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Improving medication adherence and clinical outcomes of hypertensive patients through patient counseling

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ABSTRACT

Poor control of hypertension may result in end organ damage and affect the patient's quality of life. To increase awareness of the disease and the importance of counseling, a randomised prospective study was structured to assess the influence of patient education by pharmacist to improve medication adherence and therapeutic outcomes in a tertiary care hospital in Kanchipuram district. A total of 100 subjects were recruited and counseling was provided on diet, physical activity, behavioural modifications and medication adherence. Statistical analysis of the data collected revealed that after four months of intervention, 63.64% (n=22) and 64.2% (n=28) experimental men and women, respectively achieved normal levels of blood pressure compared to 28.58% (n=28) and 40.91% (n=22) control men and women, respectively. The study concluded that patient counseling provided by pharmacist can improve medication adherence, which in turn improves the clinical outcomes of hypertension.

Keywords: Hypertension, counseling, medication adherence, intervention, lifestyle modification.

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INTRODUCTION

Hypertension is a chronic disease which affects about one billion people worldwide [1]. It is an important worldwide public-health challenge because of its high frequency and concomitant risks of cardiovascular and kidney disease [2, 3]. It has been identified as the predominant risk factor for mortality and is ranked third as a cause of disability-adjusted life years [4]. Hypertension increases the incidence of ischemic heart attack, stroke, heart failure and kidney disease. It is therefore a highly lethal disease. About 13% of all deaths are from complications of hypertension [5, 6]. In 2000, over 972 million adult populations were estimated to have hypertension and this number is expected to rise to 1.56 billion by the year 2025. Indian population accounts for 66 million hypertensive patients and among these 25% adults are from urban area and 10% from rural area [7].

Hypertension can be successfully managed by implementing both pharmacological and non-pharmacological interventions. By adhering to the prescribed medications and practicing the non-pharmacological strategies, desired therapeutic outcomes can be achieved which in turn will minimise the long term complications [8]. Patient knowledge and awareness of blood pressure have been described to play important roles in achieving successful control of hypertension [9].

To improve medication adherence and outcomes in hypertension, collaborative approach between the patient and health care professional is necessary [10]. According to National Institute for Clinical Excellence (NICE) Health Technology appraisal, structured patient education is defined as “a planned and graded program that is comprehensive in scope, flexible in content, responsive to an individual’s clinical and psychological needs, and adaptable to his or her educational and cultural background” [11]. Patient education is a process that improves patient’s ability to cope up and make informed decisions regarding their disease medications, and motivate the patients to introduce changes in diet and lifestyle medications [12]. Hence the present study is structured to assess the influence of patient education by the pharmacist to improve patient medication adherence, knowledge, confidence and attitude towards disease management and improvement of therapeutic outcomes.

MATERIALS AND METHOD

Study design

A randomised prospective study was carried out which involved random selection of 100 patients for counseling after receiving their consent. Patients are randomly selected and grouped as Experiment & Control. At initial consultations, blood pressure, patient demographics, medical history, drug history, cardiac risk factors, lifestyle factors (weight, smoking, alcohol consumption, nature, work, physical activity levels) and attitudes towards drug treatment and understanding of hypertension and their drugs are assessed by using proforma and questionnaires. Counseling is provided only to the Experiment group and the BP readings of both the groups are reviewed at least once in a month for 4 months. As per JNC-6 classification, patients were categorised into different stages.



Study site

Outpatient Department of Cardiology in S.R.M. Medical College Hospital & Research Centre at Kanchipuram district.

Study period

This study was carried out for eight months, from August 2010 to March 2011.

Inclusion criteria

- Patients of either sex aged greater than 18 yrs and lesser than 65 yrs.
- Patients with high blood pressure.
- Both literate and illiterate patients.
- Out patients only.

Exclusion criteria

- Patients will be excluded if they are pregnant.
- Unconscious and severely ill patients who cannot be interviewed.
- Patient who are non-cooperative & dropouts.
- In patients.

Sample size

A minimum target of 100 patients is required to detect significant differences from the intervention.

Materials

- Sphygmomanometer
- Counseling aid.

Patient education tools

- Hypertension knowledge assessment questionnaire.
- Patient education pamphlet.
- Pictorial presentation.

The percentage of hypertension in Asian south Indian population was 50% (n=100) in men and 50% (n=100) in women. Percentage distribution of the disease was found to be equal in both genders.

The percentage of stage III hypertensive patients was 22.72% (n=22) and 7.14% (n=28) in experimental men and women, respectively compared to 17.86% (n=28) and 18.18% (n=22) in control men and women, respectively before counseling. After counseling 0.00% of the experimental men and women were found to be stage III hypertensive patients compared to 3.57% and 0.00% control men and women, respectively.

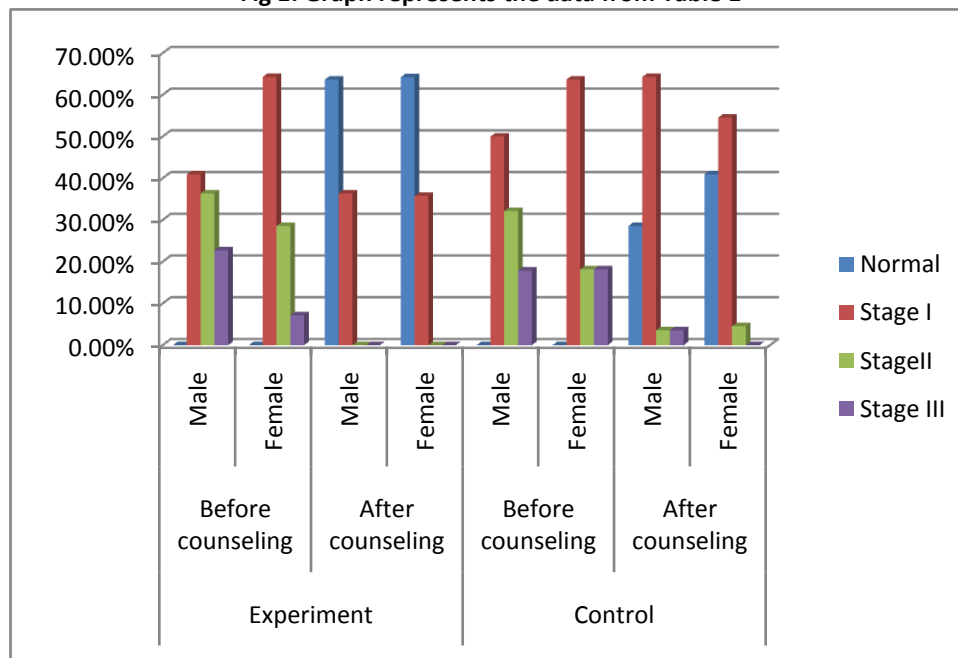
The proportion of stage II hypertensive patients was 36.36% (n=22) and 25.58% (n=28) in experimental men and women, respectively compared to 32.14% (n=28) and 18.18% (n=22) in control men and women, respectively before counseling. After counseling, 0.00% of experimental men and women were found to stage II hypertensive patients compared to 3.57% and 4.54% control men and women, respectively.

The prevalence of stage I hypertensive patients was 40.92% (n=22) and 64.28% (n=28) in experimental men and women, respectively compared to 50% (n=28) and 63.64% (n=22) control men and women, respectively before counseling. After counseling 36.36% and 35.78% experimental men and women, respectively were found to be stage I hypertensive patients compared to 64.28% and 54.54% control men and women, respectively.

Table 1. Percentage distribution of normal and hypertensive patients after 4 months of counseling:

Stages	Experiment				Control			
	Before counseling		After counseling		Before counseling		After counselling	
	Male	Female	Male	Female	Male	Female	Male	Female
Normal	0.00%	0.00%	63.64%	64.22%	0.00%	0.00%	28.58%	40.92%
Stage I	40.92%	64.28%	36.36%	35.78%	50.00%	63.64%	64.28%	54.54%
Stagell	36.36%	28.58%	0.00%	0.00%	32.14%	18.18%	3.57%	4.54%
Stage III	22.72%	7.14%	0.00%	0.00%	17.86%	18.18%	3.57%	0.00%

Fig 1. Graph represents the data from Table 1



After four months of intervention 63.64% (n=22) and 64.2% (n=28) experimental men and women achieved normal levels of blood pressure, respectively compared to 28.58% (n=28) and 40.91% (n=22) control men and women, respectively (Table 1, Fig 1).

Mean levels of systolic and diastolic blood pressure of experimental men and women were significantly higher than those of their counter parts. After 4 months of intervention, systolic and diastolic levels were found to be reduced to a greater extent in experimental men and women compared to their counter parts. The mean systolic and diastolic blood pressure in experimental and control groups before and after counseling is indicated in Table 2.

Statistical analysis data collected revealed that mean levels of systolic blood pressure before and after intervention in experimental and control male group after 4 months projected a “t” value of 7.48 and 12.74, respectively which was found to be statistically significant at p=0.001. The mean levels of systolic blood pressure before and after intervention in experimental and control female group after 4 months projected a “t” value of 11.24 and 8.39, respectively which was found to be statistically significant at p=0.001.

Table 2. Mean levels of systolic and diastolic blood pressure before and after 4 months of counseling in both experiment and control groups

Parameter	Experiment				Control			
	Before counseling		After counseling		Before counseling		After counselling	
	Male	Female	Male	Female	Male	Female	Male	Female
Mean systolic (mmHg)	164	156	127	125	158	153	136	134
Mean Diastolic (mmHg)	102	97	84	84	98	96	89	87

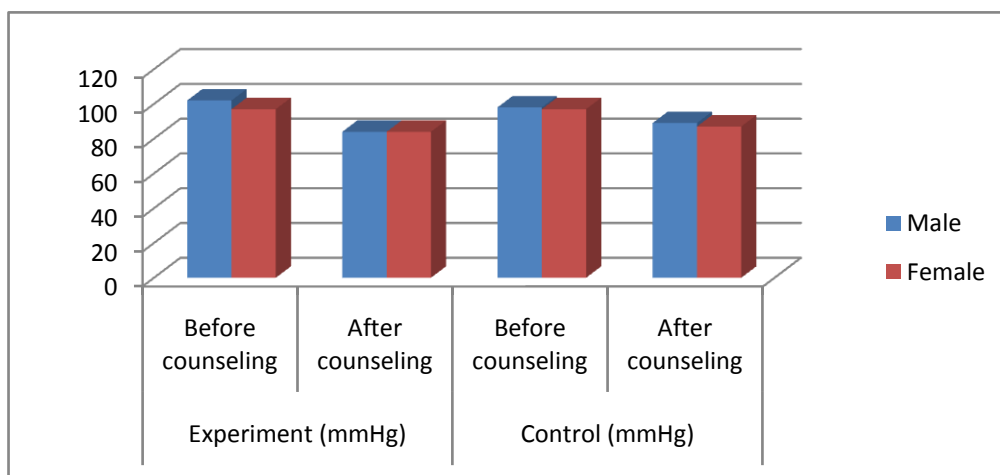


Fig 2.a. Graph represents the data from Table 2 (Mean systolic)

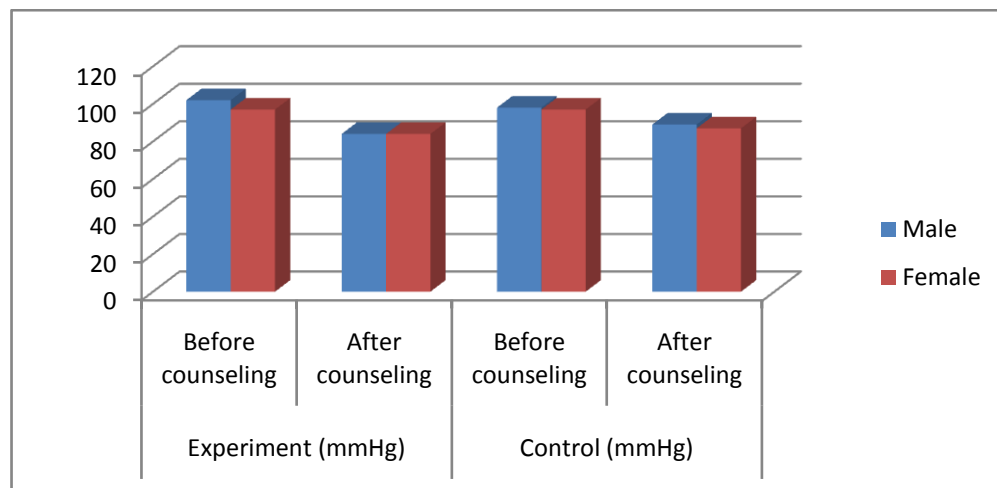


Fig 2.b. Graph represents the data from Table 2 (Mean diastolic)

The mean levels of diastolic blood pressure before and after intervention in experimental and control male group after 4 months projected a “t” value of 5.65 and 7.42, respectively which was found to be statistically significant at $p=0.001$. The mean levels of diastolic blood pressure before and after intervention in experimental and control female group after 4 months projected a “t” value of 8.32 and 6.1, respectively which was found to be statistically significant at $p=0.001$ (Table 2, Fig 2.a & 2.b).

Table 3. Percentage distribution of social habits before and after counseling:

Social habits	Experiment		Control	
	Before counseling (%)	After counseling (%)	Before counseling (%)	After counseling (%)
Smoking	6	14	2	4
Alcohol	14	10	14	18
Smoking + Alcohol	24	2	26	18
No habit	56	74	58	60

The prevalence of smokers was found to be 30% (n=50) and 28% (n=50) in experiment and control group, respectively which after counseling depreciated to 16% and 22%, respectively. The percentage of alcoholics was 38% and 4% in experiment and control group, respectively which after counseling declined to 12% and 36%, respectively. Prevalence of woman smokers and alcoholics was not reported in both experiment and control group (Table 3, Fig 3).

Awareness of hypertension and its complications was found to be greater in both experimental male (95.4%) and control male (60.71%) groups compared to their counter parts after 4 months of intervention (Table 4, Fig 4).

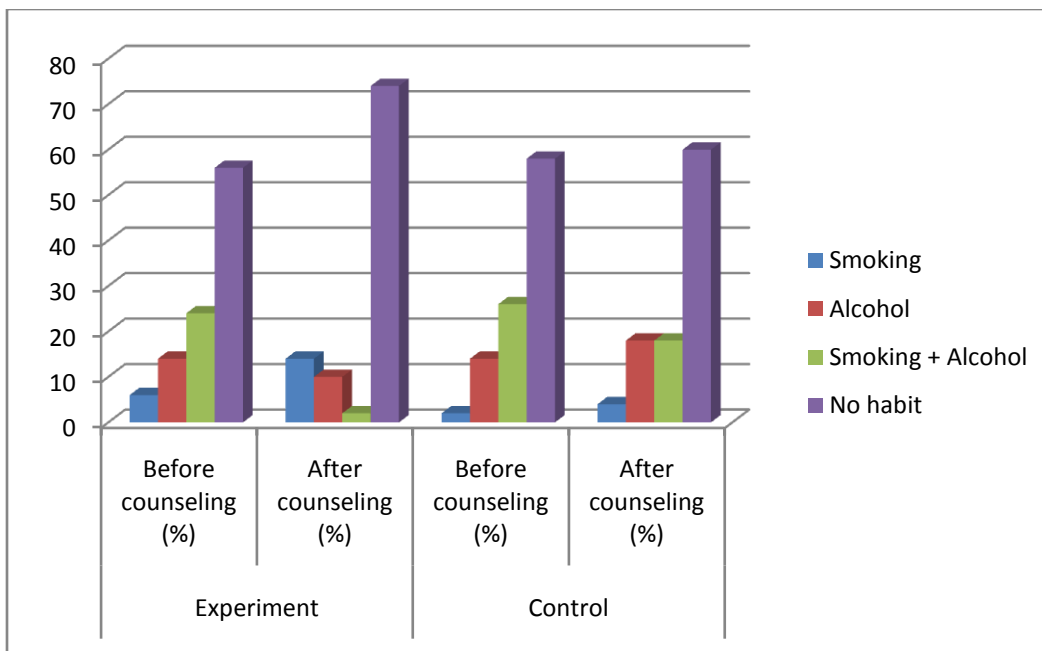


Fig 3. Graph represents the data from Table 3

Table 4. Percentage distribution of awareness on hypertension before and after 4 months of counseling in both experimental and control groups:

Awareness	Experiment		Control	
	Before counseling	After counseling	Before counseling	After counseling
Male	40.91%	95.45%	57.14%	60.71%
Female	32.14%	82.14%	27.27%	27.27%

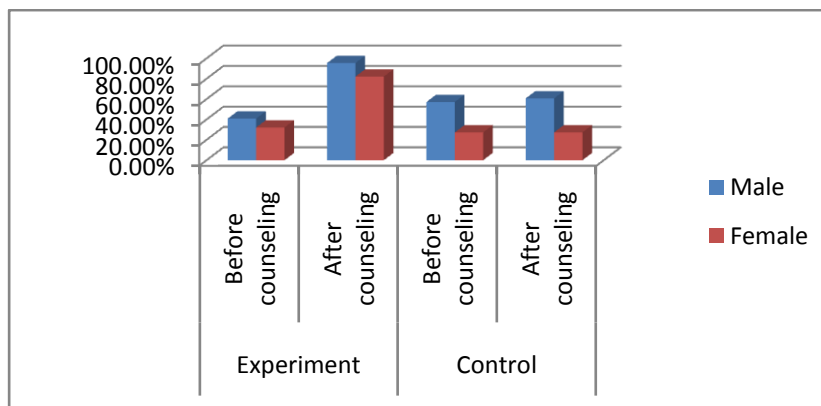


Fig 4. Graph represents the data from the Table 4

Table 5. Percentage distribution of medication adherence before and after 4 months of counseling in both experiment and control groups

Medication adherence	Experiment		Control	
	Before counseling	After counseling	Before counseling	After counseling
Male	22.73%	77.27%	60.72%	39.28%
Female	35.71%	82.14%	31.82%	40.90%

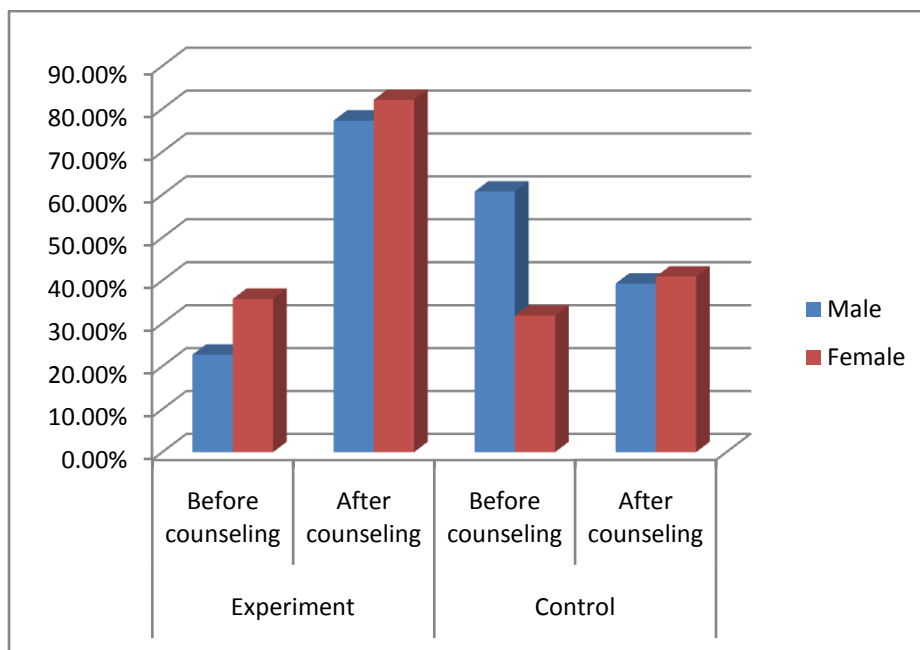


Fig 5. Graph represents the data from Table 5

Percentage of medication adherence was found to be greater in both experimental female (82.14%) and control female (40.90%) patients compared to their counter parts after 4 months of intervention. The proportion of medication adherence was found to be greater in counselled experimental group (80%) than the non-counselled group (40%) (Table 5, Fig 5).

Table 6. Percentage distribution of occupation

Occupation	Experiment	Control
House wife	48%	46%
Farmer	6%	4%
Driver	14%	16%
Businessmen	32%	34%

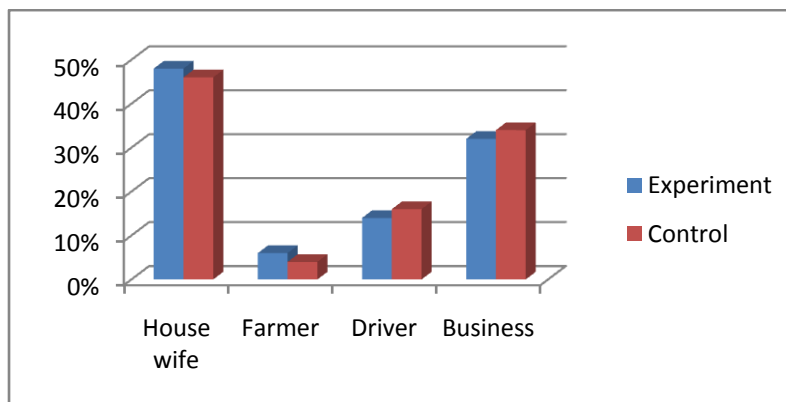


Fig 6. Graph represents the data from the Table 6

It was found that predominant part of the study population was homemakers, followed by businessmen (Table 6, Fig 6).

Table 7. Percentage distribution of co-morbidities

Co-morbidities	Experiment		Control	
	Male	Female	Male	Female
Diabetic	4.54%	7.14%	17.86%	13.64%
CAD	0.00%	0.00%	25.00%	22.72%
Nil	95.46%	92.86%	57.14%	63.64%

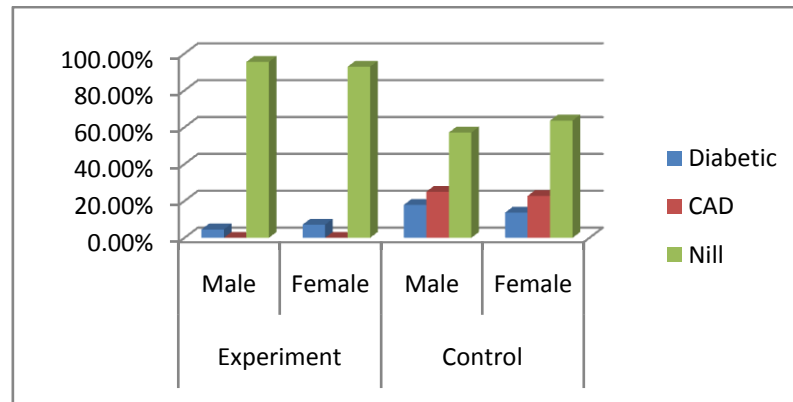


Fig 7. Graph represents the data from Table 7

Co-morbidities reported in both experimental and control groups were diabetic and coronary artery disease (Table.7, Fig 7).

Table 8. Percentage distribution of family history

Experiment		Control	
Male	Female	Male	Female
40.91%	42.85%	42.85%	50%

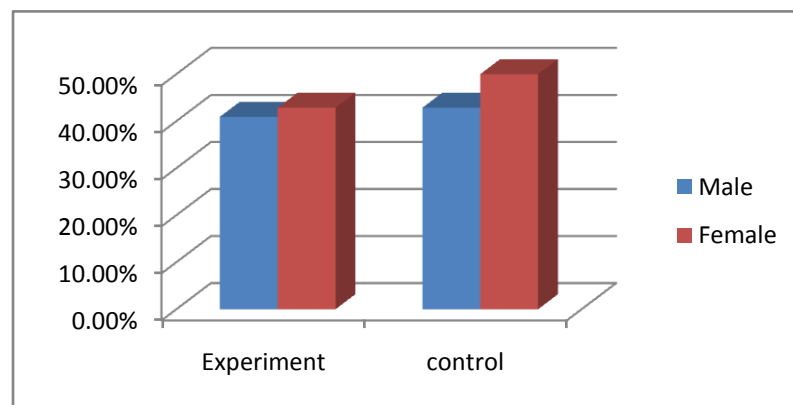


Fig 8. Graph shows the data from the Table 8

On evaluation 42% of experimental group and 46% control group were found to have a family history of hypertension (Table 8, Fig 8).

DISCUSSION

The importance of education to patients in order to improve the therapeutic outcomes is accepted in many countries all over the world. Numerous studies have indicated that counseling provided to patients improved their understanding about the disease and importance of medication and that lifestyle modification with necessary dietary changes decreased the morbidity and mortality rate [13].

After four months of intervention, it was observed that greater proportion of men and women in the experimental group achieved normal levels of blood pressure compared to the men and women in the control group which implied the importance of patient counseling in improving medication adherence and clinical outcomes of chronic diseases like hypertension.

The prevalence of smokers and alcoholics in both experimental and control male group depreciated considerably after counseling. Prevalence of female smokers and alcoholics was not reported.

The male population in both the groups was found to be more aware of the disease and its complications compared to their counterparts. This could be due to the fact that greater number of the male population recruited in the study was more educated. Majority of the female population which constituted that study were homemakers.

In comparison, the female population in both the groups demonstrated greater medication adherence after patient education than the male population. The proportion of medication adherence was found to be greater in counselled experimental group than the non-counselled group which indicates the effectiveness of counseling on increasing awareness, knowledge and patient compliance to medication. Similar results were observed in a study conducted by Palaian S *et al* [14].

Overall in the present study, non adherence was mainly due to forgetfulness, lack of time and financial problems. Similar results were found in the study conducted by Carvalho S *et al.* who reported that forgetfulness among the patients was mainly due to lack of knowledge and awareness about the consequences of the uncontrolled disease [15]. These barriers were found to be improved when patients were provided with education.

CONCLUSION

The study concluded that improving the patients' knowledge, attitude and practice about hypertension can improve the medication adherence behavior, which in turn improves the therapeutic outcomes. Pharmacists, positioned as the most accessible healthcare providers

in the community, could improve patients' knowledge and adherence to the management of high blood pressure.

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