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ASSESS THE EFFECTIVENESS OF BALLOON THERAPY ON RESPIRATORY PARAMETERS AMONG CHILDREN AGED BETWEEN 6-12 YEARS WITH LOWER RESPIRATORY TRACT INFECTION

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Article Info

ABSTRACT

A study was conducted "to assess the effectiveness of balloon therapy on respiratory parameters among children aged between 6-12 years with lower respiratory tract infection in selected Hospitals at Dindigul District" was done. In present study a quasi-experimental research design was adopted. Non-probability Purposive sampling technique was used to selected the sample, each 30 sample in control and experimental group equally. In this study the pre test and post test level of respiratory parameters among the children with Lower respiratory tract infection in the control and experimental group were assessed. Effectiveness of balloon therapy on respiratory parameters among the children with Lower respiratory tract infection in experimental group were evaluated. The level of respiratory parameters assessed by using observational check list for both groups, in experimental group received balloon blowing exercise. The data gathered was analysed by descriptive and inferential statistical method and interpretations were made based on the objectives of the study. In experimental group the obtained 't' value for overall intervention was -15.521 which was highly significant at P<0.001 level. The study findings revealed that there was significant improvement in respiratory parameters in experimental group. Hence balloon blowing exercises were beneficial among children with lower respiratory tract infection.

INTRODUCTION

Children are not 'little adult' they are in a dynamic process of growth and development. Children are particularly vulnerable to acute and chronic effects of pollutants in their environment, which leads to diseases like acute respiratory infection (ARI), diarrhoea etc. Among these infectious diseases ARI is one of the leading causes of mortality and morbidity in children. Acute respiratory infection is classified as upper respiratory tract infection or lower respiratory tract infection. The upper respiratory tract consist of airway from the nostrils to the vocal cords in the larynx, including the paranasal sinuses and the middle ear. The lower respiratory tract covers the continuation of the airways from the trachea and brochi to the bronchioles and the alveoli. ARIs are not confined to the respiratory tract and have systemic effects because of possible extension of infection or microbial toxins, inflammation and reduced lungs functions. Lower respiratory tract infection is a generic term for an acute

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Research Article

infection of the trachea (windpipe). Airways and lungs, which make up the lower respiratory system. It includes bronchitis, bronchiolitis, wheezing associated lower respiratory tract infections, croup and pneumonia. Acute infection of the lower respiratory tract may be diagnosed in children of all ages; they tend to occur most frequently in young children who have not yet developed resistance to infectious disease. The infections that occur during the childhood include asthma pneumonia bronchitis and bronchiolitis. Balloon blowing exercise help the respiratory muscles to interacting and adapt thoracic dimensions to certain breathing stages. Basic respiratory muscles are the diaphragm, the internal intercostal and the external intercostal. Regularly blowing balloon is the effective exercise of respiratory muscles and building lung capacity and stamina.

Pediatric nurses are in a position to identify the knowledge, and practice of lower respiratory tract infection in children. This will enable the nurse to plan with specialized services to help children to understand balloon blowing exercise that will make a significant difference in the improve the respiratory parameters and improve lung function[1,2].

OBJECTIVES OF THE STUDY

The present study to assess the effectiveness of balloon therapy on respiratory parameters among children aged between 6-12 years with lower respiratory tract infection in selected Hospitals at Dindigul District. This study aimed to assess the level of respiratory parameters among children with Lower respiratory tract infection in control and experimental group. The effectiveness of balloon blowing exercise on respiratory parameters among children with Lower respiratory tract infection in experimental group is evaluated.

PROTECTION OF HUMAN RIGHTS

Prior to the data collection, the ethical clearance was obtained from the institutional Human ethical committee and written consent was obtained from the concerned authority. Permission was obtained from the Leonard multi-specialty hospital Batalagundu and Shree Sathya Subha multispecialty Hospital at Dindigul District. Participant parents were informed about the study and informed consent was obtained from the individual. The children's parents were informed their children are under obligation to participate in this study.

METHODOLOGY

The research design adopted for this study is Quasi-experimental, Non-equivalent control group, pre and post test design was used. The design can be represented as: E-Experimental group. C- Control Group, O_1- Pre-test on assess the respiratory parameters, X-Balloon therapy on lower respiratory tract infection,O_2-Post-test on assess the respiratory parameters. In this study Independent Variables like Balloon blowing exercise Dependent Variables like Respiratory parameters are concerned with measurable or quantifiable characteristic feature. In this study respiratory parameters includes the respiratory rate, heart rate, use of accessory muscles, nasal flaring, cough, breath sound, air entry, chest retraction, dyspnoea and oxygen saturation are evaluated. The schematic representation of research methodology shown in Figure: 1.

Target Population:

The target population of this study was comprised all the Children with lower respiratory tract infection, admitted in Leonard multi-specialty Hospital, betalagundu (experimental group) and Shree Sathiya Subha multi-specialty Hospital, Dindigul (control group)at Dindigul District.

Accessible Population: The accessible population of this study was comprised the children who meet the inclusion criteria [3].

SAMPLE

Sample is a subset of population element who would actually be recruited for the study and who would participate in the study. This group meets the eligible criteria of the population under study. Children from Leonard multispecialty Hospital and Shree Sathiya Subha multi-specialty Hospital at Dindigul District, who fulfill the inclusion criteria, were selected to participate in this study [4].

SAMPLE SIZE

A subset of population selected to participate in the study. In this study the total sample size was 60, out of 60 sample, 30 sample for the experimental group, and 30 sample for the control group [5].

Sampling Technique

Sample is the process of selecting a portion of the population to represent the entire population so that the interferences about the population can be made. On-probability purposive Sampling technique was used to select the children from Leonard multi-specialty Hospital (experimental group) and Shree Sathiya Subha multi-specialty Hospital (control group) at Dindigul District. The count of 30 samples was selected for the experimental group and 30 samples were selected for the control group [6].

Criteria for Sample Selection
Inclusion Criteria

The study includes children both male and female children who were admitted with lower respiratory tract infection namely, asthma, pneumonia, bronchitis and bronchiolitis. Whose parents were permitting the children to participate in the study, who responds to the command of the investigator [7].

Exclusion Criteria

The study excludes the children like Who were critically ill, with any oral surgery, With co-morbid diseases like cardiac or renal diseases, with any other complimentary treatment [8].

Description of the Instrument

The data collection instrument consists of the following sections of balloon therapy and Observational check list [9].

Balloon blowing exercise

In the experimental group, the intervention of balloon blowing exercise was taught to the child and made them to do the exercises daily for 3 times(8am, 12noon, 4pm) each 10 blows, for 20 minutes, the duration of each blow will be around 2 minutes, for 5 days. During balloon blowing exercise the child Kept in an upright position and the children asked to inhale and exhale normally for 10 seconds. The children were allowed to relax for 21 seconds Seal the balloon with thumb and index finger, then asked the children to hold the open end of the balloon tightly with thumb and index finger and then instruct the children to inhale for 5 seconds through the nose and hold the breathe for 4 seconds and place the lips tightly around the end of the balloon .Now the children instructed to exhale slowly inside the balloon for 20 seconds. (5:4:20).After a single blow the children allowed to relax 60 seconds. Second blow begins after the relaxation period [10].

Observational check list

To assess the respiratory parameters the observational checklist is prepred. It consists of 10 items which includes respiratory rate, heart rate, use of accessory muscles, nasal flaring, cough, breath sound, air entry, chest retraction, dyspnoea, oxygen saturation. Based on the severity of respiratory parameters scoring was described in Table 1.

Data Collection

The participants who fulfilled the inclusion criteria were selected. Non probability purposive sampling technique was used to select 30 children for the experimental group and followed by 30 children for the control group. Every week   from Monday to Saturday data was collected. At the first study was conducted for control group for first 3 weeks without balloon blowing exercise pre- test was done to assess the respiratory parameters by observational checklist for the control group. Everyday 3-4 children will be selected based on the severity of respiratory parameters. Then the study was conducted for experimental group with balloon blowing exercise. pre-test was done to assess the respiratory parameters by observational checklist on the first day for the experimental group. The participants were categorized based on the severity of respiratory parameters. Scoring as no distress, mild, moderate and severe. The researcher selected mild and moderate cases for the study. In the experimental group, the intervention of balloon blowing were taught to the child .On 5th day Post-test was done in control and experimental group, Respiratory parameters was assessed by observational check list. On the day of discharge, the researcher educated the parents about balloon blowing exercise to the control group children and encouraged to practice regularly to improve lung function [11].

Validity and Reliability

The tool was validated by 5 nursing expert, 1 medical expert and 1 statistic expert. The experts were requested to check the relevance, sequency and adequacy of the items in the research tool. Their valuable suggestions were incorporated and the tool was modified and finalized as per the correction and suggestions given by the experts.

The respiratory parameters checklist consisted of 10 items which were graded on a Likert Scale of 1 to 4. Where 1 was 'Severe Respiratory Distress' and 4 was 'No Respiratory Distress'. Cronbach's alpha test was used for calculating the internal consistency of the checklist. We obtained an alpha value of 1.000, which shows that our checklist has an 'excellent' internal consistency and hence it is a highly reliable tool [12].

Statistical Analysis

The data was collected and analysis was done using descriptive and inferential statistics. In descriptive Statistical Analysis Frequency, Percentage, Mean Standard Deviation were studied. In inferential statistics Paired 't' test, Unpaired 't' test and Chi-square test were studied.

RESULTS

Data on the effectiveness of balloon therapy on respiratory parameters in experimental group studied by Paired 't' test of pre test and post test level of respiratory parameters among children with lower respiratory tract infection in control group shown in Table 3.

Table 1.Scoring of Respiratory Parameters

Score	Interpretation
31-40	No distress.
21-30	Mild distress
11-20	Moderate distress
< =10	Severe distress

Table 3. Data on assessment pre and post test level of the respiratory parameters in control and experimental group

Level of respiratory distress	Control group				Experimental group			
	Pretest		Post test		Pretest		Post test	
	f	%	f	%	f	%	f	%
No respiratory distress(31-40)	0	0.0%	-	-	0	0.0%	29	96.7%
Mild respiratory distress(21-30)	14	46.7%	14	46.7%	11	36.7%	1	3.3%
Moderate respiratory distress(11-20)	16	53.3%	16	53.3%	19	63.3%	0	0.0%
Severe respiratory distress(<= 10)	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	30	100.0%	30	100.0%	30	100.0%	30	100.0%

Table 4: Statistical analysis of effectiveness of balloon therapy on respiratory parameters in experimental group (N=30)

Area	Control Group				Mean difference	't' value	P value
	Pre test		Post test (Day-5)				
	Mean	SD	Mean	SD			
Respiratory parameters	24.43	5.14	24.37	5.02	0.06	1.000, df=29	0.326, NS

Paired 't' test applied. P value < 0.05 was taken as statistically significant

Table 4: Statistical analysis of respiratory Parameters among children with lower respiratory tract infection in experimental group   (N=30)

Area	Experimental Group				Mean difference	't' value	P value
	Pre test		Post test				
	Mean	SD	Mean	SD			
Respiratory parameters	26.00	5.01	39.57	1.89	13.57	-15.537, df=29	0.001*

Paired 't' test applied. P value < 0.05 was taken as statistically significant

Table 5. Statistical analysis of post-test of respiratory parameters in children with lower respiratory tract infection between control and experimental group   (N=30)

Area	Control Group Post -test		Experimental Group Post- test		Mean difference	't' value	P value
	Mean	SD	Mean	SD			
Respiratory parameters	24.37	5.02	39.57	1.89	15.20	-15.521,df=58	0.001*

Unpaired 't' test applied. P value < 0.05 was taken as statistically significant

The above table 4 shows that the calculated 't' value in control group was 1.000, which was not significant. It can be concluded that there is no significant difference in pre test and post test level of respiratory parameters in control group.

The above table 4 shows that the calculated Paired 't' test pre test and post test level of respiratory Parameters among children with lower respiratory tract infection in experimental group. The above table 4 shows that the experimental group calculated 't' value for overall intervention was -15.537, which was highly significant at

$P<0.001$ level. It can be concluded that balloon therapy was effective among children with lower respiratory tract infection in experimental group.

Unpaired "t" test of post-test of respiratory parameters among children with lower respiratory tract infection between control and experimental group were studied and shown in Table 5.

The above table 5 shows that the calculated 't' value for overall intervention was -15.521 which was highly significant at $P<0.001$ level. It can be concluded that the balloon therapy was effective in improving the respiratory

Research Article

parameters among children with lower respiratory tract infection in experimental group than the control group.

DISCUSSION

The findings shows that in control group Pre-test respiratory distress was 14 (46.7%) had mild respiratory distress and 16 (53.3%) had moderate respiratory distress. In post testthere is no changes in respiratory parameters. The findings shows that in experimental group Pre-test respiratory distress was 11 (36.7%) had mild respiratory distress,19 (63.3%) had moderate respiratory distress. Post test in experimental group respiratory distress was 29 (96.7%) had no respiratory distress and only 1 (3.3%) had mild respiratory distress. It is inferred that balloon therapy was very effective in reducing the respiratory distress among the experimental group children. On 5th day, only 1 (3.3%) child was having mild respiratory distress, while the rest majority had no respiratory distress. the significant improvement in the post–test level of respiratory parameters in the experimental group is attributable to balloon therapy [13].

CONCLUSION

The findings of the study indicate that the balloon therapy was effective in improving respiratory parameters among children with lower respiratory tract infection.

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