



Knowledge, Awareness and Practice Outcomes: Evaluating the Impact of Nutrition Counseling among Hypertensive Subjects

Sodhi Kaur Navneet^{1*} and Singla Neerja¹

¹Department of Food and Nutrition, Punjab Agricultural University (PAU), Punjab, India.

Authors' contributions

This work was carried out in collaboration between both authors. Authors SKN and SN designed the study, managed the literature searches, performed the statistical analysis, wrote the protocol, wrote the first draft of the manuscript and managed the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

In the present study impact of developed nutrition education package was studied on awareness regarding lifestyle modification of hypertensive subjects. One hundred and twenty (120) hypertensive patients were selected from Punjab Agricultural University Hospital, Ludhiana of age 45 to 60 years, both sexes (male and female). The subjects were alternatively divided into two equal groups; Experimental (E) group, comprising of sixty patients (thirty males and thirty females), which received the lifestyle modification intervention for the control of blood pressure. The second was the Control (C) group, comprising of sixty patients (thirty males and thirty females), which was exposed to routine outpatient care only. Present study concluded that developed nutrition education package had a highly significant ($p < 0.001$) impact on the improvement in knowledge, awareness and practices of the subjects.

*Corresponding author: E-mail: kaurnavneet9071@gmail.com;

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1. INTRODUCTION AND REVIEW OF LITERATURE

Hypertension is the most prevalent and most common cardiovascular disorder posing a significant public health challenge to societies. It is fast emerging as a modern epidemic in the world and is the leading and most important modifiable risk factor for heart diseases, stroke, renal diseases and retinopathy [1]. As per health statistics report by World Health Organization [2], one in three adults worldwide has raised blood pressure, a condition that results in approximately half of all deaths from stroke and heart disease. It has been projected that the number of hypertensive adults in the world is expected to increase from 25% to 29% by 2025 [3]. It is expected that about 10% of the total hypertensive population will suffer from secondary hypertension—triggered by a preexisting disease [4]. Presently Hypertension is defined as sustained resting blood pressure (BP) above 140/90 mmHg. The WHO and the International Society of Hypertension (ISH) defined hypertension as a systolic blood pressure of 140 mmHg or greater and diastolic blood pressure of 90 mmHg or greater in the subjects who were not taking antihypertensive medications [5].

Once hypertension is diagnosed, treatment involves a combination of antihypertensive medication and lifestyle modification which is the first line of intervention for all patients with hypertension [6]. Effective management of hypertension depends on patients' understanding of their condition, treatment regimen, and adherence to lifestyle and /or pharmacological treatment. Increasing patients' knowledge about the disease can achieve the goal of treatment, empower patients to make a decision about their treatment, and can also empower their motivation and intention to adhere with the treatment regimen [7]. Lifestyle modification is considered the current challenge to control blood pressure. A study conducted in 2014 by Wehedy et al. [8], analysed that modifications in all dimensions of lifestyle patterns showed significant improvement in the study group compared with the control group. The improvement in the control group may be justified by obtaining information about healthy diet from their health care providers or from the mass media such as magazines, television, and

newspapers. Lifestyle modifications included eating healthy diet, physical activity as walking and proper stress management. The knowledge acquisition during the sessions played an essential role in motivating the older adults in adopting healthy lifestyle.

Hence, rapid urbanisation has lead to a drastic change in the lifestyle of people especially regarding stress, low physical activity and faulty dietary habits. Moreover, alcohol consumption, tobacco and cigarette smoking among men further complicate the problem. In India, hypertension in the general population is largely undetected and very scanty information is available regarding the lifestyle modification knowledge level in the hypertensive subjects of age group 45-60 year especially in Punjab. Therefore, keeping in mind the increasing prevalence of hypertension and the previously available data, the study was planned with an objective to develop nutrition education package and to assess the impact of it on the selected hypertensive subjects.

2. MATERIALS AND METHODS

2.1 Locale of Study

The present study was conducted in the outpatient department of Punjab Agricultural University Hospital, Ludhiana, Punjab, India.

2.2 Selection of Subjects

The subjects comprised of one hundred and twenty (120) hypertensive patients attending, PAU, Ludhiana hospital. The patients had been selected according to the following criteria: age 45 to 60 years, both sexes (male and female), diagnosed with hypertension, able to communicate, accept to participate in the study, free from other associated diseases such as diabetes mellitus and renal diseases. The sample was selected from the PAU hospital using the purposive sampling technique. The subjects were alternatively divided into two equal groups; the first was Experimental (E) group, comprising of sixty patients (thirty males and thirty females), which received the lifestyle modification intervention for the control of blood pressure. The second was a control group, comprising of sixty patients (thirty males and thirty females), which was exposed to routine outpatient care only (Fig. 1).

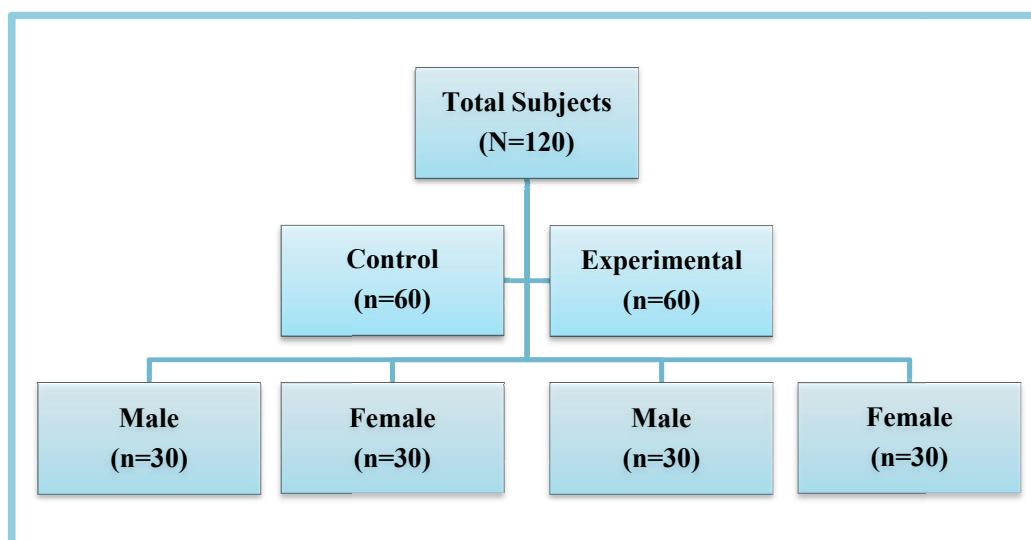


Fig. 1. Flow diagram depicting selection of subjects

2.3 Ethical Approval

According to ICMR guidelines ethical approval is to be taken for trials of drugs or foods on a human. We have not conducted any trial related to this. Hence no ethical approval was taken to conduct the present study.

2.4 Consent

Written consent of the subjects duly signed by them was taken before proceeding with the study.

2.5 Study Tool Used: Questionnaire

A well-structured Questionnaire/Interview Schedule was developed to elicit the demographic information, lifestyle-related information, health record, anthropometry, clinical assessment, dietary intake and physical activity pattern.

2.6 Pilot Testing

A pilot of 10 subjects was undertaken for pretesting the questionnaire. Thereafter, necessary modifications were incorporated. The modified questionnaire was then used in the present study. These respondents were excluded from the final sample.

2.7 Collection of Data

The data was collected by personally interviewing the subjects.

2.8 Dietary Intake

To assess the dietary intake of the subjects, a dietary survey was carried out by using "24-hour recall method" for three consecutive days.

2.9 Pretesting of Knowledge, Awareness and Practice (KAP) Score

The knowledge, awareness and practices regarding hypertension and its dietary management were pre-tested using the developed KAP questionnaire which was administered to selected sixty patients of the experimental group.

2.10 Development of Nutrition Education Package

A power point presentation, booklet and pamphlet were prepared in regional language i.e. Punjabi, as a nutrition education package containing complete information on hypertension and lifestyle modifications. The package was prepared to keep in view the collected information regarding doubts and some queries of the subjects during the interview session. The counselling material was deliberately selected for providing awareness regarding hypertension, its classifications, major risk factors of hypertension, salt and sodium, oil / fat choices and its requirement for hypertensives, recipes of fat free preparations, dietary restrictions, healthy diet for hypertensives, foods to be avoided and the healthy lifestyle guidelines for hypertensive patients.

For developing the content of the nutritional package, appropriate available literature sources were thoroughly explored. Thereafter, the selected and finalised contents in written form were transferred into a power point presentation, booklet and pamphlet. Necessary and relevant visual presentations and photographs were also used to supplement the text. The contents finalised for the booklet were used for the power point presentation. Appropriateness of developed pamphlet, booklet and power point presentation was assessed by an expert from the Department of Home Science Extension and Communication Management, PAU, Ludhiana.

2.11 Nutrition Counselling of Experimental Group Subjects

Nutrition counselling using the developed nutrition education package was imparted to selected sixty patients of the experimental group through lecture cum discussion method for 3 months during their fortnight visit to the hospital. Along with that counselling of the selected subjects was done according to their convenience, as many of them were working staff of the university and they could not attend the group counselling sessions. Therefore, those subjects including some of the professors, few field workers, and some of the housewives were given individual counselling at their respective places. A pamphlet and booklet containing all the information regarding 'Hypertension and Lifestyle Management' were distributed to the subjects, so that they can read and apply the given modifications in their routine daily for preventing hypertension and its complications in future.

2.12 Post Testing of Knowledge, Awareness and Practice (KAP) Score

To study the impact of the developed nutritional package, post-intervention test of knowledge, awareness and practice (KAP) score was conducted using a pre-structured questionnaire. The evaluation was done by awarding the score of one for each correct answer and score of zero for the wrong answer.

Gain in knowledge = score of post test-score of pre test

$$\text{Quantum of improvement} = \frac{\text{Post test score}}{\text{Pre test score}}$$

2.13 Statistical Analysis

Mean, and percentages for the various parameters were computed. The z test and their statistical significance were used to analyse the data obtained from the survey.

3. RESULTS

3.1 Impact of Developed Package on Knowledge, Awareness and Practices (KAP) Score of the Subjects

It has been reported that knowledge, awareness and practices of hypertensive subjects changed significantly after lifestyle modification counselling, especially focussing on nutrition counselling.

In the present study knowledge, awareness and practices (KAP) of both the groups (control and experimental) were assessed using a questionnaire comprising of 10 questions under each category.

3.2 Knowledge

As evident from the (Table 2) it was observed that majority of the subjects were not aware of the term 'hypertension', while the normal range of blood pressure was known to be 78.3% of the subjects in the experimental group. However, after nutrition counselling, 100% of the subjects in the experimental group knew about the normal range, while there was no improvement in the knowledge level of control group subjects. A similar trend regarding other aspects of knowledge test was observed among the control and experimental group.

3.3 Awareness

As indicated in (Table 3) all the subjects were aware of the significant risk factors of hypertension i.e. excessive alcohol intake, smoking, tobacco consumption, obesity and higher intake of fat and salt. It was also observed that 100% of subjects were aware of the importance of exercise, bad effects of higher intake of processed foods and about the importance of toned milk in hypertensive patient's diet. On the other hand, very few people 25% from

control and 6.6% of the experimental group were aware of the availability of low sodium salt in the market before nutrition counselling. Similarly, the awareness level of subjects was tested regarding other aspects of hypertension.

Table 1. Knowledge level test of subjects pre and post nutrition counseling

Knowledge	Control (n=60)				Experimental (n=60)			
	Pre test		Post test		Pre test		Post test	
	No.	%	No.	%	No.	%	No.	%
Term hypertension	37	61.7	37	61.7	32	53.3	60	100
Normal range of BP	47	78.3	47	78.3	41	68.3	60	100
Salt and fats	57	95.0	57	95.0	60	100	60	100
Processed foods rich in sodium	44	73.3	44	73.3	44	73.3	60	100
Whole grains & fibre	30	50.0	30	50.0	15	25.0	58	96.6
High cholesterol foods	49	81.6	49	81.6	19	31.7	60	100
Availability of low sodium salt in market	21	35.0	21	35.0	13	21.7	60	100
Requirement of salt for hypertensives 2g/day	1	1.7	1	1.7	1	1.7	60	100
7-8 servings fruits & vegetables	38	63.3	38	63.3	25	41.7	60	100
1 tsp sodium 2300 mg	0	0.0	0	0.0	0	0.0	59	98.0

Table 2. Awareness level test of subjects pre and post nutrition counseling

Awareness	Control (n=60)				Experimental (n=60)			
	Pre test		Post test		Pre test		Post test	
	No.	%	No.	%	No.	%	No.	%
Stress and obesity	0	0	0	0	0	0	60	100
Major risk factors of hypertension	60	100	60	100	60	100	60	100
Fruits and vegetables	60	100	60	100	60	100	60	100
Avoid Processed foods	60	100	60	100	60	100	60	100
Exercise importance	60	100	60	100	60	100	60	100
Brands of Low sodium salt	15	25.0	15	25.0	4	6.6	60	100
Toned Milk Use	60	100	60	100	60	100	60	100
DASH diet	0	0.0	0	0.0	0	0.0	59	98.0
Egg white or yolk	32	53.3	32	53.3	8	13.3	60	100
GLVs high sodium and blood thinning medicine.	0	0.0	0	0.0	0	0.0	55	92.0

Table 3. Practices testing of subjects for pre and post nutrition counseling

	Control (n=60)				Experimental (n=60)			
	Pre test		Post test		Pre test		Post test	
	No.	%	No.	%	No.	%	No.	%
One Plate Salad consumption	2	3.4	2	3.4	1	1.7	46	76.7
Top salt on salads/fruits	37	61.7	37	61.7	39	65.0	6	10.0
Low sodium salt use	6	10.0	6	10.0	4	6.7	17	28.3
Multigrain Atta use	14	23.3	14	23.3	9	15.0	47	78.3
Pressure cooker preference	49	81.6	49	81.6	44	73.3	53	88.3
Daily smoking or tobacco	1	1.7	1	1.7	0	0.0	0	0.0
>1-2 pegs of alcohol daily	5	8.3	5	8.3	2	3.3	0	0.0
Daily walk	29	48.3	29	48.3	31	51.7	35	58.3
Use of hydrogenated fats	29	48.3	29	48.3	16	26.7	3	5.0
Yoga or meditation for Stress relieving	7	11.6	7	11.6	6	10.0	58	96.6

3.4 Practices

As evident from the data presented in Table 4, it was observed that very few i.e. only 3.4 and 1.7 percent of the subjects in control and experimental group respectively had a practice of having one plate of salad before nutrition counselling. However, after nutrition counselling, 76.7 % of experimental group subjects were practising it. A great reduction in the number of people using top salt on salad/fruits was observed after nutrition counselling, which was 65 and 10% before and after nutrition counselling, respectively. Use of low sodium salt and multigrain also increased in a very high number of subjects in the experimental group. Similarly, practice of doing Yoga/Meditation for stress relieving was increased from 10 to 96.6% before and after the intervention, respectively.

3.5 Gain in Score and Quantum of Improvement

The present study revealed that there was a highly significant ($p \leq 0.01$) improvement in all three types of scores i.e. knowledge, awareness and practices after nutrition counselling in experimental group subjects. Knowledge level gain in score was found to be 0 and 5 for control and experimental group respectively. Awareness level gain in score was found to be 0 and 4 for control and experimental group, respectively. Practice level gain in score was found to be 0 and 2 for control and experimental group, respectively. Quantum of improvement for all three types of scores was found to be 1 in the control group. However, the quantum of improvement for the experimental group was found to be 2.0, 1.7 and 1.3 for knowledge, awareness and practices, respectively (Table 4 and Fig. 2). To find the overall improvement in the knowledge, awareness and practices post nutrition counselling, total KAP score was statistically analysed at ($p \leq 0.01$) and it was observed that there was no change in the knowledge, the improvement was observed in experimental group subjects. The overall gain in score and quantum of improvement of the control group was found to be 0 and 1, respectively. On the other hand, overall gain in score and quantum of improvement of experiment group subjects was found to be 12 and 1.8 respectively.

4. DISCUSSION

This study assessed the impact of nutrition counselling on knowledge and lifestyle

modification of hypertensive subjects. A regular and comprehensive dietary counselling by an expert dietician can play a great role in improving the knowledge, awareness and practices of the hypertensive subjects and hence in lowering the incidence of the disease by improving their dietary pattern and lifestyle. It revealed that developed nutrition education package had a highly significant ($p < 0.01$) impact on the improvement in knowledge, awareness and practices (KAP) score of the subjects.

Results of the present study were in accordance with the study conducted by Wehedy et al. [8] which concluded that the education to the subjects about antihypertensive medications, healthy behaviours and lifestyle patterns related to blood pressure control namely healthy diet, physical activity, measures to reduce stress, smoking cessation, weight reduction, and periodic medical follow up helped in reducing hypertension among them. This is supported by a study done in Egypt by Hassan in 2009, [9] which revealed that lack of knowledge was among the causes of non-compliance with the treatment regimen among hypertensive elderly patients.

Susan et al. [10] revealed that hypertensive patients were aware of hypertension in general, but were less aware of specific factors related to their condition. The median duration of hypertension was 14 years, suggesting that even though these patients had this condition for a long time their knowledge was inadequate. Studies done in India by Kusuma et al. [11] and in Nigeria by Iyalomhe and Iyalomhe [12] to determine knowledge and perception about hypertension concluded that despite the higher prevalence of hypertension, comprehensive knowledge about hypertension was lacking. Tobe et al. [13] and Dawes et al. [14] in Canada stated that most patients who received education booklet about hypertension had a good baseline about hypertension. Providing information about the disease and treatment regimen appeared to be sufficient for adherence, and non-adherence was attributed to inadequate knowledge [15].

The results of the present study were in accordance with a study carried out in Egypt by Soliman [16] which concluded a significant increase in knowledge level post program and in follow up after 3 months compared to pre-program.

Table 4. Knowledge, Awareness and Practices scores of subjects pre and post nutrition counselling

Parameters	Control group (n=60)					Experimental group (n=60)					Total subjects (N=120)				
	Pre test	Post test	GI	QI	z-value	Pre test	Post test	GI	QI	z-value	Pre test	Post test	GI	QI	z-value
Knowledge (10 Questions)	5.5±1.9	5.5±1.9	0	1.0	-	5.0±1.8	9.9±0.2	5	2.0	21.3**	5.3±1.9	7.7±2.6	2	1.5	8.5**
Awareness (10 Questions)	5.7±0.8	5.7±0.8	0	1.0	-	5.7±0.6	9.9±0.4	4	1.7	17.9**	5.7±0.7	7.8±2.2	2	1.4	10.14**
Practices (10 Questions)	6.2±1.3	6.2±1.3	0	1.0	-	6.4±1.2	8.3±1.2	2	1.3	8.9**	6.3±1.2	7.3±1.6	1	1.2	5.26**
KAP Score	17.5±3.3	17.5±3.3	0	1.0	-	14.7±2.1	26.4±1.2	12	1.8	37.8**	17.3±2.9	22.0±5.1	5	1.3	8.75**

GI-Gain in score; QI-Quantum of improvement; KAP-Knowledge, Awareness and Practices; *Significant at 5%; ** Significant at 1%

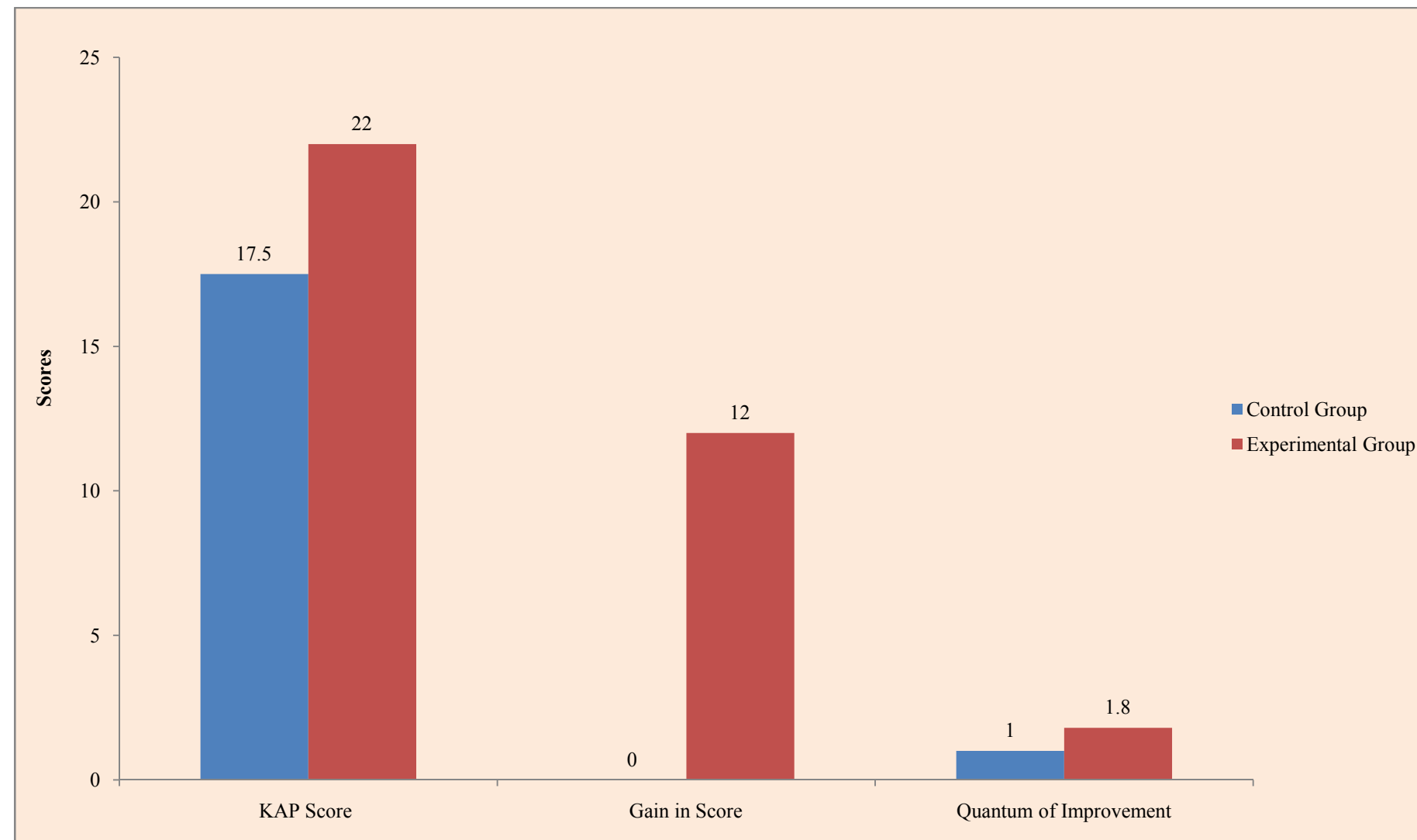


Fig. 2. Gain in score and quantum of improvement

5. CONCLUSIONS

From the interpretation of data collected under the present study, it can be concluded that the developed nutrition education package was effective in the modification of lifestyle of hypertensive subjects. However, it needs to be continued for a longer period for a better compliance.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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