

## A Study on the Effectiveness of an Educational Package on the Knowledge of Mothers of Asthmatic Children on Bronchial Asthma

Erna Roach<sup>1\*</sup> Nalini Bhaskaranand<sup>2</sup>

1. Associate Dean & Professor, Manipal College of Nursing Manipal, Manipal University, Manipal- 576104, Karnataka, India
2. Professor, Pediatric Medicine Department, Kasturba Hospital, Manipal - Manipal- 576104, Karnataka, India

\*E-mail of the corresponding author: [ernajudith5@gmail.com](mailto:ernajudith5@gmail.com)

### Abstract

An evaluative study was conducted to determine the level of knowledge of mothers of asthmatic children on asthma and to determine the effectiveness of an educational package in terms of improvement in knowledge of mothers. A quasi experimental pretest posttest control group design was used. Purposive sampling technique was employed to select the subjects and they were randomized into either the experimental or control group using block randomization. Each group consisted of 40 mothers who fulfilled the sampling criteria. Baseline characteristics and a structured knowledge questionnaire on asthma were used to collect data. The findings of the study revealed that the difference from pretest to posttest knowledge scores in the experimental and control group was statistically significant ( $F = 444.35$ ,  $p < 0.01$ ) and the difference between the experimental and control group was statistically significant ( $F = 223.663$ ,  $p < 0.01$ ). The Post Hoc Bonferroni test showed significant difference within the groups and also between the experimental and control groups ( $p < 0.01$ ). There was significant improvement in knowledge among mothers in the experimental group than in the control group. Hence empowering mothers about asthma will help in adopting appropriate preventive measures and reduce asthma exacerbations in children.

**Keywords:** Knowledge, Mothers of asthmatic children, Educational package

### 1. Introduction

There has been a sharp increase in the global prevalence, morbidity, mortality and economic burden associated with asthma over the last 40 years, particularly in children (Braman SS 2006). Between 100 and 150 million people around the globe suffer from asthma and this number is rising. Worldwide deaths from this condition have reached over 180,000 annually. India has an estimated 15-20 million asthmatic patients and about 10-15% i.e. 1.5-3.0 million belong to 5-11 year age group (WHO Fact Sheet N0 206 2000). These children show symptoms of asthma with a resultant ten-fold variation and corresponding increase in the prevalence of severe asthma. This is attributed to the region's industrialization and urban growth occurring at an unprecedented rate in what was previously a predominantly agrarian society (Masoli M et al 2004).

Mothers of asthmatic children need to have adequate knowledge regarding asthma and its management in order to identify and prevent fatal asthma outcomes in their children. A study done by Rastogi D, Gupta S, Kapoor R, (2009) found the caregivers understanding of asthma pathophysiology to be sub-optimal. A study on knowledge and preventive asthma care measures found that parents of children with persistent asthma had inadequate understanding of appropriate inhaled corticosteroid use and parents who received a written action plan were more confident in their ability to provide care for their child during an asthma exacerbation( Deis JN et al .,2010)

### 2. Objectives of the study

The objectives of the study were to:

- 1) To assess the knowledge level of mothers of asthmatic children on bronchial asthma.

- 2) To develop an educational package on asthma for mothers of asthmatic children.
- 3) To determine the effectiveness of educational package in terms of improvement in knowledge.

### 3. Hypothesis

H<sub>1</sub>: The mean posttest knowledge scores of the experimental group will be significantly higher than that of the control group.

### 4. Methodology

An evaluative research approach was used with a quasi-experimental pretest posttest control group design. The study was carried out in selected hospitals of Udupi district, Karnataka State, India. Sample consisted of mothers of asthmatic children with persistent asthma, 40 each in the experimental and control group, attending the pediatric Out Patient Department along with their children. Purposive sampling technique was used for selecting the sample based on the inclusion criteria such as mothers of asthmatic children and children between 5 and 12 years diagnosed with persistent bronchial asthma, and on oral and inhalation therapy. Following consent process the subjects (mothers and children) were randomized into either the experimental or the control group using block randomization. Mothers of Physically and mentally challenged children, and children with associated chronic illnesses and other respiratory conditions were excluded. Data was collected using a validated & reliable tools developed by the researcher such as Baseline Characteristics (BC) and a Structured Knowledge Questionnaire (SKQ) on asthma, on day one and day 180. The SKQ included areas on factors associated with asthma (20 true / false items) and knowledge about asthma (15 multiple choice items) in eight areas of learning on asthma i.e. structure and function, meaning of asthma, triggers of asthma, altered mechanism, signs and symptoms, medication, preventive and control measures and peak flow meter. The educational package consisted of a video CD and informational booklet on bronchial asthma.

### 5. Data Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 16.0. Descriptive analyses i.e. mean, standard deviation and median was used to describe the knowledge variable. Data were also graphically represented in Box and Whiskers. The effectiveness of the educational package was determined using Inferential statistics such as Two factor ANOVA for repeated measures and Post Hoc Bonferroni test, as the Shapiro –Wilk test showed a normal distribution.

### 6. Results

#### 6.1 *Table 1 shows the distribution of sample according to their baseline characteristics*

The mean age of mothers in the experimental group was  $37.73 \pm 5.68$  (CI: 35.91- 39.54) and in the control group it was  $36.35 \pm 5.34$  (CI: 34.64- 38.05). Majority of the mothers in both groups were between >30-40 years of age. Most of the mothers in the experimental group (27.5%) were having high school education, and an equal percentage had intermediate level of education. There were 22.5% graduates / postgraduates in this group.

In the control group, 37.5% had high school education, which was a higher percentage in comparison with the experimental group. There were 20% mothers with intermediate level of education and 27.5% with graduation/post-graduation. Majority of mothers in both groups were housewives, and the monthly family income was > Rs 5000.

The p values for all the variables were not significant ( $p > 0.05$ ), indicating that the characteristics of samples in the experimental and control groups were similar.

6.2 *Table 2 shows the living environment of families*

Majority of families in both groups i.e. experimental (77.5%) and control (62.5%) were of nuclear type. Most of families in both groups i.e. experimental (77.5%) and control (72.5%) had 1-2 children. Maximum families lived in urban areas in both groups and had concrete type of homes. Majority used gas as fuel in both groups, while 12.5% used gas and firewood in the experimental group and 10% in the control group. Majority of them did not have any pets at home in both groups. The p value for the variable type of house ( $p < 0.05$ ) was significant and for all other variables it was not significant, ( $p > 0.05$ ) indicating that the characteristics of samples in the experimental and control groups did not differ significantly except for the type of house they lived in.

6.3 *Table 3 shows the knowledge scores of mothers in both groups.*

In the experimental group the posttest mean knowledge score  $28.00 \pm 2.32$  (CI: 27.26 – 28.74) was significantly higher than the pretest mean knowledge score  $17.85 \pm 3.27$  (CI: 16.80 – 18.90). The scores of the posttest ( $SD \pm 2.32$ ) was less dispersed than the scores of the pretest ( $SD \pm 3.27$ ). The mean percentage of the post test was 80% and the pretest was 51%. In the control group the posttest mean knowledge score  $19.00 \pm 3.96$  (CI: 17.73 – 20.27) was higher than the pretest mean  $17.28 \pm 3.51$  (CI: 16.15 – 18.40). The scores of the posttest ( $SD \pm 3.96$ ) was more dispersed than the scores of the pretest ( $SD \pm 3.51$ ). The mean percentage of the post test was 54.29 % and the pretest was 49.37%. There was an increase in the mean knowledge scores in the experimental group (29%). In the control group also there was an increase (4.92%), which was minimal.

6.4 *Figure 1 depicts the median, quartiles and range in a Box and Whiskers Plot.*

In the experimental group the median of posttest knowledge scores (28.50) were significantly higher than the pretest median (17.50). The posttest lower quartile Q1 lies at 26 and the upper quartile Q3 lies at 30 and in the pretest the lower quartile lies at 16 and upper quartile lies at 20. The posttest scores range from 24 to 32 and the pretest scores range from 12 to 25. In the control group the posttest median 18.50 is higher than the pretest median 17.00. The posttest lower quartile Q1 lies at 16 and upper quartile Q3 at 22 and the pretest lower quartile lies at 15 and the upper quartile lies at 20. The posttest scores range from 9 to 27.

6.5 *Table 4 and 5 shows the effectiveness of educational package in terms of improvement in knowledge*

In table 4 the two factor ANOVA for repeated measures shows that there was significant increase from the mean pretest to posttest knowledge scores within groups ( $F = 444.35$ ,  $p < 0.01$ ). A significant difference in knowledge scores between the experimental and control group was also found ( $F = 223.66$ ,  $p < 0.01$ ).

The Bonferroni test in table 5 shows that there was significant difference in knowledge scores from pre-test to post-test both in the experimental and control group ( $p < 0.01$ ) with mean difference 10.15 (CI: 9.29 – 11.02) and 1.73 (CI: 0.98 – 2.47) in the experimental and control group respectively. Both groups showed significant improvement in knowledge. When the mean improvement between the experimental and control group was compared the Bonferroni test showed significant difference between experimental and control group ( $p < 0.01$ ) with mean difference 8.43 (CI: 7.30 – 9.55). This indicates significant improvement in knowledge among the experimental group than the control group. Hence  $H_0$  is rejected and  $H_1$  is accepted.

## 7. Conclusion

The findings of the study showed that the educational package was effective in improving the knowledge of mothers significantly in the experimental group than in the control group. Hence successful asthma education is possible and rewarding if efforts are taken by health professionals to educate mothers of asthmatic children to adopt preventive measures thus reducing the morbidity among children.

## 8. Limitation

1. The researcher did not have any control over the routine care that the mothers of asthmatic children in the control group received, which could have influenced the findings in the control group.
2. The study setting was selected conveniently which limits generalization of the findings.

## 9. Recommendation

1. Individualized guidelines on self-management at home can be developed for parents while age appropriate guidelines for children can be developed and its effectiveness can be tested.
2. A larger study can be done for a longer duration to find the impact of the educational package on all aspects such as knowledge of parents in asthma management.

## References

Braman, S.S. ( 2006). The Global Burden of Asthma. *Chest*, 130 (1 Suppl), 4S-12S.

World Health Organization (2000). Asthma fact sheet no.206. [Online] Available: [www.who.int/mediacentre/factsheets/fs206/en](http://www.who.int/mediacentre/factsheets/fs206/en)

Masoli, M., Fabian, D., Holt, S., & Beasley R. (2004). Global burden of asthma. [Online] Available: [www.ginasthma.org/pdf/GINABurdenReport.pdf](http://www.ginasthma.org/pdf/GINABurdenReport.pdf)

Rastogi, D., Gupta, S., & Kapoor R. (2009). Comparison of asthma knowledge, management and psychological burden among parents of asthmatic children from rural and urban neighborhoods in India. *J Asthma*, 46 (9), 911-15.

Deis, J.N., Spiro, D.M., Jenkins, C.A., Buckles, T.L. & Arnold, D.H. ( 2010). Parental knowledge and use of preventive asthma care measures in two pediatric emergency departments. *J Asthma* , 47(5),551-6.

Table 1: Baseline characteristics of mothers of children in the experimental and control groups

	Experimental (n=40)	Control (n=40)	p value	Signifi- cance
<b>1. Age ( in years)</b>	37.73 ± 5.68 ( 35.91 – 39.54)	36.35 ± 5.34 (34.64- 38.05)	0.268 t ( df 78)	NS
20-30	5 (12.5%)	8 (20%)	0.633 #	
>30-40	24 (60%)	23 (57.5%)	( df 2)	NS
>40-50	11 (27.5%)	9 (22.5%)		
<b>2. Education</b>				
Primary	8 (20%)	6 (15%)		
Middle	1 (2.5%)	0	0.563 #	NS
High	11 (27.5%)	15 (37.5%)	(df 3)	
Intermediate	11 (27.5%)	8 (20%)		
Graduate/ postgraduate	9 (22.5%)	11 (27.5%)		
<b>3. Occupation</b>				
Housewife	30 (75%)	26 (65%)		
Unskilled	1 (2.5%)	5 (12.5%)		
Semi –skilled	1 (2.5%)	1 (2.5%)	0.521 F	NS
Skilled	3 (7.5%)	4 (10%)		
Semi- professional	4 (10%)	2 (5%)		
Professional	1 (2.5%)	2 (5%)		
<b>4. Monthly family income( in Rs)</b>				
<2000	7 (17.5%)	3 (7.5%)		
2001-3000	5 (12.5%)	6 (15%)	0.603 #	NS
3001-5000	6 (15%)	7 (17.5%)	( df 3)	
>5000	22 (55%)	24 (60%)		

NS= Not Significant, t='t' test, # = Chi Square test, F= Fishers exact test

Table 2: Living environment of families in the experimental and control group

	Experimental (n=40)	Control (n=40)	p value	Significance
<b>1. Type of family</b>				
Nuclear	31 (77.5%)	25 (62.5%)	0.143 # (df 1)	NS
Joint	9 (22.5%)	15 (37.5%)		
<b>2. No: of children</b>				
1-2	31 (77.5%)	29 (72.5%)	0.230 F	NS
3-4	9 (22.5%)	11 (27.5%)		
<b>3. Type of house</b>				
Kutchra	1 (2.5%)	0	0.011 F	NS
Pucca	6 (15%)	13 (32.5%)		
Concrete	33 (82.5%)	27 (67.5%)		
<b>4. Location of house</b>				
Urban	20 (50%)	17 (42.5%)	0.358 # (df 2)	NS
Semi-urban	5 (12.5%)	10 (25%)		
Rural	15 (37.5%)	13 (32.5%)		
<b>5. No: of rooms</b>				
1-2	14 (35%)	13 (32.5%)	0.428 # (df 2)	NS
3-4	19 (47.5%)	14 (35%)		
>5	7 (17.5%)	13 (32.5%)		
<b>6. Type of fuel used</b>				
Gas	28 (70%)	25 (62.5%)	0.290 F	NS
Kerosene	1 (2.5%)	5 (12.5%)		
Firewood	6 (15%)	6 (15%)		
Gas & Firewood	5 (12.5%)	4 (10%)		
<b>7. Type of pets</b>				
Dog	6 (15%)	2 (5%)	0.476 F	NS
Cat	3 (7.5%)	1 (2.5%)		
Dog & Cat	5 (12.5%)	7 (17.5%)		
No pets	26 (65%)	30(75%)		

NS= Not Significant # = Chi Square test, F= Fishers exact test

Table 3: Mean, standard deviation, median, standard error of mean, confidence interval, mean percentage of pretest and posttest knowledge scores of experimental and control groups

Knowledge Scores		Mean $\pm$ SD	Median	SEM	95% CI for Mean	Mean %
<b>Experimental group</b> (n= 40)	<b>Pretest</b>	17.85 $\pm$ 3.27	17.50	0.517	16.80 -18.90	51.00
	<b>Posttest</b>	28.00 $\pm$ 2.32	28.50	0.367	27.26 -28.74	80.00
<b>Control group</b> (n= 40)	<b>Pretest</b>	17.28 $\pm$ 3.51	17.00	0.555	16.15 -18.40	49.37
	<b>Posttest</b>	19.00 $\pm$ 3.96	18.50	0.626	17.73 -20.27	54.29

Fig. 1: Box and Whiskers plot showing the median, quartiles and range of pretest and posttest knowledge scores in the experimental and control groups

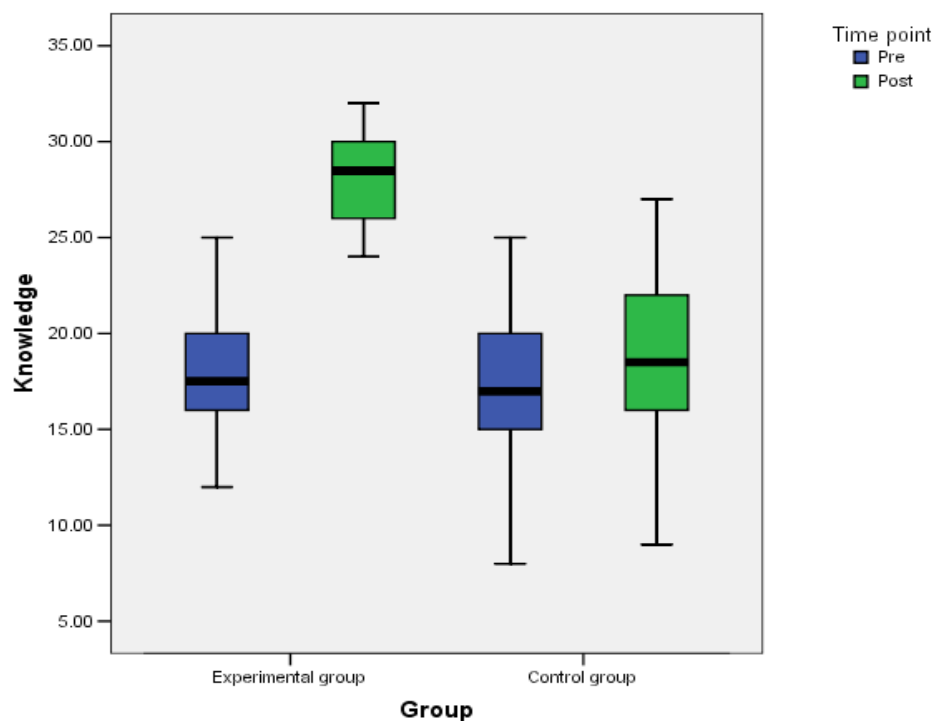


Table 4: Two factor ANOVA for repeated measures of knowledge score of experimental and control groups

Knowledge score	F Value	df	p	Significance
Difference from pretest to posttest	444.35	1,78	.000	S
Difference between experimental (n=40) and control group (n=40)	223.66	1,78	.000	S

p< 0.01

Table 5: Comparison of effect of knowledge scores within and between experimental and control group

Knowledge scores	Mean Difference	SE <sub>MD</sub>	95% CI for difference	Bonferroni test p value
Experimental group (n=40) Pretest to Posttest	10.15	0.428	9.29 - 11.02	.000
Control group (n=40) Pretest to Posttest	1.73	0.367	0.98 - 2.47	.000
Between experimental and control group	8.43	0.563	7.30 - 9.55	.000

p<0.01