A Study to assess the effect of balloon blowing exercise on airway patency among preschool children with acute respiratory illness in selected schools at Kanyakumari District

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ABSTRACT

Children are the blessings from the Lord. They are like clay in the potter's hand. Health plays a major role in the future of the children to withstand and meet personal, psychological and social needs and fulfils the challenges in life. In India about 35% of total population are children below 15 years of age. The World Health Organisation (WHO) estimates that respiratory infections account for 6% of the total global burden of disease. The study was quasi experimental study with quantitative research approach. The study was conducted in two government primary schools (Marankonam and Mundavilai). The data collection period was one month. The samples were preschool children between the age group of 4-6 years with acute respiratory illness. Purposive sampling technique was used to select the samples, sample size was 40. The tools used for data collection was Respiratory Parameter's Observation Checklist. The findings revealed that the pre-test mean score level of respiratory parameters among preschool children was 24. The post-test mean score level of respiratory parameters among preschool children was 16.5.the 't' value 19.034* which is significant at p<0.001. The mean score of respiratory parameters among preschool children with acute respiratory illness in post-test was 16.5 and in control group 19.4 respectively. The unpaired 't' values were 3.908* which is significant at p<0.001 level. It shows that balloon blowing exercise was effective in reducing the level of respiratory parameters among preschool children. There is a significant association between the score of respiratory parameters with the selected demographic variables like gender (3.232*), food habit consumption (0.809*), allergens (0.556*) at P value>0.05. So the hypothesis (H2) is accepted.

Keywords- Effect, Balloon Blowing Exercise, Airway Patency, Preschool Children, Acute Respiratory Illness

1. INTRODUCTION

Children are the blessings from the Lord. They are like clay in the potter's hand. Blend them with godly love and care, they become a vessel that stays strong and perfect, purge them with toil and dust they may break and crumble. They build the nation

sound and strong, because today's children are responsible citizens of tomorrow.

Acute respiratory infections (ARIs) are a major cause of morbidity and mortality worldwide. Each year, about 1.3 million children under 5 years die from acute respiratory infections worldwide. ARIs constitute one third of the deaths among under five in low income countries. The World Health Organization (WHO) estimates that respiratory infections account for 6% of the total global burden of disease; this is a higher percentage compared with the burden of diarrheal disease, cancer, human immunodeficiency virus (HIV) infection, ischemic heart disease or malaria. Each year ARIs account for over 12 million hospital admissions in children less than 5 years. The study was conducted the causes and circumstances of death among northern Cameroon, out of 67% of all deaths in children, majority 24% (167) deaths were caused by ARIs, followed by malaria 21% (152) and diarrheal diseases 19% (133). ARIs is one of the leading public health problems in under-five children.

In worldwide, lower respiratory tract infections among children place a considerable strain and serious on the health budget. In 2008 lower respiratory tract infections was the leading cause of deaths among all infectious diseases, and they accounted for 3.9 million deaths. According to WHO "Health is a complete state of physical, mental, social and spiritual well-being not merely the absence of any disease or illness". Healthy children are the future citizen of nation so protection and promotion of the child is of prime importance for building a healthy and sound nation.

2. STATEMENT OF THE PROBLEM
"A Study to assess the effect of Balloon Blowing Exercise on airway patency among Preschool Children with Acute Respiratory Illness in selected schools at Kanyakumari district".

3. OBJECTIVES
- To assess the pre-test and post-test score of respiratory parameters among preschool children in experimental group and control group.
- To compare the mean pre-test and post-test score between experimental group and control group.
- To find the association between the pre-test score of
- respiratory parameters and selected demographic variables among preschool children in experimental group and control group.

4. MATERIALS AND METHODS
Research design incorporates the most important methodological decisions that a researcher makes in conducting research study. The study was quasi experimental design with quantitative research approach. The study was conducted in two government primary schools (Marankonam and Mundavilai). The data collection period was one month. The samples were, preschool children between the age group of 4-6 years with acute respiratory illness. Purposive sampling technique was used to select the samples, sample size was 40 (20 in experimental group and 20 in control group). The data were analysed by using descriptive and inferential statistics.

The design was described as:

E	O_1 X O_2
C	$O_3 - O_4$
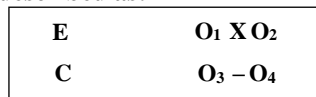
E- Experimental Group
C- Control Group

O_1, O_3- Pre-test level of acute respiratory illness among experimental and control group.
X- Balloon Blowing Exercise
O_2, O_4- Post-test level of acute respiratory illness among experimental and control group.

5. RESULTS AND DISCUSSION

Table 4.1: Frequency and percentage distribution of demographic variables of Pre-School children with acute respiratory illness in experimental group and control group. N = 40

Sl. No	Demographic Variables	Experimental Group (n =20)		Control Group (n = 20)	
		f	%	f	%
1.	**Age**				
	a) 4 Years	6	30	4	20
	b) 5 Years	8	40	11	55
	c) 6 Years	6	30	5	25
2.	**Gender**				
	a) Male	9	45	12	60
	b) Female	11	55	8	40
3.	**Educational status**				
	a) LKG	6	30	4	20
	b) UKG	8	40	11	55
	c) 1stStd	6	30	5	25
4.	**Type of family**				
	a) Nuclear	14	70	14	70
	b) Joint	6	30	5	25
	c) Extended	0	0	1	5
5.	**Order of birth**				
	a) 1st	8	40	4	20
	b) 2nd	9	45	11	55
	c) 3rd	3	15	5	25
6.	**Religion**				
	a) Hindu	9	45	6	30
	b) Christian	9	45	8	40
	c) Muslim	2	10	6	30
	Residence				
7.	a) Rural	20	100	18	90
	Urban	0	0	2	10
	Family monthly income (Rs)				
8.	a) < 5,000	3	15	5	25
	b) 5,000- 10,000	12	60	13	65
	c) > 10,000	5	25	2	10
	Father Occupation				
9.	a) Unemployed	3	15	3	15
	b) Coolie	16	80	15	75
	Private employee	1	5	2	10
	Mother Occupation				
10.	a) Unemployed	16	80	14	70
	b) Coolie	2	10	4	20
	Private employee	2	10	2	10

Table 4.2: Frequency and percentage distribution of Information related to acute respiratory illness of Pre-School children with acute respiratory illness in experimental group and control group. N= 40

Sl. No	Information Related to Acute Respiratory Illness	Experimental Group (n =20)		Control Group (n = 20)	
		f	%	f	%
1.	**RTI/Month (Times)**				
	a) Nil	4	20	2	10
	b) 1 – 2	7	35	5	25
	c) 3 – 4	7	35	8	40
	d) >4	2	10	5	25

2. Food habit consumption

a)	Cold	8	40	7	35
b)	Hot	9	45	9	45
c)	Sore	2	10	3	15
d)	Others	1	5	1	5

3. Allergens

a)	Pollens	1	5	1	5
b)	Grains	1	5	6	30
c)	Pets	12	60	10	50
d)	Others	4	20	2	10
e)	No allergy	2	10	1	5

4. Family history

a)	Yes	10	50	8	40
b)	No	10	50	12	60

Table 4.3: Frequency and percentage distribution of Pre-School children with acute respiratory illness according to the score of respiratory parameters in experimental group. n=20

Variables	Levels	Experimental Group			
		Pre-test		Post-test	
		f	%	f	%
Respiratory Parameters	Absent	0	0	0	0
	Mild	1	5	19	95
	Moderate	19	95	1	5
	Severe	0	0	0	0

Table 4.3 During pre-test in experimental group, majority 19(95%) were having moderate level of Acute respiratory illness and 1(5%) were having mild level of Acute respiratory illness. In post-test, majority 19(95%) of them were having mild level of Acute respiratory illness and 1(5%) were having moderate level of Acute respiratory illness.

Table 4.4: Frequency and percentage distribution of Pre-School children with acute respiratory illness according to the score of respiratory parameters in control group. N= 20

Variables	Levels	Control group			
		Pre-test		Post-test	
		f	%	f	%
Respiratory Parameters	Absent	0	0	0	0
	Mild	1	5	15	75
	Moderate	19	95	5	25
	Severe	0	0	0	0

Table 4.4 During pre-test in the control group, majority 19(95%) were having moderate level of Acute respiratory illness and 1(5%) were having mild level of Acute respiratory illness. In post-test, majority 15(75%) of them were having mild level of Acute respiratory illness and 5(25%) were having moderate level of Acute respiratory illness.

Table 4.5: Mean, Standard deviation and paired 't' value on pre and posttest score of respiratory parameters among Pre-School children with Acute respiratory illness in experimental group and control group. N =40

Variables	Group	Mean	Standard deviation	df	Unpaired 't' value
	Experimental Group				
Level of Respiratory Parameters	Pre-test	24	7.5	19	19.034* P<0.001
	Post-test				
	Control Group				
	Pre-test	24	5.3	19	10.459* P<0.001
	Post-test				

Table 4.5 represents the mean score on the level of respiratory parameters among preschool children with acute respiratory illness in experimental group mean value were 24 in pretest and

16.5 in posttest respectively. The paired 't' value is 19.034* which is significant at p<0.001. It shows that balloon blowing exercise was effective in reducing the level of respiratory parameters among preschool children. Hence the research hypothesis (H1) is accepted.

Table 4.6 Mean, Standard deviation and un-paired 't' value on score of respiratory parameters among Pre-School children with Acute respiratory illness in experimental group and control group after intervention

Variables	Group	Mean	Standard deviation	df	Unpaired 't' value
Respiratory Parameters	Experimental group (n=20)	16.5	2.5	38	3.908*
	Control group (n=20)	19.4	2.4		

Table 4.6 represents the mean score level of respiratory parameters among preschool children with acute respiratory illness in post-test experimental group was 16.5 and in control group 19.4 respectively. The estimated unpaired 't' values were 3.908 * which is significant at p<0.001 level. It shows that balloon blowing exercise was effective in reducing the level of respiratory parameters among preschool children.

Table 4.7: Chi-square test on the pre-test score of respiratory parameters among Pre-School children with acute respiratory illness with their selected demographic in experimental group. n =20

Sl No	Variables	Number	%	χ2	df Table value
1.	**Age**				
a)	4 Years	6	30		1 df P=0.684
b)	5 Years	8	40	0.165	
c)	6 Years	6	30		
2.	**Gender**				
a)	Male	9	45	0.008	1 df P=0.927
b)	Female	11	55		
3.	**Educational status**				
a)	LKG	6	30		1 df P=0.684
b)	UKG	8	40	0.165	
c)	1stStd	6	30		
4.	**Type of family**				
a)	Nuclear	14	70		1 df P=0.239
b)	Joint	6	30	1.385*	
c)	Extended	0	0		
5.	**Order of birth**				
a)	1st	8	40		1 df P=0.684
b)	2nd	9	45	0.165	
c)	3rd	3	15		
6.	**Religion**				
a)	Hindu	9	45		1 df P=0.409
b)	Christian	9	45	0.682*	
c)	Muslim	2	10		
7.	**Family monthly income (Rs)**				
a)	< 5,000	3	15		1 df P=0.888
b)	5,000- 10,000	12	60	0.020	
c)	> 10,000	5	25		
8.	**Occupation of father**				
a)	Unemployed	3	15		1 df P=0.436
b)	Coolie	16	80	0.606*	
c)	Private	1	5		

	Variables	Number	%	χ^2	df Table value
	Occupation of mother				
9.	a) Unemployed	16	80	1.385*	1 df P=0.239
	b) Coolie	2	10		
	c) Private	2	10		
	RTI/Month (Times)				
10.	a) Nil	4	20	0.375	1 df P=0.409
	b) 1 – 2	7	35		
	c) 3 – 4	7	35		
	d) >4	2	10		
	Food habit consumption				
11.	a) Cold	8	40	0.000	1 df P=1.000
	b) Hot	9	45		
	c) Sore	2	10		
	d) Others	1	5		
	Allergens				
12.	a) Pollens	1	5		
	b) Grains	1	5		
	c) Pets	12	60	0.375	1 df P=0.540
	d) Others	4	20		
	e) No allergy	2	10		
	Family history				
13.	a) Yes	10	50	0.682*	1 df P=0.409
	b) No	10	50		

Table 4.7 Shows that there is a significant association between the score of respiratory parameters with the selected demographic variables like type of family (1.385*), religion (0.682*), occupation of father (0.606*), occupation of mother (1.385*), family history(0.682*) at P value >0.05.So the hypothesis (H2) is accepted.

Table 4.8: Chi-square test on the pre-test score of respiratory parameters among Pre-School children with acute respiratory illness with their selected demographic in control group. n =20

Sl. No	Variables	Number	%	χ^2	df Table value
1.	**Age**				
	a) 4 Years	6	30	0.208	1 df P=0.648
	b) 5 Years	8	40		
	c) 6 Years	6	30		
2.	**Gender**				
	a) Male	9	45	3.232*	1 df P=0.072
	b) Female	11	55		
3.	**Educational status**				
	a) LKG	6	30	0.208	1 df P=0.648
	b) UKG	8	40		
	c) 1st std	6	30		
4.	**Type of family**				
	a) Nuclear	14	70	0.238	1 df P=0.626
	b) Joint	6	30		
	c) Extended	0	0		
5.	**Order of birth**				
	a) 1st	8	40	0.202	1 df P=0.653
	b) 2nd	9	45		
	c) 3rd	3	15		
6.	**Religion**				
	a) Hindu	9	45	0.202	1 df P=0.653
	b) Christian	9	45		
	c) Muslim	2	10		
7.	**Family monthly income (Rs)**	3	15		
	a) < 5,000	12	60	0.208	1 df P=0.648
	b) 5,000- 10,000	5	25		
	c) > 10,000				
8.	**Occupation of father**				
	a) Unemployed	3	15	0.313	1 df P=0.576
	b) Coolie	16	80		
	c) Private employee	1	5		
9.	**Occupation of mother**	16	80		
	a) Unemployed	2	10	0.313	1 df P=0.576
	b) Coolie	2	10		
	c) Private employee				
10.	**RTI/Month(Times)**				
	a) Nil	4	20		
	b) 1 – 2	7	35	0.202	1 df P=0.653
	c) 3 – 4	7	35		
	d) >4	2	10		
11.	**Food habit consumption**	8	40		
	a) Cold	9	45	0.809*	1 df P=0.369
	b) Hot	2	10		
	c) Sore	1	5		
	d) Others				
12.	**Allergens**				
	a) Pollens	1	5		
	b) Grains	1	5	0.556*	1 df P=0.456
	c) Pets	12	60		
	d) Others	4	20		
	e) No allergy	2	10		
13.	**Family history**				
	a) Yes	10	50	0.000	1 df P=1.000
	b) No	10	50		

Table 4.8 Shows that there is a significant association between the score of respiratory parameters with the selected demographic variables like gender (3.232*), food habit consumption (0.809*), allergens (0.556*) at P value>0.05. So the hypothesis (H2) is accepted.

6. RECOMMENDATIONS
- This study can be replicated with larger samples for better generalization.
- Similar study can be done in different settings (rural and urban).
- A comparative study can be conducted to assess the effectiveness of Balloon blowing exercise and other non-pharmacological measures like bubble therapy, deep breathing exercise for reducing the frequency of acute respiratory illness.
- This study could be done in multiple settings such as schools, pediatric hospitals, anganwadi etc.

7. NURSING IMPLICATIONS
The research has derived the following implications from the study results, which are of vital concern to the field of nursing practice, nursing education, nursing administration and nursing research.

7.1 Nursing Practice
- Complementary therapies can provide effective economical, non-invasive, non-pharmacological complements to medical care.
- Balloon blowing exercise is one of touch therapy, and this study has proved effective in reducing frequency of respiratory illness and improving the lung capacity among children.

- Self-instructional module regarding balloon blowing exercises given by the health personnel will help the children to improve their knowledge on lung exercises.

7.2 Nursing Education

- As a nurse educator, we must strengthen the concept of non-pharmacological methods for management of acute respiratory illness.
- Nursing education should emphasize more on preparing the nurses to impart current changes in health information and to update the knowledge in allfields.
- Update the knowledge of staff nurses with in service education programme emphasizing various measures in reduction of acute respiratory illness.

7.3 Nursing Administration

- Nurse administrator can create awareness among nurses and enlighten their knowledge about the importance of balloon blowing exercise on children with acute respiratory illness.
- The nurse administrator should collaborative with governing bodies for the formulation of standard policies and protocols to emphasize nursing care for respiratory illness.
- To organize awareness camp regarding balloon blowing exercise for children on special days.

Nursing Research

- This study motivates nursing personnel to do further studies related to this field.
- The research findings of the study need to be disseminated through conferences, seminars and publishing in nursing journal to the nursing staff.
- This study can be used as a baseline study for further studies.

8. CONCLUSION

The study was done to assess the effect of balloon blowing exercise on airway patency among pre-schoolers with acute respiratory illness in selected schools at Kanyakumari district. Based on statistical findings, in experimental group the mean score on the level of respiratory parameters among preschool children with acute respiratory illness in experimental group mean value were 24 in pretest and 16.5 in posttest respectively. The paired 't' value is 19.034* which is significant at $p<0.001$. It shows that balloon blowing exercise was effective in reducing the level of respiratory parameters among preschool children. Hence the research hypothesis (H1) is accepted. The study proves that Balloon blowing exercise was cost effective, easily available, it is applicable to be used even by low socio-economic group peoples but also children enjoyable to as a recreational game and children were easily attracted towards it. Therefore, the researcher felt that more importance should be given for deep breathing exercise among children like balloon blowing to enhance lung expansion and reduce the reoccurrence of lower respiratory tract infection.

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