

Application of Trans-Theoretical Model on Diet Behavior Modification among Hypertensive Employee in Electrical Company

Hasnaa.M.El-Said¹, Ebtisam.M.Abd el-Aal², Ahlam.E.Mohamed³, Hedyia.F.Mohy⁴

Community Health Nursing Dept., Faculty of Nursing, Benha University, Egypt

E-mail: hasnaamohamad2022@gmail.com

Abstract

Background: A healthy diet is one of the real modifiable factors in controlling high blood pressure. The trans theory model is the best known and applies to a variety of unhealthy behaviors such as: Hypertension, obesity, drug use, and smoking. **Aim of the study:** was conducted; to evaluate, the effect of application of trans-theoretical model; on diet behavior modification; among hypertensive employee; in electrical Company. **Design:** A quasi-experimental; design; was used. **Setting:** The study; was conducted; at Benha Electrical Company; in Benha City, Egypt. **Sample:** A purposive sample; of 70 hypertensive employee; in electrical company. **Study instruments included;** two tools ;used for; data collection. **First:** Structured interview questionnaire; concerned with socio-demographic; data and knowledge; of employees about hypertension, Diet behavior modification and Trans theoretical model (TTM). **Second:** Trans-theoretical model of behavior changes questionnaire. **Results:** revealed that, 14.3 %; of studied sample; had good knowledge; pre TTM application; compare to 81.4%; of studied sample had good knowledge post TTM application for Diet behavior Knowledge. And none to 88.6% for TTM Knowledge Furthermore, there were; a highly. Significant; improvement; ($p < 0.000$) in subtotal TTM levels. Post TTM application ' "satisfactory" responses were increased from a range of 28.6% pre TTM application, to 95.7% post TTM application. Besides, there was, high significant; positive correlation; between; total knowledge score and total score; of stages of diet behavior changes ($r = 0.76$, $p < 0.0001$). **Conclusion:** Application of TTM for behavior modification to control hypertension in hypertensive employees was observed by decreasing blood pressure measurements and increasing employee self-efficacy experiences and behavior modification processes. However, it decreased after TTM application compared with TTM application. **Recommendation:** provide electrical company employees with web site for health information to improve their knowledge and diet behavior to control chronic diseases as hypertension

Keywords: Trans theoretical model, Hypertension, Diet behavior modification, electrical company.

1. Introduction

Hypertension is one of the leading causes of premature death "worldwide". Hypertension increased significantly. It is estimated that approximately 1.28 billion adults worldwide suffer from hypertension due to the risk of heart, brain, kidney and other diseases. An estimated 46% of adults have had high blood pressure but are unaware of it, and fewer than 42% of adults have high blood pressure diagnosed and treated. World Health Organization's; goal is to reduce prevalence worldwide by 33% between 2010 and 2030 [1].

Electricity company activity affects workers' general health, particularly cardiovascular health, and negatively impacts job performance. Encourage investment of time resources by individuals and businesses that accept the cost of increased sitting time. Office workers have a stressful job and field workers have long hours and night shifts. Electric company workers may have chronic cardiovascular disease, hypertension, diabetes [2].

Diet behavior modification; such as: dietary approaches to stop hypertension_is sodium-saturated,

and total fat with the addition of grains, fruits, and vegetables can lower systolic blood pressure. It has been established to lower hypertension, is used to lower systolic blood pressure by 8 to 14 points and lower blood pressure by several points in 2 weeks. dietary approaches to stop hypertension_to improve quality of life and maintain blood pressure. Including a nutritional approach to combat hypertension significantly lowers [3].

The Trans Theory Model (TTM) is used in behavioral science as a primary and secondary prevention paradigm and applied to a range of unhealthy behaviors as follows: Hypertension; Smoking; Obesity; Substance Use & This model is an integrated model of intentional change that includes the 'Five Stages of Change' from pre contemplation. for contemplation; for preparation; for action; and finally for maintenance. TTM from the field of psychotherapy has been established as follows: The most widely used model in health education research [4].

Theories and models of health promotion using for designing and implementing health education

programs and more effective educational interventions. One of the common theoretical frameworks. Habitual health behavior is a trans theoretical model that helps classify the main factors that influence behavior and relationships that go through many stages during behavior change. The entire process takes "6 months to 5 years", but these steps are closely related to individual motivation [5].

Community health nurse play a key role in identifying people's health care needs and providing quality care that is unique to each person. Nursing models and theories integral to the nursing process as nursing models conduct scientific and systematic nursing practice. The use of models or theories in nursing enables nurses to analyze problems and drive solutions by providing systematic, purposeful and effective care. Nursing models and theories are integral components of scientific knowledge in nursing and guide nursing staff to people's needs [6].

Occupational health nursing (OHNs) plays a key role in providing safety programs and worker services that teach health. OHN's goal is to chain health knowledge, create a healthy work environment, and create a safe balance. OHN pays attention to the promotion, maintenance and health prevention of illness and injury. it Protecting workers from the risks of environment [7].

2. The study aim to:

Evaluate the application influence of; trans-theoretical model ;on diet behavior; modification; between ;hypertensive employee; in electrical Company.

Research. Hypotheses

After application; of trans-theoretical model; of behavior change;. Knowledge of; hypertensive ;employee in electrical; company; improved; and diet behavior; of hypertensive employee; in electrical company modified.

3. Subjects and. methods

Research. Design:

A quasi experimental design; (Pre-posttest) was used.

Setting:

The study was conducted, at Benha Electrical. Company. in Benha City, Egypt. Sample:

A purposive; sample; was used; for "70 hypertensive employee" in from; "220 employees" electrical company; was taken; as number of chronic diseases in company; who; are reported in; medical record file; suffering from; hypertension, with inclusion criteria, the employee ;diagnosed; hypertension and the employee; free from; other medical disease.

Data collection tools:

Two tools; were; used for, data collection:

Tool. (I): A Structure. Interviewing. Questionnaire:

It included; two parts:

part I: It was ;concerned with:

A. Socio- demographic. Data; contained in; the study. It included "10 "questions e.g: age, gender; education level; social status; family number; job, work system; monthly income; residence; and training courses.

B. Medical. history. It included

six questions; e.g., hurt time; with hypertension; degree of relation; have you ever been; to hospital; because hypertension, how; many times; admitted to; hospital because; hypertension, symptoms; appeared from ; the disease; and .degree of; hypertension; (Mild-Moderate- sever).

Part. II: concerned with:

A- Knowledge. of the. employee about hypertension

This part, included, nine closed ended questions; as: meaning of hypertension; causes of hypertension; factors affecting; symptoms; complication of hypertension; effect of hypertension; on employee at work; management of; hypertension, ways to prevent; hypertension complication; and precautions ;when measuring; blood pressure.

B-Knowledge of the employee about diet behavior to reduce hypertension:

This part included five closed ended questions which included: The concept of diet behavior, diet behavior goals to reduce hypertension, contents of diet behavior, factors that help in changing food pattern to diet behavior and factors effect on nutrition of hypertension.

C-Knowledge of the employee about Tran- theoretical model

This part included five closed ended questions which included : Concept of Trans theoretical model, stages of Trans theoretical model, purpose of applying Trans theoretical model , factors effect on applying trans theoretical model and source of information.

Knowledge. Scoring. system

Knowledge score; for each question; was calculated ;as follows:

2= Correct; and complete; answer

1= Correct; and incomplete, answer

0= Don't know; answer

The total; subscale, score of each employee;(36 points) was categorized; into "poor, knowledge, level " when accomplished less than "<50%" ;of the total score ;"less than; 18 points" , "Average knowledge level " when accomplished; "50 % to <75%" of the; total score; (18 > 36 points), and "good knowledge

level" was considered; when achieved; more than or equal $\geq 75\%$ of; the total, score;(36 points) .

Tool (II): Trans- theoretical model of behavior changes questionnaire

Phase (I): Employee's stage; of change; related to; diet behavior modification

This part; included; "five" stages; (23 items) which included; pre contemplation; contemplation; preparation; action and maintenance.

Scoring system employee's stage of change related to diet behavior modification

2= Often; do 1= Sometimes; do

0= Never; do

The maximum; score of; employee's stage; of change= 46 points; the score; of each employee; was classified; into "Unsatisfactory" when accomplished "0-23" points, and those; who had; "23 – 46" points were, considered ;as; "Satisfactory".

Phase (2): Self-efficacy scale regarding diet behavior modification

This part included ten items that included overcome high blood pressure problems by modifying dietary behavior, find good and effective ways to modify your correct eating behavior, achieve your goals in reducing high blood pressure by modifying your eating behavior, find solutions to overcome high blood pressure by modifying you're eating behavior, implement dietary behavior modification even when I am tired, implement dietary behavior modification even when I'm depressed, maintains dietary behavior modification without the support of family and friends, implementing dietary behavior modification without the help of a nutritionist, motivate yourself to return to dietary adjustment after stopping for a while and maintains dietary behavior modification without the presence of a nutrition center or nutritionist.

Scoring system self-efficacy scale regarding diet behavior modification

2= Always correct 1= Moderate correct

0= rarely correct

The maximum; score of; self-efficacy scale = "20 points"; and minimum score; of self-efficacy scale = 10 points, the score; of each employee; was classified; into "Unsatisfactory" when accomplished; "0-9" points, and those; who had; "10 – 20" points, were ;considered, as "Satisfactory".

Phase (3): Decision balance scale related to diet behavior modification.

Positives (ten) be more active with family and friends after adjusting you're eating behavior to reduce high blood pressure, stress and pressure decrease after

adjusting eating behavior to reduce high blood pressure, be confident in yourself after adjusting you're eating behavior to reduce high blood pressure, you sleep better after adjusting eating behavior to reduce high. blood pressure, feel good about yourself after adjusting eating behavior to reduce high blood pressure, body will be better after adjusting you're eating behavior to reduce high blood pressure, will be able to perform daily chores after adjusting eating behavior to reduce high blood pressure, be less nervous after adjusting eating behavior to reduce high blood pressure, will be more comfortable after adjusting eating behavior to reduce high blood pressure and modifying eating behavior helps have a positive outlook on life.

Negatives (six):

feel very tired when doing my daily work after applying the diet, it is difficult to find a suitable diet that love and that is not affected by bad weather, feel relieved during and after the implementation of the diet, and I feel severely sluggish, can't sit down to eat with my family and spend time after adjusting eating behavior and are too tired to follow the eating behavior it takes time to implement the eating behavior.

Scoring system decision balance scale related to diet behavior modification

2= Agree 1= Not sure

0= Disagree

The maximum; score of; decision balance scale = "32 points" and minimum score; of decision balance scale = "16 points", the score of each; employee, was classified into; "Unsatisfactory" when accomplished; "0-15" points, and those; who had; "16 – 32" points were considered; as "Satisfactory"

Phase (4): Processes change related to diet behavior modification

This part included ten statements that included Cognitive/experimental processes (five)

Are trying to increase knowledge about dietary behavior and use it to treat high blood pressure, tend to use dietary behavior modification to reduce high blood pressure, assess understanding and knowledge of correct diet modification to reduce high blood pressure, the effect of modifying correct eating behavior is due to environment, helps patients with pressure in the community to modify their eating behavior to reduce high blood pressure.

Behavioral processes (five)

Choose a method to modify eating behavior and stick to it, be able to control correct eating behavior to reduce high blood pressure by applying it or avoiding it, are trying to increase knowledge about dietary

behavior and use it to treat high blood pressure, reward by using the right positive behavior to reduce high blood pressure, discuss with people with the same condition as you and encourage them to modify their eating behavior to reduce high blood pressure.

Scoring system processes change related to diet behavior modification

2= Often do

1= Sometimes do

0= Never do

The maximum score of processes change = 20 points and minimum score of processes change = "10 points", the score of each, employee was classified into "Unsatisfactory" when accomplished "0-9 points", and those who had "10 – 20" points were considered, as "Satisfactory".

The total grand score of; each employee; was; classified into; "Unsatisfactory" when accomplished; "0-58" points, and those; who had; "59 – 118" points; were considered, as "Satisfactory".

Pilot study:

A pilot survey using the tool was conducted on 10% of the survey sample (7 out of 70 employees) before data collection began. A pilot study was conducted to test the applicability and clarity of the constructed questionnaire.

Reliability and content validity of the tool

Tool validity

Instruments; efficacy was completed by "five faculty nursing professionals." The Department of Community Health Nursing revised the tool to ensure clarity, relevance, broad applicability and usefulness of implementation, and made minor changes as felt.

Tool Reliability:

The tool's reliability helped. researchers for testing; internal consistency; reliability of tools estimated among '15' participants, using the test-retest route. There is "two weeks" between them. Next, "Cronbach Alpha" was measured between two scores on "SPSS Computer Package". That's right the first tool was "0.85" (knowledge of sample employees surveyed) and was "0.87"; second measure (questionnaire on trans theoretical models of behavioral change). what it indicates; instruments; trustworthy; to identify goals of research.

Ethical considerations:

All ethical issues, how the research was obtained, the titles of the Dean of Nursing and qualified staff, that the objectives, tools, and research techniques are shown to be successful and that their collaboration is acceptable is guaranteed. Shared consent was given 'verbally' before conducting interviews for investigators to meet tested samples in selected settings, and a brief orientation was given as to the

purpose of the study. Surveyed employers were also assured that all information collected would be kept confidential and used. For research purposes. A name is not required for the form. To ensure anonymity.

They were also informed that they had the right to withdraw the study at any time without giving any reason.

Application of Trans-Theoretical model on diet behavior modification among hypertensive employee program development include three phases:

Phase (I): Trans- theoretical Model, Application, preparation

Researchers proceeded with the application based on pre-test data obtained from questionnaire surveys, scale surveys, and literature surveys. Conducted immediately after the pretest.

Phase (II): Implementation of the model application

Data; was collected over a period of '9 months' from 'February 2022' to 'October 2022'. After clarifying the purpose of the study and introducing herself, the researchers obtained verbal informed consent. This study was conducted in a selected environment. The researcher visited the 'Benha Electrical Company' two days a week (Saturday and Wednesday) to collect data and cover the surveyed sample when shifts were changed according to the company's working hours. bottom. Researchers presented. The researcher provided theoretical sessions through lectures followed by discussion. Handout, pictures, booklet, posters and provided, practices, sessions; by demonstration and re demonstration;. According to the available article, the duration of the session was about "45 minutes". In the first session, researchers introduced herself and explained to the participants. the aim of the study, at the end of the session employee was able to define of Hypertension, determine causes of Hypertension, clarify signs and symptoms of Hypertension, identify risk factors of hypertension, effect of hypertension on employee identify preventive measures of hypertension and enumerate complication prevention for patient with hypertension. In second session: At the end of the session the employee was able to discuss Instructions before measuring blood pressure and educate how to measure blood pressure. In third session: At the end of; the session; the employee was able to; measure blood pressure without any help. In fourth session: At the end of; the session, the employee abled; to discuss ,effect Diet behavior modification component), Instructions to change diet style to), enumerate factors effect on hypertension diet, define of trans-theoretical model, mention progressive process of trans-theoretical model through a series of "five "stages, define of; pre contemplation, define of contemplation, define of

preparation, define of action and define of maintenance stage. In fifth session: At the end of it the employee able to apply progressive process of trans-theoretical model through pre contemplation stage and contemplation stage. In sixth session: at the end of it the employee was able to; apply progressive; process of trans-theoretical model through preparation stage and action stage. In "seventh session": At the finale of it the employee was able, of apply, progressive process of, trans-theoretical model through, maintenance stage, Each 'session' began with a summary of what was learned in the previous session and the purpose of the new topic, and ended with a summary of the main points discussed and implemented. Finally, a posttest was administered immediately after application to assess additional knowledge and practice. The application, was implemented for all employees, at suitable time, at the beginning of the 'first session', an orientation about the application and its processes was presented considering the use of simple language. Motivation Open discussion and reinforcement were used throughout the lectures to reinforce learning. Each session started with a summary of the content given in the previous session and goals for the new topic. At the end of each session, students participated in discussions to correct misunderstandings. They were also informed when the next meeting would be held

Phase (III) - Evaluation phase:

Application evaluation was conducted using a post-test questionnaire of the same format as the pre-test questionnaire to compare changes in employee knowledge and practices immediately after application implementation

Statistical design:

Data were entered and analyzed using the SPSS (Social Sciences Statistical Package) statistical package version 22. Graphics were created using the Excel program. Quantitative data were presented as mean (X) and standard deviation (SD). A Student's t-test was used to compare two means. Qualitative data were presented in the form of number and percentage frequency tables. However, if any cell of the table had an expected value less than '5', it was analyzed by the chi-square test (χ^2). Fisher's exact test (for 4-cell tables) or the likelihood ratio (LR) test (for more than 4-cell tables) was used. Significance level was given as P-value '<. 0.05" for all meaningful tests defined. All

tables (from Table 4: 19) were ;highly ;significant; <0.0001.

4. Results

Table. (1): Demonstrations that, the entire studied sample, aged ;more than "40 years" with mean, of 45.8 \pm 5.1 years. "68.6%" of them were males, as regards marital status, 91.4% of them were married and 2.9% were divorced, While 100% of the studied sample employees mentioned had enough income and 50% of studied sample were living in rural areas, and the other "50%" of them were living, in urban areas.

Table. (2): Demonstrations that, distribution, of medical history, of studied sample employee "100%" of studied sample employee, had hypertensive disease, 77.1% of them, had first degree family members, who suffered from, hypertension, 84.3%%, of studied sample, didn't admission to hospital, due to hypertension, 54.5% of them, once admission, 71.4%" of studied sample employees, suffered from, no balance and immobility and 100% of them suffered from hypertension from more than one year.

Table (3): Demonstrates that, there were a non-significant, relationship, between total knowledge levels, and total model levels, pre application (P=0.65). However, post application relationship between them showed a high statistical significant relationship between both of them. All participants with good knowledge showed satisfactory feeling to the TTM compared to 33.3% among those had poor knowledge and were satisfied with model (p<0.0001).

Figure (1)) shows that, hypertension of studied sample employees pre application 57.1 %of them was moderate, 28.6% was high and 14.3 %was mild compare to post application, 85.7% was mild, 14.4% was moderate and 0% was high that revealed statistical significant improvement.

Figure (2) Reveals that, 85.7% of studied sample employees had good knowledge post application compare to 2.9% pre application , 10% of studied sample employees had average knowledge post application compare to 65.7% pre application and 4.3% of studied sample employees had poor knowledge post application compare to 31.4% pre application.

Figure (3) Demonstrations that, there were a highly, significant, improvement (p<0.000) in subtotal, application, levels. The post application "satisfactory" responses were increased from a range of 28.6% pre application to 95.7% post application.

Table (1) Frequency .distribution. of the studied sample, employees regarding, socio-demographic characteristics. (n = 70)

Medical History	N0.	%
Previous Medical History:		
Chronic diseases:		
Hypertension	70	100
Relations to other family members who are suffering from hypertension:		
Frist degree	54	77.1
Second degree	10	14.3
No one has hypertension	6	8.6
Admission to hospitals due to hypertension:		
Yes	11	15.7
No	59	84.3
If yes, how many times admitted?(n=11)		

Table (2) Frequency distribution of the studied sample employees regarding their medical history of (n=70)

Socio demographic characteristics	N0.	%
Age Years)		
≥40 years	70	100
Mean ± SD		45.8 ± 5.1 years
Sex:		
Male	48	68.6
Female	22	31.4
Marital status		
Married	64	91.4
Widowed	4	5.7
Divorced	2	2.9
Family size:		
From 2 to 3	5	7.2
From 4 to 5	18	25.7
From 6and more	47	67.1
Job:		
Technician	50	71.4
Administrative	20	28.6
Work system:		
At morning	20	28.6
At Evening	18	25.7
Both	32	45.7
Residence:		
Rural	35	50
Urban	35	50
Monthly income:		

Once	6	54.5
Twice	5	45.5
Symptoms suffered before discovery of hypertension:		
No balance and immobility	50	71.4
Continuous fatigue during least effort	20	28.6
Current medical history :		
Duration of suffering current hypertension		
≥ one year	70	100

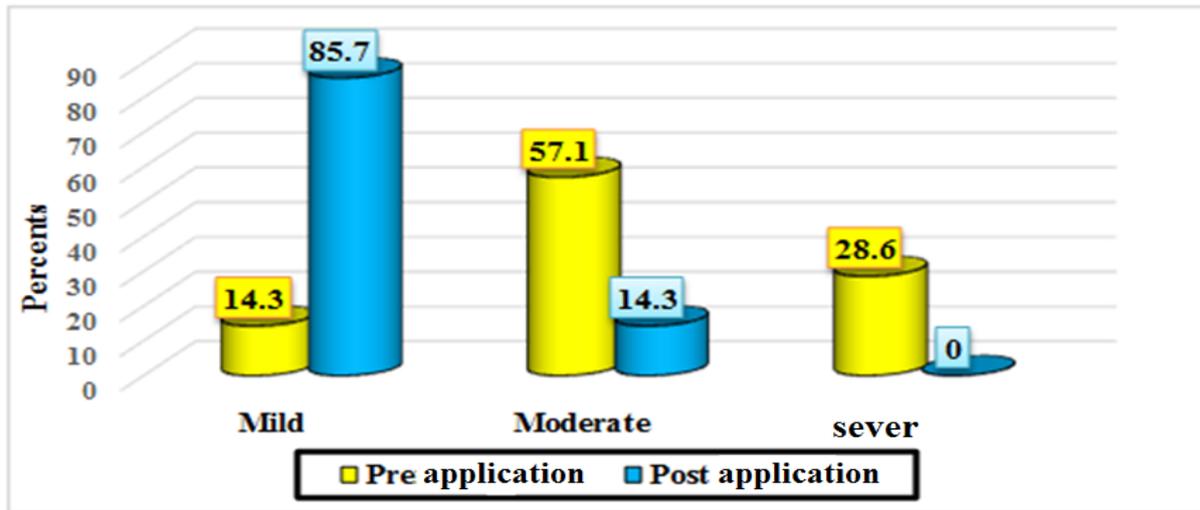


Fig (1). Percentage distribution of studied sample regarding measurement of blood pressure pre and post application (n=70).

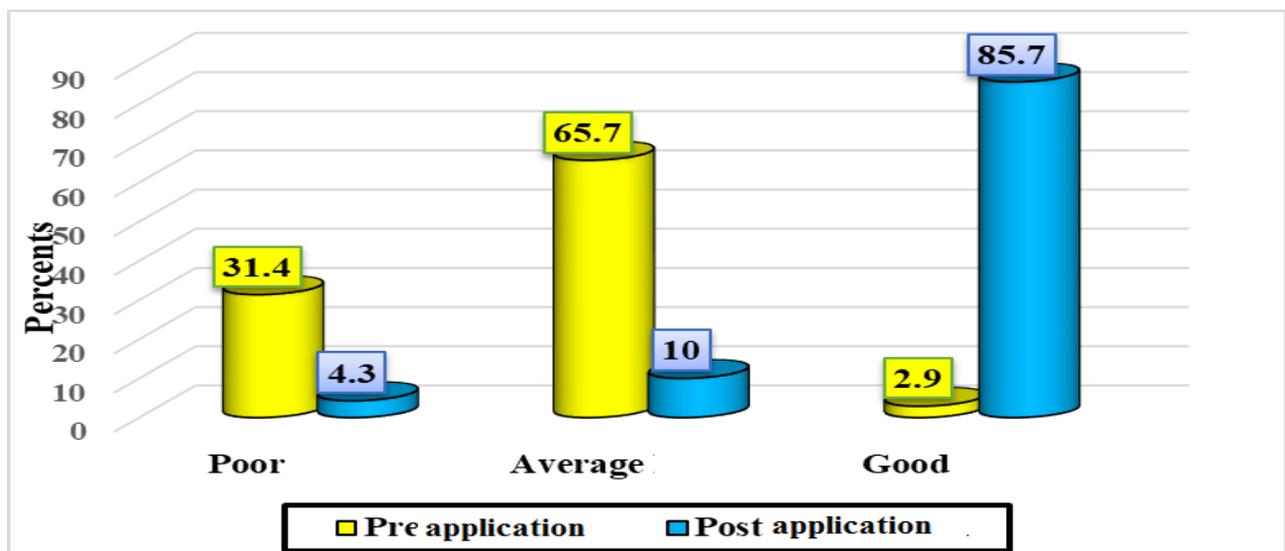


Fig (2). Percentage. Distribution. of studied sample, about total Knowledge level, regarding, hypertension, Diet and Trans theoretical model pre and post ,(N=70)

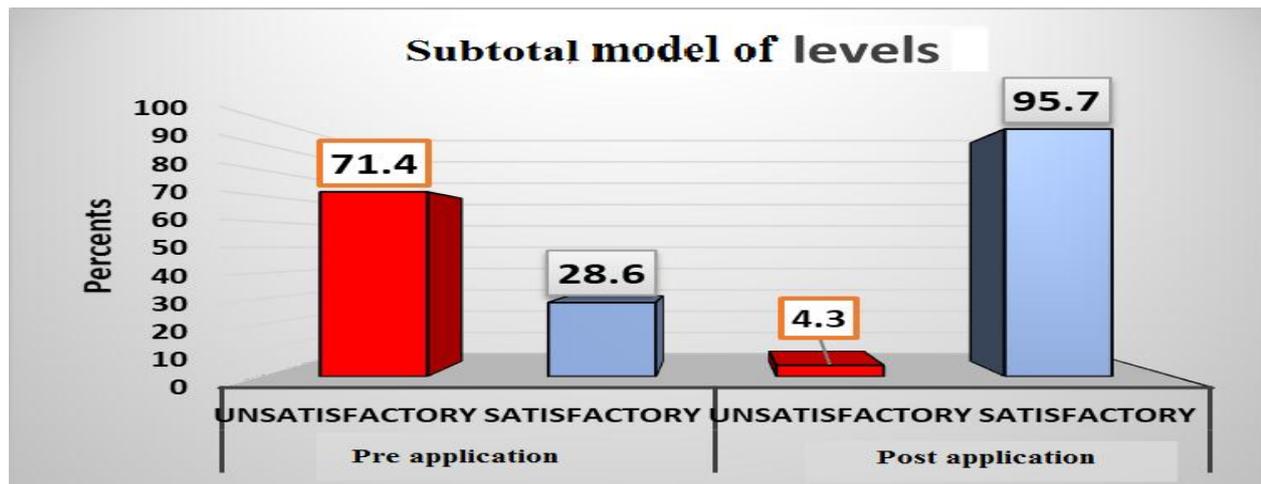


Fig. (3) Percentage distribution. about the effect of applying, TTM on subtotal model ,of levels among studied sample employees, pre and post application (n=70)

Table (3) Relation between, total knowledge, level and total model levels, in diet behavior of the studied sample employees' pre and post application of the Trans theoretical Model

Knowledge levels	Model levels Pre application				P1 value	Model levels Post application				P2 value
	Unsatisfied N=55		Satisfied N=15			Unsatisfied N=3		Satisfied N=67		
	No.	%	No	%		No	%	No	%	
Poor	18	81.8	4	18.2	$\chi^2=0.21,$ $p=0.65$	2	66.7	1	33.3	$\chi^2=66.7,$ $p<0.0001$ HS
Average.	35	77.1	11	22.9		1	14.3	6	85.7	
Good	0	0	5	0		0	0	60	100	
Total	50	78.6	20	21.4		3	4.3	67	95.7	

HS= High Significant

5. Discussion

High blood pressure is one of the most common health problems, along with other health problems. It is estimated that "20%" of people "worldwide" suffer from this condition. Chronic conditions such as high blood pressure are becoming increasingly common and a public health threat. [1].

Trans theory is one of the largest shared theoretical frameworks used to understand health behavior change models. Some of the change phases also enable individualized and easily adaptable support strategies [4].

According to Socio-demographic; characteristics, of the studied sample; employee, (Table1), the findings of; the present study; showed that, the entire studied sample; aged ,more than 40 years ,with mean of 45.8 ± 5.1 , years. More than two thirds, of them were males, as regards ;marital status, most of ;them were ;married and less than fifth were divorced, While all of the studied sample employees mentioned had enough income and half of studied sample, were living in rural areas, more than two thirds of the studied sample employees had; high education, fifth of them; had moderate; education, and less than fifth of them

postgraduate education(Figure1) ,the training courses received by the studied sample employees,(Figure2), less than half of them, took all courses, more than one quarter of studied sample employee, took other occupational courses, while less than fifth of them took occupational safety courses, and only less than tenth of them, took first aid training courses.

Regarding; medical history; of studied sample (Table 2), the results of ;the present, study revealed that majority of them, had first degree family members who suffered from hypertension, this findings was supported, by [8] (n= 235) they reported that regarding the medical/family history of ;the respondents, more than one third had family history of hypertension . This might be due to, family history not only the cause of hypertension but also work in electrical company under stress was important cause of hypertension of the studied sample employees.

Regarding measurement; of blood pressure; pre and post, application, (figure 1).The present; study; revealed that, hypertension of; studied sample employees pre application; more than half of them was moderate, one quarter was high and less than fifth was mild compare to post application, majority was mild,

less than fifth was moderate and none was high that revealed statistical significant improvement.

This findings was in the same line with, by [9]. They reported that, changes in blood pressure measurements in study and control groups before and after the program. In the study group, systolic and diastolic blood pressure measurements decreased significantly after 6 months of sessions ($p=0.000$ and 0.000 , respectively).

This findings ;was supported by; [10] .They reported that, According to model-based education, behavioral changes in hypertensive patients affect significant reductions in blood pressure. Blood pressure changes with a decrease in systolic and diastolic blood pressure in more than half of the samples, after application of Trans theoretical model. This might be, due to, the effective choice of Trans theoretical mode to applicable on hypertensive population and effect lifestyle on hypertension.

Regarding Percentage distribution of studied sample about total Knowledge level regarding hypertension, diet behavior modification and model pre; and post;(Figure 2), Revealed that, majority of studied sample employees, had good knowledge post application compare to less than tenth pre application, "tenth of studied sample employees had average knowledge post application compare to more than half pre application and 'less than of studied sample employees had poor knowledge post application, compare to 'less than one third pre application.

This findings; agreement with [11] ($n=44$), they reported that, more half of sample had ,a significant reduction in blood pressure in , majority of sample had an increase in hypertension knowledge and improvement in all three medication adherence behaviors six weeks after the intervention.

Regarding subtotal eating behavior levels pre; and post; application of model, the present study, revealed that ;(figure2), there were, a highly significant improvement, in every model part as well as subtotal model levels ($p<0.0001$). The post application satisfactory responses, were ranged from majority for decision balance negative items to most for cognitive process of change. In addition, subtotal model levels showed, a satisfactory response with most Again, this result approved the second part of current study research hypothesis which stated "Knowledge of hypertensive employee in electrical company will be improved and diet behavior of hypertensive employee in electrical company will be modified after application of trans-theoretical model of behavior change".

This findings was convention with [12] ($n= 400$) in Isfahan's health centers, they reported that, stages of change was significantly correlated with decision-making balance ($P = 0.04$), process of change and self-efficacy ($P < 0.01$), and significant improvement in each model part and TTM subtotal ($p < 0.0001$) was.

This findings was not convention, with [13]. They showed that, astatistically significant negative correlation ($P < 0.000$) was found between the women's decision-making balance score (barrier to physical activity) in the study and the stage of change before and after the intervention. This means that women in the final stages (behavior and maintenance) experience fewer decision-making detrimental wounds than women in the preparatory, contemplation, and pre contemplation stages. A lower con score for (behavior and maintenance) also suggests that women are less aware. This might; be due to, Differences in results between this study and others may be related to differences in the samples selected in each study.

Regarding relation between, total knowledge level and total model, in diet behavior of the studied sample employees', pre; and post; application of the Trans theoretical model; and correlation; between; total knowledge about hypertension as independent variables with studied sample employees' total stages changes as dependent variable, pre; and post; application (Table 3), the present; study, demonstrated that, there were; a non-significant; relationship ;between; total knowledge levels and total model levels pre application ($P=0.65$). However, post application relationship between them showed a high statistical significant relationship between both of them. All participants with good knowledge showed satisfactory feeling to the model compared tone third among those had poor knowledge and were satisfied with model ($p<0.0001$) and Revealed that, pre application, a low non-significant positive correlation; between ;total knowledge about hypertension score and total score of stages changes ($r = 0.22$, $p=0.08$). This pattern was improved in post application, where there was; high significant positive ;correlation; between; total knowledge score and total score of; stages changes ($r = 0.76$, $p<0.0001$).

This findings of present study in the same line with [14], they reported that, Between total knowledge scores of tested pregnant women and stages of change in eating behavior before and after the intervention, and self-efficacy, benefits, and changes in the stages of empirical and behavioral processes and eating behavior of tested pregnant women was positive, highly; statistically; significant, correlation.

Also, this finding in the same line with [13.] They indicated; A positive correlation ($P < 0.05$) between postpartum women's assessment scores on self-efficacy and decision-making balance. Stages of strengths, empirical and behavioral processes, and postnatal behavioral change exercises. On the other hand, significant negative correlations ($P < 0.05$) were observed between women's cone scores and postpartum motor stages, and behavioral changes before and after intervention. Plus, it's positive. Correlations between total knowledge of postpartum women ($P < 0.05$).

Conclusion

Based on the results of the present study, it was concluded that:

There were a highly significant improvement ($p < 0.0001$) in the three aspects; as well as subtotal knowledge. All of the studied sample had good knowledge responses post application for each aspect as well as subtotal knowledge. There were a highly significant improvement in every part as well as subtotal TTM levels ($p < 0.0001$). Majority of the studied sample had satisfactory responses for decision balance negative items post application, almost of the studied sample had satisfactory responses for cognitive process of change. In addition, almost of the studied sample had a satisfactory response subtotal TTM levels and there was a high significant positive correlation between total knowledge score and total score of stages changes ($r = 0.76$, $p < 0.0001$). This result approved the first and second part of the current study research hypothesis.

6. Recommendations

Based on the results of this study, the following recommendations are proposed.

- Educational interventions should be based on models of employees with hypertension associated with dietary changes.
- Hypertensive workers in electric company clinics should be provided with staged interventions to improve their knowledge. Further studies also recommended:

-provide electrical company employees with a web site for health information to improve their knowledge and diet behavior to control chronic diseases as hypertension.

7. References

- [1] WHO. Hypertension. Available at https://www.who.int/health-topics/hypertension#tab=tab_1. Accessed March 2, 2022. (4):140–151. <https://doi.org/10.21315/mjms2022.29.4.13>, (2022).
- [2] U. Jayarajah, & S. Seneviratne, Occupational Aspects of Hypertension, Professorial Medical Unit, National Hospital of Sri Lanka, Colombo, Sri Lanka, Institute of Immunity and Transplantation, Royal Free Hospital and University College London. (2019).
- [3] C. Filippou, F. Tatakis, D. Polyzos, E. Manta, & C. Thomopoulos, Overview of salt restriction in the Dietary Approaches to Stop Hypertension (DASH) and the Mediterranean diet for blood pressure reduction PMID: 35092228 DOI : 10.31083/j.rcm.2301036. (2022).
- [4] B. Mohebbi, B. Tafaghodi, R. Sadeghi, A. Tol, & M. Yekanenejad, Factors predicting nutritional knowledge, illness perceptions, and dietary adherence among hypertensive middle-aged women: Application of transtheoretical model. Published online 2021 Jun 3. doi: 10.4103/jehp.jehp_1434_20. (2021).
- [5] S. Jalali, N. Roozbahani, & M. Shamsi, The effectiveness of tailored interactive multimedia software based on the trans-theoretical model for the promotion of physical activity behaviours. *Malays J Med Sci.* 29 (2022).
- [6] N. Kaya, K. Babadag, G. Yesiltepe-Kacar, & E. Uygur, Nursing model / theories of nurses, nursing process and classification systems and their applications. *Maltepe University Nursing Science and Art Journal:* 3(3): 24-33, (2020).
- [7] M. Romero, A. Morenol, & A. Santos, Occupational Health Nursing: Competence and experience to achieve the safety, health and well-being of the working population, (2020).
- [8] N. Oforia, & J. Obosib, Prevalence of hypertension among office workers in a multi-national company in the Niger-Delta with the 2017 American College of Cardiology/ American Heart Association Blood Pressure Guidelines, (2017).
- [9] A. Al-Wehedy, S. Abd Elhameed, & D. Abd El-Hameed, Effect of Lifestyle Intervention Program on Controlling Hypertension among Older Adults. *Journal of Education and Practice* www.iiste.org ISSN 2222-1735 (Paper) ISSN 2222-288X (Online) Vol.5, No.5, (2017).
- [10] E. Sjattar, & R. Arafat, "Trans theoretical model on the self-care behavior of hypertension patients: a systematic review", *Journal of Health Research*, Vol. 36 No. 5, pp. 847-858. <https://doi.org/10.1108/JHR-01-2021-0053>, (2021).
- [11] B. Marseille, Y. Commodore-Mensah, P. Davidson, D. Baker, R. D'Aoust, & D. Baptiste, Improving hypertension knowledge, medication adherence, and blood pressure control: A feasibility study. *Journal of Clinical Nursing*, <https://doi.org/10.1111/jocn.15803>, 2021.

- [12] A. Pirzadeh, F. Mostafavi, F. Ghofarnipour, & M. Mansourian, The Application of the Transtheoretical Model to Identify Physical Activity Behavior in Women, Iran J Nurs Midwifery Res.,; 22(4): 299-302, 2017.
- [13] H. El Sayed, H. Ibrahim, S. Aboud, & A. Sarhan, The Effect of a Trans-Theoretical Model Based Intervention on Physical Exercises Behaviour among Postpartum Women at Benha City, Egypt, *American Journal of Nursing Research*, Vol. 7, No. 3, 342-353 Available online at <http://pubs.Sciepub.com/ajnr/7/3/15> Published by Science and Education Publishing DOI:10.12691/ajnr-7-3-15, 2019.
- [14] M. Ibrahim, Epidemiology of Hypertension in Egypt. Nov 14];10:352-6. Available from: <https://www.sjkdt.org/text.asp?1999/10/3/352/37243>, 2020.