INTERNATIONAL JOURNAL OF ADVANCE RESEARCH AND DEVELOPMENT

(Volume 5, Issue 5)

Available online at: www.ijarnd.com

The effect of education classes in addition to home exercise program in community based middle-aged hypertensive adults

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ABSTRACT

The aims of this study is: To see the effect of education on blood pressure BMI, HR, QOL in community based middle aged hypertensive adults; To see the effect of education classes in addition to home exercise program on blood pressure BMI, HR, QOL in community based middle aged hypertensive adults; and Finally, to compare the effects of education class & education classes in addition to home exercise program on BP, BMI, HR & QOL in community based middle aged hypertensive adults. The study is conducted to see the effect of education classes and education classes in addition to home exercise program on 1.BMI, 2. Heart rate, 3. Systolic BP, 4. Diastolic BP and 5. Quality of life using SF-36. It is a quasi-experimental study. he main findings of the present study were that difference in means of BMI, Systolic BP, Diastolic BP and PCS score and MCS score scores of SF-36 (QOL) questionnaire were found to be statistically significant within group A and group B using paired t-test. In Group C an increase in BMI, HR Systolic BP and Diastolic BP were found, which were statistically significant. There was no change in PCS and MCS scores of SF-36 in group C. The change in Heart Rate, was not significant in group A, B & C. The present study was done to see the effect of education classes in addition to home exercise program in community based middle-aged hypertensive adults with mean age of 47.27±5.869 years in Group A, 44.87±3.720 years in Group B and 47.33±4.964 in Group. In the present study mean difference of HR was not found to be statistically significant within 3 groups. Mean difference of HR was not found to be statistically significant between three group A, B and C. In the present study mean difference of Systolic BP and Diastolic BP in Group A was found to be statistically significant. Mean difference of Systolic BP and Diastolic BP was found to be statistically significant between groups A, B and C. Difference in PCS and MCS scores of SF-36 (QOL) within the group A was found to be statistically significant in the present study. Mean difference of PCS and MCS between groups A & B was also found to be statistically significant. Difference in means in Group C of BMI, Systolic BP, Diastolic BP were increased and statistically significant. Difference in HR was not found to be statistically significant. In Group C PCS & MCS scores did not change pre & post intervention. As a result, it was concluded that, Education classes in middle aged hypertensive subjects decreases BMI, BP & improves QOL. Education + Home Exercise Program for 6 weeks decreases BMI, BP & improves QOL in middle aged hypertensive subjects. Education + exercise in more effective than education alone in decreasing BMI, BP & improves QOL.

Keywords— *Hypertension, Health education, BMI, QOL*

1. INTRODUCTION

The American Heart Association (AHA) defines hypertension as blood pressure of 140 over 90 or higher. Hypertension is sustained high blood pressure (≥140/90mmHg). Blood pressure follows a circadian rhythm in a normal individual. Blood pressure falls during sleep and rises rapidly just before one wake, which is when the risk of cardiovascular events is the highest.[1] Hypertension is an important public health challenge worldwide because of its prevalence. The estimated total number of adults with hypertension in 2000 was 972 million. Of these, 333 million were estimated to be in economically developed countries and 639 million in economically developing countries.[2,3] By 2025, the number of people with hypertension will increase by about 60% to a total of

1.56 billion as the proportion of elderly people will increase significantly. Other reasons are the continuing population increase and change in lifestyle, which includes a diet rich in sugar and high- fat processed foods and sedentary behavior.[2,3]

2. MANAGEMENT OF HYPERTENSION[5]

The goals of antihypertensive therapy are the reduction of cardiovascular and renal morbidity and mortality,with the focus on controlling the systolic BP, as most patients will achieve diastolic BP control when the systolic BP is achieved.[17,18,19] Prehypertension (systolic 120-139 mm Hg, diastolic 80-89 mm Hg) requires health-promoting lifestyle modifications to prevent the progressive rise in blood pressure and cardiovascular disease.[17,18,20] It should be used for the pharmacologic treatment of most cases. In specific high-risk conditions, there are compelling indications for the use of other antihypertensivedrugs.[17,18,19,20] Health

education and hypertension: Counseling in hypertension is related to lifestyle changes, i.e. non- pharmacological treatment regarding smoking, alcohol, weight, diet, physical activity and stress and is aimed at reducing complications such as stroke and myocardial infarction. Many patients have several risk factors to deal with.[6,7,8]

According to National guidelines (1998), the major objective for hypertension management is to empower patients to actively become involved in the management of their hypertension through lifestyle modification and to ensure that they understand the importance of compliancy to treatment through continued patient health education. In most facilities patients are offered advice on lifestyle modification during consultation because there is not enough time to conduct group education.[9,10,11] According to the data, health workers seem to adhere to the recommendations made in the guidelines with regard to lifestyle modification and patient education. It appears that almost all health workers in all the facilities advice their patients to restrict salt intake in their food, to follow a prudent diet, to do regular physical exercises and to control their body weight.[12,13,14]

3. AIMS AND OBJECTIVE

The aims of the study are:

(a) To see the effect of education on blood pressure BMI, HR, QOL in community based middle-aged hypertensive adults.
(b) To see the effect of education classes in addition to home exercise program on blood pressure BMI, HR, QOL in community based middle-aged hypertensive adults.
(c) Finally, to compare the effects of education class & education classes in addition to home exercise program on BP, BMI, HR & QOL in community based middle-aged hypertensive adults.

The objective of the study is:
To see the effect of education classes and education classes in addition to home exercise program on 1.BMI, 2.Heart rate, 3.Systolic BP, 4.Diastolic BP and 5.Quality of life using SF-36.

4. HYPOTHESIS

Null Hypothesis (0):
There is no significant difference in effect of education classes, education classes in addition to home exercise program and no intervention in community based middle-aged hypertensive adults.
Alternative Hypothesis (H1):

There is significant difference in effect of education classes, education classes in addition to home exercise program and no intervention in community based middle-aged hypertensive adults.

5. MATERIAL AND MATHODOLOGY

5.1 Study Design

A quasi experimental study to see the effect of education classes with and without home exercise program in community based middle-aged hypertensive adults.

5.2 Study Setting

Intervention was conducted in the community of Ahmedabad.

5.3 Study Duration

Total study duration was 12 months; all subjects underwent intervention for 6 weeks.

5.4 Sample Size

45 subjects were divided in three groups.
GROUP A: 15 subjects (Education+ Home exercise) GROUP B: 15 subjects (Education)
GROUP C: 15 subjects (Control group)

5.5 Sampling Design

Convenient sampling

5.6 Inclusion Criteria

(a) Age: 40 to 60 years
(b) Gender: Both males and females
(c) Subjects with clinical diagnosis of hypertension.

5.7 Exclusion Criteria

(a) Doing regular exercise
(b) Any associated systemic involvement
(c) Any musculoskeletal problem
(d) Any neurological problem
(e) Any respiratory and cardiovascular diseases

5.8 Outcome Measures

(a) BMI- Body Mass Index
(b) HR- Heart Rate

(c) Systolic Blood Pressure
(d) Diastolic Blood Pressure
(e) SF-36(QOL) questionnaire

5.9 Data collection and Procedure

45 subjects from various hospitals & clinics of Ahmedabad were included. Education was given to group A and B. For the education three classes were held. Classes were composed of a half-hour lecture on patho-physiology of hypertension, nutritional advice and effect of exercise on hypertension.

Following suggestions were given in session 2:

(a) Have your blood pressure checked and then monitor it regularly,
(b) Maintain a healthy body weight, reduce intake of dietary saturated fat and cholesterol,
(c) Exercise regularly,
(d) Eat a healthy diet rich in whole grain, more fruits, vegetables and low-fat dairy products,
(e) Reduce sodium in diet,
(f) Maintain an adequate intake of dietary potassium and calcium,
(g) Cut back on caffeine,
(h) Avoid tobacco products & second hand smoke,
(i) Limit alcohol intake,
(j) If prescribed blood pressure medication, take it as directed,
(k) Manage stress, get support from family and friends, for encouragement and emotional or morale boost.

Group A also performed exercises with the following principles:

(a) Intensity: Moderate intensity at RPE 11-13
(b) Frequency: 5days/week
(c) Type:
  - Walking
  - Stretching exercise as warm up
  - 5 minutes cool down exercise (including very slow walking, stretching and relaxed breathing)
(d) Duration: Each session lasted for 30- 45 minutes Session 1: (5 days per week)
(e) Flexibility Exercises (5-repetitions, 10-second hold)
  Hamstring stretches
  Calf stretches
  Thoraco-lumbar fascia stretch Overhead arm stretch and bend
(f) Wall push-ups
(g) Abdominal muscles (5 repetitions), Curl-ups with arms forward (as much as possible)
(h) Walking for 20 minutes.
(i) Cool down exercise: slow walking, stretching and relaxed breathing exercise.

Session 2: (5 days per week)

(a) Flexibility exercises (as above)
(b) Upper limb muscles (Wall pushups 10 repetitions)
(c) Abdominal muscles (5-10 repetitions)
(d) Forward stepping (5 repetitions)
(e) Brisk walking for 30 minutes
(f) Cool down exercise as above Session 3: (5 days per week)
(g) Flexibility exercises (5 repetitions,15 second hold)
(h) Upper limb muscles (Wall pushup 10-15 repetitions)
(i) Abdominal muscles (10 repetitions)
(j) Brisk walking for 30 minutes
(k) Cool down exercise as above.

6. Education Classes

Fig. 1: Stretch and bend

Fig. 2: Wall Pushups

Fig. 3: Hamstring stretching

Fig. 4: Calf stretching

Fig. 5: Curl Ups

7. RESULTS

The present study comprised of 45 middle aged hypertensive adults, 15 in each group, all 45 subjects completed the study satisfactorily. Group A was given education for hypertension control and home exercise, Group B was given education for hypertension control and Group C was control group (no intervention).

Table 1: Mean difference in BMI between groups A, B & C

GROUP	BMI		H	p Value
	Mean	SD		
Group A	-0.5053	0.3596	25.92	<0.0001
Group B	-0.2813	0.1940		
Group C	0.2587	0.3507		

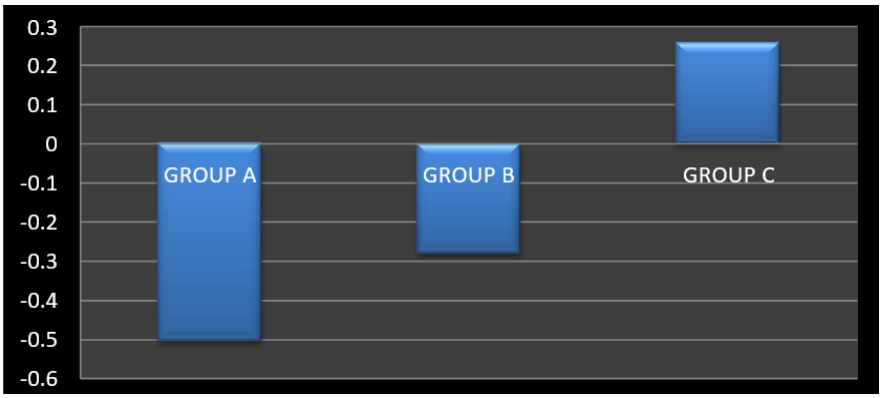

Fig. 6: Mean difference in BMI between groups A, B & C

Here Kruskal Wallis test was performed to compare difference in BMI value was found to be statistically significant at p<0.0001. Mean difference of Systolic BMI in Group A was found to be statistically more significant between 3 groups.

Table 2: Mean difference in HR between groups A, B & C

GROUP	HR		H	p Value
	Mean	SD		
Group A	2.4	4.421	4.517	0.1045
Group B	2.8	5.747		
Group C	-0.8	3.764		

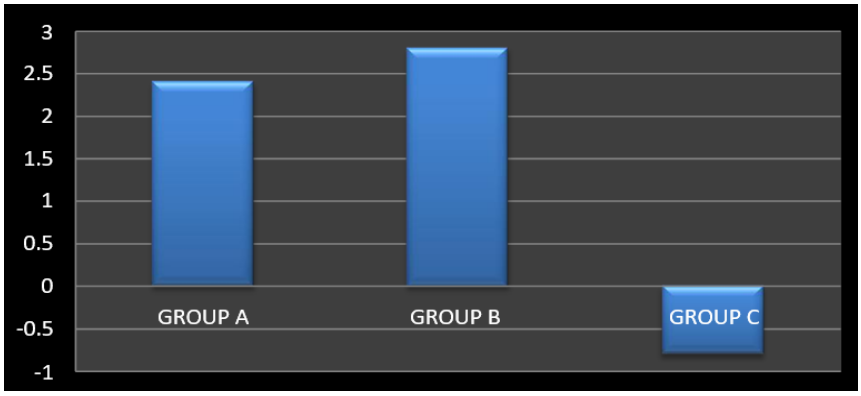

Fig. 7: Mean difference in HR between groups A, B & C

Here Kruskal Wallis test was performed, mean difference in HR was not significant at p= 0.1045

Table 3: Mean difference in Systolic BP between groups A, B & C

Group	Systolic BP		H	p Value
	Mean	SD		
Group A	-8.263	3.770	30.14	<0.0001
Group B	-7.467	2.875		
Group C	0.8000	1.014		

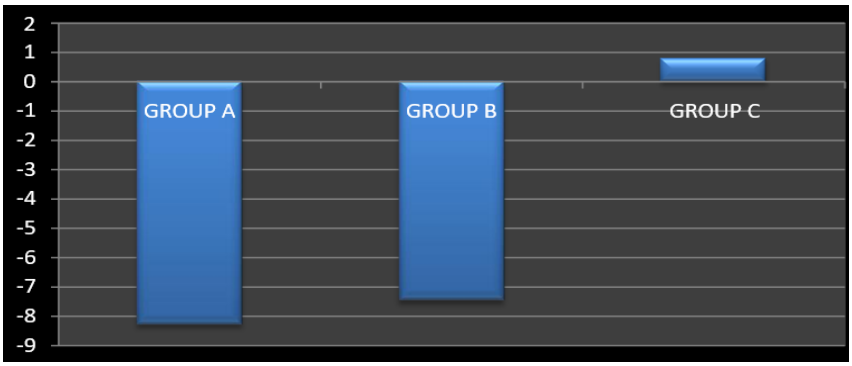

Fig. 8: Mean difference in Systolic BP between groups A, B & C

Here Kruskal Wallis test was performed. Mean difference in Systolic BP was found to be statistically significant at p<0.0001. Mean difference of Systolic BP in Group A was found to be statistically more significant between 3 groups.

Table 4: Mean difference in Diastolic BP between groups A, B & C

Group	Diastolic BP		H	p Value
	Mean	SD		
Group A	-4.000	4.000	18.83	<0.0001
Group B	-1.333	1.447		
Group C	0.8000	1.014		

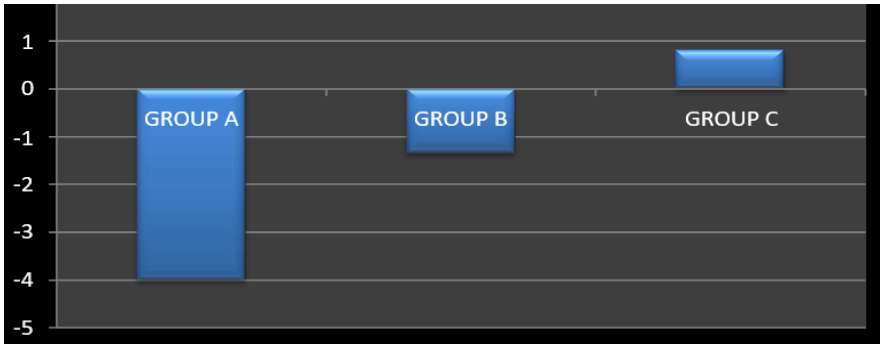

Fig. 9: Mean difference in Diastolic BP between groups A, B & C

Here Kruskal Wallis test was performed, mean difference in Diastolic BP was statistically significant at p<0.0001. Mean difference of Diastolic BP in Group A was found to be statistically more significant between 3 groups.

Table 5: Mean difference in PCS SCORE OF SF-3 between groups A, B & C

Group	PCS		t Value	p Value
	Mean	SD		
Group A	18.32	3.232	3.379	0.0045
Group B	13.96	4.034		
Group C	0.0	0.0		

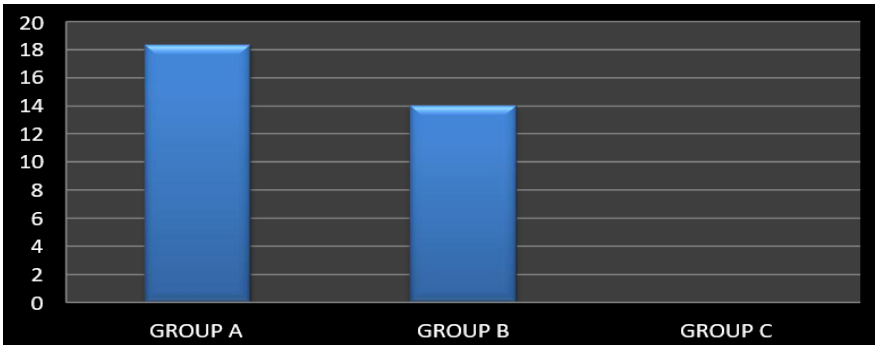

Fig. 10: Mean difference in PCS SCORE OF SF-3 between groups A, B & C

Here, paired t test was performed for analysis for mean difference in PCS score of SF-36 between groups A & B. t=3.379 and p=0.0045 was found statistically significant. Increase in PCS score of Group A was found to statistically more significant. There was no difference in PCS score of Group C (control group).

Table 6: Mean difference in MCS score of SF-36 between groups A, B & C

Group	MCS		t Value	p Value
	Mean	SD		
Group A	2.907	2.367	2.338	0.0248
Group B	1.340	1.169		
Group C	0.0	0.0		

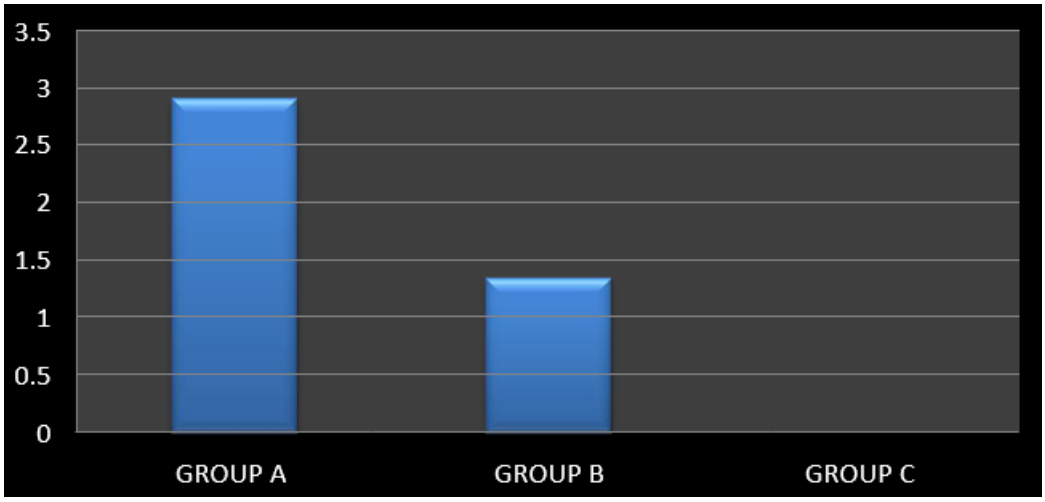

Fig. 11: Mean difference in MCS score of SF-36 between groups A, B & C

Here, paired t test was performed for analysis for mean difference in MCS score of SF-36 between groups A & B. t=2.338 and p=0.0248 was found statistically significant. Increase in MCS score of Group A was found to statistically more significant. There was no difference in MCS score of Group C (control group).

8. DISCUSSION

The present study was done to see the effect of education classes in addition to home exercise program in community based middle-aged hypertensive adults with mean age of 47.27±5.869 years in Group A, 44.87±3.720 years in Group B and 47.33±4.964 in Group. In the present study mean difference of HR (Group A t=2.103, p=0.0541, Group B t=1.887, p=0.0801 & Group C t=0.8231, p=0.4243) was not found to be statistically significant within 3 groups. Mean difference of HR (H=4.517, p=0.1045) was not found to be statistically significant between three group A, B and C.

In the present study mean difference of Systolic BP (t=8.493, p<0.0001), and Diastolic BP in Group A(t=3.873, p=0.0017) was found to be statistically significant. Mean difference of Systolic BP (H=30.14, p<0.0001) and Diastolic BP (H=18.83, p<0.0001), was found to be statistically significant between groups A, B and C.

Difference in PCS (Group A t=21.95, p<0.0001) and MCS (Group A t=4.475, p=0.0003) scores of SF-36 (QOL) within the group A was found to be statistically significant in the present study. Mean difference of PCS (t= 3.379, p= 0.0045) and MCS (t= 2.338, p= 0.0248) between groups A & B was also found to be statistically significant
Difference in means in Group C of BMI (t=), Systolic BP, Diastolic BP were increased and statistically significant. Difference in HR () was not found to be statistically significant. In Group C PCS (pre & post score=33.16) & MCS (Group C pre & post score=32.66) scores did not change pre & post intervention.

8.1 Limitations

- Long term follow-up was not taken
- Subjects were not under daily observation
- Some days were missed out by subjects during their exercise program

8.2 Future Study

The future study can be done with a larger sample size and for longer time duration.

8.3 Clinical Implication

Along with antihypertensives, middle aged adults with hypertension can be advised for the exercise and education programs.

9. CONCLUSION

Education classes in middle aged hypertensive subjects decreases BMI, BP and improves QOL. Education + Home Exercise Program for 6 weeks decreases BMI, BP & improves QOL in middle aged hypertensive subjects. Education + exercise is more effective than education alone in decreasing BMI, BP and improving QOL in middle aged hypertensive subjects. Education +

exercise and education alone has no effects on HR in middle aged hypertensive subjects.

t=14.10, p<0.0001 & Group B t=5.615, p<0.0001), Systolic BP (Group A t=8.493, p<0.0001 & Group B t=10.06, p<0.0001), Diastolic BP (Group A t=3.873, p=0.0017 & Group B t=3.568, p=0.0031) and PCS score (Group A t=21.95, p<0.0001 & Group B t=13.40, p<0.0001) and MCS score (Group A t=4.475, p=0.0003 & Group B t=4.439, p=0.0006) scores of SF-36 (QOL) questionnaire were found to be statistically significant within group A and group B using paired t-test. In Group C an increase in BMI (t=2.856, p=0.0284), HR (t=0.8231, p=0.4243) Systolic BP (t=3.055, p=0.0086) and Diastolic BP (t=3.055, p=0.0086) were found, which were statistically significant. There was no change in PCS (pre & post score=33.16) and MCS (pre & post score=32.66) scores of SF-36 in group C. The change in Heart Rate (Group A t=2.103, p=0.0541, Group B t=1.887, p=0.0801 & Group C HR t=0.8231, p=0.4243), was not significant in group A,B & C,

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