

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

Dr. Eman Elsayed Hussein Mohammad, Dr. X. S. Blessing NimaSajai, Dr. Selvia Arokiya Mary

Applied Medical Science College for Females, Alnamas, University of Bisha

Corresponding Author: Dr. X. S. Blessing NimaSajai

ABSTRACT

Hypertension (HTN or HT), also known as high blood pressure (HBP), is a long-term medical condition in which the blood pressure in the arteries is persistently elevated. High blood pressure is a major risk factor for coronary artery disease, stroke, heart failure, atrial fibrillation, peripheral vascular disease, vision loss, chronic kidney disease, and dementia. Hypertension has a major economic impact ranging from medical costs to human capital loss and decrease in productivity. The Global Burden of Disease 2010 (GBD 2010) study shows the estimation that hypertension was the leading risk factor for death in the Kingdom of Saudi Arabia (KSA). Statistics shows that hypertension accounted for about 24% of total deaths from cardiovascular and circulatory diseases and 1.87% of total deaths from hypertensive urogenital, blood, and endocrine diseases. From 1990 to 2010 the burden of hypertension remained very high in Kingdom of Saudi Arabia (KSA) Previous studies reported high levels of blood pressure in Kingdom of Saudi Arabia (KSA). These levels ranged from 26.1% among individuals 30–70 years old in 1995–2000 to 25.5% among individuals 15–64 years old in 2005, A study was done to assess Effectiveness Of Breathing Exercise In Lowering High Blood Pressure Among Hypertensive Patients At General Hospital , Alnamas, Kingdom of Saudi Arabia. 80 patients were selected by convenient sampling method. Researcher's convenience and familiarity with settings were added reason. The tool used for the study includes demographic data and vital signs assessment sheet & digital BP apparatus to assess the blood pressure. After collecting the data, the data analysis was done

according to the objectives of the study using descriptive statistics and inferential statistics. The study findings reveals that reveals that, Level of significance (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. The reduction in hypertension over breathing exercise (Mean = 13.34,) was significant at 5% .So the breathing exercise was effective on hypertensive patient. The findings revealed that there was significant association between hypertension level and age, gender, Education of the participant, Occupation of the participant, Duration since diagnosis of hypertension, Family history of diabetes mellitus. But there is no association between hypertension level and Religion, Marital status, Family income per –month.

Key Words: Assess, effectiveness, breathing exercise, hypertension, cardiovascular disease

I. INTRODUCTION

“Important event you can do by yourself during your life time is breathing in and out ... so if you do your breathing air in and out regularly as an exercise.. you can maintain your blood circulation and keep your body in relax state and healthy”

Hypertension is one of the leading causes of cardiovascular diseases and other life style disease. If we want to know in detail, Hypertension (HTN or HT), also known as high blood pressure (HBP), is a long-term medical condition in which the blood pressure in the arteries is persistently elevated. High blood pressure is

a major risk factor for coronary artery disease, stroke, heart failure, atrial fibrillation, peripheral vascular disease, vision loss, chronic kidney disease, and dementia. Hypertension has a major economic impact ranging from medical costs to human capital loss and decrease in productivity. As per global review the prevalence of hypertension is highest in Africa (46% of adults) while the lowest prevalence is found in the Americas (35% of adults).

According to The Global Burden of Disease 2010 (GBD 2010) study revealed that the hypertension was the leading risk factor for death in the Kingdom of Saudi Arabia (KSA). Statistics shows that hypertension accounted for about 24% of total deaths from cardiovascular and circulatory diseases and 1.87% of total deaths from hypertensive urogenital, blood, and endocrine diseases. From 1990 to 2010 the burden of hypertension remained very high in Kingdom of Saudi Arabia (KSA) Previous studies reported high levels of blood pressure in Kingdom of Saudi Arabia (KSA). These levels ranged from 26.1% among individuals 30-70 years old in 1995-2000 to 25.5% among individuals 15-64 years old in 2005.

Recent research shows that 3 or 4 15-minute sessions of slow breathing (less than or equal to 10 breaths per minute) can lower both systolic and diastolic blood pressure, usually within 8 weeks (1) – (19). In one clinical trial, some diabetics were not able to sufficiently lower their respiration rate. However, with a longer training period a lower rate of respiration might be achieved.

Slow breathing has the physiological effect of relaxing the muscles surrounding the small blood vessels, which allows the blood to flow more easily. Alpha blockers block receptors in arteries and smooth muscle. This action relaxes the blood vessels and leads to an increase in blood flow and a lower pressure for the control of hypertension.

This section will provide brief description on the various significances of the study. The proposed study serves the hypertensive patients with information and experience in doing breathing exercises which helps them to maintain their blood pressure in normal range.. It also help them during life threatening emergency situations. The proposed study will benefits and help the future researcher as their guide. The study can also open in development of this study. While seeing in our nursing profession, saving one's life and preventing them from getting further complications and maintain the health of the patients is a great challenge. Also nowadays many people were suffering from hypertension and other life style diseases, so I selected this study to assess the effectiveness of breathing exercises among hypertensive patients who were attending in Medical clinic and ward at General Hospital Alnamas.

Statement of the Problem

A Study To assess Effectiveness Of Breathing Exercise In Lowering High Blood Pressure Among Hypertensive Patients At General Hospital, Alnamas, Kingdom of Saudi Arabia.

A. Aim/objectives of the study

To assess Effectiveness Of Breathing Exercise In Lowering High Blood Pressure Among Hypertensive Patients At General Hospital, Alnamas, Kingdom of Saudi Arabia

B. Objectives

- ❖ To assess the pretest blood pressure value among hypertensive patients before demonstrating breathing exercise.
- ❖ To assess the post-test blood pressure value among hypertensive patients after demonstrating breathing exercise.
- ❖ To evaluate the effectiveness of breathing exercise among hypertensive patients.
- ❖ To find out the association between the post-test blood pressure value among

hypertensive patients with their selected demographic variables.

C. Operational definition

Assess: Assess refers to know something accurately

Hypertension: Blood pressure is the force exerted by the blood against the walls of the blood vessels. Normal blood pressure of 120 mm Hg when the heart beats (systolic) and a blood pressure of 80 mm Hg when the heart relaxes (diastolic) and when systolic blood pressure is equal to or above 140 mm Hg and/or a diastolic blood pressure equal to or above 90 mm Hg the blood pressure is considered to be raised or high Or termed as hypertension.

D. Hypothesis

Research hypotheses:

The following research hypotheses were formulated to achieve the aim of the current study:

H1- There will be a statistical significant difference in blood pressure before and after breathing exercise intervention.

H2- There will be a significant association between the blood pressure level of study subjects with their selected demographic variables

E. Assumption

Breathing exercise might have direct effect in reducing high blood pressure

F. Delimitation

The data collection is delimited to 7 weeks
The patients who are willing to participate during data collection

G. Projected outcome

The study findings help to assess blood pressure before and after breathing exercise intervention among hypertensive patients.

H. Limitation

The study was conducted among Hypertensive Patients At General Hospital,

Alnamas, Kingdom of Saudi Arabia, generalization can be done but with caution

II. METHODOLOGY

This chapter includes research design, the setting of the study, the sample size, the criteria for sample selection, the methods of sample selection the instruments and tools for data collection, the technique of data analysis and protection of human subjects. The present study was designed to assess effectiveness of breathing exercise in lowering high blood pressure among hypertensive patients at general hospital, Alnamas, Kingdom of Saudi Arabia.

A. Research Approach

The research approach used for this study was quantitative approach.

B. Research Design

The research design selected for the present study was quasi experimental one group pre-test post-test design. The Investigator had developed Stress Assessment Rating Scale for evaluation of pretest and post-test stress score of the samples. For manipulation of independent variable Investigator had prepared a plan for demonstration on the Progressive Muscles Relaxation Technique and observes its effect on the stress of samples as dependent variable. The research design adopted for the study is diagrammed as:

ONE GROUP	PRE TEST O1	INTERVENTION X	POST TEST O2
Hypertensive Patient	Assess Vital Signs including Blood Pressure & Demographic data	Breathing Exercise	Assess Vital Signs including Blood Pressure

KEY -:

O1 = It is the First Observation means assessment of pre-test score of blood pressure level among hypertensive in general hospital at Alnamas.

X = Treatment to the group is the administration of the breathing exercise.

O2 = It is the second observation means assessment of post-test score of blood pressure level among hypertensive in general hospital at Alnamas.

C. Setting of the study

The study was conducted at general hospital, Alnamas, Kingdom of Saudi Arabia. 80 hypertensive patients were selected as samples for this study. This setting was selected because of the availability of participants and feasibility of conducting the study. Researcher's convenience and familiarity with settings were added reason.

D. Population

The target population for this study is hypertensive patients from general hospital, Alnamas, Kingdom of Saudi Arabia.

E. Sample

Sample consisted of 80 hypertensive patients who attended in medical OPD & ward at general hospital, Alnamas, Kingdom of Saudi Arabia.

F. Sampling Technique

80 hypertensive patients were selected by convenient sampling method.

G. Criteria for sample selection

1. Inclusion Criteria: The patients who are willing to participate in the study, age between 30-60, patient free from liver disease, renal disease, cardiac disease, cancer, diabetes etc and patient who is medically fit to do breathing exercise

2. Exclusion Criteria: Unconscious patients, smokers and women with contraceptives, patient who is having the range of normal blood pressure & hypertension stage 2, patients who not interested to do breathing exercise

H. Research tool and technique

The tool used for the research study was demographic data and vital signs assessment check list to assess the blood pressure

I. Description of the tool

The tool used for the study includes two section that is section I and section II.

Section I: I had items related to demographic data consists of age, sex, education, occupation, marital status, family income, Duration since diagnosis of Hypertension and family history of hypertension.

Section II: Vital Signs Assessment Sheet and digital BP apparatus

Scoring Procedure: The subjects were classified into four categories based on their blood pressure value. The score for the blood pressure level is assessed by digital BP apparatus. The patients are classified according to the range as follows.

CATEGORY	SYSTOLIC(mm of Hg)	DIASTOLIC(mm of Hg)
Normal	< 120	< 80
Pre Hypertension	121-139	81-89
Hypertension-Stage 1	140-159	90-99
Hypertension-Stage 2	>160	>100

J. Data Collection Procedure

Before conducting the study, formal permission was obtained. Informed consent was obtained from the participants. The period of data collection was done for seven weeks. The researcher introduced self to each subject and explained the purpose of the study and checked vital signs before demonstrating breathing exercise. Investigator demonstrated breathing exercise and its three types. Researchers assisted the patients while doing exercise. 10 mts after finishing breathing exercise by the patient, Make the patient in relaxed state and vital signs was checked again and recorded.

K. Plan for data analysis

Data analysis was done according to the objectives of the study using descriptive statistics and inferential statistics.

L. Descriptive Statistics

Frequency percentage mean and standard deviation were used for the analysis.

M. Inferential Statistics

Paired “T” test was used for testing effectiveness of breathing exercise. Chi -square was used to determine the association between demographic variables with level of blood pressure.

N. Protection of human subjects

After the problem statement was approved formal permission was obtained before starting the study. The oral & written consent was obtained from each participants of the study before starting the data collection. Assurance was given to the subject that the anonymity of each individual would be obtained.

III. RESULTS & DISCUSSION

This section shows the result findings of the study which is based on data analysis and interpretation of data collected from the participants

The data collected during the present study were analysed based on the objectives formulated for the study. The objectives of the study were

- ❖ To assess the pre-test blood pressure value among hypertensive patients before demonstrating breathing exercise.
- ❖ To assess the post-test blood pressure value among hypertensive patients after demonstrating breathing exercise.
- ❖ To evaluate the effectiveness of breathing exercise among hypertensive patients.
- ❖ To find out the association between the post-test blood pressure value among hypertensive patients with their selected demographic variables.

A. Organization of the Findings

In order to find out the relationship between the variables and also to assess the blood pressure value the data gathered were tabulated, analyzed and interpreted using both descriptive and inferential statistics. The data are presented under the following headings.

Frequency and percentage distribution of sample characteristics of the study.

Findings related to frequency and distribution of blood pressure level of the participants.

Association between blood pressure level and demographic variables such as age, year of study, previous education syllabus, parent education, family income, area of residence.

B. Frequency and percentage of sample characteristics of the study

Frequency and percentage of distribution of pre-test level of hypertension(N=80)

Hypertension level	Frequency	Percentage
Pre Hypertension	63	78.75%
Hypertension-Stage 1	17	21.25%

Distribution of frequency and percentage of demographic variables among patients with hypertension (N=80)

Demographic factor	Category	% Of Sample
Age	<40years	38.75
	41-50years	33.75
	51-60years	16.25
	61-70years	11.25
Gender	Male	65
	Female	35
Education	Primary level of education	46.25
	Secondary level of education	21.25
	Higher level of education	16.25
	Graduate and above	16.25
Occupation	Unemployed	6.25
	Private Sector	8.75
	Government Sector	23.75
Marital status	Self-employed	61.25
	Married	58.75
	Unmarried	5
Family income per –month	Widower	13.75
	Divorced/separated	22.5
	Less than2000SR	3.75
	2001SR-3000SR	8.75
Duration since diagnosis of Hypertension	3001SR-4000SR	21.25
	4001SRand above	66.25
	<3years	13.75
	4-6years	36.25
Family history of Hypertension	7-9years	28.75
	>10years	21.25
	Yes	83.75
	No	16.25

Frequency and percentage of distribution of post-test level of hypertension (N=80)

Hypertension level	Frequency	Percentage
Normal	23	28.75%
Pre Hypertension	46	5.75%
Hypertension-Stage 1	11	13.75%

Determine the effectiveness of deep breathing exercise on level of blood pressure among patients with hypertension (N=80)

PARAMETERS	MEAN SCORE			N	SE (±)	Paired“t”	“p-value”(One Pre- tailed)	
	Pre-Test Level Of Hypertension	Of	Post-Test Level Of Hypertension					Difference
Mean hypertension score	40		26.66	13.34	80	1.806	8.603	< 0.001

Above table reveals that, Level of significance (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. The reduction in hypertension over breathing exercise (Mean = 13.34) was significant at 5%.So the breathing exercise was effective on hypertensive patient

The findings revealed that there was significant association between hypertension level and age, gender, Education of the participant, Occupation of the participant, Duration since diagnosis of hypertension, Family history of diabetes mellitus. But there is no association between hypertension level and Religion, Marital status, Family income per- month.

IV. CONCLUSIONS

Slow and Deep breathing can have a powerful influence on our health. when our breathing is full and deep, the diaphragm moves through its entire range downward to massage liver, stomach and other organs and tissues below it, and upward to massage the heart. when our breathing is full and deep, the belly, lower ribcage, and lower back all expand on inhalation, thus drawing the diaphragm down deeper into the abdomen, and retract on exhalation, allowing the diaphragm to move fully upward toward the heart. in deep breathing the upward and downward movement of the diaphragm, combined with the outward and inward movements of belly ribcage and lower back help to massage and detoxify our inner organs and promote blood flow and peristalsis, and pump the lymph more efficiently through our lymphatic system. The lymphatic system which is an important part of our immune system has no pump other than muscular movements, including

the movements of breathing. Our study shows breathing exercise is effective in lowering high blood pressure. Based on the study, the investigator proposed following recommendations:

- ❖ To maintain blood pressure, all can do breathing exercise
- ❖ Breathing exercise is one of the non-pharmacological method in reducing high blood pressure
- ❖ A comparative study can be carried out in different settings.

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