

Effectiveness of Collaborative and Proactive Intervention on Psychological and Physiological Variables among hypertensive patients

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ABSTRACT

Hypertension is the most crucial risk factor for fatal and nonfatal cardiovascular disease in India. The collaborative and proactive interventions is a combination package of yoga and cognitive behavior therapy for modifying negative thought process. A true experimental design was adopted for this study to assess the effectiveness of collaborative and proactive interventions on psychological and physiological variables among 280 hypertensive patients, selected through simple random sampling technique at selected community and randomized to 140 in control and 140 in experimental group. The data was collected using the pretested and validated tools such as background characteristics performa, perceived stress scale, COPE coping questionnaire through self-reporting method. Blood pressure was assessed by using Aneroid BP apparatus and recorded in the BP monitoring sheet. The collaborative and proactive interventions were administered for the experimental group for one hour/day up to 2 weeks. The posttest assessments of psychological and physiological variables were done at the end of 2nd week, first and third month. The study findings revealed that the collaborative and proactive interventions was effective in significant reduction of the stress, systolic and diastolic blood pressure and improvement in the coping scores ($p < 0.001$). The study's findings support the notion that proactive and cooperative interventions can effectively lower stress and increase coping mechanisms, both of which can lead to better blood pressure regulation. There fore health care providers, particularly nurses, play a crucial role in assisting hypertension patients in properly coping with stress and maintaining their blood pressur.

Keywords: Blood pressure, Stress, Coping, collaborative and proactive interventions, Hypertension.

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INTRODUCTION

Hypertension is the significant risk factor for heart -related ailments [World Health Organization, (2013)], which is also one of the major global risk factors, contributing to 13% of fatalities worldwide.[World Health Organization, (2009)] Approximately 1.13 billion persons worldwide suffer from hypertension. [World Health Organization, (2016)] The psychological factors such as anxiety, sadness, stress, and personality traits may contribute to increase in blood pressure. If this elevation persists over time, it may result in hypertension. [Okoronta BC, (2002)]. These factors may raise blood pressure by stimulating sympathetic nervous system activity and secreting more cortisol [Holsboer F and Ising M, (2010)] and norepinephrine, which causes vasoconstriction and raises blood pressure.[Moret C and Briley M, (2011)] Furthermore, any one of these three disorders—hypertension, anxiety, and depression—may

precipitously affect the others on its own (Bhat R, Shanbhag P et al., (2025)). Since blood pressure regulation has a physiological basis, antihypertensive medicines are the most widely used method of treatment for hypertension. [Palase AO, Aje A, et al., (2015)] Even with the increasing usage of antihypertensive drugs, hypertension is still a major worldwide health issue. A two-year psychological interventional trial has been shown to enhance blood pressure control, health-related quality of life, and stroke prevalence among Chinese mine workers. This research implies that effective stress management could enhance the management of hypertension. [Liu L, Li M, et al., (2017)] In an effort to determine if other therapies, such as behavior therapy, may be used in addition to hypertension treatments. Collaborative and proactive interventions is a package combining Yoga and Cognitive Behavior Therapy. Collaborative and proactive interventions aims at modifying negative thought process and behaviour by using

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specific techniques. Positive ideas are intended to replace negative ones, making the person more realistic and rational in their perception, which will result in healthy behavior. As a result, proactive and cooperative therapies promote good mental health and improve adjustment. Yoga is more successful in promoting positive results and cognitive behavior therapy (CBT) is effective for psychosomatic outcomes [Allen TM, Wren AA, et al., (2018)]. Thus, combining CBT with yoga techniques could further balance mind and body for enhanced beneficial effects, since CBT focuses on changing outlooks and belief systems that contribute to stress [Kadden RM, (2001); Forfylow AL, (2011)]. Collaborative and proactive interventions is one of the psychosocial interventions to manage many psychological problems such as stress and anxiety. This study was aimed to determine the effectiveness of collaborative and proactive interventions on the psychological and physiological variables of the hypertensive patients.

2. MATERIAL AND METHODS

A true experimental repeated measures design was adopted for this study conducted among hypertensive patients residing at selected community in Chennai. The institutional ethical committee clearance and setting permission from the concerned authorities were obtained. The calculated sample size was 214 (107 in each group) based on a previous study findings [Friedberg JP, Rodriguez MA, et al., (2015)] with the proportion of BP control 64.6% in cognitive therapy group 45.8% in control group, α 0.05 and β = 0.80. Considering the attrition of 10% and better generalization 280 (140 in each group) samples were selected for this study through consecutive sampling technique (fig.1). Through survey registries, known cases of hypertension were located. Door-to-door screening was conducted in the chosen locations, and a sampling frame was created. Using a computer random table, 140 of them were assigned to the control group and 150 to the experimental group. The hypertensive patients aged between 30 to 59 years, who could speak and understand Tamil and willing to participate were included for this study. The hypertensive patients with sensory deficits such as total blindness, total hearing loss, severe cognitive impairment and dementia, other comorbid illness such as diabetes mellitus and cardiac diseases were excluded. All guidelines as per declaration of Helsinki and good clinical practice were followed. After obtaining verbal and written consent from the study participants, an assurance was given regarding confidentiality of their data and the data was collected using the pretested and validated tools such as demographic variable performa, clinical variable performa, perceived stress scale, COPE coping questionnaire. Blood pressure was assessed and recorded in the monitoring sheet. The perceived stress scale was developed by Cohen et al (1983) which consist of 14 items (7 positive and 7 negative statements) on stress with 5 point likert scale (0 - 5). Thus total obtainable score ranges from 0 to 54. Each positive statement was scored as 1- 4 and each negative statement was scored as 4-1. The total score of perceived stress scale

was 56. The total obtained scores were converted into percentage and interpreted as Mild Stress (<50%) Moderate Stress (50-75%) and Severe Stress (> 75%). The COPE Coping questionnaire is a standardized tool developed by Folkman and Lazarus (1998) consisted of 60 items in 4point rating scale (1 - 4). The collaborative and proactive interventions was administered to the experimental group who were divided into 6 groups (25 participants in each group). The study participants were gathered in common recreation hall in the community area. For each participant the therapy was given one hour per day upto 2 weeks. The posttest assessments were done at the end of 2nd week, one month and three months. The collected data were analyzed in SPSS 20 version using descriptive such as mean and standard deviation and inferential statistics such as chi square, independent t test and repeated measures ANOVA

3. RESULTS

The frequency and percentage distribution of hypertensive patients (table.1) projects that majority of them were belonging to the age group of 40- 49 years, females, married, having 2 children, with primary school level education, working in government aided concerns, with the monthly income of Rs. 5001–Rs. 10000/-, living in joint family, smokers (62%, 69%) and not exposed to collaborative and proactive interventions previously on both control and experimental group. It is evident from the above result that nearly half of them were having the disease for 1 -5 years (43%, 46%), majority were on medication for controlling hypertension, being hospitalized previously for 1-2 times (63% and 63%), with self-treatment seeking behavior (53%, 58%), habit of regular intake of alcohol (62%, 64%) performing moderate physical activity in control and experimental group respectively. An accumulating body of research suggests that alcohol triggers both cerebral and peripheral reactions, which work together to produce a hypertensive effect. According to the aforementioned findings, there was no statistically significant variation in background variables between the experimental and control groups ($P>0.05$). Because of this, the two groups were similar and homogeneous in terms of their demographic and clinical variables.

There repeated measure ANOVA depict that there were significant difference in the stress, coping scores, and blood pressure during baseline, and at 2nd week, 4th week, and 3rd month in both the control and experimental groups at $p<0.001$ level. But the difference was higher in the experimental group projecting the effectiveness of the collaborative and proactive interventions in reducing the stress and blood pressure with significant improvement in the coping scores in the experimental group as depicted as in table.2. The independent t test revealed that there was no significant difference in the baseline scores of stress, coping and blood pressure between the control and experimental group, but a significant improvement was noted at the end of 2nd week, 4th week, and 3rd month at $p<0.001$ level. The above results show that the collaborative and proactive interventions were effective in reducing the stress and

improving the coping score which in turn reduces the blood pressure (table.2)

Table 1: Frequency and Percentage Distribution of Homogeneity of Background Characteristics of Control and Experimental Group of Patients with Hypertension.

Background Characteristics	Control group (n=140)	Experimental Group (n=140)	χ^2 value	'p' Value
Age group (years)				
30-39	34	36	2.822	0.24
40-49	64	64		
50-59	42	40		
Gender				
Male	40	39	0.0181	0.89
Female	100	101		
Education				
Illiterate	26	20	2.984	0.56
Primary	52	45		
Secondary	27	29		
Higher Secondary	27	37		
Graduates	8	9		
Marital status				
Married	60	64	0.36	0.94
Unmarried	15	16		
Separated	32	30		
Widowed	33	30		
Source of income				
Salary	31	34	1.24	0.743
Govt. aid	51	54		
Property	30	31		
Savings	28	21		
Monthly income in INR				
<5000	23	21	11.472	0.009
5001-10000	54	58		
10001- 15000	34	33		
15,001 & above	29	28		
No of Children				
Nil	35	38	0.266	0.96
1	71	63		
2	22	26		
3 and above	12	13		
Family Type				
Nuclear	39	36	0.533	0.76
Joint	71	69		
Extended	30	35		
HT Duration (years)				
<1	36	26	3.26	0.35
1-5	43	46		
5-10	30	27		
10+	31	41		
Taking treatment				
Yes	64	69	0.35	0.63
No	76	71		
No of times hospitalized				
Nil	42	49		

1-2	63	63	1.31	0.51
≥ 3	35	28		
Reason for not taking treatment (C=82, Exp= 76)				
Lack of time	35	35	1.57	0.66
Financial problem	46	43		
Not advised	33	28		
Others	26	34		
Treatment seeking Behavior				
Med. Facilities	49	43	0.629	0.729
Self	53	58		
Others	38	39		
Smoking habit				
Smoker	62	69	0.700.70	0.401
Non smoker	78	71		
Alcoholism				
No	42	55	5.72	0.06
Regular	62	64		
Social	36	21		
Physical activity				
Sedentary	42	45	0.36	0.83
Moderate	64	59		
Heavy	34	36		
Exposure to any relaxation technique				
Yes	71	66	0.35	0.55
No	69	74		

Table 2: Comparison of Stress, Coping and Blood Pressure Before and After Collaborative and Proactive Intervention in Control and Experimental Group of Hypertensive Patients

Variable	Group	Baseline	2 nd week	4 th week	3 rd month	F value	'p' value
Stress	Control (n=140)	40.81±10.23	40.60±10.15	40.71±10.17	40.62±10.12	5.65	0.001
	Experimental (n=140)	41.80±8.69	31.80±9.15	32.23±9.27	31.76±9.17	180.28	0.001
	t =	0.875	7.609	7.287	7.67		
	p =	0.382	0.001	0.001	0.001		
Coping	Control	138.52±9.48	138.68±9.35	138.79±9.36	138.80±9.32	9.59	0.001
	Experimental	138.00±9.46	146.91±9.34	153.16±9.35	159.36±9.00	461.40	0.001
	t =	0.461	7.363	12.847	18.766		
	p =	0.645	0.001	0.001	0.001		
Systolic BP	Control	143.81±9.68	143.47±9.50	143.20±9.54	143.05±9.65	14.61	0.001
	Experimental	144.86±9.36	141.85±9.45	139.91±9.59	138.91±9.59	817.74	0.00
	t =	0.922	1.425	3.118	3.602		
	p =	0.357	0.155	0.002	0.001		
Diastolic BP	Control	88.56±5.56	88.40±5.67	88.22±5.76	88.01±5.81	19.76	0.001
	Experimental	89.39±5.60	86.51±5.63	84.33±5.05	83.15±5.04	855.39	0.001
	t =	1.24	2.79	5.995	7.46		
	p =	0.216	0.006	0.001	0.001		

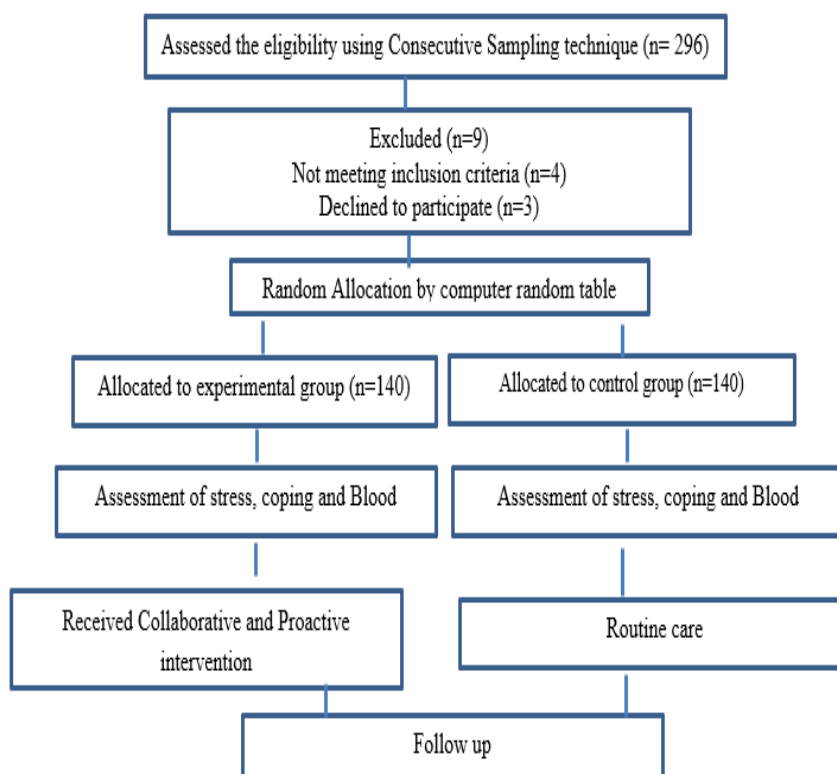


Figure 1: Flow diagram of methodology

4. DISCUSSION

Behavioral therapy is a psychological treatment employed as full or complementary treatment for hypertension. The selected study participants of both the groups in this study were homogenous with respect to the background characteristics. In this study majority of them were aged between 40 and 49 years. These findings are similar to a previous study findings reporting that around half of their hypertensive patients were in the age group of 40- 49 years (47.3% & 52.7%) in control and experimental group. This indicates that the incidence of hypertension increases with age. Salt sensitivity is known to increase with age in both sexes and is most likely caused by impaired renal circulation vasodilation, which may result from decreased NO availability or an enhanced vasoconstriction response to angiotensin II [Dubey RK, Oparil S, et al., (2002)]. In the current study, women made up the majority of participants. This finding suggests that hormonal imbalances cause women to acquire hypertension only in the 40–49year postmenopausal period. From the foregoing results, it is clear that the protective impact of estrogen may be the cause of this gender difference and age factor. Estradiol levels are correlated with postmenopausal hypertension and sex hormones. [Taddei S, Virdis A, et al., (1996); Nealey-Moore JB, Smith TW, et al., (2007)]. These findings also supported those of a related study, which found that social connections help mitigate the detrimental effects of stress on the body and mind and are valuable sources of both practical and

emotional support. Stress can be greatly increased by the absence of helpful relationships. In many people's life, marriage serves as the primary relationship. These partnerships occasionally have the potential to escalate blood pressure and cause conflict. [Virdis A, Giannarelli C, et al., (1998)]. In the present study majority were smokers. The study's findings also indicate that people with moderate levels of physical activity were more likely to have hypertension. Additionally, smoking cigarettes promotes arterial stiffness and wave reflection, which may have a more negative impact on central blood pressure. Cigarette smoking also has an immediate hypertensive effect, primarily through stimulating the sympathetic nervous system. Energy is used when the skeletal muscles of the body move, which contributes to the maintenance of physical fitness. Absence of muscle action causes energy and fat to be stored, which accelerates the onset of obesity, hypertension, and diabetes mellitus. [Liu MY, Li N, et al., (2017)]

The current study projects that there were significant improvement in the stress, coping scores, and blood pressure from baseline, to 2nd week, 4th week, and 3rd month in the experimental group at p<0.001 level compared to those of control group. The above result of this study presents the effectiveness of collaborative and proactive interventions among the experimental group of hypertensive clients. Similarly, a psychological intervention based on Cognitive Behavior Therapy plus medicine was found to be more effective in reducing blood pressure

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compared to standard medication alone among hypertensive patients in the Chinese working population. [Ahmadpanah M, Paghale SJ, et al., (2016)] Another study conducted by Ahmadpanah et al. [David Shapiro, Ka Kit Hui, et al., (1997)] also reported the greatest mean decreases in systolic and DBP. The study involved the use of mindfulness training and relaxation treatment techniques within two intervention groups. According to the other trial, adding a cognitive-behavioral intervention to medication for mild-to-moderate (Stage 1–2) hypertension helped lower the amount of medication needed. [Okoronta BC, (2002)] The combination of the intervention and medication therapy was roughly twice as successful as the control method. The psychological factors such as anxiety, sadness, stress, and personality traits may contribute to blood pressure rise. If this elevation persists over time, it may result in hypertension. [Holsboer F and Ising M, (2010)] These factors may raise blood pressure via stimulating sympathetic nervous system activity, secreting more cortisol [Moret C and Briley M, (2011)] and norepinephrine, which causes vasoconstriction and raises blood pressure. Such approaches have a place in the treatment of hypertension and perhaps other illnesses, especially in an era where alternative treatments are receiving more attention and health care expenses are on the rise. [Okoronta BC, (2002)]

5. LIMITATIONS

The researcher's convenience in choosing the study location, the brief therapy period, and the absence of an assessment of quality of life were the limitations of the study. A few patients declined to take part in the trial, and obtaining authorization from the community was a challenge that the researchers encountered.

6. CONCLUSION

The overall results of the study show that proactive and cooperative therapies are beneficial for people with hypertension. Health care providers, particularly nurses, play a crucial role in assisting hypertensive patients in effectively coping with stress and maintaining their blood pressure.

DECLARATIONS

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Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

Data Availability

The authors declare that no data availability.

Conflict of Interest

None.

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