Effect of Foot Reflexology on Blood Pressure and Quality of Life among Patients with Essential Hypertension

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Abstract

Background: Hypertension represents a major threat for millions of people around the world, it's a cause for growing public health concern in most countries, a leading cause of death, disability and a highly health care cost, which must persuade all health authorities to cope with this challenge. **Aim of the study**: was to evaluate the effect of foot reflexology on blood pressure (BP) and quality of life(QOL) among patients with essential hypertension. **Methods**: A quasi-experimental design was used. **Setting:** the study was conducted at out-patient of cardiac, medical & neurological clinics at Benha University Hospital. **Study subjects**: A purposive sample of 60 patients with essential hypertension who attended the cardiac, medical & neurological outpatient clinics at Benha University Hospital within 6 months ago. They were divided into equal two groups, foot reflexology group (study) and control group. **Tools:** Three tools were used to collect data (1) Interview questionnaire sheet, (2) Patients' heart rate (HR) & BP measurement sheet & (3) Quality of Life Questionnaire. **Results**: the present study revealed that there was no significant difference between both groups in the 1st month of follow up visit pre-interventional period regarding complaint, HR, BP & QoL p>0.05 while become highly significant difference in the 2nd & 3rd months p<0.001 **Conclusion**: Foot reflexology had statistically significant positive effect on the complaint, HR, BP & QoL among the patients with essential hypertension. **The study recommended**: replication of the study on large sample selected from different geographical areas of Egypt is recommended to generalize the study results.
Keyword: Essential hypertension, Foot reflexology, Blood pressure, Quality of Life

Introduction

Hypertension (HIN) is an important global health challenge because of its high prevalence. It is a term referred to high blood pressure (BP); the flow of blood is based on the beat of which heart pumps blood. The pressure of the heart doesn't remain at the same level all the time, it changed according to activities and occurs as a result of persistent abnormal pressure of main arteries. *(James, 2014 and Cunha & Marks, 2011).* Moreover, it is defined as persistent elevation of the systolic blood pressure (SBP) at a level of 140 mm Hg or higher and diastolic blood pressure (DBP)at a level of 90 mm Hg or higher based on the average of two or more correct BP measurements *(WHO, 2012).* A few people with high BP may have headaches, shortness of breath or nosebleeds, but these signs and symptoms aren't specific and usually don't occur until high BP has reached a severe or life-threatening stage **(Kaplan, et al.,2015).**

Primary (essential) hypertension for most adults, there's no identifiable cause of high BP and progresses from occasional to established HIN **(Whelton, et al., 2017)**. After a long, invariable, asymptomatic period, persistent HIN develops into complicated HIV, in which uncontrolled high BP can

result in target organ damage to the aorta and small arteries, kidneys, retina, and central nervous system (CNS) is evident. **(Hall, et al.,2012 and Calhoun, et al., 2000).** It may be leading to; heart attack or stroke, aneurysm, heart failure, weakened and narrowed blood vessels in the kidneys, thickened, narrowed or torn blood vessels in the eyes, metabolic syndrome & trouble with memory **(Daniel, et al., 2017).** Therefore, the higher BP is the higher likelihood of the harmful consequences to the major organs but also the harmful consequences be high in people with mild HIN in combination with other risk factors e.g., tobacco use, physical inactivity, unhealthy diet, obesity, diabetes, high cholesterol, low socioeconomic status and family history of HIN (**WHO, 2013 and Denardo, et al., 2010**).

Treatment line of HTN includes pharmacological and non- pharmacological methods; the choice of which medications to prescribe has long term implications. These medications include, Diuretics Thiazide diuretics- Loop diuretics, Angiotensin converting enzyme (ACE) inhibitors, Aldosterone inhibitors, Beta blockers, Renin inhibitors, Peripheral alpha blockers, Centrally-acting alpha-2 agonists and direct vasodilators **(Brown, etal., 2011).** Regarding non- pharmacological treatment for HTN, the majority of the physicians recommend changing the lifestyle and non-pharmacological treatments before prescription of the medications in the BP control. One of the non-pharmacological and lifestyle based treatments is the complementary medicine. **(Kamalifard, et al., 2012).**

Complementary and alternative medicine (CAM) has been defined as a group of diverse medical and health care systems, practices and products that are not generally considered part of conventional medicine. In 21th century, it is thought that CAM therapies play a significant role in health care and especially in self-treatment of healthy and unhealthy individuals. These therapies include acupuncture, chiropractic, herbal medicine and dietary supplements, spirituality and faith healing therapeutic touch and a number of others**. (Hassan, et al., 2012).** Foot reflexology is one of the complementary therapy, linked to other treatments that widely used in a palliative care or to alleviate a problem without dealing with the underlying cause in order to improve a patients' emotional, physiological and spiritual health and increase the value of their life.

Foot reflexology has mechanical effects that improve circulation, remove waste products from the body, improve joint mobility, relieve pain and reduce muscle tension. It has psychological benefits such as relaxation. Additionally, it had been reported that the reflexology effects valuably on the baroreceptors reflex sensitivity, sinus arrhythmia **(Lu, et al., 2011)** and impact positively on the physiological parameters i.e. SBP, DBP and heart rate (HR) **(Moeini, et al., 2011).** It was found that there was significant difference in SBP, DBP, pulse rate, general fatigue, and mood status after giving reflexology session (**Mehdi, et al., 2016).**

It is a noninvasive and manual therapeutically approaches that can be performed on the hands, feet, or ears at specific reflex points using of special manipulations with varying degrees of the pressure. It establishes both the psychological and physiological standardization of the body using special manipulations with varying degrees of the pressure; it helps to improve the performance in individuals' life day by day and

has a valuable effect on the quality of life (QoL) and the well-being, diminishing of the anxiety, stress and pain. **(Cressy, 2011 and Moeini, et al., 2011**).

Moreover, past interventional researches on HTN while seeking for indicator to measure the intervention outcomes of them, researches focused more on medical outcomes without taking into cognizance the importance of QoL that the patients perceive before and after the intervention. The evaluation of patients' total well-being should no longer be viewed from disease control and management alone but the QoL of the patients will live in complete state of well-being (**Pezzin, et al., 2010).** As a result of the QoL of HIN patients is not good, reflexology/ reflex zone therapy is one of way to improve their QOL. **(Kande & Mash, 2014).**

Foot reflexology has always been a part of the nursing care and now it has become a part of this. It is a way to strengthen the nurse-patient interrelationship as a nurse can easily and practically use massage. It offers a strategy to fulfill the goals of human touch and holistic care **(Kozier, et al., 2013).** Today nursing is focusing on holistic health care and it is believed that complementary therapies are also a part of holistic nursing **(Kwai, 2015)**. It is expected from the nurses who adopt integrated approach in patient care to develop nursing applications depending on evidence by references for CAM, to have knowledge about its effects, side effects and reliability to direct the healthy/unhealthy patients to its uses properly and safely **(Turan, et al., 2010**).

Significance of the study

HIN is a major public health problem. Its incidence is increasing year after year. This disease is the most common cause of morbidity and disability and incurs great economic costs. The worldwide prevalence has been estimated as, males 24.1 % & females 20.1 % *(Onwukwe, 2012)*.

HIN is a common health problem in Egypt with a prevalence rate of 26.3 % among the Egyptian population. Its incidence increases with aging, approximately 50 % of Egyptians over the age of 60 years had been diagnosed as HIN. Results of national step wise survey, by the **WHO***, (2017)* that about 24.8 % males & 25.0% females of Egyptian population suffer from raised BP**.**

HIN patients should be aware of various CAM namely foot reflexology as complementary therapy that plays an important role in the ability to control HTN. High BP is the primary risk factor for cardiovascular diseases and if uncontrolled can lead to large number of complications with consequent death. So, the present study was undertaken with the objectives to evaluate the effects of foot reflexology on BP and QoL among patients with essential HIN. Hopefully this study has positive reflection for enhancing the QoL for such group of patients and finally it will generate attention & motivation for future researches.

Aim of the Study

This study aimed to evaluate the effect of foot reflexology on blood pressure and quality of life among patients with essential hypertension.

Research Hypotheses:

1. There will be difference in level of blood pressure between pre and post test phase among foot reflexology group versus control group at the end of four weeks of practice and at follow up on the 2th and 3rd months of practice.

2. There will be difference in patients' complaints between pre and post test phase among foot reflexology group versus control group at the end of four weeks of practice and at follow up on the 2th and 3rd months of practice.

3. There will be more improvement in quality of life scores for the foot reflexology group versus control group at the end of four weeks of practice and at follow up on the 2th and 3rd months of practice.

Subjects and Method

The subject and methods of the study was portrayed under the four main designs as follows:

I. Technical design

The technical design for this study includes research design, settings, subjects and tools for data collection.

Research design

A quasi-experimental, design was utilized to achieve the aim of the study.

Study setting

The study was conducted at out-patient of cardiac, medical & neurological clinics at Benha University Hospital.

Subjects

A purposive sample of 60 consecutive eligible patients with HIN who attended to the above mentioned setting were included in the study. Subjects recruited were randomly allocated and classified into two equal groups, 30 participated in the foot reflexology group (study group) and 30 control group. All participants of both groups were followed to their usual prescribed medical treatment throughout the duration of the study. Data collection was undertaken during six months, between June to end of November, 2017.

Inclusion criteria:

The subjects were eligible in the study were:
- conscious adult males and females,
- their age ranged from 30 years to less than 60 years old,
- had essential HIN (SBP greater than or equal to 140mmHg, and DBP greater than or equal to 90 mmHg).

Excluded criteria:

The subjects were excluded:

- had thrombotic disease of the lower extremities, foot ulcers, foot infections/diseases, or undergone foot surgery, and pregnant women were excluded.
- with recent major surgery such as open heart surgery, lesions or fractures, sprains or bruises of the lower extremities, hemorrhage, epilepsy, diabetic foot, irregular heart rate and hypotension
- with open skin wounds on their feet, and foot tumor, or undergoing radiotherapy.
- had associated diseases like TB, DM, Asthma, heart, and renal disease.

Tools for data collection

Tool I: Patients' Interview Questionnaire: It was designed and adapted by the researcher through a review of related literature *(Somchock, 2006 & Elshamy, 2011)*. It included the following:

Part 1: It concerned with Patients' demographic Characteristics:

It included seven items related to information about age, gender, residence, marital status, educational status, occupation, and economic status which included type of house and number of children, as well as crowding index in which rated as follow "Crowding index = Number of persons living in the house / number of rooms in the house".

Part 2: It concerned with Patients' complaints of hypertension:

It comprised six items related to complaints and its suffering level, including: headache, numbness, tiredness, blurred vision, nausea, and fainting. The participants were asked for frequency suffered which is classified by a three point of Likert scale Liker Scale Liker scale, scored as: " never" = 0, " rarely" = 1, "sometimes" = 2 and " often " = 3 with a total score = 18.

Tool II: Patients' heart rate and blood pressure measurement assessment:

It aimed to assess HR & BP for both groups (study & control) as a baseline through the 1st month of follow up visit then the 2nd & 3rd months using sphygmomanometer and stethoscope standardized device for measuring BP. This applied according to normal standardized measurements stated by *WHO, 2012* as SBP greater than or equal to 140mmHg, DBP greater than or equal to 90 mmHg & heart rate = 60-100

Tool III: Quality of Life Scale Questionnaire:

This tool aimed to assess the QoL for patients with essential HTN in both groups (study & control) as a baseline through the 1st month of follow up visit then the 2nd & 3rd months. It was derived from the (WHOQoL - BREF) **(WHO, 1996)** & modified to the Arabic language. It is a 26- item, generic questionnaire related to QoL that is a short version of the WHOQoL-100 scale. It consisted of four domains, namely: physical health (seven items), psychological health (six items), social relations (three items) and environment (eight items) as well as subjective satisfaction with health constitute the general facet on QoL and health (two items). The response options ranged from 1= (never / not at all satisfied), 2= (rarely / hardly satisfied), 3= (sometimes / quiet &bit satisfied), 4= (often/almost satisfied), 5= (always/constantly satisfied). The total score for this tool was ranged from 1-130 & was classified as the following:

- < 26 points representing < 20% was considered extremely sever affection which means not at all satisfied QoL.
- 26- < 52 points representing 20% < 60% was considered sever affection which means hardly satisfied QoL.

- 52- < 104 points representing 60% < 80% was considered moderate affection which means quiet &bit satisfied QoL.
- 104 - < 130 points representing 80% < 100% was considered mild affection which means almost satisfied QoL.
- 130 points representing 100% was considered no affection which means constantly satisfied QoL.

Foot reflexology guidelines booklet:

It was designed by the researcher through a review of related literature and included the following: definition of reflexology, history of reflexology benefits of reflexology, reflexology and HTN, contraindications of reflexology, maps of foot reflexology, reflex zone therapy, principles of foot reflexology and foot reflexology application technique. This technique was developed and adopted from *FARNSWORTH, (1995)* & the researcher applied it on the patients in the study group after became trained under supervision of the reflexologist.

Method

II. Administrative design

An official permission to carry out the study was obtained by submission an official letter from the dean of faculty of nursing at Benha University to the director of Benha university hospital. This letter explains and clarifies the aim and objectives of the study to obtain permission to conduct.

Ethical consideration

The ethical research considerations in this study included the following:
- The researcher clarified the objectives and aim of the study to the patients before data collection.
- The researcher assured maintaining anonymity and confidentiality of subjects' data and that was used for purpose of the study only.
- The subjects were informed that they allowed to choose to participate or not in the study and they had the right to withdraw from the study at any time.

III. Operational design

The operational design for this study involved three phases, namely preparatory phase, tools validity and reliability, pilot study and field work.

- **Preparatory Phase**

This phase included reviewing of literature of various aspects for this study in order to develop the appropriate tools for data collection according to supervisors' guidance and experts' opinions. The researcher developed foot reflexology guideline booklet in Arabic language. During this phase, the researcher also visited the study setting to be acquainted with the personnel and the setting.

- **Tools validity and reliability:**

The validity of the tools was ascertained by a group of five experts from medical surgical nursing department, faculty of Nursing, Ain Shams University and Benha University (one Professor and 2 assistant professors) and from ICU department (one Professor and 1 assistant professor). Their opinions elicited regarding the format, layout, consistency, accuracy and relevancy of the tools. Testing reliability of the developed tools was done through Alpha Cronbach test that was 0.851& 0.745

- **Pilot Study**

Pilot study was conducted on 10 % of studied sample (6 patients) to test the clarity, feasibility and applicability of the tools. According to the results of the pilot study, some modifications were performed as needed so; the patients involved in the pilot study were excluded from the main study.

- **Field work**

Data collection of this study was carried out through six months, from the beginning of June, 2017 to end of November, 2017. It was carried out by the researcher **in three phases**:

Assessment Phase (baseline data)

The study was conducted at cardiac, medical & neurological out-patient clinics at Benha University Hospital. The cardiac & medical clinics were opened in Sunday, Tuesday, Thursday but the neurological clinic was opened in Wednesday. The researcher was present in these days from 9 a.m. to 2 p.m. as this time duration that the outpatients were opened. The researcher was present in Sunday & Tuesday for collecting the patients in study group and Wednesday & Thursday for collecting the patients in control group. In the first month about 18 patients were taken in the study, in the second month about 27 patients & in the third month about 15 patients were taken in the study. All patients were followed for 3 months. Baseline assessment was collected regarding the patients' demographic characteristics, complaints, HR, BP and QoL for both study and control groups before practicing foot reflexology technique using tools I, II and III in the 1st month for patients in study group.

Implementation Phase

Patients' demographic characteristics, health history and complaints of HTN and lifestyle, HR, BP and QoL for both study and control groups were assessed once prior the practice of foot reflexology technique. Once the baseline data was assessed for the patients in both groups, patients were provided with 10-minutes rest. Following this rest time, their BP level and pulse rate were measured. The researchers worked to decrease factors affecting BP such as emotion, exercise, respiration, meals, tobacco, temperature, pain, bladder distension based on the protocols for taking BP. The sphygmanometer was calibrated before use. In the first visit the patients in study group were received foot reflexology technique by the researcher & trained their companied persons about this technique to practice it for the patients twice a day at home.

Pre technique application the researcher firstly starts to prepare the patients psychologically through explaining the purpose and effects of foot reflexology and its importance upon body muscles and BP, then assisting the patient sitting or lying down for relaxation. Assuming the patients' legs uncrossed, extended, so they can feel the flow of energy and applying a 30-minutes foot reflexology technique (15mins for each foot). Enforcement and reinforcement of the session was done during and after the implementation phase. Meanwhile, the patients in control group received their routine usual medical treatment only (prescribed antihypertensive drugs).

Evaluation Phase (Post-test)

It aimed to evaluate the effectiveness of implementing the practice of foot reflexology technique. It was based on the finding of differences between pre and post implementation of the technique. The evaluation was done by the researchers for the patients in both groups through the following phases :-

Phase 1: in the 1st month of follow up visit immediately post technique application for the patients in study group, the researcher measured their complaints, HR & BP.

Phase 2: in the 2nd month of follow up visit, the researcher measured complaint, HR, BP and QoL for the patients in both groups.

Phase 3: in the 3rd month of follow up visit the researcher measured the previously mentioned measurements for the patients in both groups.

IV. Statistical analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean and standard deviation. Significance of the obtained results was judged at the 5% level.

The used tests were Chi-square test for categorical variables, to compare between different groups. Fisher's Exact or Monte Carlo correction used for chi-square when more than 20% of the cells have expected count less than 5. Student t-test used for normally distributed quantitative variables, to compare between two studied groups. ANOVA with repeated measures used for normally distributed quantitative variables, to compare between more than two periods or stages, and Post Hoc test (LSD) (Bonferroni adjusted) for pairwise comparisons and McNamara and Marginal Homogeneity Test was used to analyze the significance between the different stages.

Results

Table 1 represents frequency & percentage distribution of the patients in both groups according to the demographic characteristics (n = 60). It showed that there is no statistically significant difference between the patients in the study & control groups regarding demographic characteristics p>0.05. Whereas their mean age was 49.13 ± 7.28 & 47.67 ± 9.14 respectively, living in urban area were 76.6 & 56.7%, respectively and not working were 56.7% & 50.0%, respectively. Also, 93.3% &80.0%, respectively were married, 66.7% & 46.7% respectively were females as well as 36.7% of them respectively were illiterate.

Table 2 Continued: represents frequency & percentage distribution of the patients in both groups according to the demographic characteristics (n = 60). It revealed that there is no statistically significant difference between the patients in both groups (study & control) regarding their economic status p>0.05, whereas 93.3 % & 100 %, respectively had private house. With a mean number of children was 3.70 ± 1.26 &4.10 ± 1.16 respectively. Also, their crowding index was 1.45 ± 0.93 &1.42 ± 0.45 respectively. Moreover, 60.0% & 56.7% respectively had sufficient monthly income.

Table 3 - 4: illustrates comparison between the patients in both groups (study and control) regarding their complaints of hypertension throughout the study phases (n= 60). It was clear that there was no significant difference between both groups in the 1st month of follow up visit pre-interventional period p > 0.05. While there was statistically significant difference between both groups in the 2nd month regarding the complaints p < 0.05 except numbness, nausea & vomiting. In the 3rd month there was highly significant difference between both groups regarding all complaints p < 0.001.

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Table 5: clarifies comparison between the patients in both groups (study and control) regarding their heart rate and blood pressure mean scores throughout the study phases (n = 60). It is clear that there was no statistically significant difference between both groups in the 1st month of follow up visit pre the interventional period p>0.05 to become highly significant difference in 2nd & 3rd months p<0.001.

Table 6: shows comparison between the patients in both groups (study and control) regarding their quality of life domains mean scores throughout the study phases (n = 60). There was no statistically significant difference in all domains p > 0.05except regarding their social status in the 1st month of follow up visit pre the interventional period with a highly statistically significant difference in the 2nd and the 3rd months p < 0.001.

Table (7): illustrates correlation between the patients' complaints, heart rate, blood pressure and quality of life in study group pre & post the interventional period. There is a significant correlation between patients' HR & their complaint, SBP& DBP in study group where p<0.05 in the 1st month of follow up visit pre the interventional period. Meanwhile in the 3rd month post intervention patients' HR is significantly correlated with each of SBP, DBP & QoL where p<0.05.

Table (8): clarifies correlation between the patients' complaints, heart rate, blood pressure and quality of life in control group pre & post the interventional period. It revealed that there is a significant correlation between patients' HR & SBP& DBP in control group in the 1st month of follow up visit pre the interventional period and there is a significant correlation between their DBP & QoL where p<0.05. In the 3rd month post interventional period there is a significant correlation between patients' HR and SBP& DBP where p<0.05.

Table (1): Frequency & percentage distribution of the patients in both groups according to the demographic characteristics (n = 60)

Variables	Study group (n = 30)		Control group (n = 30)		Test of sig.	P
	No.	%	No.	%		
Age						
30 -	4	13.3	7	23.3		
40 -	11	36.7	9	30.0	χ^2=1.053	0.591
50 – 59	15	50.0	14	46.7		
Mean ± SD.	49.13 ± 7.28		47.67 ± 9.14		t=0.687	0.495
Gender						
Male	10	33.3	16	53.3	χ^2=2.443	0.118
Female	20	66.7	14	46.7		
Residence						
Urban	23	76.6	17	56.7	χ^2=2.700	0.100
Rural	7	23.3	13	43.3		
Educational level						
Illiterate	11	36.7	11	36.7		
Primary education	10	33.3	5	16.7	χ^2=5.729	0.057
Secondary education	6	20.0	4	13.3		

University education	**3**	**10.0**	**10**	**33.3**		

Variables	No.	%	No.	%	Test of Sig.	P
Occupation						
- Worker						
Physical work	**4**	**13.3**	**4**	**13.3**	χ^2=2.796	0.221
Employee	**9**	**30.0**	**11**	**36.6**		
- Non worker	**17**	**56.7**	**15**	**50.0**		
Marital Status						
Married	**24**	**80.0**	**28**	**93.3**	χ^2=2.308	0.254
Not married	**6**	20.0	2	6.7		

* Statistically significant at p ≤ 0.05   Insignificant at p > 0.05

Table (2): continued: Frequency & percentage distribution of the patients in both groups according to the demographic characteristics (n = 60)

Variables	Study group (n = 30)		Control group (n = 30)		Test of Sig.	P
	No.	**%**	**No.**	**%**		
Economic status						
Type of house						
Private	**28**	**93.3**	**30**	**100.0**	χ^2=2.069	0.492
Family house	**2**	**6.7**	**0**	**0.0**		
Number of Children						
Min. – Max.	**1.0 – 6.0**		**2.0 – 6.0**		t=1.280	0.206
Mean ± SD.	**3.70 ± 1.26**		**4.10 ± 1.16**			
Crowding index						
Number of persons living in the house						
Min. – Max.	**1.0 – 9.0**		**2.0 – 6.0**		t=1.219	0.229
Mean ± SD.	**3.47 ± 1.93**		**3.97 ± 1.16**			
Number of rooms in the house						
Min. – Max.	**1.0 – 4.0**		**2.0 – 3.0**		t=1.564	0.125
Mean ± SD.	**2.60 ± 0.72**		**2.83 ± 0.38**			
Total crowding index						
Min. – Max.	**0.50 – 4.50**		**0.67 – 2.50**		t=0.148	0.883
Mean ± SD.	**1.45 ± 0.93**		**1.42 ± 0.45**			
Monthly income						
Enough	**18**	**60.0**	**17**	**56.7**	χ^2=0.989	1.000
Not enough	**12**	**40.0**	**13**	**43.3**		

* Statistically significant at p ≤ 0.05   Insignificant at p > 0.05

Table (3): Comparison between the patients in both groups (study and control) regarding their complaints of hypertension throughout the study phases (n= 60)

Complaints	Study Group (n = 30)								Control Group (n = 30)						Sig bet both groups		
	1st month				2nd month		3rd month		1st month		2nd month		3rd month				
	Pre		Immediate Post		Post		Post		Pre		Post		Post		p_1	p_2	p_3
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Headache																	
Often	10	33.3	0	0.0	0	0.0	0	0.0	12	40.0	8	26.7	3	10.0	0.793	0.007*	<0.001*
Sometimes	19	63.3	14	46.7	26	86.7	0	0.0	18	60.0	19	63.3	22	73.3			
Rarely	1	3.3	16	53.3	4	13.3	14	46.7	0	0.0	3	10.0	5	16.7			
Never	0	0.0	0	0.0	0	0.0	16	53.3	0	0.0	0	0.0	0	0.0			
p_4	<0.001*				<0.001*		<0.001*		0.090				0.002*				
Sig. bet. Periods within each group			p_5<0.001*				p_6<0.001*										
					p_7<0.001*						p_7=0.127						
Tiredness																	
Often	21	70.0	1	3.3	0	0.0	0	0.0	23	76.7	7	23.3	9	30.0	0.843	0.012*	<0.001*
Sometimes	5	16.7	20	66.7	22	73.3	0	0.0	4	13.3	19	63.3	18	60.0			
Rarely	4	13.3	9	30.0	8	26.7	25	83.3	3	10.0	4	13.3	3	10.0			
Never	0	0.0	0	0.0	0	0.0	5	16.7	0	0.0	0	0.0	0	0.0			
p_4	<0.001*				<0.001*		<0.001*		0.001*				0.004*				
Sig bet Periods within each group			p_5=1.000,				p_6<0.001*										
					p_7<0.001*						p_7=0.467						
Numbness																	
Often	13	43.3	2	6.7	0	0.0	0	0.0	13	43.3	4	13.3	3	10.0	0.430	0.249	<0.001*
Sometimes	8	26.7	13	43.3	19	63.3	0	0.0	9	30.0	17	56.7	23	76.7			
Rarely	6	20.0	15	50.0	8	26.7	19	63.3	8	26.7	6	20.0	4	13.3			
Never	3	10.0	0	0.0	3	10.0	11	36.7	0	0.0	3	10.0	0	0.0			
p_4	0.003*				0.001*		<0.001*		0.053				0.239				
Sig bet Periods within each group			p_5=0.796				p_6<0.001*										
					p_7<0.001*						p_7=0.144						

Table (4): continued: Comparison between the patients in both groups (study and control) regarding their complaints of hypertension throughout the study phases (n=60)

Complaints	Study group (n = 30)								Control group (n = 30)						Sig bet both groups		
	1st month				2nd month		3rd month		1st month		2nd month		3rd month				
	Pre		Immediate Post		Post		Post		Pre		Post		Post		p_1	p_2	p_3
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
Blurred vision Often	11	36.7	1	3.3	0	0.0	0	0.0	11	36.7	5	16.7	1	3.3	1.000	0.053	<0.001*
Sometimes	15	50.0	17	46.7	21	70.0	0	0.0	15	50.0	20	66.7	26	86.7			
Rarely	4	13.3	12	40.0	9	30.0	17	56.7	4	13.3	5	16.7	3	10.0			
Never	0	0.0	0	0.0	0	0.0	13	43.3	0	0.0	0	0.0	0	0.0			
p_4	<0.001*				<0.001*		<0.001*		0.108				0.050*				
Sig bet Periods within each group			p_5=0.564				p_6<0.001*										
					p_7<0.001*						p_7=0.527						
Nausea Often	3	10.0	0	0.0	0	0.0	0	0.0	3	10.0	0	0.0	0	0.0	0.545	0.400	<0.001*
Sometimes	11	36.7	8	26.7	12	40.0	0	0.0	11	36.7	10	33.3	7	23.3			
Rarely	8	26.7	20	66.7	10	33.3	4	13.3	12	40.0	15	50.0	21	70.0			
Never	8	26.7	2	6.7	8	26.7	26	86.7	4	13.3	5	16.7	2	6.7			
p_4	0.439				0.025*		<0.001*		0.217				0.117				
Sig bet Periods within each group			p_5=0.527				p_6<0.001*										
					p_7<0.001*						p_7=1.000						
Fainting Often	1	3.3	0	0.0	0	0.0	0	0.0	1	3.3	0	0.0	0	0.0	1.000	0.488	1.000
Sometimes	0	0.0	0	0.0	1	3.3	0	0.0	0	0.0	0	0.0	0	0.0			
Rarely	0	0.0	1	3.3	0	0.0	0	0.0	0	0.0	2	6.7	1	3.3			
Never	29	96.7	29	96.7	29	96.7	30	100.0	29	96.7	28	93.3	29	96.7			
p_4	0.317				1.000		1.000		0.763				0.527				
Sig bet Periods within each group			p_5=0.317				p_6=1.000										
					p_7=1.000						p_7=1.000						
Total score	10.53±2.40		7.63±1.63		8.03±1.65		2.63±1.0		11.00±1.78		9.23±1.76		9.20±1.41		0.396	0.008*	<0.001*
			<0.001*		<0.001*		<0.001*				<0.001*		<0.001*				

p_1: comparing between both groups pre 1st month.

p_4: comparing between pre and 2nd & 3rd months within each group

p_2: comparing between both groups post 2nd month. p_5: comparing between immediate post and 2nd month in study group

p_3: comparing between both groups post 3rd month. p_6: comparing between immediate post and 3rd month in study group

p_7: comparing between 2nd and 3rd months within each group   * Statistically significant at $p \leq 0.05$

** Highly significant at $p < 0.001$ Insignificant at $p > 0.05$

Table (5): Comparison between the patients in both groups (study and control) regarding their heart rate and blood pressure mean scores throughout the study phases (n = 60)

| | Study group (n = 30) | | | | Control group (n = 30) | | | Sig bet both groups | | |
| | 1st month | | 2nd month | 3rd month | 1st month | 2nd month | 3rd month | | | |
	Pre	Immediate post	Post	Post	Pre	Post	Post	p_1	P_2	P_3
Heart rate										
Min. – Max.	63.0 – 105.0	61.0 – 100.0	60.0 – 96.0	60.0 – 93.0	75.0 – 105.0	62.0 – 90.0	60.0 – 80.0	0.376	$<0.001^*$	$<0.001^*$
Mean ± SD.	90.70 ± 10.86	87.67 ± 10.44	83.73 ± 9.29	81.20 ± 8.69	93.0 ± 9.01	73.57 ± 6.97	66.67 ± 5.84			
P_4	$<0.001^*$		$<0.001^*$	$<0.001^*$	$<0.001^*$		$<0.001^*$			
Sig bet Periods within each group		$p_5<0.001^*$		$p_6<0.001^*$						
			$p_7<0.001^*$			$p_7<0.001^*$				
Blood Pressure Systolic										
Min. – Max.	130.0 – 180.0	130.0 – 180.0	110.0 – 135.0	100.0 –120.0	110.0 – 157.0	130.0 – 174.0	125.0 – 170.0	0.617		$<0.001^*$
Mean ± SD.	154.0 ± 14.24	152.1 ± 15.01	124.8 ± 6.76	110.0 ± 7.31	131.5 ± 131.5	148.0 ± 14.07	144.4 ± 13.30			
P_4	$<0.001^*$		$<0.001^*$	$<0.001^*$	$<0.001^*$		$<0.001^*$	$<0.001^*$		
Sig bet Periods within each group		$p_5=0.001^*$		$p_6<0.001^*$						
			$p_7<0.001^*$			$p_7<0.001^*$				
Diastolic										
Min. – Max.	74.0 – 115.0	70.0 – 100.0	68.0 – 90.0	60.0 – 80.0	74.0 –115.0	75.0 – 110.0	70.0 – 105.0	0.589	$<0.001^*$	$<0.001^*$
Mean ± SD.	98.67 ± 9.42	82.73 ± 8.61	78.60 ± .16	0.67 ± 4.69	97.27 ± 10.52	89.87 ± 8.98	85.33 ± 8.80			
P_4	$<0.001^*$		$<0.001^*$	$<0.001^*$	$<0.001^*$		$<0.001^*$			
Sig bet Periods within each group		$p_5=0.002^*$		$p_6<0.001^*$						
			$p_7<0.001^*$			$p_7<0.001^*$				

p_1: comparing between both groups pre 1st month. p_4: comparing between pre and 2nd & 3rd months within each group

p_2: comparing between both groups post 2nd month. p_5: comparing between immediate post and 2nd month in study group

p_3: comparing between both groups post 3rd month. p_6: comparing between immediate post and 3rd month in study group

p_7: comparing between 2nd and 3rd months within each group   * Statistically significant at $p \leq 0.05$ ** Highly significant at $p < 0.001$ Insignificant at $p > 0.05$

Table (6): Comparison between the patients in both groups (study and control) regarding their quality of life domains mean scores throughout the study phases (n = 60)

Quality of life domains	Study group (n = 30)			Control group (n = 30)			Sig bet both groups		
	1st month	2nd month	3rd month	1st month	2nd month	3rd month			
	Pre	Post	Post	Pre	Post	Post			
General health							p_1	p_2	p_3
Min. – Max.	4.0 – 8.0	6.0 – 8.0	10.0 – 10.0	4.0 – 8.0	6.0 – 8.0	5.0 – 9.0			
Mean ± SD.	5.67 ± 1.12	6.70 ± 0.92	10.0 ± 0.0	5.63 ± 0.93	6.20 ± 0.48	6.33 ± 0.88	0.901	0.011*	<0.001*
M % S	45.83±14.06	58.75± 11.44	100.0 ±0.0	45.42± 11.60	52.50± 6.05	54.17± 1.05			
P_4	<0.001*		<0.001*	0.014*		<0.001*			
Sig bet Periods within each group	P_5<0.001*			P_5<0.001*					
Physical domain									
Min. – Max.	12.0 – 21.0	22.0 – 31.0	28.0 – 35.0	14.0 – 20.0	14.0 – 20.0	14.0 – 21.0			
Mean ± SD.	15.97 ± 2.27	26.17 ± 2.02	31.80 ± 1.47	16.37 ± 1.69	16.30 ± 1.64	17.20 ± 1.94	0.442	<0.001*	<0.001*
M % S	32.02 ± 8.09	68.45 ± 7.21	88.57 ± 5.26	33.45 ± 6.04	33.21 ± 5.87	36.43 ± 6.92			
P_4	<0.001*		<0.001*	0.423		0.005*			
Sig bet Periods within each group	p_5<0.001*			p_5=0.003*					
Psychological domain									
Min. – Max.	13.0 – 17.0	16.0 – 25.0	25.0 – 28.0	11.0 – 17.0	12.0 – 18.0	13.0 – 17.0			
Mean ± SD.	14.67 ± 1.30	20.53 ± 2.10	27.17 ± 0.83	13.93 ± 1.70	13.93 ± 1.64	14.70 ± 1.24	0.065	<0.001*	<0.001*
M % S	36.11 ± 5.40	60.56 ± 8.74	88.19 ± 3.47	33.06 ± 7.09	33.06 ± 6.83	36.25 ± 5.15			
P_4		<0.001*	<0.001*		1.000	0.007*			
Sig bet Periods within each group	p_5<0.001*			p_5=0.009*					
Social domain									
Min. – Max.	6.0 – 11.0	9.0 – 15.0	12.0 – 15.0	4.0 – 9.0	6.0 – 9.0	6.0 – 9.0			
Mean ± SD.	8.20 ± 1.19	10.70 ± 1.99	13.23 ± 1.22	7.27 ± 1.23	7.10 ± 1.06	6.97 ± 1.03	0.004*	<0.001*	<0.001*
M % S	43.33± 9.88	64.17 ± 16.54	85.28 ± 10.19	35.56± 0.25	34.17± 8.85	33.06 ± 8.61			
P_4	<0.001*		<0.001*	0.134		0.231			
Sig bet Periods within each group	p_5<0.001*			p_5=0.536					
Environmental domain									
Min. – Max.	11.0 – 22.0	18.0 – 31.0	31.0 – 38.0	14.0 – 22.0	14.0 – 22.0	13.0 – 22.0			
Mean ± SD.	17.37 ± 2.70	22.37 ± 3.30	33.37 ± 1.43	16.77 ± 1.89	17.77 ± 1.48	17.60 ± 1.85	0.322	<0.001*	<0.001*
M % S	29.27 ± 8.43	44.90± 10.30	79.27 ± 4.46	27.40 ± 5.90	30.52± 4.62	30.0 ± 5.78			
P_4	<0.001*		<0.001*	<0.001*		0.025*			
Sig bet Periods within each group	p_5<0.001*			p_5=0.550					

p_1: comparing between both groups pre 1st month. p_4: comparing between pre and 2nd & 3rd months within each group

p_2: comparing between both groups post 2nd month. p_4: comparing between 2nd & 3rd months within each group

p_3: comparing between both groups post 3rd month.

* Statistically significant at p ≤ 0.05   ** Highly significant at p < 0.001   -Insignificant at p > 0.05

Table (7): Correlation between the patients' complaints, heart rate, blood pressure and quality of life in study group pre & post the interventional period No=30.

			study group (n = 30)				
			Complaints	Heart rate	Blood pressure		Overall quality of life score
					Systolic	Diastolic	
1st month pre	Complaints	r		0.427*	-0.024	0.133	0.006
		p		0.019*	0.901	0.483	0.977
	Heart rate	r	0.427*		0.482*	0.483*	0.122
		p	0.019*		0.007*	0.007*	0.521
	Blood pressure						
	Systolic	r	-0.024	0.482*		0.720*	-0.022
		p	0.901	0.007*		<0.001*	0.907
	Diastolic	r	0.133	0.483*	0.720*		0.154
		p	0.483	0.007*	<0.001*		0.417
	Overall quality of life score	r	0.006	0.122	-0.022	0.154	
		p	0.977	0.521	0.907	0.417	
3rd month Post	Complaints	p		0.176	-0.168	0.195	0.002
		p		0.352	0.376	0.301	0.992
	Heart rate	r	0.176		0.424*	0.443*	-0.427*
		p	0.352		0.020*	0.014*	0.019*
	Blood pressure						
	Systolic	r	-0.168	0.424*		0.622*	-0.130
		p	0.376	0.020*		<0.001*	0.494
	Diastolic	r	0.195	0.443*	0.622*		-0.210
		p	0.301	0.014*	<0.001*		0.265
	Overall quality of life score	r	0.002	-0.427*	-0.130	-0.210	
		p	0.992	0.019*	0.494	0.265	

r: Pearson coefficient

*: Statistically significant at p ≤ 0.05

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Table (8): Correlation between the patients' complaints, heart rate, blood pressure and quality of life in control group pre & post the interventional period No=30.

			Control group (n = 30)				
			Complaints	Heart rate	Blood pressure		Overall quality of life Score
					Systolic	Diastolic	
1st month pre	Complaints	r		0.004	0.291	0.059	0.294
		p		0.985	0.118	0.757	0.114
	Heart rate	r	0.004		0.555*	0.593*	0.240
		p	0.985		0.001*	0.001*	0.202
	Blood pressure						
	Systolic	r	0.291	0.555*		0.776*	0.144
		p	0.118	0.001*		<0.001*	0.448
	Diastolic	r	0.059	0.593*	0.776*		0.397*
		p	0.757	0.001*	<0.001*		0.030*
	Overall quality of life score	r	0.294	0.240	0.144	0.397*	
		p	0.114	0.202	0.448	0.030*	
3rd month post	Complaints	r		-0.053	0.241	0.139	0.127
		p		0.779	0.199	0.462	0.504
	Heart rate	r	-0.053		0.485*	0.553*	-0.077
		p	0.779		0.007*	0.002*	0.688
	Blood pressure						
	Systolic	r	0.241	0.485*		0.766*	0.036
		p	0.199	0.007*		<0.001*	0.850
	Diastolic	r	0.139	0.553*	0.766*		0.150
		p	0.462	0.002*	<0.001*		0.430
	Overall quality of life score	r	0.127	-0.077	0.036	0.150	
		p	0.504	0.688	0.850	0.430	

r: Pearson coefficient

*: Statistically significant at p ≤ 0.05

Discussion

In the context of chronic diseases, HTN is counted as one of the major factors in decreasing life expectancy and results in the development of further systematic abnormalities. The expensive treatments, comorbidities associated with HTN and the fear of developing further life-threatening conditions have a negative influence on patients' daily life activities and HRQL. Presently, Non-pharmacologic and alternative lifestyle based treatments have become a common part of holistic health care. The HTN is one of the conditions purported to be improved by complementary therapies such as foot reflexology *(Miller., et al, 2016)*.

Part I: Concerned with demographic characteristics of studied patients:

As regards demographic characteristics of the patients, the current study revealed that there is no statistically significant difference between the patients in both groups this means that both groups are homogenous and matched. This study finding is on line with the study of **Polat & Ergüney, (2016).** That titled " The effect of reflexology applied to patients with chronic obstructive pulmonary disease on dyspnea and fatigue" and they found that there was no statistically significant difference between the patients in the experimental and control groups in terms of age, gender, marital status, educational status, income level, smoking habit, and disease duration in other words, the groups were similar.

Also this study result is in agreement with the study of *Elshamy & Elsafety, (2011).* That titled " Effect of nursing interventions using foot reflexology on BP and QoL of hypertensive patients at Mansoura university hospitals" who reported that demographic data of control and intervention groups were similar without statistically significant differences in age, marital status & economic factors.

As regard to gender, the current study revealed that more than half of the patients were females. This finding explained by the researcher's experience may be due to that as a result of the biological factors include sex hormones that are protective against HTN in women during adolescence and persist through adulthood until women reach menopause. During this period the women become at higher risk for HTN. This finding is also similar to that of *Silva., et al, (2015)*, their study titled "foot reflexology in feet impairment in the study group, 65% of them were females with an average age of 63 years old, average weight of 73.2 kg and average height of 1.63 meters. In the control group, 62% were women, whose average age was 60 years old.

As regard to marital status, the current study revealed that majority of the patients in both groups were married. This study finding is on line with that of *Jebakani, (2015)*. His study titled "Effectiveness of zone therapy on QoL among patients with HTN in selected villages" and revealed that (93.33% & 100% respectively) were married.

As regard to residence, the current study revealed that higher percent of the patients in both groups were living in urban area. This finding explained by the researcher's experience may be attributed to as a result of living in areas with higher levels of particle air pollution and more stressors is associated with

higher BP. This study finding is on line with study of **Saleem, et al., (2014)** that titled " A cross-sectional assessment of HRQoL among hypertensive patients in Pakistan" who reported that about 75.1% (n = 289) were resident of urban area in their study.

As regard to monthly income, the current study revealed that more than half of the patients in both groups had sufficient income. This may be due to most of patients in sample have extra income from other sources as having markets. This study finding is also in accordance with *Abd El Razik, (2012),* who conducted study titled "Effect of educational program on quality of life for patient with cancer undergoing chemotherapy" and found that about two thirds of the studied subjects were having sufficient income.

Part II: Comparison between the patients in both groups (study and control) according to their complaints of HTN throughout the study phases

The current study revealed that there were no significant differences between the patients in both groups in the 1st follow up visit pre-interventional period regarding their complaints from disease symptoms while there was significant difference in the 2nd month between both groups regarding the complaints except numbness, nausea & vomiting. And in the 3rd month there were highly significant difference between both groups regarding all complaints. This could be due to the positive effect of foot reflexology received to the study group.

This study finding is similar to *Grealish., et al, (2010)* who conducted study entitled " Foot massage. A nursing intervention (foot massage) to modify the distressing symptoms of pain and nausea in patients hospitalized with cancer " and they found a statistically significant immediate effect on the experience of pain, nausea and relaxation when measured with a visual analog scale. In this regard, *Nerbass., et al, (2010)* conducted study entitled " Effects of massage therapy on sleep quality after coronary artery bypass graft surgery" and they found that massage therapy influences and accelerates patients' recovery after Coronary artery bypass surgery because it improves sleep and decreases fatigue.

Part III: Comparison between the patients in both groups (study and control) according to their heart rate and blood pressure and quality of life throughout the study phases

The current study revealed that there was no significant difference between the patients in both groups in the 1st month of follow up visit regarding their HR, BP and QoL pre the interventional period, this may be due to the negative effect of HTN on HR, BP and QoL. Meanwhile, there is highly significant difference in the 2nd & 3rd months, this reflects the significant improvement in HR & QoL results from controlling BP among the patients in study group who practice foot reflexology.

This study finding is also in accordance with that of *Vinaya & Shweta, (2017),* who conducted study entitled " Effect of foot reflexology on vital parameters of hypertensive patients" and stated that after the successful completion of the statistical evaluation, the investigators found that with the application of foot reflexology, there is significant reduction in all the vital parameters i.e. pulse rate, respiratory rate and BP.

Also, this study finding is similar to *Abdi, et al, (2016)* who conducted study entitled

" The effect of foot massage on BP and HR of critical care unit (C.C.U) patients" who report that paired t test showed significant differences between the mean SBP and DBP and the HR rate also showed a significant difference before and after foot massage in experimental group. Meanwhile there was a not significant difference between the mean SBP and DBP and the HR in the control group.

This study finding is in congruent with **Khalili, et al, (2016***)***, who conducted study entitled " The effect of foot reflexology on physiological parameters" who reported that   the mean SBP in both groups had significant difference compared to before. The DBP in both groups had significant difference compared to before.

Also, this study finding is in agreement with *Priyanka, et al, (2015),* who conducted study entitled " the effectiveness of foot massage to change in the BP among patients with HTN in selected setting". This finding proved the statistical evidence which clearly indicates that foot massage is best alternative to reduce the level of blood pressure among patients with hypertension.

This study result is on line with that of *Khaledifar, et al, (2015),* who conducted study entitled " The effect of reflex therapy and massage therapy on vital signs and stress before coronary angiography" and found that improvement in DBP, HR and respiratory rate was shown in the reflex-therapy group, and similar effects were observed following other interventions including massage therapy and routine resting program.

Also, as in the **Park & Cho, (2014),** their study titled " Effects of foot reflexology on essential hypertension patients " and they conducted this study to evaluate the effects of foot reflexology on BP, serum lipids level and life satisfaction in essential HTN patients. Thirty-four subjects were assigned to an experimental group (18) and control group (16). Foot reflexology was administered twice a week for 6 weeks and self-foot reflexology was administered twice a week for 4 weeks on the experimental group. The results proved that foot reflexology was an effective nursing intervention to decrease SBP, triglyceride & life satisfaction but not for the DBP, LDL & HDL and blood cholesterol.

Also, these current study findings are contraindicated with **Kaur,** (**2012)** his study titled "effect of foot massage and reflexology on physiological parameters of critically ill patients" who reported that during the controlled observations there was no significant difference in any of the physiological parameters. There was significant decrease in the SBP, increase in DBP, reduction in the HR and improvement in the oxygen saturation in some interventional observations after the intervention.

The study results showed that foot reflexology was significantly reducing DBP and SBP for the patients in study group than control group. Also, this finding is in agreement with studies supporting these results of them a study conducted by *Hayes & Cox, (1999*). That titled "Immediate effects of a five-minute foot massage on patients in critical care". who used mean arterial BP as an indicator of measurement of physiological and psychological stress in patients in a CCU. They found that there was a significant decrease in HR, mean arterial BP and respirations during the foot massage intervention in

participants in the foot massage group compared to those in the control group who received no intervention.

Regarding the QoL, this study shows that there was no statistically significant difference in all domains except regarding their social status in the 1st month of follow up visit pre the interventional period. This could be due to the people living in rural give greater attention and care about the extended family &social relationships versus people living in urban. With a highly statistically significant difference in the 2nd and the 3rd months. This means that controlling BP improving the QoL as showed among the patients in study group due to effect of foot reflexology that reflects positively on their BP and consequently on their QoL.

This study finding is also congruent with *Jebakani, (2015)*, who revealed in his study that there was a significant improvement in the QoL of HIN patients after application of zone therapy in the experimental group. On the basis of the study, the researcher concluded that application of zone therapy to the HIN patients to improve the QoL. Zone therapy is an effective; easy and potentially risk free intervention. Similarly, the study result is in agreement with that of the **Elshamy & Elsafety, (2011)** who conducted their study to investigate the effect of foot reflexology on BP and QoL among HIN patients. This study supported that foot reflexology can reduce BP levels in patients with HIN and QoL.

The study result is also in congruent with *Hakhoe*, **(2008),** The research design used was a nonequivalent control group pretest-posttest design. Forty subjects were assigned to an experimental group (20) and control group (20). Foot Reflexology was administered twice a week for 3 weeks and self-foot Reflexology was administered twice a week for 4 weeks on the experimental group. There was a significant decrease in SBP in the experimental group compared to the 31 control group. Life satisfaction in the experimental group compared to the control group was significantly improved after foot reflexology.

Also, the study result is in agreement with **Somchock, (2006)** who conducted study entitled " Effects of foot reflexology on reducing BP in patients with HIN". The study proved that foot reflexology can decrease BP, and it could improve the QoL in patients with HIN.   Compared to *Park and Cho, (2014* they conclude that foot reflexology has been proved to lower DBP and SBP. However, its effects on quality of life or life satisfaction in patients with HIN are ambiguous.

The current study revealed that there was a significant correlation between patients' complaints, HR, SBP, DBP & QoL pre & post the interventional period among patients in both groups. This study finding explained by the researcher's experience may be attributed to the bad consequence effect of HTN on the patients' complaints, HR and QoL which enhanced by the highly statistically significant positive effect of foot reflexology that results in decreasing HTN and therefore it is reflected positively on their complaints, HR and QoL.

This finding goes in the same line with *Oza , et al, (2014)* who conducted study entitled "HRQoL in HIN patients in a tertiary care teaching hospital " this study revealed that patients with HTN have worse

QoL particularly when BP is controlled by drugs. SBP, age, number of symptoms and number of co-morbidities showed significant negative correlation with some of the WHOQoL-BREF domains and positive correlation with MINICHAL scale which suggests as these parameters increase, QoL worsens. Though HTN is seen as an asymptomatic condition, increasing symptom count and BP is a major determinant of the HRQOL of HIN patients.

In addition, **Reule & Drawz, (2012)** conducted study entitled "HR and BP: any possible implications for management of HIN?". This study revealed that HR is considered an integral part of the assessment of the HIN patient. Elevated HR is associated with increased peripheral BP and increased risk for CVD.

Conclusion
This study concluded that:

There was no significant difference between the patients in both groups pre-interventional period regarding complaints, HR, BP & QoL to become highly significant difference throughout the (2nd & 3rd months). Foot reflexology had statistically significant positive effect on the complaints, HR, BP & QoL. among the patients with essential HTN.

Recommendations:
The results of this study projected the following recommendations:
- Foot reflexology should be taken into consideration as a complementary modality beside antihypertensive drugs prescribed for subgroup of patients.
-The need for continuous educational programs for HTN patients and their families about the disease, management, complication and complementary/ alternative therapies to alleviate from their complaints.
- Encouraging social agencies to enhance public awareness about reflexology through the media, publications, educational sessions and lectures.
- Replication of the study on large sample selected from different geographical areas of Egypt is recommended generalizing the study results.

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