researchers embarking on and engaging in research and the scholarship it produces.[13]

The conceptual framework for this present study was direction from Wiedenbach's Helping Art of Clinical Nursing Theory (1964).

The Helping Art of Clinical Nursing Theory was first introduced by the Ernestine Wiedenbach in the year of 1964. It explains that every individual has his own level of coping and capabilities, and in times of difficulties an individual may require assistance to satisfy requirements in order to achieve health and independence or a resting peace.

Nursing has evolved with the main purpose of assisting; however, nursing profession is not about literal 'assisting'. It is an art; a unique profession wherein basic tool is the helping touch of great nurses. On this assisting/helping principle' the great Ernestine Wiedenbach developed a theory - **"The Helping Art of Clinical Nursing",** which is known for great influence in nursing practice.

Emestine Wiedenbach was born on 18th August, 1900, in Hamburg, Germany. She earned her Bachelor of Arts degree from Wellesley College in 1922. She gained her Registered Nurse license from Jhon Hopkins School of Nursing in 1925. She earned certificate in Nurse-midwifery from the Maternity Centre Association, School of Nurse-midwives in New York in 1946. In 1952, she became an Instructor for

Maternal nursing in Yale University. In 1954, she promoted to Assistant professor of Obstetric Nursing and promoted to Associate professor of Obstetric Nursing in 1956 in Yale University. She published a book of 'Clinical Nursing, A Helping Art' on 1964. She died on 8th March, 1998.[13]

Wiedenbach's explanation of her theory is that "Account must be taken of the motivating factors that influence the nurse not only in doing what she does, but also in doing it the way she does it with the realities that exist in the situation in which she is functioning".[13]

Three ingredients essential to the perspective theory are -

* The central purpose

* The prescription and

* The realities

The central purpose: The nurse's central purpose in nursing is the nurse's professional commitment. For Wiedenbach, the central purpose in nursing is to motivate the individual and/or facilitate efforts to overcome the obstacles that may interfere with the ability to respond capably to the demands made by the realities within the situation. She recognized that nurses have different values and various commitments to nursing and that to formulate one's purpose in nursing is a 'soul-searching experience'. She encouraged each nurse to undergo this experience and be willing and ready to present the central purpose in nursing for examination and discussion when appropriate.[13]

In the present study, the central purpose referred to rule out the usefulness of Breathing exercise to reduce the level of blood pressure among hypertensive patients.

To achieve the central purpose, the researcher needed to identify the need of the samples. The need was assessed by data collection with the use of the Socio-demographic proforma through an interview schedule, which includes the demographic variables- Age, Gender, Type of family, Number of family members, Marital status, Occupational status, Family monthly income (Rs/month), Daily working hours, Duration of hypertension, Do you have any other associated diseases along with HTN, If yes, mention it, Are you taking any other alternative therapy to reduce hypertension, If yes, mention it, Family history of hypertension, If yes, relationship with that family members, B.M.I, Dietary pattern, Do you have any prior information regarding breathing exercise, If yes, source of information, Do you have any habits, if yes, tick the following, Sleeping hours/day.

The pre-existing level of blood pressure among hypertensive patients was assessed by using American Heart Association recommended blood pressure category table (2023) through direct observational method.

The prescription: The prescription indicates the broad general action that the nurse deems appropriate to fulfillment of his or her central purpose. The nurse will have thought through the kind of results to be sought and will take action to obtain these results, accepting accountability for what he or she does and for the outcomes of any action.[13]

In the present study, prescription referred to the Breathing exercise, which consists of diaphragmatic breathing, glossopharyngeal breathing, pursed lip breathing, segmental breathing (apical breathing, lateral costal expansion and posterior costal expansion. The duration of the exercises are 21 minutes per day for 15 consecutive days.

The realities: The realities are the aspects of immediate nursing situation that influence the results the nurse achieves through what he or she does. These include the physical, psychological, emotional and spiritual factors in which nursing action occurs.[13]

Within the situation are these components -

- **The agent -** Who is the nurse, supplying the nursing action. In the present study, agent referred to the Researcher.
- **The recipient -** The patient receiving the action or on whose behalf the action is taken. In the present study, recipient referred to the hypertensive patients.
- **The farmwork -** It comprising the situational factors that affect the nurse's ability to achieve nursing results. In the present study, framework referred to the Dukli Urban Health Training Centre, Agartala, West Tripura.
- **The goal -** The goal or the end to be attained through nursing activity on behalf of the patient. In the present study, goal referred to rule out the usefulness of Breathing exercise to reduce the level of blood pressure among hypertensive patients.
- **The means -** The actions and devices through which the nurse is enabled to reach the goal. In the present study, means referred to administration of Breathing exercise by the researcher for 21 minutes for 15 consecutive days.

Post- test: To rule out the usefulness of breathing exercise to reduce the level of blood pressure among hypertensive patients, the researcher had conducted the post-test assessment of level of blood pressure by used of sphygmomanometer on hypertensive patients for two times within 5 mins gap.

Feedback: If the post-test level of blood pressure is lower than the pre-test level of blood pressure, it indicates that Breathing exercise are effective to reduce the level of blood pressure among hypertensive patients. Whereas, if the post-test level of blood pressure is not lower than the pre-test level of blood pressure, it indicates that Breathing exercise are ineffective to reduce that level of blood pressure among hypertensive patients. So, evaluation of the realities are to be done again and the process continues. In the present study, feedback was not included.

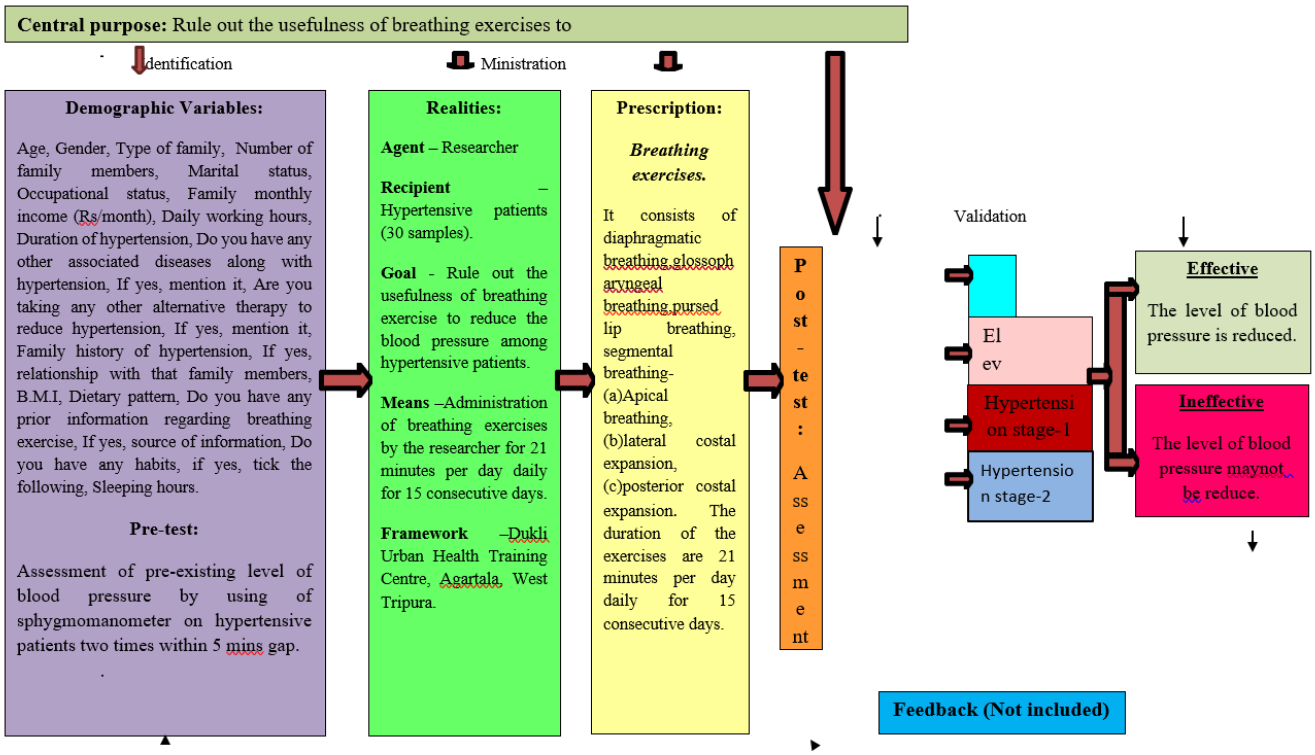

Fig-1: Conceptual framework based on Modified Wiedenbach's Helping Art of Clinical Nursing Theory (1964)

1.10 DELIMITATION:

- The study was delimited to the hypertensive patients at Dukli urban heath training centre, Agartala West Tripura.

1.11 SUMMARY:

This chapter has dealt with the background of the study, need of the study, statement of the problem, aim of the study, objectives, variables, operational definitions, assumption hypotheses and delimitations of the study.

2. REVIEW OF LITERATURE:

The review of literature is a broad, comprehensive, in depth, systematic and critical review of scholarly publication, unpublished materials, AV materials and personal communications. Literature review can serve a number of important functions in the research process. It helps to lay the foundation for a study and can also inspire new research ideas. It helps to assess what is already known, what is still unknown and untested, justify the need for its replication and throw some light on the feasibility of the study problems that may be encountered. It also helps to uncover a promising methodology of data collection of obtaining useful information on how to increase the effectiveness of data analysis. Review of literature is a critical summary of research on topic of interest, often prepared to put a research problem in contact as the basis for an intimation project.[17]

Review of literature for the present study has been organized under the following section:

Section A: Study related to prevalence of hypertension in both male and female.

Section B: Study related to effectiveness of breathing exercise.

Section C: Study related to effectiveness of breathing exercise in lowering blood pressure.

SECTION 'A': Study related to prevalence of hypertension in both male and female.

1. **Everett B, Zajacova A (2016)** was conducted a study on gender differences in hypertension and hypertension awareness among young adults. The objectives of the study are to examine whether there were gender differences in hypertension and the role of key known hypertension risk factors in particular obesity and health care utilization to explain the gender differences among young adults. The study was using the data from National Longitudinal study of Adolescent to Adult Health. The descriptive statistic were presented separately for males and females. The total sample was 14,497. The results of the study was found that women were significantly less likely to be hypertensive than men (OR=0.37, P<.001) and the gender disparities in hypertension status were already evident among men and women in their twenties: women were far less likely to be hypertension compared to men (12% vs 27%) on ANOVA testing (F=1.35, p<.05 vs F=1.24, p<.10). The results also reveal very low levels of hypertension awareness among young women (32% of hypertension women were aware of their status) and even lower levels among men (25%). This study identifies key factors that contribute to observed gender disparities. The findings thus suggest that regular medical visits are critical for improving hypertension awareness among young adults and reducing gender disparities in cardiovascular health.[15]

2. **Singh S**, **et.al** (**2017**) was conducted a study on prevalence and associated risk factors of hypertension. The objectives of the study was to assess the prevalence prevalence of hypertension was 32.9% (male: 40.9%, female: 26%)of hypertension and its associated factors and to estimate awareness, treatment and adequacy of control of hypertension among study subject. A community based cross-sectional study with multistage sampling design was conducted among Urban Varanasi. A modified WHO STEPS interview schedule on 640 study subjects aged 25-64 years was used. The subject were 699,25-64 years was used as a sample. The result was out of the total hypertensive 211 subject, only 81 (38.4%) were aware about their blood pressure status; out of those, 57(70.4%) were seeking treatment and 20(35.08%) had their blood pressure adequately controlled and prevalence of hypertension was 32.9% (male: 40.9%, female: 26%). Mean systolic and diastolic BP were 124.25±15.05mmHg and 83.45±9.49mmHg, respectively.[16]

3. **Ghosh S and Kumar M (2019)** was conducted a study on prevalence and associated risk factors of hypertension among persons aged 15-49 in India: a cross-sectional study. The objectives of the study was the first attempt to provide estimated on the prevalence of hypertension at the national, state and district level, prerequisite for designing effective interventions. Besides, the study aims to identify the risk factors of hypertension. The cross-sectional survey data from the fourth round (2015-2016) of National Family Health Survey (NFHS). The total sample was 811917. The results showed that the age-adjusted prevalence of hypertension in India was 11.3% (95% CI 11.16% to

11.43%) among persons aged between 15 and 49 and was four percentage points higher among males 13.8% (95% CI 13.46% to 14.19%) than among females 10.9% (95% CI 10.79% to 11.06%). Persons in the urban location (12.5%, 95% CI 12.25% to 12.80%) had a marginally higher prevalence than persons in rural location (10.6%, 95% CI 10.50% to 10.78%). The proportion of population suffering from hypertension varied greatly between states, with a prevalence of 8.2% (95% CI 7.58% to 8.85%) in Kerala to 20.3% (95% CI 18.81% to 21.77%) in Sikkim. Advancing age, obesity/overweight, male sex, socioeconomic status and consumption of alcohol were found to be the major predictors of hypertension.[17]

4. **Defianna SR, et al (9 June 2021)** was conducted a study on gender differences in Prevalence and Risk Factors for Hypertension among Adult Populations: A Cross-Sectional Study in Indonesia. This cross-sectional study was conducted with data from the 2018 Sleman HDSS-a longitudinal and community-based survey established in 2014 through a close collaboration between the Faculty of Medicine, Public Health and Nursing Universitas Gadjah Mada and Government of Sleman District, Yogyakarta Special Region, Indonesia. The total sample was 5640 included subjects who were aged ≥ 18 years. The results found that the prevalence of hypertension was 40% (42% in men and 38% in women). Age, abdominal obesity and chronic non-communicable diseases were the common predictors of hypertension in men and women ($p < 0.05$). The odds ratio of hypertension among men with low education was lower than among those with high education (OR = 0.52, 95% CI: 0.29–0.94). For women, being in the poorest socioeconomic condition increased the risk of hypertension by 1.67 times compared to the richest (95% CI: 1.21–2.32). Gender differences in the prevalence of and factors associated with hypertension were observed among adult populations in Sleman District, Yogyakarta, Indonesia. Therefore, a gender-based approach in the health prevention strategy to control hypertension for men and women were needed. Therefore, men were having a higher prevalence than women.[18]

5. **Singh A**, **Dr**.**Dixit**.**P** (**2023 Jan**) was conducted a study on gender specific prevalence, awareness, treatment and control of hypertension in adults in India: A study from developing gender specific public policy from longitudinal ageing study in India(LASI) data 2017-2018.The objectives of the study was to examine the differences between men and women in the prevalence, awareness, treatment and control of hypertension and related risk factors among people aged 45 and older. Descriptive statistics were presented separately for males and females. The study was conducted using surveys weights available in the LASI datasets. The overall sample size for this was 72,250 which included all eligible older individuals aged 18 and above. The results of the study was found that 45.1% of the population had hypertension, with 26.9% self-reporting their condition and 30% having hypertension at the time of measurement 41% of males and 59% of females had hypertension. The self-reported hypertension of men was found to differ significantly from measured hypertension by 8.7%, while in women the difference was only 1.2%. Diabetes was found to increase the odds of having hypertension in both males (OR = 3.65, 95% CI (3.37-3.97)) and females (OR = 3.46, 95% CI (3.21-3.74)). In both males and females mean age differed significantly among various hypertension categories among various hypertension categories on ANOVA testing ($F=132.8$; $p<0.0001$ and $F= 527.2$; $P<0.0001$ respectively).[19]

Section 'B': Study related to effectiveness of breathing exercise.

1. **K.M.I & Isaac S (2016**) was conducted a study to assess the effectiveness of breathing exercises on hypertension among patients with chronic renal failure in selected hospital at Coimbatore. A quasi experimental study was done with pre test post test with control group to determine the effectiveness of breathing exercises on Blood Pressure among CRF patients. The subject were 60 Chronic Renal Failure Patients with Hypertension using from Sree Abirami Hospital selected using non-probability purposive sampling technique. Among them 30 were allotted to interventional group and 30 to control group. Blood pressure was checked and categorized based on the World Health Organization (WHO) recommended blood pressure category table. Patients with mild to severe hypertension were only included for the study. After screening the patients the researcher administered breathing exercises to the subjects in the interventional group for 15 minutes once in morning for 6 consecutive days. After the intervention, the researcher checked the blood pressure immediately (zero hours), at half an hour. The findings shows that in experimental group, the pre-test score was 132.3 $\pm$ 3.54 and the post test score was at zero hour (116.5 $\pm$ 1.6,df=16.3, 't' value=33.1*), at half an hour (120 $\pm$ 2.05, df=12.6, 't' value=23.39*) and at one hour later(122.6 $\pm$ 2.3, df=10, 't' value=12.58*). The obtained 't' value was 22.23*was significant at $p< 0.05$ level. It shows that the breathing exercise was effective in reducing the level of blood pressure among patients with Chronic Renal Failure.[20]
2. **George A, et.al (3 Sep 2017)** was conducted a study to assess the effectiveness of deep breathing exercise with incentive spirometer on the respiratory status of patients who have undergone cardio thoracic and vascular surgery in selected hospital Puducherry. The objective of the study was to assess the effectiveness of deep breathing exercise with incentive spirometer on the respiratory status of patients who have undergone cardio thoracic and vascular surgery in selected hospital Puducherry. A quasi-experimental one group pre-test post-test design was used. The total sample was 30 patients who have undergone cardio thoracic and vascular surgery at Cardio Thoracic and Vascular words of Mahatma Gandhi medical College and Research Institute (MGM&RI), Puducherry and A G Padmavathy hospital, Puducherry. Stratified random sampling technique was used. The results showed that the mean and standard deviation of both pre-test & post test was (1.63±0.490 & 1.03±0.183) respectively at mean difference was 0.60. The obtained paired 't' value was 6.595 and P-value was 0.000*** at df=29. It was highly significant at $p<0.001$% level. This study reveals that deep breathing exercise with incentive spirometer was highly effective of respiratory status for the patients who have undergone cardio thoracic vascular surgery to a great extent.[21]
3. **Makwana R H, et.al (2019)** was conducted a study to assess the effectiveness of deep breathing exercise to reduce the level of stress among working women in a selected area at Rajkot, Gujarat. The research design adopted was quasi – experimental time series pre – test, post – test with control group design. The conceptual framework for this study was based on King's Theory of goal attainment. The study has been conducted at Bahumali government quarters, Rajkot, Gujarat. Non – probability purposive sampling technique has been adopted to select the desired sample. The sample size was 60. As an intervention of 30 minutes of deep breathing exercise was administered for experimental group. The data was collected through PSS (Perceived Stress Scale) which range from 0 to > 40 range. The collected data were analyzed by using both descriptive and inferential

statistical methods. The results showed that the effectiveness of deep breathing exercise on level of stress, the obtained 'F' value for level of stress in control group was 1.68125 not at significant level and in experimental group, the sum of square between the group was 1194.68 and within the group was 5471.76 at degree of freedom between groups (df) was 87. The mean sum of square between groups was 597.344 and within group was 62.8939. The obtained 'F' value 9.49766 that was highly significant (at $p<0.01$), which suggest that deep breathing exercise were very effective to reduce the level of stress.[22]

4. **Cecyli C**,**et.al** (**2020**) was conducted a study on to assess the effectiveness of breathing exercise among hypertensive patients. The objective of the study was to evaluate the effect of breathing exercise on blood pressure among patients with hypertension. A pre experimental (pretest and post test) research design was used to conduct the study at Urban Primary Health Centre, Koyambedu. A total 50 hypertensive patients were selected by convenience sampling technique. The criteria for sample selection were known hypertensive patient and who are medically fit to do breathing exercise. The results was that in the pre test, out of 50 samples (48%) had pre-hypertension, (40%) had stage-I hypertension, (8%) had stage-II hypertension and (4%) have normal blood pressure. Whereas, in the post-test after intervention, out of 50 samples (46%) have normal blood pressure, (50%) had pre-hypertension and (4%) had stage-I hypertension among hypertensive patients. And, the pretest score among hypertension patients was (125.5 $\pm$ 11.298) and post test score was (110.7 $\pm$ 9.090) . The calculated paired 't' test value=7.971 level was found to be statistically highly significant. p value<0.001***. Thus, there was a reduction in the level of blood pressure after deep breathing exercise among posttest group patients.[23]

5. **Patidar K and Patidar K (Oct 21, 2020)** was conducted a study to assess the effectiveness of rhythmic breathing exercises on postoperative pain of patient after abdominal surgery in selected Hospitals of North Gujarat. The aim and objectives of the study was to assess the post-operative patient after abdominal surgery among experimental and control group, to evaluate the effectiveness of rhythmic breathing exercise on post-operative pain after abdominal surgery among experimental group, to determine the post-test score of post-operative pain among experimental and control group, to find out the association of post-operative pain with selected demographic variables in control and experimental group. A quantitative approach using Quasi-experimental research (nonrandomized control group design). 40 patients were selected using non probability purposive sampling in selected hospitals of North Gujarat. In experimental group, majority in pre test19 (95%) reported severe pain, after intervention of rhythmic breathing exercises in post test 18(90%) reported mild pain. in control group, majority in pre test 20 (100%) reported severe pain, without intervention of rhythmic breathing exercises in post test reported severe pain 15(75%). In experimental group, the mean & standard deviation of both pre-test & post test was (7.21±1.44 & 3.22±1.02) respectively and the mean difference was 3.98. The t-value was 10.18 which were significant at 0.05levels at df=39. In control group, the mean and standard deviation of both pre test and post test was (8.35±0.79 & 6.56±0.94) respectively and the mean difference was 1.78. The t-value was 6.45. The pre test and post test mean in experimental group was 7.21% and 3.22% and different was 3.98%. and pre test and post test in control group was 8.35% and 6.56% and difference was 1.78 so decrease the pain score in experimental group after intervention of rhythmic breathing exercises. Hence the stated hypothesis was accepted. It reveal that rhythmic

breathing exercises was an effective measures to reduced the postoperative pain of patient after abdominal surgery.[24]

SECTION C: Study related to effectiveness of breathing exercise in lowering blood pressure.

1. **Kaur A, et.al (2015)** was conducted a study on effectiveness of abdominal breathing exercise on blood pressure among hypertensive patients. The objective of the study was to assess the effectiveness of abdominal breathing exercise on blood pressure among hypertensive patients. A quasi- experimental study with quantitative approach was done to assess the effectiveness of abdominal breathing exercise on blood among hypertensive patients and to find the association between blood pressure and selected Socio-demographic and clinical characteristics of hypertensive patients. The present study was conducted at medicine OPD Outpatient department) of G.G.S. Medical Hospital, Faridkot, Panjab. The population of this study was 60 patients diagnosed as primary hypertensive and were conveniently selected at G.G.S. Medical Hospital, Faridkot, Panjab. Interview schedule were used to collected the data Experimental group had done abdominal breathing exercise twice a day for continuous 10 days. The result of the study was in experimental group, on day 1 blood pressure (pretest score was 123.60±7.47, posttest was 119.96±7.35, df=29, 't'value=9.664,p=0.001***), on day 2 blood pressure (pretest score was 118.10±6.09, posttest score was 113.63±6.22, df=29, 't' value=12.592, p=0.00***), on day 3 blood pressure (pretest score was 113.13±4.80, posttest score was 108.16±4.14, df=29, 't' value=13.320, p=0.00***) and on day 11 blood pressure (pretest score was 109.66±4.35, posttest score was 104.63±3.69, df=29, 't' value=14.491, p=0.001***). So, breathing exercise helps to lowering the blood pressure among hypertensive patients.[25]
2. **Elavarasi R (1 Jan 2018)** was conducted an experimental study to assess the effectiveness of abdominal breathing exercise on regulation of blood pressure among patients with hyperetsion. The objectives of the study was to assess the level of blood pressure among patient with hypertension, to evaluate the effectiveness of abdominal breathing exercise among patient with hypertension, to find out the association of level of blood pressure with selected demographic variables. The Experimental research design was used. The sample size was 60 (control group+experimental group). The study findings that the systolic pressure of pre-test mean and standard deviation was 141.07±8.45 and the post-test mean and standard deviation was 124.33±8.33 and the mean difference was 16.74. Wilcoxon test value for systolic blood pressure was -4.638 .The diastolic pressure of pre-test mean and standard deviation was 89±6.62 and the post test of mean and standard deviation was 79.5±3.56 and the mean difference was 9.5. Wilcoxon test value for diastolic blood pressure is -4.344 and the mean arterial pressure of pre-test mean and standard deviation was 106.36±5.7 and the post-test mean and standard deviation was 94.44±2.75 and the mean difference was 11.92. Wilcoxon test value of mean arterial pressure was -4.685 and the 'p' value was 0.001*. It was highly significant at p<0.001* level. It implies that abdominal breathing exercise was effective for reducing blood pressure level among people in experimental group. There was no significant relationship between the hypertension and selected demographic variables. It was inferred that the abdominal breathing exercise was highly effective, which will reduce the blood pressure. Hence, H_1 was accepted.[26]

3. **Kumari R (2018)** was conducted an experimental study to assess the effectiveness of deep breathing exercise on lowering of blood pressure among secondary hypertensive patients in selected villages.

The sample setting was Panchayatan village, Greater Noida, Gautam Buddha Nagar, U.P. It shown that from baseline Mean score of pretest Systolic Blood Pressure and SD in Experimental Group was150.47 ±6.137 and after 15 minutes of Deep Breathing Exercise as intervention, the post test mean and SD on first day was 147.63 ±21.442.On the second day post test mean and SD was 140.77±9.982. On the third day post test mean and SD was 138.40 ±9.658.On the fourth day post test mean and SD was 131.50 ± 8.316 and On the fifth day post test mean and SD 137.2 ± 7.50. The Baseline Mean score of Pretest Systolic Blood Pressure and SD in Experimental Group was 91.30 ±3.678 and after 15 minutes of Deep Breathing Exercise as intervention, the post test mean and SD on first day was 85.40 ±5.899.On the second day post test mean and SD was 83.83±7.918. On the third day post test mean and SD was 84.63 ±5.968. On the fourth day post test mean and SD was 81.40 ± 8.764 and On the fifth day post test mean and SD79.50 ± 4.058.Hence the p value in Experimental Group is <0.001.This shows that there was gradual reduction in Systolic and Diastolic mean Blood Pressure and SD score after each intervention in Experimental Group. The Baseline mean score of pre-test Diastolic Blood Pressure and SD in Control Group was 98.50 ± 14.616 and after 15 minutes of Deep Breathing Exercise as intervention, the post test mean and SD on first day was 92.40 ±6.495.On the second day post test mean and SD was 93.40±5.468. On the third day post test mean and SD was 92.00±6.131. .On the fourth day post test mean and SD was 92.67±8.547 and on the fifth day post test mean and SD was 95.8±6.3. Hence, p value in control group was 0.363. This shows that there was no reduction in systolic and diastolic mean blood pressure and SD score in control group because no intervention was given.[27]

4. **Kathore V, More V (2 Nov 2019)** was conducted a study of effect of slow and deep breathing exercise on blood pressure among the patients with essential hypertension. The objectives of the study was to determine the effectiveness of deep breathing exercise on blood pressure among patients with essential hypertension. A randomized control trial research design carried out in the tertiary care centre, Sambalpur, Odisha. The study subjects were selected from medicine outpatients department. The systolic blood pressure range (140-160mmHg) and diastolic blood pressure range (80-100mmHg) with no change in medications for at least 2 months preceding the study. The total sample size was 100. Patients were assigned into two groups randomly i.e., study group and control group comprising of 50 patients each. The results of the study was in experimental group (SBP was 145.66±4.35) and control group (SBP was 151.62±3.94), 't' value=7.18, p=0.001* and in experimental group(DBP was 79.58±2.57) and control group (DPS was 83.92±2.21), 't' value=9.05 with the p value 0.001*. Here p value less than 0.05, shows that there was significant difference in the diastolic blood pressure. Therefore, practicing slow deep breathing exercise decreases the systolic and diastolic blood pressure of the patients with essential hypertension.[28]

5. **Salian A**, **Gireesh G.R**(**2022**) was conducted a study on effectiveness of abdominal breathing exercise on biological parameters among Hypertensive patients at selected tertiary care hospital, Mangaluru, India. This quasi experimental time series design was conducted at Yenepoya Medical College Hospital, Mangaluru, Karnataka, India from February 2021 to March 2021. A total of 60 samples were selected, with 30 samples in each of the control and experimental groups. Abdominal breathing exercise was given for 5-10 minutes about 3-4 times a day for seven days after the pretest of biological parameter assessment. Data was collected for three alternative days. The findings was that in the experimental group, the mean post-test value of systolic BP(133.3±11.2) p=0.01 was much

less than the control group (150.3±8.89) p=0.112. The mean and standard deviation post-test value of diastolic blood pressure (85.0±6.82)p=0.01, in the experimental group was much less than the control group(96.0±6.21)p=0.641. In experimental group post-test IQR (10) was much less than the control group (12.50) and in experimental group of systolic blood pressure Z value was 1.40 and in control group of systolic blood pressure Z value was 2.82 and in experimental group of diastolic blood pressure Z value was 1.82 and in control group of diastolic blood pressure Z value was 2.67. The obtained p values was <0.05, hence there was a difference in SBP &DBP. So, there is a significant difference in the BP after doing breathing exercise, hence there was an effectiveness of abdominal breathing exercise on BP among hypertensive patients.[29]

SUMMARY:

This chapter dealt with the Review of Literature.

3. RESEARCH METHODOLOGY:

Methodology refers to general pattern for organizing the procedure for the study. Research methodology is a way to systematically solve the research problem. It consists of the various steps that are generally adopted by a researcher in studying the problem along with the logic behind them. The methodology of research indicates the general pattern of organizing the procedure for gathering valid and reliable data for the purpose of the study. It is a procedure of empirical investigation. It includes the research approach, research design, research setting and sample technique, selection and development of tool, validity and reliability of the instrument, data collection procedure and plan for data analysis.

Researchers not only need to know how to develop certain indices or tests, how to calculate the mean, median or the SD or ANOVA, how to apply particular research techniques, but they also need to know which of these methods or techniques are relevant and which are not, and what would they mean and indicate and why.

Researchers also need to understand the assumptions underlying various techniques and they need to know the criteria by which they can decide that certain techniques and procedures will be applicable to certain problems and others will not. All this means that it is necessary for the researcher to design his methodology for his problem as the same may differ from problem to problem.[30]

3.1 METHODOLOGY FLOW CHART

Research Approach: Quantitative evaluative Approach

⇩

Research Design: Time series experimental research design

⇩

Research setting: Dukli urban health training centre

⇩

Target population: Hypertensive patient from Dukli urban health training centre at Agartala, Tripura

⇩

Accessible population: Patients who diagnosed with hypertension

⇩

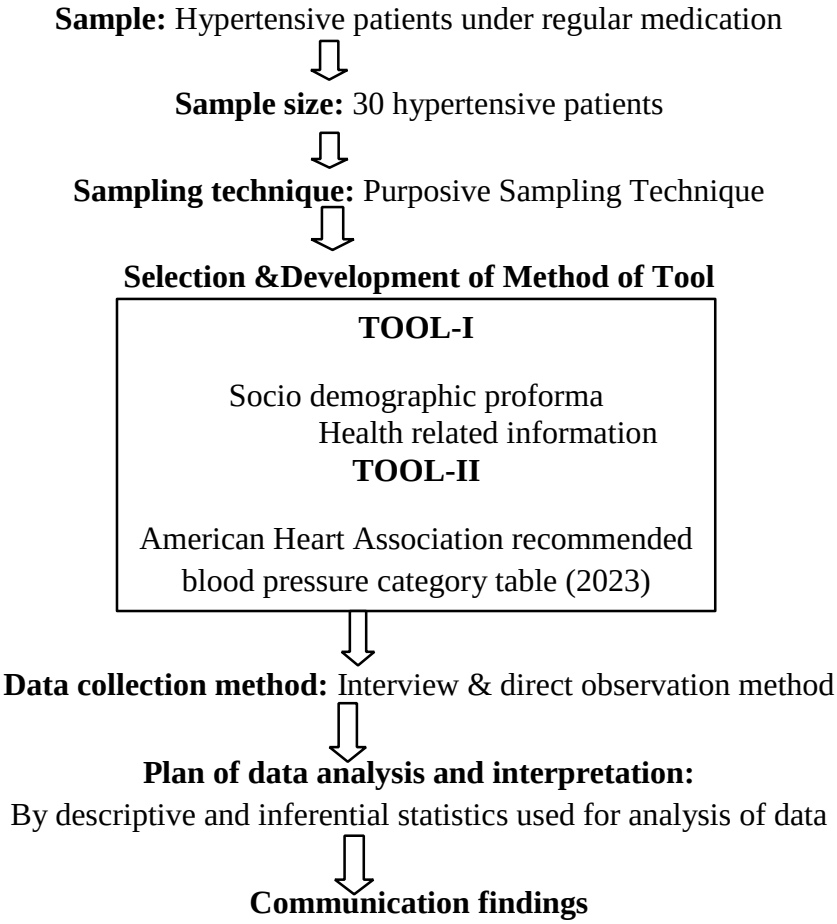

Fig 2: Schematic Representation of Research Methodology

RESEARCH APPROACH:

The research approach involves the description of the plan to investigate the phenomenon under study in a structured (quantitative), unstructured (qualitative) or a combination of the two methods (quantitative-qualitative integrated approach). Therefore, the approach helps to decide about the presence or absence as well as manipulation and control over variables. In addition, it also helps to identify the presence or absence of and comparison between groups. The approach of research study depends on several factors, but primarily on the nature of phenomenon under study.[14]

With a view of accomplishing the objectives in developing and effectiveness of breathing exercise **quantitative evaluative approach** was considered to be more appropriate.

RESEARCH DESIGN:

Research design can be defined as a blueprint to conduct research study which involves the description of research approach, study setting, sampling size, sampling technique, tools and method of data collection and analysis to answer a specific research question or for testing research hypotheses.[14]

In this study, time series experimental research design.

Experimental	Day-1 O_1 O_2 5 mins interval	X 21 mins	Day-15 O_3 O_4 5 mins interval
One group (sample size-30)	**Administration of tools.** **Tool-I: (1 time)** A. Socio-demographic Proforma B. Health related information **Tool-II: (2 times)** American Heart Associarion recommended blood pressure category table (2023).	Breathing Exercise 1.Diaphragmatic breathing 2.Glossopharyngeal breathing 3.Pursed lip breathing 4.Segmental breathing a) Apical breathing b)Lateral costal expansion c)Posterior costal expansion For 21 minutes/day	**Administration of tool-II:** American Heart Association recommended blood pressure category table (2023).

VARIABLES UNDER STUDY:

Variables are qualities, properties, or characteristics of person, things, or situations that change or vary. Chinn and Kramer stated that, ‘ Variables are concepts at different level of abstraction that are concisely defined to promote their measurement or manipulation within study'.[14]

The variables of the present study were-

- **Independent variables -** Breathing exercise.
- **Dependent variables -** Blood pressure among hypertensive patients.
- **Demographic variables -** Age, Gender, Type of family, Number of family members, Marital status, Occupational status, Family monthly income (Rs/month), Daily working hours, duration of hypertension, Do you have any other associated diseases along with hypertension, If yes, mention it, Are you taking any other alternative therapy to reduce hypertension, If yes, mention it, Family history of hypertension, If yes, relationship with that family members, B.M.I, Dietary pattern, Do you have any prior information regarding breathing exercise, If yes, source of information, Do you have any habits, if yes, tick the following, Sleeping hours/day.

SETTING OF THE STUDY:

The study setting is the location in which the research is conducted - it could be natural, partially controlled, or highly controlled. Natural or field setting is an uncontrolled real-life situation. In a partially controlled situation, environment is partially modified to control extraneous variables, while in highly controlled situations, study environment is fully controlled to combat the effect of extraneous variables.[14]

The present study was conducted at Dukli Urban Health Training Centre, Agartala, West Tripura. The centre was established in 2006. The centre was under Tripura Medical College & Dr. Bram Teaching Hospital, Agartala, West Tripura. The total population covered by this centre was 5145. The total number of family was 2440. Total number of Anganwadi centre was 9. There was 2 immunization centre and 2 primary school. 1 (one) Doctor 1 (one) who is incharge of this centre, MSW 1, (one) lab technichian, 2 (two) group – D.

POPULATION:

The entire set of individuals or objects having some common characteristics selected for a research study; sometimes referred to as the universe of the research study.

Target population: The entire population in which the researchers are interested and to which they would like to generalize the research findings.[14]

Accessible population: The aggregate of cases that conform to designated inclusion or exclusion criteria and that are accessible as subjects of the study.[14]

The target population in the present study comprises the hypertensive patients in Dukli Urban Health Training Centre, Agartala, West Tripura.

The accessible population was the population on whom the researcher has done the present study. The accessible population for the present study was hypertensive patients in Dukli Urban Health Training Centre, Agartala, West Tripura, who met the pre-set inclusion and exclusion criteria of the study.

SAMPLE AND SAMPLING TECHNIQUE:

Sampling is the process of selecting a representative part of the population. Thus, a carefully carried out sampling process helps to draw a sample that represents the characteristics of the population from which the sample is drawn.[14]

In the present study, the researcher used the purposive sampling technique for selecting the sample.

Sample may be defined as representative unit of a target population, which is to be worked upon by researchers during their study.[14]

In the present study the sample was hypertensive patients in Dukli Urban Health Training Centre, Agartala, West Tripura.

SAMPLE SIZE:

Sample size refers to the number of subjects, events, behaviors, or situations that are examined in a study. It is very essential to determine the size of the sample, so that the researcher can plan the implementation of the sampling process accordingly.[14]

In this study the researcher selected 30 hypertensive patients from Dukli urban health training centre at Agartala, Tripura.

CRITERIA FOR SAMPLE SELECTION:

INCLUSION CRITERIA: Hypertensive patient-

1. who were taking regular drugs of calcium channel blocker (Tab.amlodipine).

2. age group from 18-50 years.

3. who were diagnosed more than 6 months.

4. who can understand Bengali.

5. who were having ≥ hypertension stage-1 (130/80mmHg).

EXCLUSION CRITERIA: Hypertensive patient-

1. who were diagnosed more than 10 years .

2. who were having critical condition.

3. who were doing regular physical exercises.

4. who were not able to do breathing exercises.

SELECTION AND DEVELOPMENT OF TOOLS:

Tools were prepared on the basis of the objectives of the study. The tools were prepared by the researcher on his personal and professional experience. Socio-demographic proforma was prepared to collect the background information of the samples. According to American Heart Association recommended blood pressure category table(2023) was prepared to assess the pre-existing level of blood pressure among hypertensive patients. Following steps were carried out in the development of tools.

Review of literature -

Related review of literature from journals, articles, thesis, and dissertations were reviewed and used for development of tools.

Experts opinion and consultation with Guide and Co-guide -

The tools were further modified and finalized after experts opinion and consultation with Guide and Co-guide.

Development of final draft -

The researcher had prepared the final draft of Socio-demographic proforma and according to American Heart Association recommended blood pressure category table (2023) after incorporating the valuable suggestions of the experts.

In final draft of the tools, the total items kept in the Socio-demographic proforma were 17 (twenty) items and in the American Heart Association recommended blood pressure category table(2023) were 4 (four) category.

DESCRIPTION OF TOOL:

After an extensive review of literature, experts opinion and discussion with the Guide and Co-guide, Socio-demographic proforma and American Heart Association recommended blood pressure category table(2023) were developed.

Description of the tools consists of two main sections.

TOOL-I

A. Socio demographic profoma:

- Age, Gender, Type of family, Number of family members, Marital status, Occupational status, Family monthly income (Rs/month), Daily working hours.

B. Health related information:

- Duration of hypertension, Do you have any other associated diseases along with hypertension, If yes, mention it, Are you taking any other alternative therapy to reduce hypertension, If yes, mention it, Family history of hypertension, If yes, relationship with that family members, B.M.I, Dietary pattern, Do you have any prior information regarding breathing exercise, If yes, source of information, Do you have any habits, if yes, tick the following, Sleeping hours/day.

TOOL-II

American Heart Association recommended blood pressure category table.

The sources of the tool were developed by American Heart Association in the year (2023).

It consists of 4 (four) category. In (category 1) **Normal,** (category 2) **Elevated,** (category 3) **Hypertension stage-1** and (category 4) **Hypertension stage-2,** were developed by American Heart Association in the year 2023.

VALIDITY OF TOOL:

Validity of tool were done by total 9 Experts of related fields on Master's in Medical Surgical Nursing Specialty (8), medicine physician (1).

As per the experts opinion, in tool-I: Socio-demographic proforma

- Item no. 2, 3, 7, 10(i), 11(i) (ii), 12(i) (ii), 15(i) (ii), 16(i), 17-100% relevant.
- Item no. 1, 4, 5, 6, 8, 9, 10(ii), 13, 14, 16(ii)-need modification.
- Item no. 4-not relevant.

Validator-1:

- Excluded the item no. 8 (Daily working hours).
- Mention the DASH diet specifically in item no. 14 (Dietary pattern).

Validator-2:

- Excluded the item no. 4 (Number of family members).
- Mention the DASH diet specifically in item no. 14 (Dietary pattern).
- Option should be specify more in item no. 16(ii) (Do you have any habits).

Validator-3:

- Add the option in item no. 9 (Duration of hypertension).

Validator-6:

- Add age in year in item no. 1 (Age).

Validator-7:

- Mention the DASH diet specifically in item no. 14 (Dietary pattern).

Validator-8:

- Suggested to used SES scale in item no. 4 (Number of family members), item no. 5 (Marital status) and item no. 6 (Occupational status).
- Suggested to used record analysis in item no. 9 (Duration of hypertension) and item no. 10(ii) (If yes, mention it…)

Validator-9:

- Mention the associated diseases at option no. (i) Heart disease, (b) Kidney disease, (c) Hereditary disease, (d) Deficiency disease, (e) Others- in item no. 10(ii) (If yes, mention it…)
- Mention the DASH diet specifically in item no. 14 (Dietary pattern).

All the items remarked as **'Need Modification'** by the experts, were modified in the final draft of the tool after discussion with the Guide and Co-guide.

The items remark as **'Not relevant'** by the expert- item no.4 (Number of family members) was not excluded from the tool after discussion with the Guide and Co-guide.

As per the experts opinion, in Tool-II: American Heart Association recommended blood pressure category table (2023).

- 100% relevant.

RELIABILITY OF TOOL:

- **Date:** 6/03/2024
- **Setting:** . Amtali (Sub Centre) Bypass Baishnabtilla, Agartala, West Tripura
- **Sample:** 10
- **Reliability of tool:** Reliability of sphygmomanometer and stethoscope was tested by inter-rater method formula on 10 samples. The reliability was **0.8,** which indicated that the tool was good reliable.

RESEARCH ASSISTANT:

Name: Ch. Dhanapriyari Devi

Qualification: PBB.Sc

Designation: Staff nurse at Tripura Medical College and Dr.BRAM Teaching Hospital.

ETHICAL CONSIDERATION:

☒ The permission was obtained from the research committee of Tripura College of Nursing, Hapania, Agartala, West Tripura.

☒ The ethical clearance obtained from the institutional ethics committee (IEC) of society for TMC & DR.BRAM Teaching Hospital, Agartala, West Tripura.

☒ Written consent obtained from the authority of the urban community area of Agartala for conducting main study and pilot study.

☒ Informed consent was obtained from the participants.

PILOT STUDY:

A pilot study is referred to a small-scale preliminary try out of the method to be used in an actually large study, which acquaints the researcher with problems that can be corrected in proportion for the large research study or is done to provide the researcher with an opportunity to try out the procedure, methods, and tools of data collection.[14]

In the present study, pilot study was done at Amtali (Sub Centre) Bypass Baishnabtilla, Agartala, West Tripura. There was 1 (One) Community Health Officer, who was the In-charge of the centre, 1 (One) MPS (Multipurpose Supervisor) and 4 (Four) ASHA workers in this centre.

The result of the pilot study showed that -

Maximum 40% of the samples of hypertensive patients were belongs to the age group of 41-45 years, followed by 30% of the samples belongs to the age group of 46-50 years, 20% of the samples belongs to the age group of 36-40 years and only 10% of the samples belongs to the age group of 20-25 years.

Mostly 70% of the samples of hypertensive patients were female and only 30% of the samples were male.

50% of the samples of hypertensive patients were belongs in both nuclear and joint family.

Most of the 70% samples of hypertensive patients, the total number of family members staying with the sample were 1-5 nos. of family members, followed by 20% were 6-10 nos. of family members and only 10% of the samples were staying with 11-15 nos. of family members.

All of the 100% samples of hypertensive patients were married.

Maximum 60% of the samples of hypertensive patients were housewife and only 40% of the samples were self employment.

Maximum 70% of the samples of hypertensive patients, their monthly family income were Rs. 5,001-9,999/month, followed by 20% of the samples monthly family income were Rs. ≥20,000/month and only 10% of the samples monthly family income 10,000-14,999/month.

Most of the 60% samples of hypertensive patients, daily working hours were 7-9 hours and 20% of the samples were found in both 4-6 hours and 10-12 hours.

Maximum 40% of the samples of hypertensive patients were found in both ≥6months and 1year-3years and only 10% were found in both 3years-5years and 6years-8years.

Most of the 80% samples of hypertensive patients belongs to no and only 20% of the samples were belongs to yes.

50% of the samples were found in both thyroid and diabetes mellitus.

All of the 100% samples of hypertensive patients were not taking any other alternative therapy to reduce hypertension.

Mostly of the 90% samples of hypertensive patients were belongs to yes and only 10% of the samples were belongs to no.

Most of the 10% samples of hypertensive patients were family history of HTN.

Maximum 50% of the samples of hypertensive patients were 18.5-22.9kg/m^2 , followed by 40% of samples were 23.0-24.9kg/m^2 and only 10% of the samples were <18.5kg/m^2.

Maximum 70% of the samples of hypertensive patients were taken mixed diet (non veg & veg), and only 30% were taken salt restricted diet.

All of the 100% samples were not getting any prior information regarding breathing exercise.

Maximum 60% of the samples of hypertensive patients were not having any habits and only 40% of the samples were having habits.

Most of the 40% samples of hypertensive patients were taken pan and battle nuts.

Mostly 90% of the samples, sleeping hours/day were 6-7 hours and only 10% of the samples were 8-9 hours.

In pre-test out of 10 samples of hypertensive patients, systolic 10% of the samples were found in elevated category, 20% of the samples were found in hypertension stage-1 category and 70% of the samples were found in hypertension stage-2 category and diastolic 50% of the samples were found in hypertension stage-1 category and 50% of the samples were found in hypertension stage-2 category. Whereas, in post-test out of 10 samples of hypertensive patients, systolic 40% of the samples were found in elevated category and 60% of the samples were found in hypertension stage-1 category and diastolic 20% of the samples were found in normal category, 50% of the samples were found in hypertension stage-1 category and 30% of the samples found in hypertension stage-2 category. So, it indicated that there was a reduction in blood pressure after administration of breathing exercise.

The mean post test of systolic and diastolic (138±0.54) and (85±0.20) respectively was lower than the pre-test level of blood pressure for both systolic and diastolic (141±1.46) and (89±0.48) with the mean difference of systolic & diastolic . The paired ‘t’ test value systolic (18.4) and diastolic (20.2) was also found significant at 0.05 level of significance (df=9, table value=2.26). It indicated that the mean post test was significantly lower than the mean pre-test level of blood pressure for both systolic and diastolic. So, breathing exercise were an effective measures to reduce the blood pressure among the hypertensive patients.

Analysis of Variance (ANOVA) ‘F’ value showed significant association between the HTN & family monthly income i.e, 37.36 higher than the ‘F’ value in df=2 & 7 . So, it indicated that family monthly income was dependent variable.

And other variables i.e, age (in years), number of family members, daily working hours, duration of hypertension and B.M.I. So, it indicated that these were independent variables..

PROCEDURE FOR DATA COLLECTION:

- Researcher was hiring 2 (two) ASHA workers from the Government Dukli Sub-Centre.

- With the help of 2 (two) ASHA workers, on 6/5/2024, 30 hypertensive patients were selected by purposive sampling technique.

- On that day (6/5/2024), consent was taken from the participants and the pre-existing level of blood pressure was assessed with sphygmomanometer and socio-demographic proforma was assessed through interview method.

- From 7/5/2024 to 21/5/2024, Breathing exercise was performed with the samples as an intervention.

- For giving intervention the 30 samples were divided into 2 groups (15 in each group). The duration of the exercise was 21 minutes, 2 times per day (morning group 1, 7.30am to 11am & evening group 2, 3pm to 6.30pm) for 15 consecutive days.

- Everyday, researcher and assistant of researcher done 2 times pre-test and 2 times post-test. There was 5 minutes gaps between 2 times of each test for 15 consecutive days.

- After each session lite refreshments was provided to the samples.

- Intensive was given to 2 (two) ASHA workers.

Table No.-1: Data Collection Method

Data Collection Procedure	Day	Number of Participants	Duration
1. A.Socio- demographic proforma	**Pre-test Day-1 (1st group)** (06/05/2024)	15	15 X 10 mins = 150 mins (2 hours 30mins)
B.Health related information	**Day-1 (2nd group)** (06/05/2024)	15	15 X 10 mins = 150mins (2hours 30mins)

2. Pre-test with the help of American Heart Association recommended blood pressure category table (2023)	**Pre-test Day-2nd – Day 16th** (07/05/2024 to 21/05/2024) **1st group** **2nd group**	 15 15	(8 participants B.P was checked by researcher) (7 participants B.P was checked by assistant of researcher) 3+3mins (for checking B.P) + (5mins interval) X 8 = 88 mins (1 hours 28 mins) 3+3mins (for checking B.P) + (5mins interval) X 8 = 88 mins (1 hours 28mins)
3. Breathing exercises	**Intervention Day-2nd- 16th** (07/05/2024 to 21/05/2024)	30	21 mins/day.
	After intervention 30 mins break Day-2nd -16th (07/05/24 to 21/05/2024) **1st group** **2nd group**	 15 15	 30 mins 30 mins

4. Post-test with the help of that same American Heart Association recommended blood pressure category table (2023)	**Post-test Day-2nd-16th** (07/05/2024 to 21/05/2024) **1st group**	15	**Total:-** 88mins +21mins + 30mins+ 88 mins =227mins (3hours 47mins/day)
	2nd group	15	88mins+ 21mins +30mins + 88mins =227mins (3 hours 47mins/day)

PLAN OF DATA ANALYSIS:

Data analysis were done by using descriptive and inferential statistics.

Descriptive statistics –

- Frequency and percentage distribution were used to describe the socio-demographic proforma.
- Mean, Median, Standard deviation and Mean difference were used to describe the pre-test and post-test score of blood pressure.
- Skewness and Ogive were used to evaluate the effectiveness of breathing exercise.

Inferential statistics –

- Paired 't' test was used to evaluate the effectiveness of breathing exercise on blood pressure among the hypertensive patients.
- Analysis of Variance (ANOVA) was used to find out the association between pre-existing level of blood pressure among hypertensive patients with their selected demographic variables.
- The analysed data were presented in the form of tables, diagrams, and graphs based on the study findings.

SUMMARY:

This chapter has dealt with the flow chart of research methodology, research approach, research design, variables under study, setting of the study, population, sample and sampling technique, sample size, criteria for sample selection, selection and development of tools, description of tools, validity of tools, reliability of tool, ethical consideration, pilot study, procedure for data collection, and plan for data analysis.

4. ANALYSIS & INTERPRETATION OF DATA

Analysis and interpretation of data is the most important phase of the research process, which involves the computation of certain measures along with searching for patterns of relationship that exists among data groups. Data collection is followed by the analysis and interpretation of data, where collected data are analyzed and interpretated in accordance with the study objectives. Analysis and interpretation of data includes compilation, editing, coding, classification and presentation of data.[14]

The purpose of analyzing the data in a study is to describe the data in meaningful terms as the data collected does not answer the research questions or test research hypotheses.

The data used is to be systematically analyzed so that trends and patterns of relationships can be detected.

Analysis and interpretation of data is defined as the process of systematically applying statistical and logical techniques to describe, summarize and compare data.[14]

This chapter deals with the analysis and interpretation of the data collection from 30 (thirthy) samples of hypertensive patients by administering Socio-demographic proforma and American Heart Association recommended blood pressure category table (2023).

OBJECTIVES OF THE STUDY:

1. To assess the pre existing blood pressure among hypertensive patients.
2. To evaluate the effectiveness of breathing exercise on blood pressure among hypertensive patients.
3. To find the association between the pre test score of blood pressure among hypertensive patients with their selected demographic variables.

HYPOTHESES OF THE STUDY:

All hypotheses were tested at 0.05 level of significant.

- H_1: There is a significant differences between the pre and post test level of blood pressure among the hypertensive patients.
- H_2: There is a significant association between pre test score of high blood pressure with their selected demographic variables.

Null hypotheses:

- **H_{01}:** There is no significant difference between the pre and post test level of blood pressure among the hypertensive patients.
- **H_{02}:** There is no significant association between pre test score of high blood pressure with their selected demographic variables.

ORGANIZATION AND PRESENTATION OF DATA:

The data were presented according to the objectives set for the study. The data were organized and presented under the following headings.

- **Section-1:** Findings related to the frequency and percentage distribution of Socio-demographic proforma.
- **Section-2:** Findings related to effectiveness of breathing exercise on blood pressure among hypertensive patients.
- **Section-3:** Findings related to the association between the pre test score of blood pressure among hypertensive patients with their selected demographic variables.

SECTION-I

FINDINGS RELATED TO THE FREQUENCY & PERCENTAGE DISTRIBUTION OF SOCIO-DEMOGRAPHIC PROFORMA

Table No.-2: Frequency and percentage distribution of Socio-demographic proforma

n=30

Sl no.	Demographic Proforma		Frequency	Percentage
1.	Age (in years)	a)20-25years	0	0%
		b)26-30years	2	6.7%
		c)31-35years	2	6.7%
		d)36-40years	6	20%
		e)41-45years	7	23.3%
		f)46-50years	13	43.3%
2.	Gender	a)Male	9	30%
		b)Female	21	70%
3.	Types of family.	a)Nuclear	23	76.7%
		b)Joint	7	23.3%
		c)Extended	0	0%
4.	Number of family members.	a)1-5	23	76.7%
		b)6-10	5	16.6%
		c)Extended family	2	6.7%
5.	Marital status	a)Married	29	96.6%
		b)Unmarried	0	0%
		c)Widow/widower	1	3.4%
		d)Separated	0	0%
		e)Divorce	0	0%
6.	Occupational status	a)Housewife	17	56.6%
		b)Daily labourer	0	0%

		c)Self-employment	10	33.4%
		d)Private employee	3	10%
		e)Government employee	0	0%
7.	Family monthly income (Rs/month)	a)≤5,000/month	0	0%
		b)5001-9,999/month	10	33.3%
		c)10,000-14,999/month	15	50%
		d)15,000-19,000/month	4	13.3%
		e)≥20,000/month	1	3.4%
8.	Daily working hours	a)4-6 hours	5	16.6%
		b)7-9 hours	19	63.4%
		c)10-12 hours	6	20%
9.	Duration of hypertension.	a)≥6 months	9	30%
		b)1years-3years	7	23.3%
		c)3years-5 years	10	33.3%
		d)6years-8years	3	10%
		e)≤10years	1	3.4%
10(i).	Do you have any other associated disease along with HTN?	a)Yes	12	40%
		b)No	18	60%
(ii).	If yes, mention it…	a)Thyroid	1	8.4%
		b)Diabetes Mellitus	8	66.6%
		c)Joint Pain	2	16.6%
		d)Gastritis	1	8.4%
11(i).	Are you taking any other alternative therapy to reduce HTN?	a)Yes	0	0%
		b)No	30	100%
(ii).	If yes, mention it…			
12(i).	Family history of HTN?	a)Yes	6	20%
		b)No	24	80%
(ii).	If yes, relationship with that family members.	a)Father	4	66.6%
		b)Mother	2	33.4%
13.	B.M.I	a)<18.5kg/m^2	2	6.7%
		b)18.5-22.9kg/m^2	5	16.6%
		c)23.0-24.9kg/m^2	16	53.4%
		d)>25kg/m^2	7	23.3%
14.	Dietary pattern	a)Mixed diet (non-veg & veg)	24	80%
		b)Salt restricted diet	6	20%

		c)Only non-veg diet maximum time	0	0%
		d)Low fat diet	0	0%
		e)Fast food most of the time	0	0%
15(i)	Do you have any prior information regarding breathing exercises?	a)Yes	1	3.4%
		b)No	29	96.6%
(ii).	If yes, source of information.	a)Family	0	0%
		b)Friends	0	0%
		c)Mass media	0	0%
		d)Health professional	1	100%
		e)Voluntary organization	0	0%
		f)Others	0	0%
16(i).	Do you have any habits?	a)Yes	18	60%
		b)No	12	40%
(ii).	If yes, tick the following.	a)Smoking	1	5.6%
		b)Alcohol	0	0%
		c)Pan & battles nuts	17	94.4%
		d)Khaini	0	0%
		e)Zarda	0	0%
		f)Others	0	0%
17.	Sleeping hours/day	a)6-7 hours b)8-9 hours	16 14	53.3% 46.7%

Data presented in the **Table no.-2** revealed that, out of 30 (thirty) samples of the hypertensive patients-

Maximum 43.3% of the samples of hypertensive patients were belongs to the age group of 46-50 years, followed by 23.3% of the samples belongs to the age group of 41-45 years, 20% of the samples belongs to the age group of 36-40 years and only 6.7% of the samples belongs to the age group of 31-35 years and 26-30 years.

Most of the 70% samples of hypertensive patients were female and only 30% of the samples were male.

Most of the 76.7% samples of hypertensive patients were belongs to nuclear family, followed by 23.3% of the samples were belongs to joint family and 0% of the samples were belongs to extended family.

Most of the 76.7% samples of hypertensive patients, the total number of family members staying with the sample were 1-5 nos. of family members, followed by 16.6% were 6-10 nos. of family members and only 6.7% of the samples were staying with 11-15 nos. of family members.

Mostly 96.6% of the samples were married, followed by 3.4% of the samples were widow/widower, 0% of the samples were unmarried, 0% of the samples were separated and 0% of the samples were divorce.

Maximum 56.6% of the samples of hypertensive patients were housewife, followed by 33.4% of the samples were self employment, 10% of the samples were private employee, 0% of the samples were daily labourer and 0% of the samples were government employee.

Most of the 50% samples of hypertensive patients, their monthly family income were Rs. 10,000-14,999/month, followed by 33.3% of the samples monthly family income were Rs. 5001-9,999/month, 13.3% of the samples monthly family income 15,000-19,000/month, 3.4% of the samples were ≥20,000/month and 0% of the samples were ≤5,000/month.

Most of the 63.4% samples of hypertensive patients, daily working hours were 7-9 hours, followed by 20% of the samples were belongs to 10-12 hours and only 16.6% of the samples were 4-6 hours.

Out of 30 (thirty) samples, 33.3% of the samples of hypertensive patients were found in 3years-5years, followed by 30% were found in ≥6months, 23.3% of the samples were found in 1years-3years, 10% of the samples were found in 6years-8years and 3.4% of the samples were found in ≤10 years.

Maximum 60% of the samples of hypertensive patients belongs to no and only 40% of the samples were belongs to yes.

Out of the 30 (thirty) samples, 66.6% of the samples were suffering from diabetes mellitus, followed by 16.6% of the samples were suffering from joint pain and only 8.4% of the samples were suffering from thyroid and gastritis.

All of the 100% samples of hypertensive patients were not taking any other alternative therapy to reduce hypertension.

Mostly of the 83.3% samples of hypertensive patients were belongs to yes and only 16.6% of the samples were belongs to no.

Maximum 66.6% samples of hypertensive patients were having family history of HTN with father and only 33.3% of the samples were having family history of HTN with mother.

Maximum 53.4% of the samples of hypertensive patients were belongs to <18.5kg/m^2 , followed by 23.3% of samples were belongs to >30kg/m^2, 16.6% of the samples were belongs to 18.5-24.9kg/m^2 and only 6.7% of the samples were <18.5kg/m^2.

Maximum 80% of the samples of hypertensive patients were taken mixed diet (non veg & veg), followed by 20% were taken salt restricted diet, 0% of the samples were taken only non-veg diet maximum time, 0% of the samples were taken low fat diet and 0% of the samples were taken fast food most of the time.

Mostly 96.6% of the samples were not getting any prior information regarding breathing exercise and only 3.4% of the samples were getting information regarding breathing exercise.

All of the 100% of the samples were getting information from health professional.

Maximum 60% of the samples of hypertensive patients were having habits and only 40% of the samples were not having habits.

Maximum 94.4% samples of hypertensive patients were belongs to pan and battle nuts, followed by 5.6% of the samples were belongs to smoking, 0% of the samples were belongs to alcohol, 0% of the samples were belongs to khaini, 0% of the samples were belongs to zarda and 0% of the samples were belongs to others .

Maximum 53.3% of the samples, sleeping hours/day were 6-7 hours and only 46.7% of the samples were 8-9 hours.

The data were also represented in the graphs.

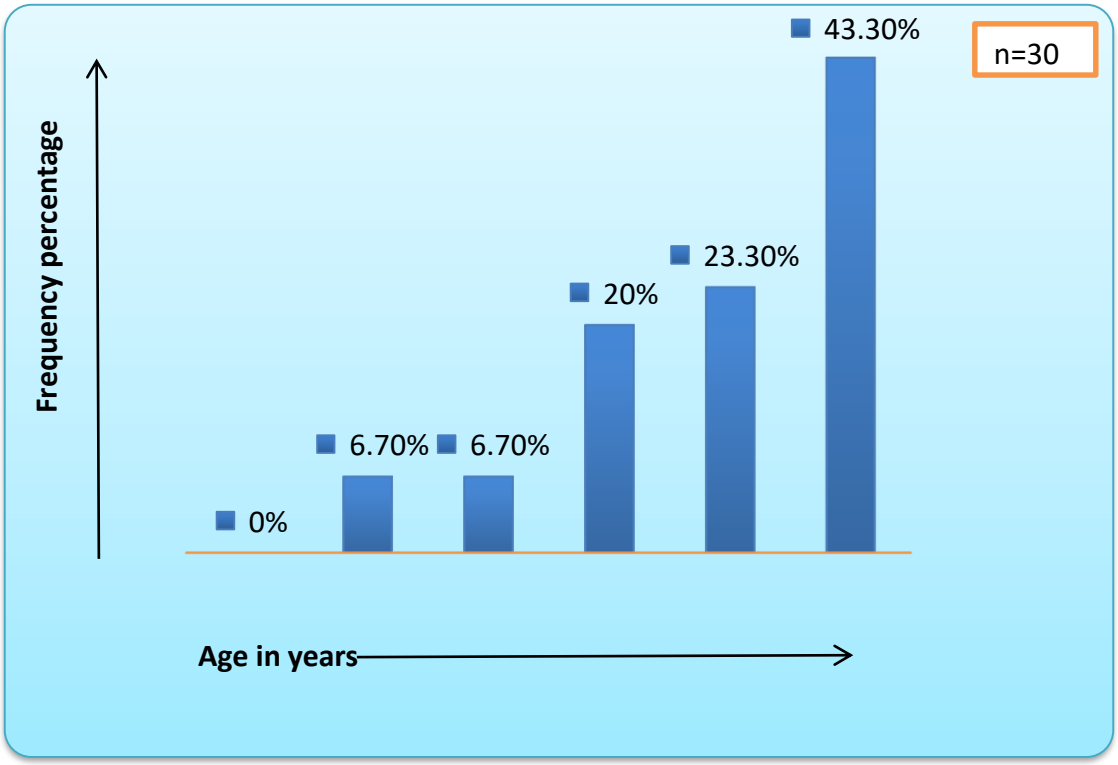

Fig-3: Bar diagram showing frequency and percentage distribution of age of hypertensive patients.

Data presented in the **Fig-3** showed that out of the 30 samples of hypertensive patients, 43.30% of the samples were belongs to the age group of 46-50 years, followed by 23.30% of the samples were belongs to the age group of 41-45years, 20% of the samples were belongs to the age groups of 36-40years and only 6.70% of the samples were belongs to the age group of both 26-30years and 31-35years.

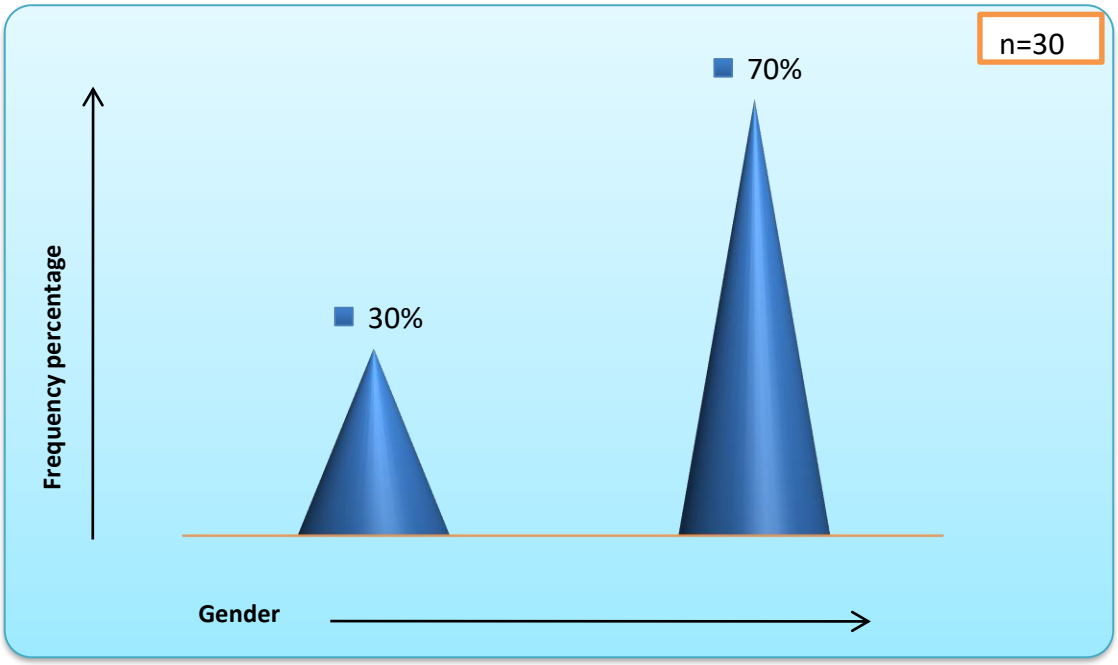

Fig-4: Cone shape bar diagram showing frequency and percentage distribution of gender of hypertensive patients.

Data presented in the **Fig-4** showed that mostly 70% of the samples of the hypertensive patients were female and only 30% of the samples were male.

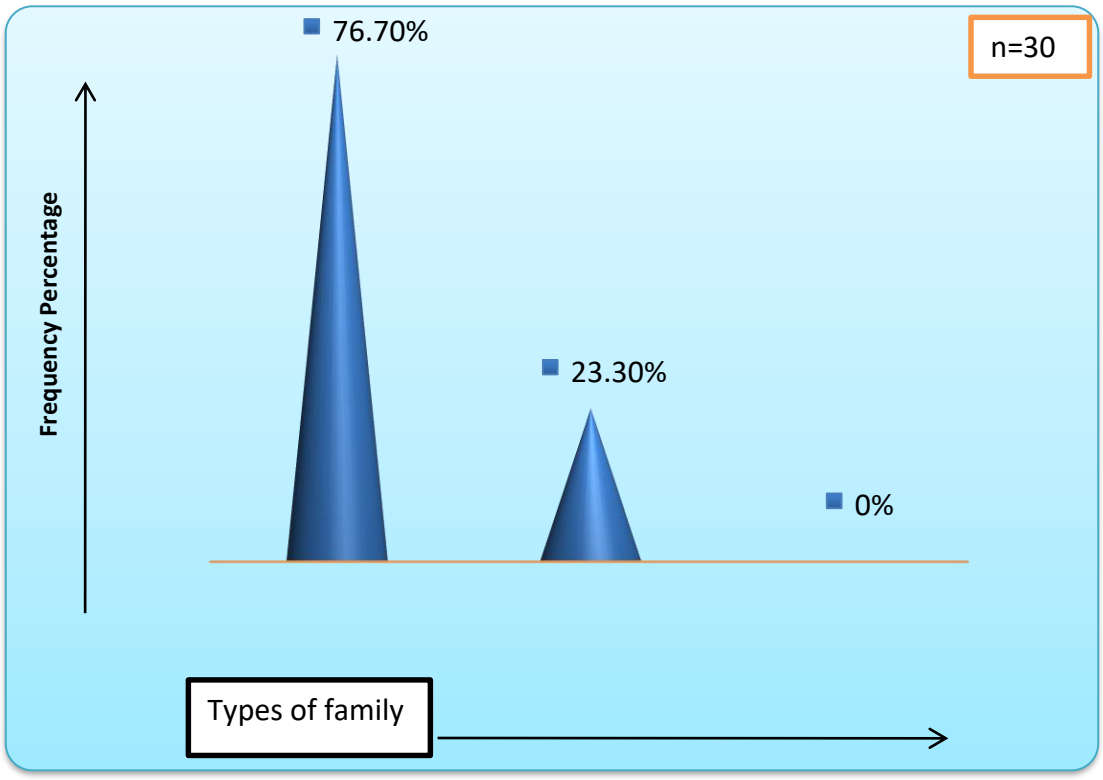

Fig-5: Cone shape bar diagram showing frequency and percentage distribution of types of family of hypertensive patients.

Data presented in the **Fig-5** showed that most of the 76.70% samples of the hypertensive patients were belongs to nuclear family and only 33.30% of the samples were belongs to joint family.

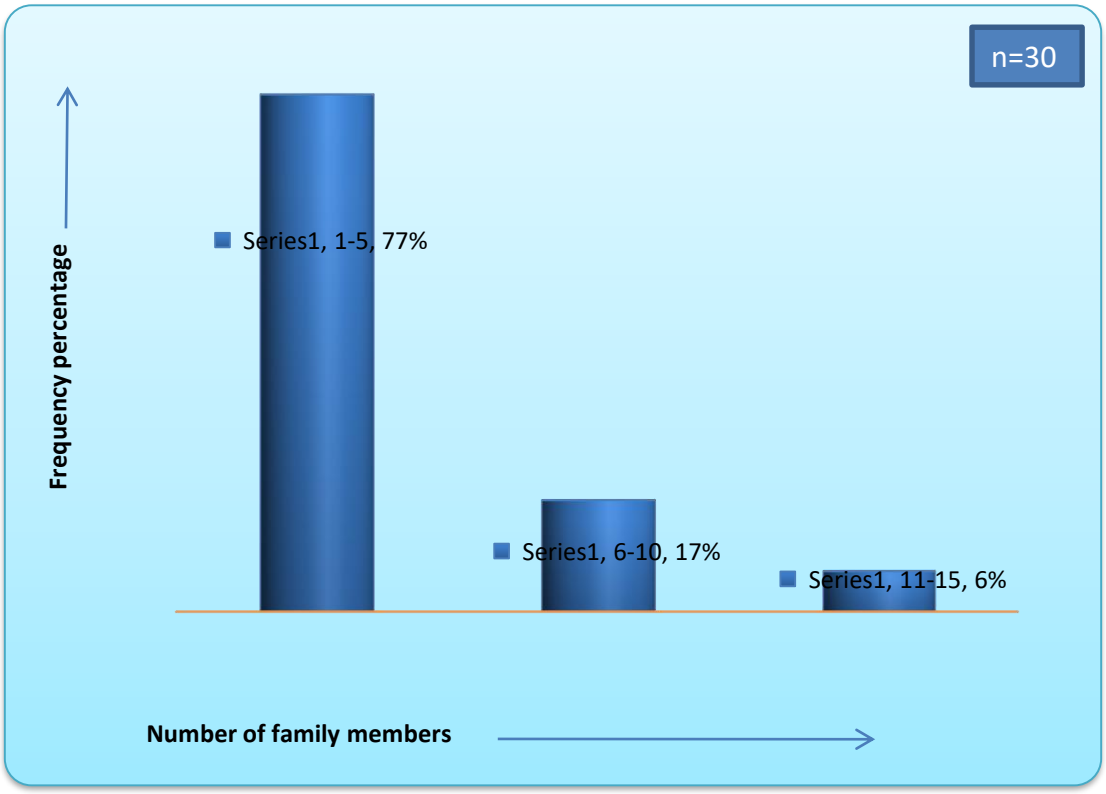

Fig-6: Cylindrical shape bar diagram showing frequency and percentage distribution of number of family members of hypertensive patients.

Data presented in the **Fig-6** showed that most of the 77% samples of the hypertensive patients were belongs to 1-5 nos. of family members, followed by 17% of the samples were belongs to 6-10 nos. of family members and only 6% of the samples were belongs to 11-15 nos. of family members.

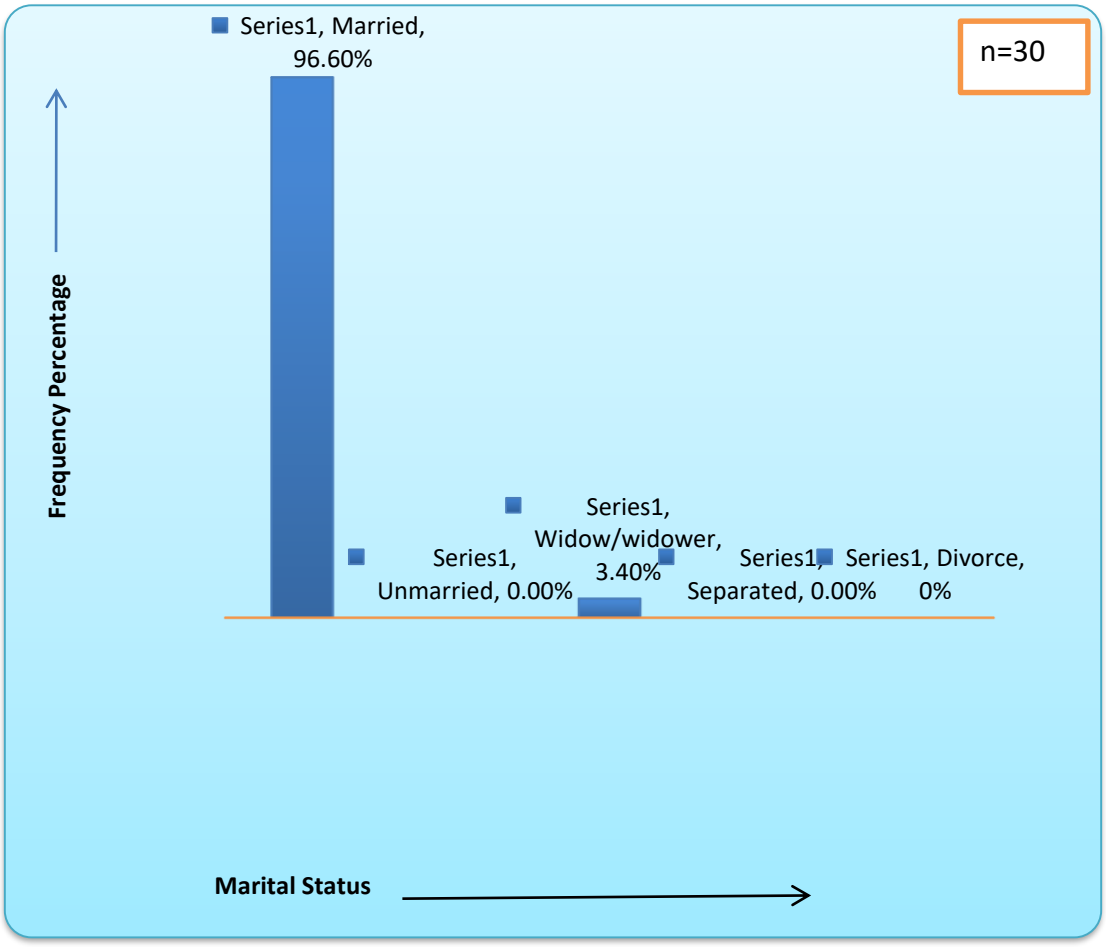

Fig-7: Bar diagram showing frequency and percentage distribution of marital status of hypertensive patients.

Data presented in the **Fig-7:** showed that mostly 96.6% samples of the hypertensive patients were married and only 3.40% of the samples were widow/widower.

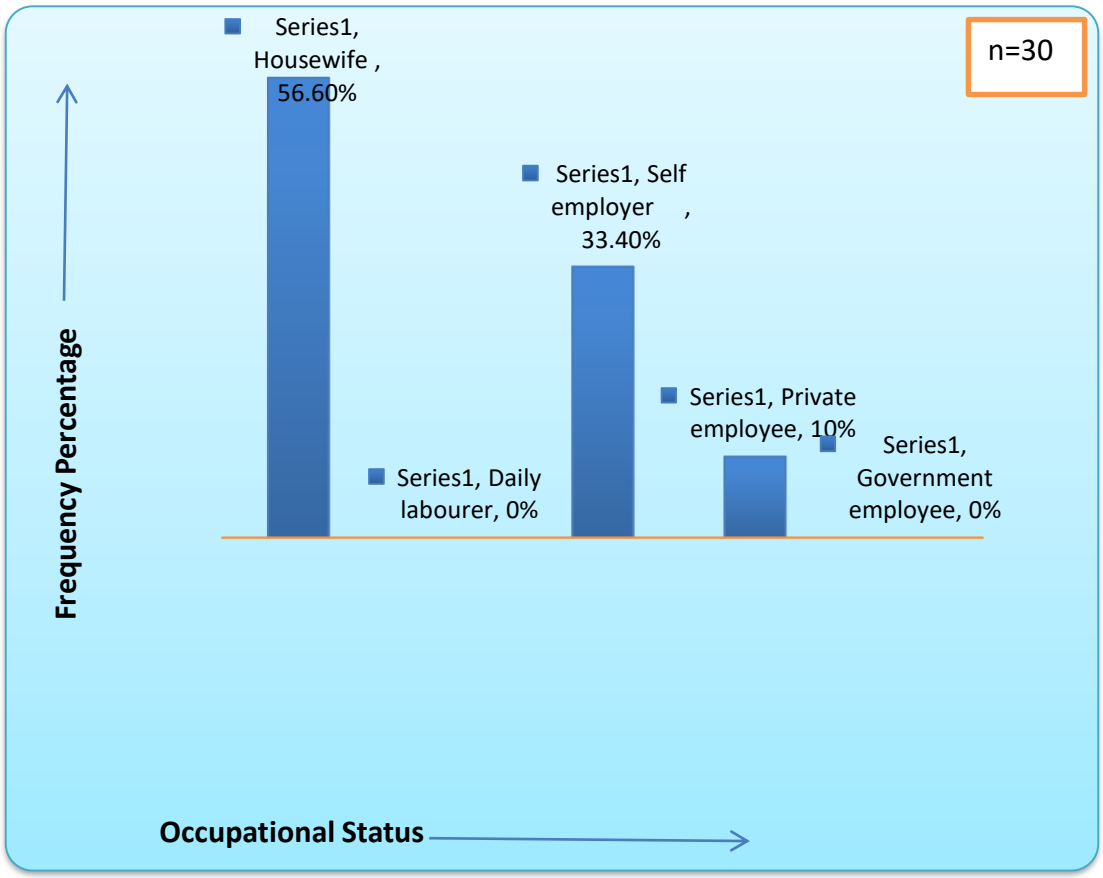

Fig-8: Bar diagram showing frequency and percentage distribution of occupational status of hypertensive patients.

Data presented in the **Fig-8** showed that maximum 56.60% of the samples of hypertensive patients were belongs to housewife, followed by 33.40% of the samples were self employer and only 10% of the samples were belongs to private employee.

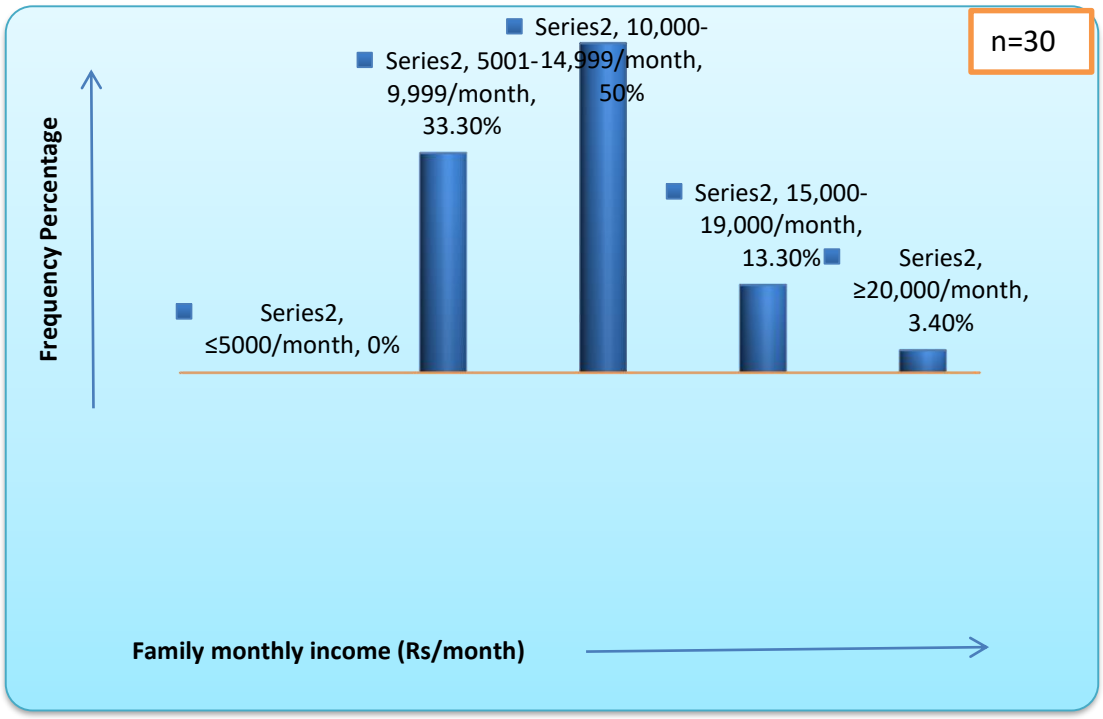

Fig-9: Cylindrical shape bar diagram showing frequency and percentage distribution of family monthly income (Rs/month) of hypertensive patients.

Data presented in the **Fig-9** showed that most of the 50% of the samples of hypertensive patients were belongs to 10,000-14,999/month, followed by 33.30% of the samples were belongs to 5001-9,999/month, followed by 13.30% of the samples were belongs to 15,000-19,000/month and only 3.40% of the samples were belongs to ≥20,000/month .

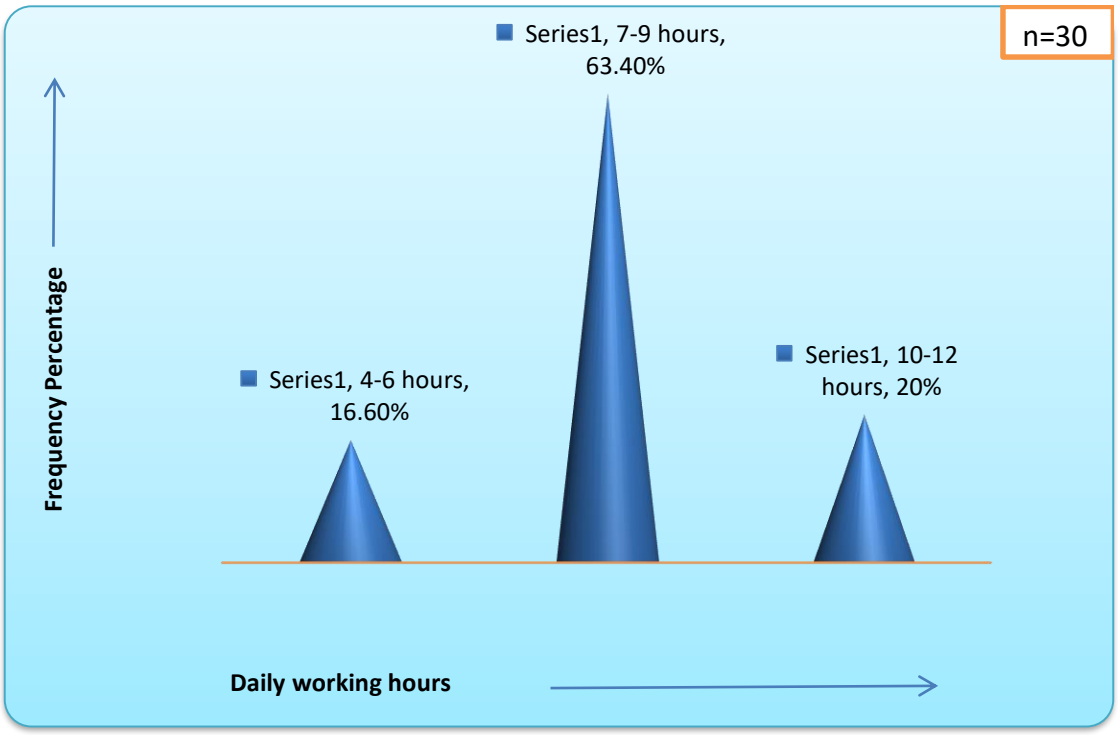

Fig-10: Cone shape bar diagram showing frequency and percentage distribution of daily working hours of hypertensive patients.

Data presented in the **Fig-10** showed that maximum 63.40% of the samples of hypertensive patients were daily working hours from 7-9hours, followed by 20% of the samples were from 10-12hours and only 16.60% of the samples were from 4-6 hours.

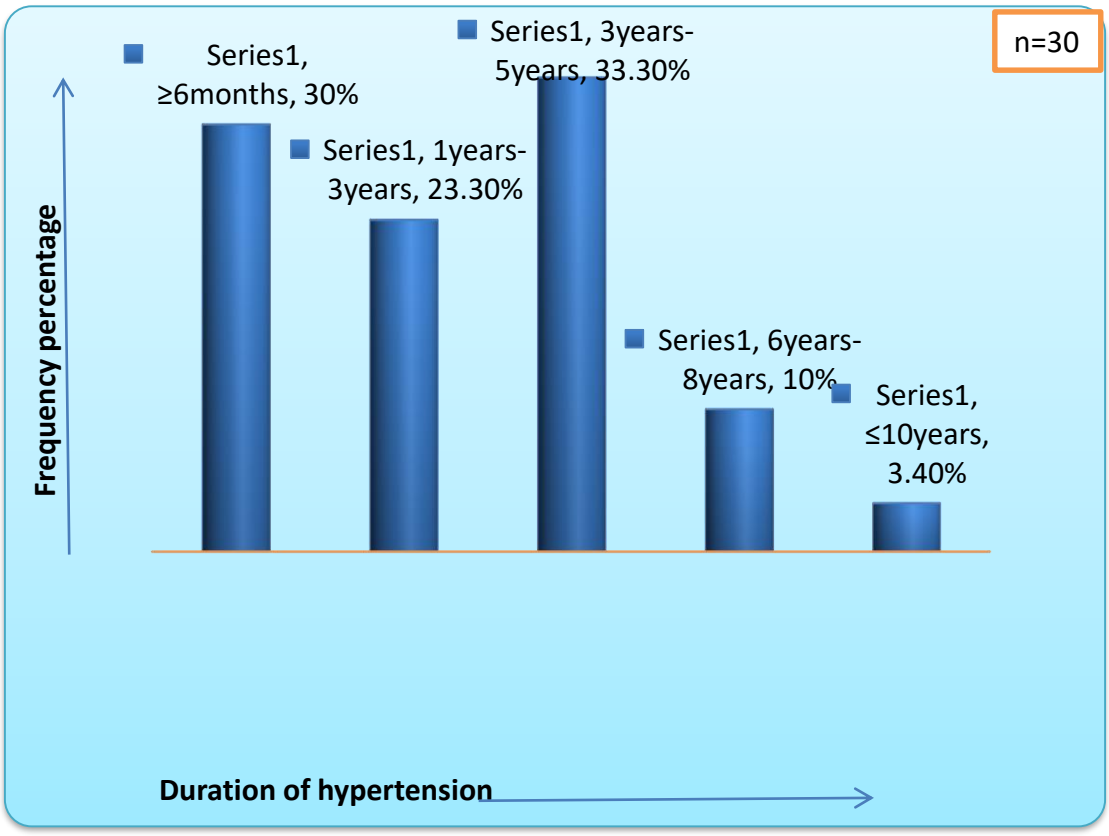

Fig-11: Cylindrical shape bar diagram showing frequency and percentage distribution of duration of hypertension of hypertensive patients.

Data presented in the **Fig-11** showed that the duration of HTN, where most of the 33.30% samples of hypertensive patients were belongs to 3years-5years, followed by 30% of the samples were belongs to ≥6months, 23.30% of the samples were belongs to 1years-3years, 10% of the samples were belongs to 6years-8years and only 3.40% of the samples were belongs to ≤10years.

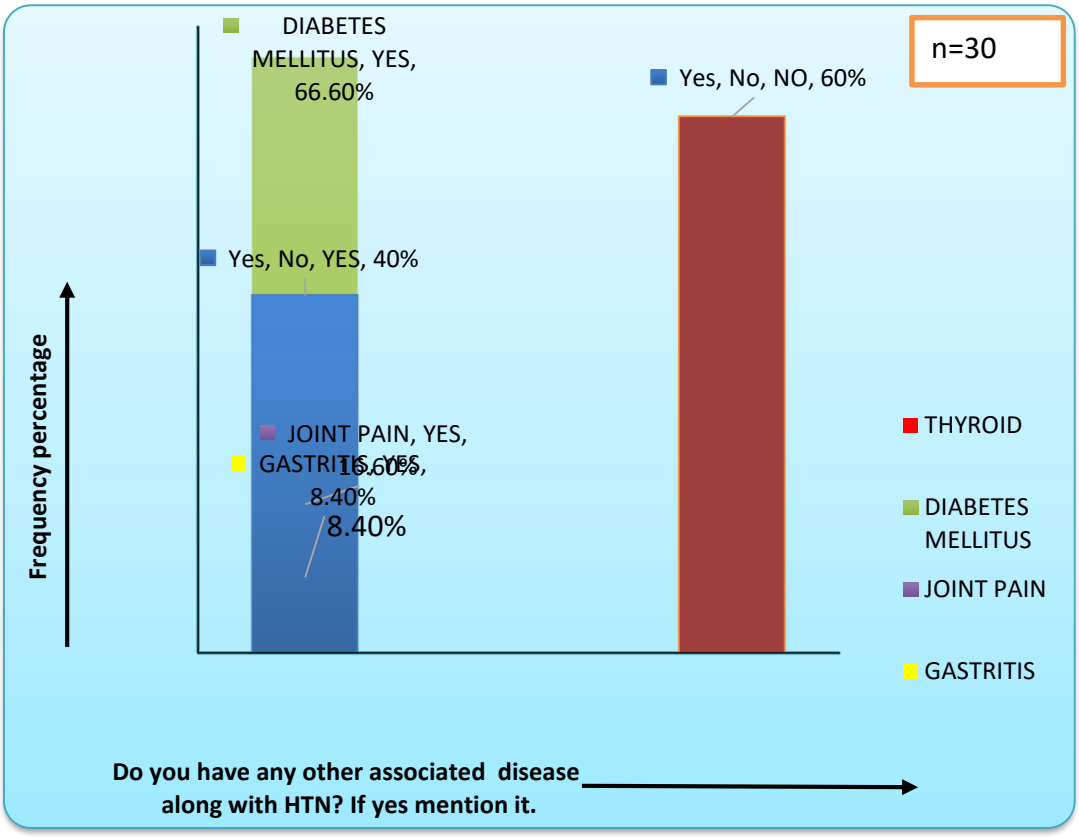

Fig-12: Bar diagram showing frequency and percentage distribution of do you have any other associated disease along with HTN? If yes, mention it of hypertensive patients.

Data presented in the **Fig-12** showed that maximum 60% of the samples of hypertensive patients were not having other disease, only 40% of the samples of were having other disease; where 66.60% of the samples were suffering from diabetes mellitus, followed by 16.60% of the samples were suffering from joint pain and only 8.40% of the samples were suffering from thyroid and gastritis.

Table no.-3: Frequency and percentage distribution of are you taking any alternative therapy to reduce hypertension? If yes, mention it of hypertensive patients.

n=30	
Are you taking any alternative therapy to reduce hypertension? If yes, mention it…	
No	**100%**

Data presented in the **table no.-3:** showed that 100% of the samples of hypertensive patients were not taking any other alternative therapy to reduce the hypertension.

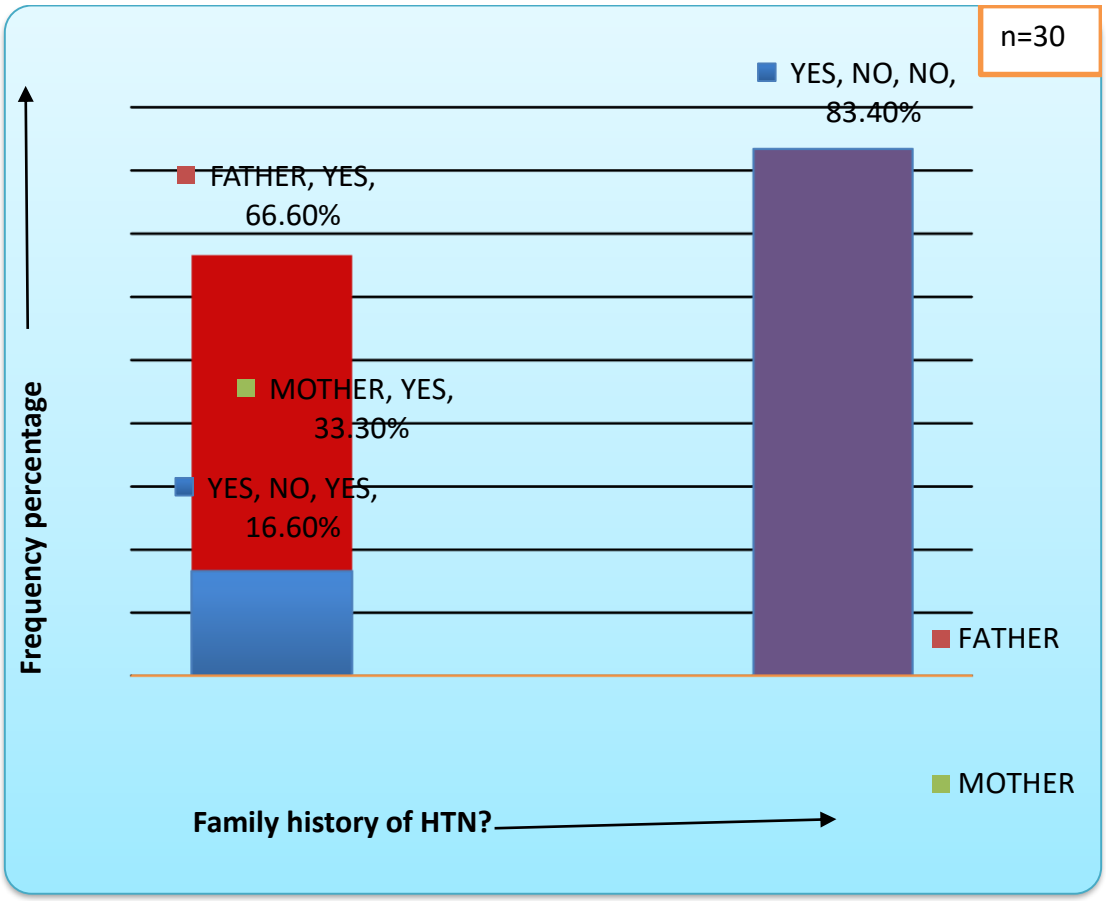

Fig-13: Bar diagram showing frequency and percentage distribution of family history of HTN of hypertensive patients.

Data presented in the **Fig-13** showed that most of the 83.40% samples of hypertensive patients were not having family history of hypertension and only 16.60% of the samples of were having family history of hypertension; where maximum 66.60% of the samples were having family history of HTN with father and only 33.30% of the samples were having family history of HTN with mother.

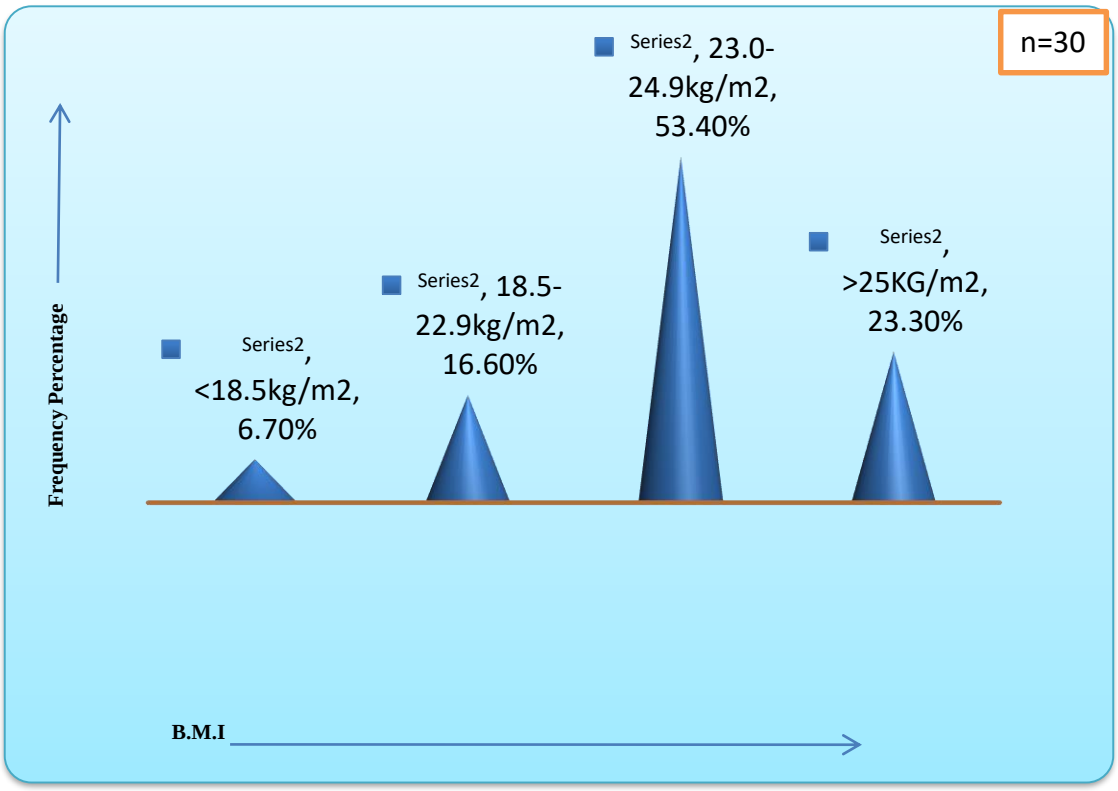

Fig-14: Cone shape bar diagram showing frequency and percentage distribution of B.M.I of hypertensive patients.

Data presented in the **Fig-14** showed that maximum 53.40% of the samples of B.M.I were 23.0-24.9kg/m^2 (overweight), followed by 23.30% of the samples were ≥25kg/m^2 (pre-obese), 16.60% of the samples were 18.5-22.9kg/m^2 (Normal weight) and only 6.70% of the samples were <18.5kg/m^2 (under weight).

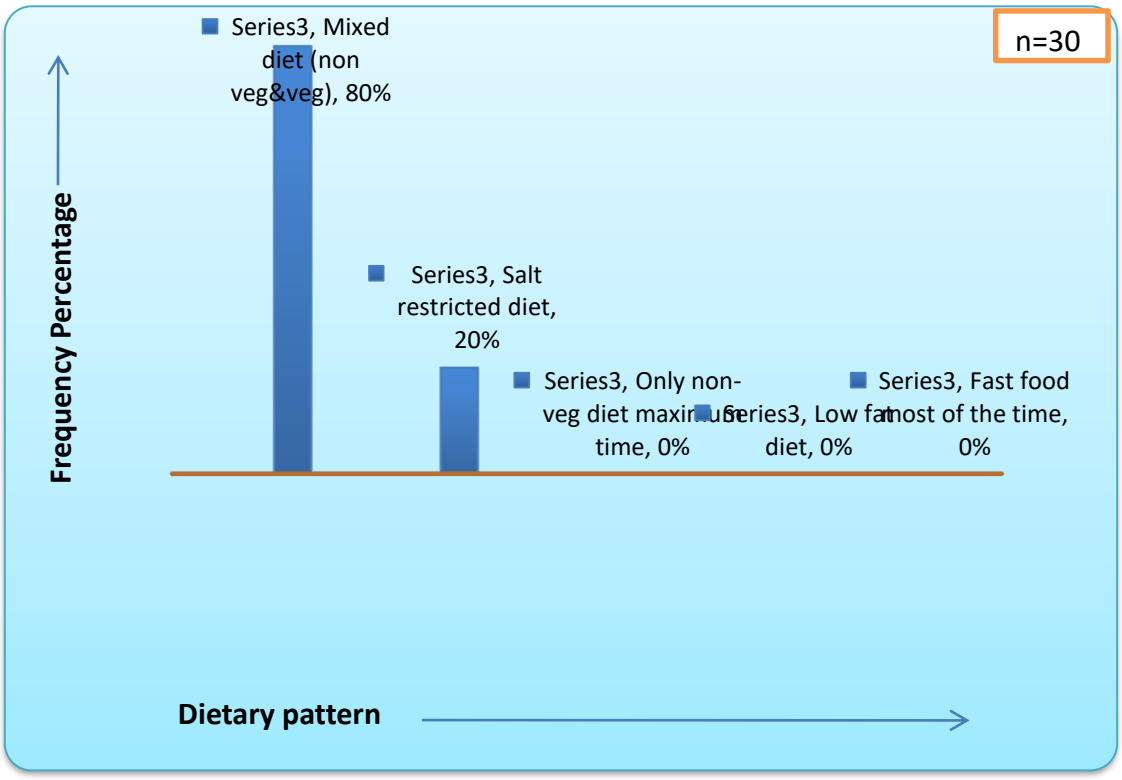

Fig-15: Bar diagram showing frequency and percentage distribution of dietary pattern of hypertensive patients.

Data presented in the **Fig-15** showed that most of the 80% samples of hypertensive patients were taking mixed diet (non veg & veg), and only 20% of the samples were taking salt restricted diet.

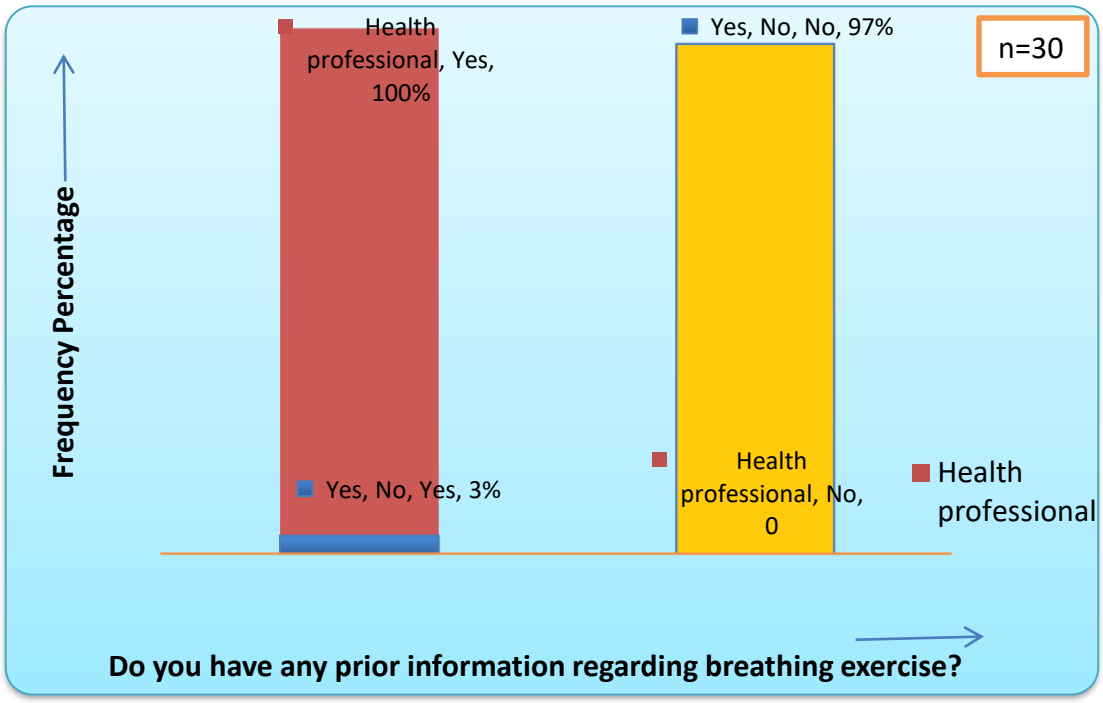

Fig-16: Bar diagram showing frequency and percentage distribution of do you have any prior information regarding breathing exercise of hypertensive patients.

Data presented in the **Fig-16** showed that most of the 97% samples of hypertensive patients were not having prior information regarding breathing exercise and only 3% of the samples were having prior information regarding breathing exercise; where 100% of the samples were getting information from health professional.

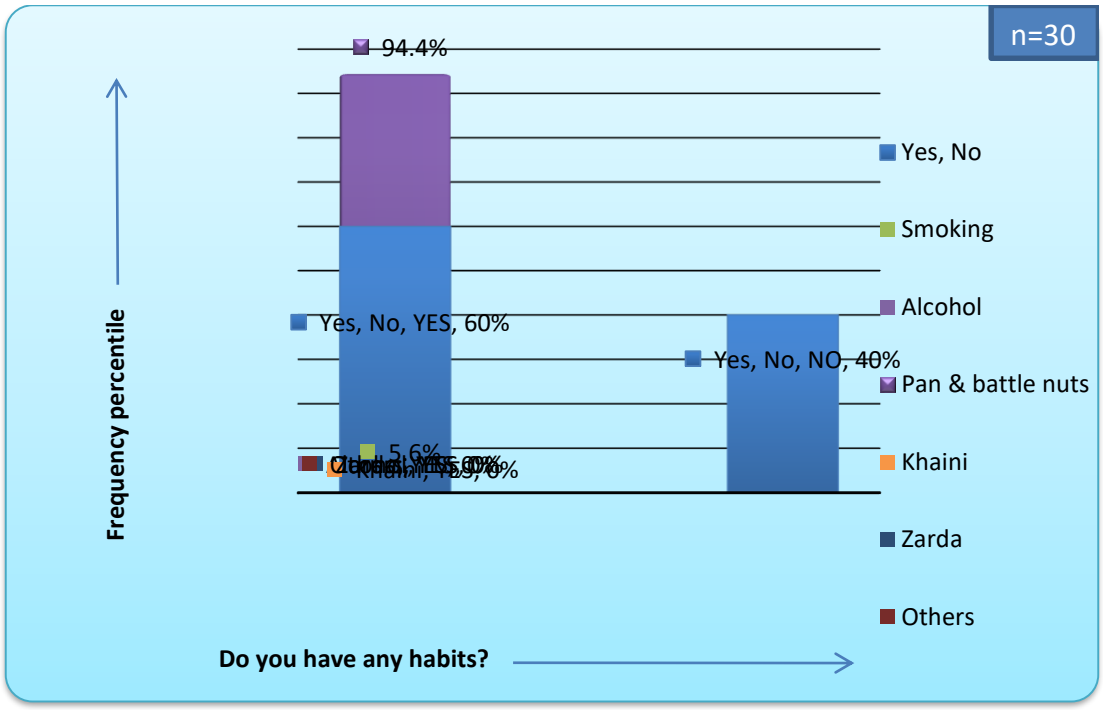

Fig-17: Bar diagram showing frequency and percentage distribution of do you have any habits of hypertensive patients.

Data presented in the **Fig-17** showed that maximum 60% of the samples of hypertensive patients were having habits and only 40% of the samples were not having any habits; where maximum 94.4% of the samples were taking pan & battle nuts and only 5.6% of the samples were taking smoking.

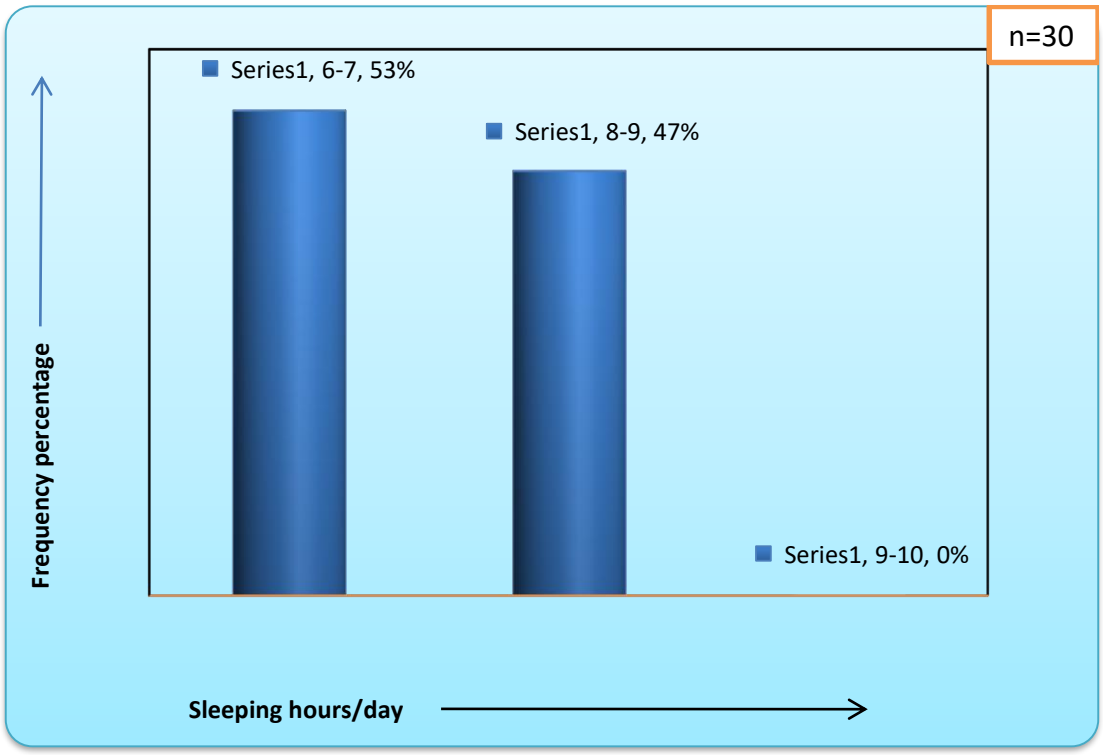

Fig-18: Cylindrical shape bar diagram showing frequency and percentage distribution of sleeping hours/day of hypertensive patients.

Data presented in the **Fig-18** showed that maximum 53% of the samples of hypertensive patients were belongs to 6-7 sleeping hours and only 47% of the samples were belongs to 8-9 sleeping hours.

SECTION-2

Table No.-4

Mean pre-test & post test of systolic & diastolic pressure of the hypertensive patients.

Code no.	SYSTOLIC PRESSURE		DIASTOLIC PRESSURE	
	Pre-test	Post-test	Pre-test	Post-test
A1	144	139	84	85
A2	148	145	89	82
A3	149	146	89	84
A4	147	140	89	83
A5	149	148	92	85
A6	147	143	89	81
A7	139	136	90	84
A8	138	135	91	80
B1	143	130	95	71
B2	149	144	95	84
B3	147	139	95	77
B4	152	134	92	84
B5	132	130	91	80
B6	141	135	93	84
B7	145	127	94	72
C1	146	140	95	90
C2	144	134	88	81
C3	144	136	94	87
C4	143	136	90	82
C5	134	135	93	80
C6	134	135	92	83
C7	145	136	94	82
C8	146	136	94	84
D1	145	138	89	76
D2	149	136	86	70
D3	152	144	90	82
D4	144	129	87	79
D5	156	141	88	80
D6	153	143	90	74
D7	147	127	90	87

Data presented in the **table no.-4** on mean pre-test and post-test of systolic and diastolic pressure of the hypertensive patients, revealed that the systolic and diastolic mean post-test blood pressure were lesser than the mean pre-test blood pressure. Which indicated that breathing exercise helps to reduce blood pressure among the hypertensive patients.

Table No.-5

Frequency and percentage distribution of pre-test & post test score of blood pressure among hypertensive patients.

Category	Systolic (mmHg)	Pre-test		Post-test		Diastolic (mmHg)	Pre-test		Post-test	
		(f)	(%)	(f)	(%)		(f)	(%)	(f)	(%)
Normal	Less than 120	0	0%	0	0%	Less than 80	0	0%	7	23.4 %
Elevated	120-129	0	0%	3	10%	Less than 80	0	0%	0	0%
Hypertension stage-1	130-139	5	16.6 %	18	60%	80-89	10	33.4 %	22	73.3 %
Hypertension stage-2	140 or higher	25	83.4 %	9	30%	90 or higher	20	66.6 %	1	3.3 %

Data presented in the **Table no.-5,** frequency and percentage distribution of pre-test score of blood pressure among hypertensive patients. Where out of 30 samples, most of them 83.4%(25) were having hypertension stage-2 in systolic pressure and only 16.6%(5) were in hypertension stage-1. And in diastolic pressure, out of 30 samples 66.6%(20) were in hypertension stage-2 and only 33.4%(10) were in hypertension stage-1.

Table no.-5 also represent the post-test score of blood pressure among hypertensive patients, where out of 30 samples had reduce systolic blood pressure i.e., 60%(18) were in hypertension stage-1, followed by 30%(9) were in hypertension stage-2 and only 10%(3) were in elevated. And in out of 30 samples their diastolic blood pressure were (23.4%) in normal category, followed by 73.3%(22) were in hypertension stage-1 and only 3.3%(1) was in hypertension stage-2.

The above findings revealed that breathing exercise were able to reduce the systolic and diastolic pressure. So, it indicated that breathing exercise were an effective measure to reduce the blood pressure among the hypertensive patients.

Table No.-6

Mean, median, standard deviation, mean difference,'t' value of pre-test and post-test of blood pressure among hypertensive patients.

n=30

Group	Mean		Median		SD		Mean Difference		't' value (paired)	
	Systolic pressure	Diastolic Pressure	Systolic Pressure	Diastolic Pressure	Systolic Pressure	Systolic Pressure	Systolic Pressure	Diastolic Pressure	Systolic Pressure	Diastolic Prees ure
Pre-test	145	88	145	94	5.56	4.07	7	7	**5.6***	**7.4***
Post-test	138	81	127	72	5.09	3.44				

***=Significant at 0.05 level, (df=29, table value=2.04)**

Data presented in the **Table no.-6** revealed that the mean post-test blood pressure for both systolic and diastolic (138 & 81 respectively) were lower than the mean pre-test blood pressure (145 & 88 respectively) with the mean difference of both systolic and diastolic was 7. The post- test median for both systolic and diastolic (127 & 72 respectively) was also lower than the pre-test median for both systolic and diastolic (145 & 94 respectively). The post-test standard deviation for both systolic and diastolic (5.09 & 3.44 respectively) was dispersed than the pre-test standard deviation for both systolic & diastolic (5.56 & 4.07 respectively).

Paired 't' test value for both systolic and diastolic was 5.6 & 7.4 respectively (df-29, table value-2.04), which was significant at 0.05 level of significance.

Hence, null hypothesis was rejected and research hypothesis was accepted, which indicated that the breathing exercise were an effective measure to reduce the blood pressure among the hypertensive patients.

Table No.-7

MEAN, MEDIAN AND SKEWNESS AT PRE-TEST & POST-TEST OF BLOOD PRESSURE AMONG HYPERTENSIVE PATIENTS.

n=30

Group	Mean		Median		Skewness	
	Systolic pressure	Diastolic pressure	Systolic pressure	Diastolic pressure	Systolic pressure	Diastolic pressure
Pre-test	145	88	145	94	1.5	-9
Post-test	138	81	127	72	16.5	13.5

Data presented in **Table no.-7** revealed that the skewness of pre-test systolic was positive (1.5) and diastolic was negative (-9). Whereas, the skewness of post-test systolic (16.5) & diastolic pressure were positive (13.5), which revealed that the maximum samples in the post test had less blood pressure than the average score of blood pressure for their group.

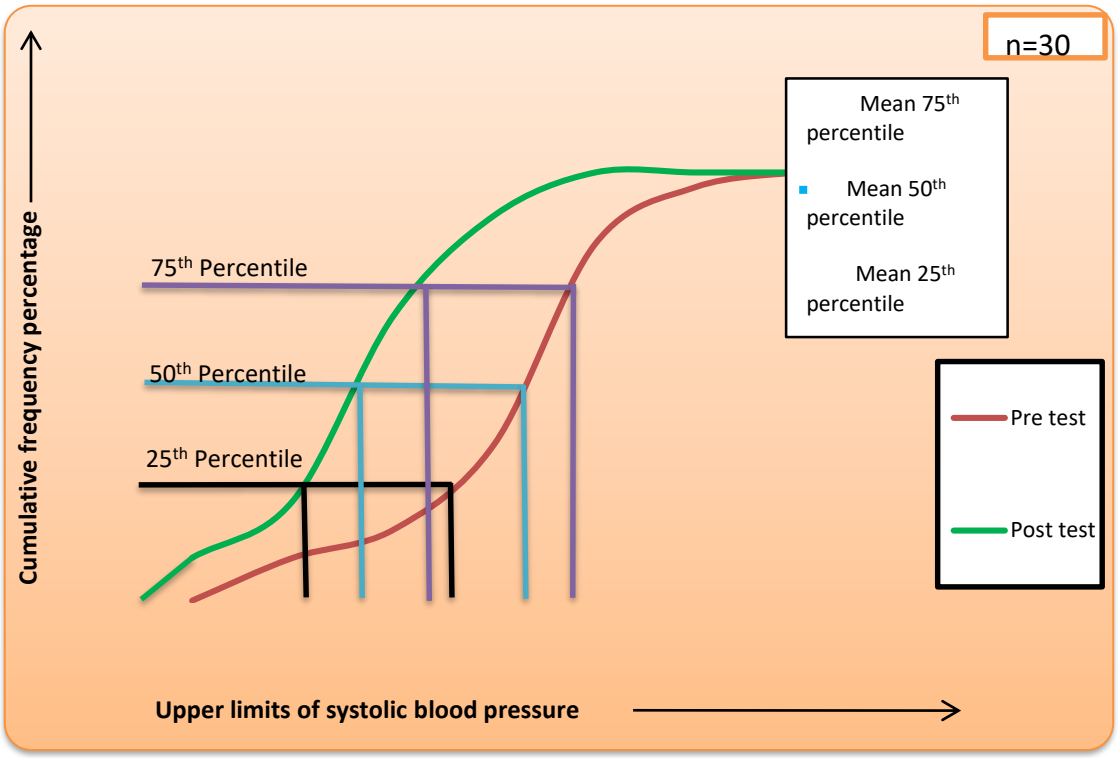

Fig-19: Ogive on pre-test and post-test score for systolic pressure of hypertensive patients.

Data presented in the **Fig-19** showed that the post-test systolic pressure was lie down in the left side of the pre-test systolic pressure. In every percentile (25%, 50%, 75%), the post-test mean score lines were lie

down in the left side of the pre-test mean score lines. Also, in every percentile (25%, 50%, 75%), the post-test of systolic pressure were 135,137,142, lower than the pre-test of systolic pressure were 142, 145, 149.

The reduction in the blood pressure among the hypertensive patients after the administration of breathing exercise were obvious by differences in pre-test and post-test of systolic pressure at various levels of Ogive. So, it revealed that there was a reduction in the post-test of systolic pressure after the administration of the breathing exercise. So, breathing exercises were an effective measure to reduce the blood pressure among the hypertensive patients.

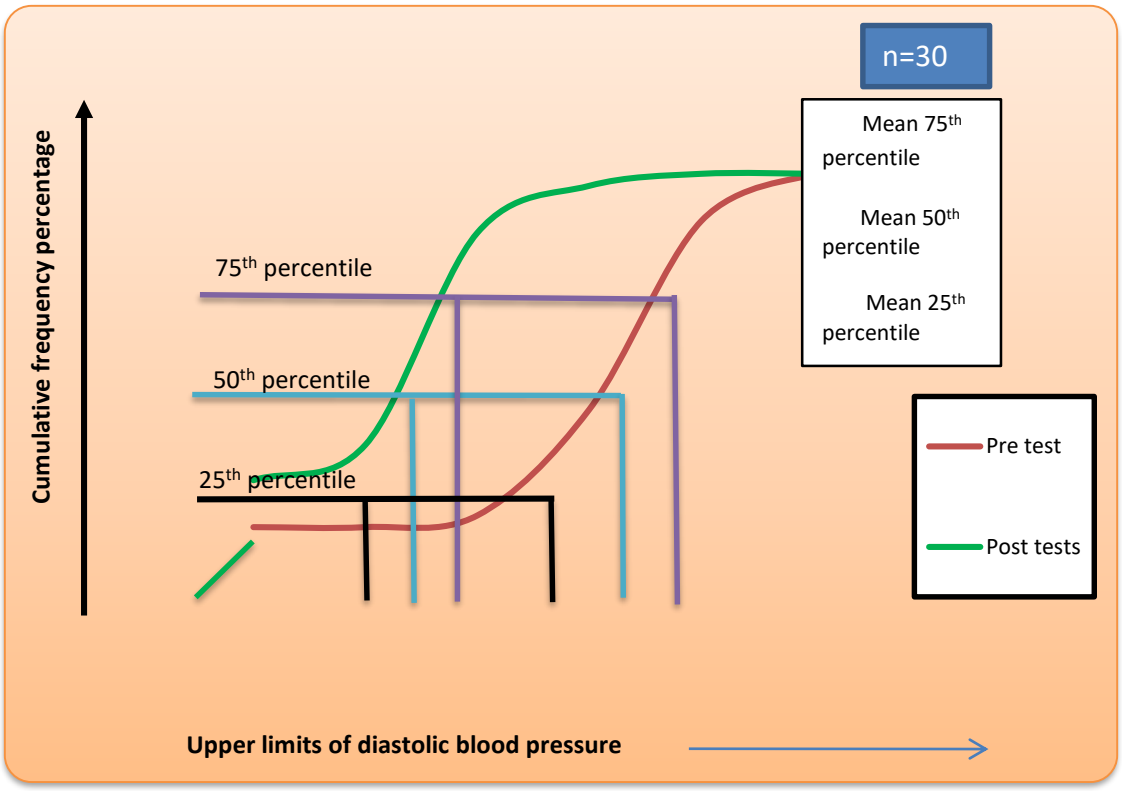

Fig-20: Ogive on pre-test and post-test score for diastolic pressure of hypertensive patients.

Data presented in the **Fig-20** showed that the post-test diastolic pressure was lie down in the left side of the pre-test diastolic pressure. In every percentile (25%, 50%, 75%), the post-test mean score lines were lie down in the left side of the pre-test mean score lines. Also, in every percentile (25%, 50%, 75%), the post-test of diastolic pressure were 80, 82, 84, which were lower than the pre-test of diastolic pressure were 88, 92,93.

The reduction in the blood pressure among the hypertensive patients after the administration of breathing exercise were obvious by differences in pre-test and post-test of diastolic pressure at various levels of Ogive. So, it revealed that there was a reduction in the post-test of diastolic pressure after the administration of the breathing exercise. So, breathing exercises were an effective measure to reduce the blood pressure among the hypertensive patients.

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SECTION-3

FINDINGS RELATED TO THE ASSOCIATION BETWEEN PRE-EXISTING LEVEL OF BLOOD PRESSURE AMONG HYPERTENSIVE PATIENTS WITH THEIR SELECTED DEMOGRAPHIC VARIABLES

Table No.-8: ANOVA ('F' value) of association between pre-existing level of blood pressure among hypertensive patients with their selected demographic variables.

n=30

Sl no.	Demographic variables		Frequency (f)	df		Mean of sum of square between group	Mean of sum of square within group	Tabulated 'F' value	Calculated 'F' value
				Between group	Within group				
1.	Age (in years)	20-25 years	0	4	25	0.0025	0.002	2.76	1.25 NS
		26-30 years	2						
		31-35 years	2						
		36-40 years	6						
		41-45 years	7						
		46-50 years	13						
2.	Number of family members.	1-5	23	2	27	-0.005	0.0025	3.35	-2 NS
		6-10	5						
		11-15	2						
3.	Occupational status	Housewife	17	2	27	0	0.002	3.35	0 NS
		Daily labourer	0						
			10						
			3						

		Self employer	0						
		Private employee							
		Government employee							
4.	Family monthly income (Rs/month)	≤5000/month	0	3	26	-0.003	0.0026	2.98	0 NS
		5,001-9,999/month	10						
		10,000-14,999/month	15						
		15,000-19,999/month	4						
		≥20,000/month	1						
5.	Daily working hours	4-6 hours	5	2	27	0.01	0.001	3.35	**10***
		7-9 hours	19						
		10-12 hours	6						
6.	Duration of hypertension	≥6months	9	4	25	-0.005	0.0032	2.76	-1.56 NS
		1year-3years	7						
		3years-5years	10						
		6years-8years	3						
		≤10years	1						
7.	If yes, mention it.	Thyroid	1	3	8	-0.003	0.001	4.07	-3 NS
		Diabetes Mellitus	8						
		Joint pain	2						
		Gastritis	1						
8.	B.M.I	<18.5kg/m^2	2	3	26	-0.003	0.0026	2.98	-1.15 NS
		18.5-22.9kg/m^2	5						
			16						
			7						

		23.0-24.9kg/m^2							
		>25kg/m^2							

***=Significant at 0.05 level of significance.**

NS= Not significant at 0.05 level of significance

Data presented in the **Table no.-8** revealed that there was a significant association between pre-test level of blood pressure among the hypertensive patients with their selected demographic variables – daily working hours ['F° value 10, table value-3.35, df between group-2, within group – 27] were significant at 0.05 level of significance. Hence, null hypothesis (H_{02}) was rejected and research hypothesis (H_2) was accepted. So, daily working hours was an dependent variables. Which indicated that the pre-test level of blood pressure among hypertensive patients was dependent on their selected demographic variables – daily working hours.

The present study also revealed that there was no significant association between pre-test level of blood pressure among hypertensive patients with their selected demographic variables – age (in years), number of family members, occupational status, family monthly income (Rs/month), duration of hypertension, do you have any other associated disease along with hypertension? If yes, mention it, B.M.I, at 0.05 level of significance. Hence, null hypothesis (H_{02}) was accepted and research hypothesis (H_{02}) was rejected. So, they were an independent variables. Which indicated that pre-test level of blood pressure among hypertensive patients was not dependent on these selected demographic variables.

SUMMARY:

This chapter has dealt with the analysis and interpretation of the data collected from 30 (thirty) samples of hypertensive patients by administering Socio-demographic proforma and sphygmomanometer to assess the pre-existing level of blood pressure among hypertensive patients, to evaluate the effectiveness of breathing exercise on blood pressure among hypertensive patients, and to find out the association between pre-existing level of blood pressure among hypertensive patients with their selected demographic variables.

5. SUMMARY, MAJOR FINDINGS, DISCUSSION, CONCLUSION, IMPLICATION, LIMITATIONS AND RECOMMENDATIONS

This chapter presents the summary of the study, major findings, discussion, conclusion, implications of the study in the nursing practice, nursing education, nursing administration and nursing research, limitation of the study and recommendation for the further studies.

SUMMARY OF THE STUDY:

This study was conducted to evaluate the effectiveness of Breathing Exercise on blood pressure among hypertensive patients at selected urban community area at Agartala, West Tripura. The findings of the

study revealed that after the administration of the Breathing Exercise there was a significant reduction in the blood pressure among the hypertensive patients, which indicated that the Breathing Exercise were an effective measure to reduce the blood pressure among the hypertensive patients. The study also revealed that there was a significant association between pre-test level of blood pressure among the hypertensive patients with their selected demographic variables – daily working hours at 0.05 level of significance, which indicated that the pre-test level of blood pressure among hypertensive patients was dependent on their selected demographic variables such as – daily working hours.

The objectives of the present study were –

1. To assess the pre existing blood pressure among hypertensive patients.
2. To evaluate the effectiveness of breathing exercise on blood pressure among hypertensive patients.
3. To find the association between the pre test score of blood pressure among hypertensive patients with their selected demographic variables.

The assumptions of the present study were –

This present study assumes that,

- Breathing exercise may be one of the effective measures to reduce blood pressure among hypertensive patients.

The variables under the present study were –

- **Independent variables:** Breathing exercise.
- **Dependent variables:** Blood pressure among hypertensive patients.
- **Demographic variables:** Age, Gender, Type of family, Number of family members, Marital status, Occupational status, Family monthly income (Rs/month), Daily working hours, duration of hypertension, Do you have any other associated diseases along with hypertension, If yes, mention it, Are you taking any other alternative therapy to reduce hypertension, If yes, mention it, Family history of hypertension, If yes, relationship with that family members, B.M.I, Dietary pattern, Do you have any prior information regarding breathing exercise, If yes, source of information, Do you have any habits, if yes, tick the following, Sleeping hours/day.

The present study was attempted to examine the following hypotheses:

All hypotheses were tested at 0.05 level of significance.

- **H_1**: There is a significant differences between the pre and post test level of blood pressure among the hypertensive patients .
- **H_2**: There is a significant association between pre test score of high blood pressure with their selected demographic variables.

Conceptual framework of the study was-

The conceptual framework was developed based on Modified Wiedenbach's Helping Art of Clinical Nursing Theory (1964). According to this theory, in the present study- central purpose, realities and prescription were included, whereas, feedback was not included.

The research methodology of the present study was-

- The study was adopted quantitative evaluative research approach.
- The research design adopted for the study was time series experimental research design.
- The study was conducted at the Dukli Urban Health Training Centre.
- The target population was hypertensive patients.
- The sample size was 30 (thirty) hypertensive patients.
- The sample was drawn by purposive sampling technique.
- The tools used for the study were – Tool-I: Socio-demographic proforma and Tool-II: American Heart Association recommended Blood pressure category table (2023).
- The data were collected through interview and direct observational method.
- Descriptive and inferential statistics were used for data analysis.

For conducting the pre-test, the Socio-demographic proforma and American Heart Association Category table (2023) were administered through interview & direct observational method to 30 (thirty) samples of hypertensive patients. The Breathing exercise were administered for 15 (fifteen) consecutive days for 21minutes/day. Everyday, 2 times pre-test and 2 times post-test was done.

Validity of the tools were done by total 9 Experts of related fields on Master's in Medical Surgical Nursing Specialty (8), Physician(1).

Reliability of the Tool-Il: American Heart Association recommended blood pressure category table (2023) was tested by inter-rater method formula on 10 samples. The reliability was 0.8, which indicated that the tool was good reliable.

The pilot study was conducted at Amtali (Sub-Centre) Bypass Baishnabtila, Agartala, West Tripura, from 7th March 2024 to 23rd March 2024 with 10 (ten) samples of hypertensive patients.

The main research study was conducted at Dukli Urban Health Training Centre, Agartala, West Tripura, from 6th May 2024 to 21st May 2024 with total 30 (thirty) samples of hypertensive patients.

Analysis of the data were done based on the objectives and hypotheses of the study by using both the descriptive and inferential statistics. Socio-demographic porforma was described by frequency and percentage distribution. The pre-testst and pos- test was level of blood pressure among hypertensive patients were described by using mean, median, standard deviation, mean difference and the effectiveness of Breathing exercise were described by paired 't' test, skewness and Ogive. The association between pre-existing level of blood pressure among hypertensive patients with their selected demographic variables were analyzed by using Analysis of Variance (ANOVA) test.

MAJOR FINDINGS OF THE STUDY:

The major findings of the study were summarized below-

Findings related to socio-demographic proforma:

Among 30 (thirty) samples of hypertensive patients-

Maximum of the samples 43.3% belongs to the age group of 46-50 years.

Most of the samples 70% were female.

Most of the samples 76.7% belongs to nuclear family.

Most of the samples 76.7% were 1-5 nos for total number of family member staying with them.

Mostly 96.6% were married.

Maximum of the samples 56.6% were housewife.

Maximum of the samples 50% monthly family income were Rs 10,000-14,999/month.

Most of the samples 63.4% were 7-9 hours of daily working hours.

Maximum of the samples 33.3% duration of suffering from HTN were 3years-5years.

Maximum of the samples 60% are not suffering with any other diseases.

Maximum of the sample 26.6% were suffering from diabetes mellitus.

Mostly 100% are not taking any other alternative therapy to reduce HTN.

Mostly 83.4% are not having family history of HTN.

Maximum of the sample 13.3% were belongs to father, 6.7% of the sample were belongs to mother.

Maximum of the samples 53.4% were belongs to 23.0-24.9kg/m^2 (overweight) of B.M.I.

Mostly 96.6% had no information regarding breathing exercises.

Maximum of the samples 3.4% had information regarding breathing exercises, out of which maximum of the samples 3.4% source of information were from health professionals.

Maximum of the samples 60% said yes in do you have habits.

Maximum of the samples 56.6% were habituated to chewing pan & battle nuts.

Maximum of the samples 53.3% belongs to 6-7 hours/day for sleeping.

Findings related to effectiveness of breathing exercise on blood pressure among hypertensive patients:

- In pre-test systolic (83.4%) & diastolic (66.6%) of the samples had hypertension stage-2, systolic (16.6%) & diastolic (33.4)% of the samples had hypertension stage-1 and systolic (0%) & diastolic (0%) of the samples had normal. Where as in post-test systolic (30%) & diastolic (3.3%) of the samples had hypertension stage-2, systolic (60%) & diastolic (73.3) of the samples had hypertension stage-1 and systolic (0%) & diastolic (23.45) of the samples had normal, which indicated that breathing exercise was effective to reduce the level of blood pressure among hypertensive patients.

- The mean post-test pain score of blood pressure among hypertensive patients (systolic 138,diastolic 81± systolic5.09, diastolic 3.44) was significantly lower than the pre-test pain score (systolic 145,diastolic 88 ± systolic5.56, diastolic 4.07) with mean difference of both systolic and diastolic is 7.. Paired 't' test was calculated to find out the effectiveness of breathing exercises on blood pressure among hypertensive patients and the 't' value (systolic 5.6) & (diastolic 7.4) was also found significant at 0.05 level (df=29, table value=2.04), which indicated that the breathing exercises was effective to reduce the level of blood pressure among the hypertensive patients.

- The skewness of pre-test systolic was positive (1.5) and diastolic was negative (-9), which revealed that the maximum samples in the pre-test had more score of blood pressure than the average score in the group. Whereas, the skewness of post-test systolic was positive (16.5) & diastolic was also positive (13.5), which revealed that the maximum samples in the post test had less score of blood pressure than the average score in the group.

Findings related to association between pre-existing level of blood pressure among hypertensive patients with their selected demographic variables:

- Analysis of variance (ANOVA) 'F' value showed significant association between pre-existing level of blood pressure among hypertensive patients with their selected demographic variables – daily working hours ['F' value=10, table value=3.35, df between group – 2, within group – 27] at 0.05 level of significance.

- So, it revealed that daily working hours was an dependent variables, the blood pressure among hypertensive patients was dependent on their daily working hours. Other variables showed no significant association.

DISCUSSION:

The findings of the study discussed in this chapter were based on the objectives, hypotheses and conceptual framework on the study.

The first objective was – to assess pre-existing level of blood pressure among hypertensive patients.

- According to the conceptual framework based on Modified Wiedenbach's Helping Art of Clinical Nursing Theory (1964), "Identification" where the researcher identified the pre-existing score of blood pressure among hypertensive patients by using sphygmomanometer on hypertensive patients.

- The statistical findings of the present study revealed that in pre-test out of 30 (thirty) samples of hypertensive patients for systolic pressure, 83.4% (25) of the samples had hypertension stage-2, 16.6% (5) of the samples had hypertension stage-1 and 0% (0) of the samples had both elevated and normal and in post-test out of 30 (thirty) samples of hypertensive patients for diastolic pressure, 66.6% (20) of the samples had hypertension stage-2, 33.4% (10) of the samples had hypertension stage-1 and 0% (0) of the samples had elevated and normal.

- The statistical findings of the present study revealed that the mean pre-test score of blood pressure was (systolic 145 & diastolic 88), median (systolic 145 & diastolic 94) and standard deviation (systolic 5.56 & diastolic 4.07).

- The present study was supported by the findings of the following study –

Singh AB, et al (20 March 2024) was conducted a study to assess the effectiveness of abdominal breathing exercise in reduction of blood pressure among hypertensive patients in selected hospitals at Bhopal. Pre-experimental one group pre-test-post-test design was adopted for the study. Total 60 samples were selected by convenient sampling technique from male & female medical general ward. The researcher gathered the information through interview method and blood pressure recording table to collect the data. The results showed that the mean and standard deviation of pre-test of was 116.77±7.57 and mean and standard deviation value of post-test was 111.16±7.41 and the 't value is 19.39. The obtained 't' value was greater than table value of $t'_{(59)}$= 1.96. Therefore, the abdominal breathing exercise was effective in reducing blood pressure among hypertensive patients. These findings were strongly supported by study on the effect of abdominal breathing exercise on hypertension. There was a significant reduction in post-test mean systolic blood pressure (t=3.45, p=0.001) and diastolic pressure (t=3.5, p=0.001) after abdominal breathing exercise between experimental group that control group. This study tested that the abdominal breathing exercise can be used as a part of nursing management of hypertensive patients.[31]

The second objective was – to evaluate the effectiveness of breathing exercise on blood pressure among hypertensive patients.

In the present study the hypotheses were stated as –

H_1: There is a significant differences between the pre and post test level of blood pressure among the hypertensive patients.

The findings were supported by the present conceptual framework which was based on Modified Wiedenbach's Helping Art of Clinical Nursing Theory (1964), "Ministration" and "validation" where the researcher found the effectiveness of breathing exercise on blood pressure among hypertensive patients through post-test with the use of same sphygmomanometer on blood pressure among hypertensive patients after administration of breathing exercise.

- In the pre-test systolic pressure, most of them 83.4%(25) were having hypertension stage-2, followed by 16.6%(5) were having hypertension stage-1 and 0%(0) were found in both normal and elevated category. And in diastolic pressure, out of 30 samples 66.6%(20) were having hypertension stage-2, followed by 33.4%(10) were having hypertension stage-1 and 0%(0) were found in both normal and elevated category. And in the post-test systolic pressure, were out of 30 samples 60%(18) were in hypertension stage-1, followed by 30%(9) were in hypertension stage-2, 10%(3) were in elevated and 0%(0) were in normal category. And in diastolic pressure were (23.4%) in normal category, followed by 0%(0) in elevated, 73.3%(22) were in hypertension stage-1 and only 3.3%(1) was in hypertension stage-2.

- The statistical findings of the present study revealed that the mean post-test level of blood pressure (systolic 138±5.09 ,diastolic 81±3.44) was significantly lower than the mean pre-test level of blood pressure (systolic 145±5.56 diastolic 88± 4.07systolic) with the mean difference of both systolic & diastolic 7. The paired 't' test value (systolic 5.6) and (diastolic 7.4) was found statistically significant at 0.05 level (df=29, table value=2.04) of significance.

- The skewness of post-test systolic was positive (16.5) & diastolic was also positive (13.5), which revealed that the maximum samples in the post test had less blood pressure than the average score for the group.

- The present study was supported by the findings of the following study –

Singh AB, et al (20 March 2024) was conducted a study to assess the effectiveness of abdominal breathing exercise in reduction of blood pressure among hypertensive patients in selected hospitals at Bhopal. Pre-experimental one group pre-test-post-test design was adopted for the study. Total 60 samples were selected by convenient sampling technique from male & female medical general ward. The researcher gathered the information through interview method and blood pressure recording table to collect the data. The results showed that the mean and standard deviation of pre-test of was 116.77±7.57 and mean and standard deviation value of post-test was 111.16±7.41 and the 't value is 19.39. The obtained 't' value was greater than table value of $t'_{(59)}$= 1.96. Therefore, the abdominal breathing exercise was effective in reducing blood pressure among hypertensive patients. These findings were strongly supported by study on the effect of abdominal breathing exercise on hypertension. There was a significant reduction in post-test mean systolic blood pressure (t=3.45, p=0.001) and diastolic pressure (t=3.5, p=0.001) after abdominal breathing exercise between experimental group that control group. This study tested that the abdominal breathing exercise can be used as a part of nursing management of hypertensive patients.[31]

The third objective was – to find out the association between pre test score of blood pressure among hypertensive patients with their selected demographic variables.

In the present study the hypotheses were stated as –

H_2: There is a significant association between pre-test score of blood pressure among hypertensive patients with their selected demographic variables.

- The findings were supported by the present conceptual framework which was based on Modified Wiedenbach's Helping Art of Clinical Nursing Theory (1964), "Identification" where the researcher developed and administered socio-demographic proforma during pre-test to find out the socio-demographic characteristics of the hypertensive patients.

- In the present study, Analysis of variance (ANOVA) 'F' value showed significant association between pre-test score of blood pressure among hypertensive patients with their selected demographic variables – daily working hours ['F' value=10, table value=3.35, df between group – 2, within group – 27] at 0.05 level of significance.

- So, the pre-test score of blood pressure among hypertensive patients was dependent on their selected demographic variables –daily working hours.

- **The present study was supported by the findings of the following study –**

Beautily V and Lakshmi P (2021) was conducted a study on effectiveness of deep breathing exercise on hypertension among women at a selected community. A quantitative research approach pre-experimental pre-test design was used. The study was conducted in Thiruvannamalai (Vadamathmanglam), Tamil Nadu. The total 60 samples were selected by using convenient sampling method. The results showed that the pre-test mean score of systolic BP was 136.50±7.98 and the post-test mean score of systolic BP was 131.67±9.24. The calculated paired 't' test value of t=4.862 was found to be statistically highly significant at $p<0.001$ level and the pre-test mean score of diastolic BP was 79.0±8.77 and the post-test mean score of diastolic BP was 76.67±7.52. The calculated paired 't' test value of t = 2.076 was found to be statistically highly significant at $p<0.05$ level. This clearly infers that administration of Deep Breathing Exercise on lowering of blood pressure level among women was found to be effective in lowering of BP in the post test. The chi-square showed significant association of post test level of systolic & diastolic with their socio-demographic variables that was education systolic (χ^2 =10.336) & diastolic (χ^2 =6.588) at 0.05 level of significance. So, education was dependent variables.[32]

CONCLUSION:

The present study was conducted to evaluate the effectiveness of breathing exercise on blood pressure among hypertensive patients in Dukli Urban Health Training Centre, Agartala, West Tripura. The result shows that breathing exercise was effective to reduce the level of blood pressure among hypertensive patients.

IMPLICATIONS:

The findings of the present study could be applied in various areas of nursing education, nursing practice, nursing administration and nursing research.

Nursing education –

Nursing education is an important area of nursing research where nurse researcher try to generate or refine the knowledge, which is useful to improve the teaching – learning methods and environment in nursing discipline.[14]

- Imparting the concept of breathing exercise to nursing students by conducting demonstration.

Nursing practice –

Evidence-based nursing care practices are in greater need to improve the quality of patient care. High-quality and cost-effective nursing care is only possible through research in this area of nursing profession. Nursing practices are the most researched field in nursing science, where nurse researchers regularly make modest attempts to generate or refine the nursing interventions.[14]

- Those patients who are suffering from hypertension associated with heart related disease, kidney related disease and any other chronic diseases must be encouraged to participate in the breathing exercise to reduce blood pressure.

- Prepare and issue information booklet, self-instructional module, pamphlets regarding breathing exercise to the patients.

- Nursing students can utilize the breathing exercise on daily base to reduce anxiety and stress.

Nursing administration –

Administration is one of the most difficult disciplines to manage. It is the process by which nurse manager work through others to achieve nursing organizational goals. It is also a system of activities directed toward the nursing care of patients and includes the establishment of overall goals and policies within the aims of health agency and provision for the organization, personnel and facilities to accomplish these goals in the most effective and economical manner through coordinating the service with other departments of the institution.[33]

- Nursing personnel can organize CNE program on breathing exercise for reducing blood pressure in all health sectors.

- Nurse administrator can conduct successful in-service and public awareness program regarding breathing exercise to reduce blood pressure.

Nursing research –

Nursing research can be defined as the systematic and rigorous collection and analysis of data on the organization, delivery, uses and outcomes of nursing care for the purpose of enhancing clients' health. It is not only about what nurses do, but also about clients' behavior, knowledge, beliefs, attitudes, perceptions and other factors influencing how they make use of and experience care and treatment.[14]

- The study will serve as a valuable reference material for further investigations.
- The findings of the study serve as the basis for professionals and the students to conduct further studies.

LIMITATIONS OF THE STUDY:

1. The study was confined to only a single setting.
2. The study was limited to only 15 days of regular breathing exercise.

RECOMMENDATIONS OF THE STUDY:

1. A similar study can be conducted among the patients with hypertension in hospital setting.
2. A comparative study can be conducted between different measures to reduce blood pressure.
3. A similar study can be replicated on large sample there by findings can be generalized to a large population.
4. A quasi-experimental study can be conducted to evaluate the effectiveness of breathing exercise on blood pressure among hypertensive patients.
5. A similar study can be conducted for a longer duration.

SUMMARY:

This chapter has dealt with the summary of the present study, major findings, discussion, conclusion, implications of the study in the nursing practice, nursing education, nursing administration and nursing research, limitations of the study experienced by the researcher and recommendations for the further studies.

References

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