



THE EFFECTIVENESS OF BALLOON BLOWING EXERCISE ON AIRWAY PATENCY AMONG PRESCHOOL CHILDREN WITH ACUTE RESPIRATORY ILLNESS

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ABSTRACT

In a study conducted at chettinad Hospital and Research Institute in Kelambakkam, Chengalpattu, India, preschoolers with acute respiratory illnesses were evaluated for how well balloon blowing exercise affected their airway patency.

AIM:

A study to assess the effectiveness of balloon blowing exercise on airway patency among preschool children with acute respiratory illness.

MATERIAL AND METHOD: This is a quantitative study. This study employed a quasi-experimental design. The participants of 40 samples were chosen using the purposive sampling technique. A structured tool was utilized to gather the data.

RESULTS: The study demonstrates that balloon-blowing exercises effectively improve airway patency in preschool-aged children with acute respiratory disease, with a mean improvement of 0.775 and a significant paired t-test result ($t = 11.590$, $p < 0.05$). Additionally, post-test airway patency levels showed significant correlations ($p < 0.05$) with demographic factors such as income, education level, birth order, and frequency of illness. These findings highlight the therapeutic benefits of balloon-blowing and the importance of considering demographic factors in respiratory health management.

INTRODUCTION:

Exercise that involves blowing balloons is beneficial for improving lung capacity, breathing issues, chest mobility, respiratory muscle strength and pulmonary functions. In order to blow balloons, you must regulate the airflow. For kids, the physical experience of stretching and inflating a balloon offers sensory input that can be entertaining and aid in the development of sensory integration. It takes hand-mouth coordination to blow up balloons. It enhances dexterity and helps build stronger hand and finger muscles.

OBJECTIVES:

1. To assess the pre-test level of airway patency among preschool children with acute respiratory illness.
2. To assess the effectiveness of balloon blowing exercise on airway patency among preschool children with acute respiratory illness.
3. To find out the significant association between post-test level of airway patency with selected demographic variables of preschool children with acute respiratory illness.

RESEARCH HYPOTHESIS:

H1: There will be a significant difference between the pretest and post-test score on airway patency among preschool with acute respiratory illness.

H2: There will be a significant association between post-test level of airway patency with selected demographic variables of preschool children with acute respiratory illness.

METHODS AND MATERIALS:

This is a quantitative study, one group pretest-posttest quasi experimental design was adopted in this study. Using purposive sampling technique, 40 preschool children with acute respiratory illness who were admitted in Pediatric ward at Chettinad Hospital and Research Institute, Kelambakkam, Chengalpattu, Tamil Nadu, India.

SAMPLE SELECTION CRITERIA**INCLUSION CRITERIA:**

1. Preschool children between the age group of 4-6 years,
2. Who are all having mild and moderate level of respiratory illness
3. Who are all available during study period
4. Who can able to follow the instruction and able to do activity
5. Who are all willing to participate in interventions

EXCLUSION CRITERIA:

1. Preschool children between the age group of 4-6 years,
2. Who are admitted in intensive care unit
3. Who are not able to follow the instructions

RESEARCH TOOL:

Description of the tool

Section: A

It consists of demographic variables such as age, gender, type of family, birth order, residence, religion, education, occupation and income of parents. Information related to acute respiratory illness such as type of allergens, family history of allergy, food habits and source of information.

Section: B

The ten criteria on the observation checklist, which assesses the degree of airway patency, include physiological factors including heart rate, temperature, respiration rate and clinical factors include dyspnea, exhaustion, sneezing, coughing, runny nose, mucus discharge and breathe noises.

RESULTS:**TABLE -1:** Frequency & percentage distribution of demographic variables of preschool children.

S.NO	DEMOGRAPHIC VARIABLES	FREQUENCY	PERCENTAGE %
1	AGE IN YEAR		
	4 years	14	35%
	5 years	11	27.5%
	6 years	15	37.5%
2	GENDER		
	Male	18	45%
	Female	22	55%
3	EDUCATION		
	LKG	13	32.5%
	UKG	13	32.5%
	1 st standard	14	35%
4	TYPE OF FAMILY		
	nuclear	26	65%
	joint	14	35%
5	ORDER OF BIRTH		
	first	17	42.5%
	second	17	42.5%
	Third and above	6	15%
6	RELIGION		
	hindu	18	45%
	christian	4	10%
	Muslim	18	45%
	others	0	0%
7	RESIDENCE		
	rural	11	27.5%
	urban	29	72.5%
8	INCOME		
	Less than ₹ 5000	3	7.5%

	₹5001 - ₹10000	26	65%
	Greater than ₹10000	11	27.5%
9	OCCUPATION OF FATHER		
	unemployed	5	12.5%
	Daily wages	16	40%
	Private employee	19	47.5%
	Government employee	0	0%
10	OCCUPATION OF MOTHER		
	unemployed	25	62.5%
	Daily wages	6	15%
	Private employee	9	22.5%
	Government employee	0	0%

S.NO	ARI Information	FREQUENCY	PERCENTAGE
1	FREQUENCY OF ARI		
	No	9	22.5%
	1-2 Times	13	32.5%
	3-4 Times	14	35%
	Greater than 4	4	10%
2	FOOD HABIT		
	Cold	15	37.5%
	Hot	19	47.5%
	Sore (Orange, Lemon, Grape)	4	10%
	Others (Chocolate)	2	5%
3	ALLERGENS		
	Pollens	2	5%
	Grains	2	5%
	Pets	24	60%
	Others (chemicals and perfumes)	8	20%
	No allergy	4	10%
4	FAMILY HISTORY		
	Yes	23	57.5%
	No	17	42.5%

Table 2: Frequency & percentage distribution of pre and post-test level of airway patency.

S.N O	LEVEL OF AIRWA Y PATENC Y	PRE-TEST		POST-TEST	
		FREQUEN CY	PERCENTA GE %	FREQUEN CY	PERCENTA GE %
1	Absent	0	0%	0	0%
2	mild	5	12.5%	36	90%
3	moderate	35	87.5%	4	10%
4	severe	0	0%	0	0%

TABLE-3: Effectiveness of balloon blowing exercise on airway patency among preschool children with acute respiratory illness.

Level of airway patency	MEAN	Mean difference	Standard deviation	Standard Deviation difference	t-value
Pretest	2.88	0.775	0.335	0.423	11.590
Posttest	2.10		0.304		

TABLE4: Association between post test level of airway patency with selected demographic variables of preschool children with acute respiratory illness.

S.NO	DEMOGRAPHIC VARIABLES	ABSENT	MILD	MODERAT E	SEVERE	VALUE	CHI- SQUAR E
1	AGE IN YEARS						
	4 years	0	12	2	0	0.786	0.481 NS
	5 years	0	10	1	0		
	6 years	0	14	1	0		
2	GENDER						
	male	0	16	2	0	0.832	0.45 NS
	Female	0	20	2	0		
3	EDUCATION						
	LKG	0	11	2	0	0.341	2.149 S
	UKG	0	13	0	0		
	1 ST STANDARD	0	12	2	0		
4	TYPE OF FAMILY						
	Nuclear	0	24	2	0	0.507	0.440 NS
	joint	0	12	2	0		

5	ORDER OF BIRTH						
	first	0	16	1	0	0.118	4.270 S
	second	0	16	1	0		
	Third and above	0	4	2	0		
6	RELIGION						
	Hindu	0	15	3	0	0.421	1.728 NS
	christian	0	4	0	0		
	muslim	0	17	1	0		
	others	0	0	0	0		
7	RESIDENCE						
	Rural	0	10	1	0	0.906	0.014 NS
	urban	0	26	3	0		
8	INCOME						
	Less than 5000	0	3	0	0	0.302	2.393 S
	5001-10000	0	22	4	0		
	Greater than 10000	0	11	0	0		
9	OCCUPATION OF FATHER						
	unemployed	0	4	1	0	0.565	1.140 NS
	Daily wages	0	14	2	0		
	Private employee	0	18	1	0		
	Government employee	0	0	0	0		
10	OCCUPATION OF MOTHER						
	unemployed	0	23	2	0	0.811	0.420 NS
	Daily wages	0	5	1	0		
	Private employee	0	8	1	0		
	Government employee	0	0	0	0		

*S- SIGNIFICANCE

*NS – NON-SIGNIFICANCE

S.No	ARI Information	Absent	Mild	Moderate	Severe	Value	Chi-Square
1	FREQUENCY OF ARI						
	No	0	7	2	0	0.300	3.668 S
	1-2 Times	0	1	0	0		
	3-4 Times	0	1	2	0		
	Greater than 4	0	4	0	0		
2	FOOD HABIT						
	Cold	0	1	2	0	0.836	0.858
	Hot	0	1	2	0		

			7				NS
	Sore (Orange, Lemon, Grape)	0	4	0	0		
	Others (Chocolate)	0	2	0	0		
3	ALLERGENS						
	Pollens	0	2	0	0	0.893	1.111 NS
	Grains	0	2	0	0		
	Pets	0	2 1	3	0		
	Others (chemicals and perfumes)	0	7	1	0		
	No allergy	0	4	0	0		
4	FAMILY HISTORY						
	Yes	0	2 2	1	0	0.166	1.921 NS
	No	0	1 4	3	0		

4. DISCUSSION:

Frequency & percentage distribution of demographic variables of preschool children.

The table above illustrates that the participants, primarily 6-year-old (37.5%), followed by 4-year-old (35%) and 5-year-old (27.5%), demonstrated a balanced gender distribution with males at 45% and females at 55%. Education levels varied with 32.5% each in LKG and UKG, 35% in the 1st Standard. Fathers were mainly engaged in private employment (47.5%), daily wage labour (40%) while most mothers were unemployed (62.5%) with smaller proportions in private employment (22.5%) or daily wage labour (15%).

Frequency & Percentage distribution pre-test and post test level on airway patency among preschool children.

The distribution of airway patency levels before and after the intervention is shown in the table. 12.5% of participants had light patency prior to the intervention, compared to 87.5% who had moderate patency. 90% of participants achieved mild patency after the intervention, while only 10% of participants maintained moderate patency. This represents a significant improvement. Following the intervention, no cases of severe patency or absence were noted. These results show how well the intervention improved the subjects' airway patency.

Effectiveness of balloon blowing exercise on airway patency among preschool children with acute respiratory illness.

According to the preceding table, the pretest mean airway patency level was 2.88 with a standard deviation of 0.335. Following the intervention, the post-test mean airway patency score was 2.10, with a standard deviation of 0.304. The pretest and posttest mean differences were 0.775. The computed t-value for the paired t-test was 11.590. According to the study, balloon-blowing exercises significantly and statistically effectively improved airway patency in preschool-aged children with acute respiratory illnesses (t-value=11.590). Therefore, it was statistically accepted that hypothesis H1. These results demonstrate how well balloon-blowing activities work to enhance airway patency in young children suffering from acute respiratory illnesses.

Association between post-test level of airway patency with selected demographic variables of preschool children.

The results demonstrate a strong correlation between the degrees of airway patency and a number of demographic factors, as the above table demonstrates. this conclusion is based on the results of the chi-square tests, which indicate that certain variables, including income level(Less than ₹5000), order of birth(first), education level(LKG) and frequency of acute respiratory illness(1-2 times), have statistically significant ($p < 0.05$) associations with airway patency levels. Therefore, among preschool-aged children with acute respiratory illnesses, these demographic characteristics are strong predictors of airway patency levels.

CONCLUSION:

The results of the study imply that balloon-blowing exercises are useful for helping preschoolers with acute respiratory illnesses maintain their airway patency. For young children with acute respiratory problems, this straight forward non-invasive intervention can be helpful as part of respiratory treatments.

Reference:**Textbook:**

1. ParulDatta (2014), textbook of Pediatric Nursing, Third edition, New Delhi, Jaypee Brothers Medical Publishers (P) Ltd, pg:273- 275.
2. Padmaja A (2016) textbook of Pediatric Nursing, Third edition, New Delhi, Jaypee Brothers Medical Publishers (P) Ltd, pg:101- 116.
3. Sharma, S.K. (2012). Nursing Research & Statistic, 6th edition, New Delhi, ElsevierPublications, pg:403-405.
4. Polit, D.F &Beck.C.T.(2010). Textbook of Nursing Research, 9th edition, New Delhi, Elsevier publication, pg:730-731.
5. Waechter(1985), Nursing care of children, 10th edition, St. Louis, J.B Lippincott Company, pg:782-794.
6. Achar S.T (2005), Textbook of pediatrics, 2nd edition, Madras, Orient Longman, pg:57- 65.