A Study to Assess the Effectiveness of Selected Nursing Intervention on Improving the Respiratory Status among Toddlers with Lower Respiratory Tract Infection in Government Head Quarters Hospital, Cuddalore

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ABSTRACT:

Background: LRTI is the most common cause of hospitalization in pediatric patients with LRTI who are at an increased risk of morbidity and mortality. In India, 1.2 million death have been detailed among children due to LRTI among 5.9 million passing universally. India has the most elevated number of death among children <5 a long time of age and most of them are due to LRTI there are many non-pharmacological measures are involving in treating the respiratory illness like massage therapy breathing exercises, oxygen therapy, nebulization, physiotherapy, etc. **Aim**: the aim of the study is to assess the effectiveness of massage therapy on respiratory status among toddlers with LRTI. **Materials and methods:** A sample of 60 toddlers was simple random sampling assigned to the intervention and control groups. In the control group (routine care) and massage therapy was performed for three days. In the morning and evening then post-test was conducted end of the third day. Whereas the control group receives routine care. (pre-assessment level of respiratory status Respiratory rate, heart rate, temperature, oxygen saturation, chest retraction, and breath sounds, use of accessory muscles, cough, sputum, nasal flaring, and dyspnea) **Result:** the findings of the study show that there was a highly significant observed between pre and post mean score of level of respiratory status in (30.76 ± 3.38) and after (40.13 ± 3.01) the massage therapy. The calculated 't' value was 19.76, which was highly significant at $P<0.000**$ level. **Conclusion:** It can be concluded that back massage was effective among toddlers with lower respiratory tract infection.

Keywords: Massage therapy, Respiratory status, lower respiratory tract infection.

INTRODUCTION:

According to the world bank statistics, the children population comprises 26.6% of the total population, and India has a child population of 26.16%.[1] Children are highly vulnerable to diseases due to their immature immune systems. Worldwide, under-five mortality noted in 2020 was 5.0 million, and every day 13,800 children dying every day. Lower respiratory infection (17.9%) is one of the leading causes of under-five children mortality.[2,3] lower respiratory infections consist of bronchitis, pneumonia, and bronchiectasis.[4] LRTIs accounted for about 11.9 million young children hospitalized worldwide. LRTIs contributed to 6.8% of deaths in neonates. 20% of death in children aged 1 – 12 months, and 12% of death in children aged 1-4 years. [5]

Environmental risk factors have a significant impact on the occurrence of pediatric respiratory tract infections. Nonexclusive breastfeeding, malnutrition, low birth weight, lack of measles vaccination in children under the age of one, zinc and vitamin A deficiency, concomitant diseases (e.g., asthma, heart disease, and diarrhea), low maternal education, poor socioeconomic status, indoor crowding, air pollution, parental smoking, humidity, and cold weather are the most important risk factors.[6,7] The frequency of mortality due to lower respiratory tract infections has decreased as a result of improvements in children's nutritional status, supportive care, improved access to antibiotics, and increasing immunization uptake.[8,9]

MATERIALS AND METHODS:

A quantitative research approach was used in this study. A true experimental design was adopted in this study. The study was conducted in Pediatric wards in Cuddalore Government Head Quarters Hospital. The population of the study was the toddlers (1-3 years) who got admitted to Pediatric Ward, Government Head Quarters Hospital, Cuddalore. The sample size of the study is 60 children who were diagnosed with LRTI and they are divided into two groups (Group1-Intervention; Group2-Control). The ethical permission to conduct the study was obtained from the institutional ethical committee and written informed consent was taken from concerned authorities of the Government hospital at cudalore and also from the parents or guardian and teachers of the sample with assurance of confidentiality.

PROCEDURE:

The data collection period was 30 days. Before starting the data collection, researchers obtained formal permission from the Joint Director of Government Headquarters Hospital Cuddalore and from parents' of research participants. The samples were selected and toddlers were assigned for intervention and control group based on simple randomization and inclusion & exclusion criteria. After assigning the group the researcher was assessed the respiratory status of the toddler in both intervention and control groups, and then the back massage was given to the intervention group twice a day with the duration of 15 minutes for

3 consecutive days. Whereas the control group received routine treatment. At the end 3rd day of intervention, the post-test assessment was done for the toddlers of both groups.The tool consists of:

SECTION 1:

It contains demographic variables of Children's age, sex, child education status, mother and father education status, mother and father occupation, family income, type of family, residence, order of birth, no of children in the family, religion, frequency of respiratory infection in last year, family history of cigarette smoking.

SECTION 2:

It includes some selected physiological parameters like Respiratory rate, heart rate, temperature, oxygen saturation, chest retractions, breath sounds, use of accessory muscles, cough, sputum, nasal flaring, and dyspnea were assessed by a rating scale.

Score.

The maximum score was 4 and the minimum score was 1.

37-44: No respiratory distress.

29-36: Mild respiratory distress

20-28: Moderate respiratory distress

11-19: Severe respiratory distress

STATISTICS

Description of the demographic variables of toddlers with lower respiratory tract in fectionin both the intervention group and control group. Assessment of the level of respiratory status of toddlers with lower respiratory tract infection in both the intervention group and control group before the intervention.   Effectiveness of selected nursing intervention (Back Massage) on respiratory status among toddlers with lower respiratory tract infection in both intervention group and control group. Association between the pre-test level of respiratory status of toddlers with lower respiratory tract infection and with selected demographic variables of intervention and control group.

RESULT:

Table 1: Frequency and percentage-wise distribution of demographic variables of toddlers with lower respiratory tract infection in both intervention group and control group

(N=60 (30+30))

S.NO	DEMOGRAPHIC AND CLINICAL VARIABLES	EXPERIMENTAL GROUP		CONTROL GROUP		STATISTICAL SIGNIFICANCE
		N	**%**	**N**	**%**	
1	**Age of the Toddler in years**					
	1 year	1	3.3	0	0	X^2=5.926
	2 years	19	63.3	11	36.7	df=2
	3years	10	33.3	19	63.3	p-value=0.52
2	**Gender of the Toddler**	**N**	**%**			X^2=0.268 df=1 p-value=0.605
	Male	13	43.3	15	50	
	Female	17	56.7	15	50	
3	**Mother Education Status**					X^2=10.264
	Profession or honors	0	0	0	0	df=4
	Graduate & Postgraduate	3	10	0	0	p-value=0.036
	Intermediate or diploma	8	26.7	5	16.7	
	High school	14	46.7	14	46.7	
	Middle school	3	10	11	36.7	
	Primary school	2	6.7	0	0	
	No formal education	0	0	0	0	
4	**Father Education Status**					X^2=6.67
	Profession or honors	0	0	0	0	df=5
	Graduate & Postgraduate	2	6.7	0	0	p-value=0.246

	Intermediate or diploma	8	26.7	5	16.7	
	High school	15	50	15	50	
	Middle school	2	6.7	7	23.3	
	Primary school	2	6.7	3	10	
	No formal education	1	3.3	0	0	
5	**Occupation of Mother**					$X^2=3.907$
	Homemaker	17	56.7	21	70	df=3
	Coolie	4	13.3	6	20	p-value=0.272
	Private Employee	5	16.7	2	6.7	
	Self-Employee	4	13.3	1	3.3	
	Government Employee	0	0	0	0	
6	**Occupation of Father**					
	Unemployed	1	3.3	0	0	$X^2=10.02$
	Coolie	6	20	13	43.3	df=3
	Private Employee	3	10	8	26.7	p-value=0.018
	Self-Employee	20	66.7	9	30	
	Government Employee	0	0	0	0	
7	**Family Monthly Income**					$X^2=1.44$
						df=2
	Below Rs. 5000	13	43.3	16	53.3	p-value=0.486
	Rs. 5001- Rs. 10000	16	53.3	14	46.7	
	Above Rs. 10000	1	3.3	0	0	
8	**Type of Family**					$X^2=0.267$
	Nuclear	16	53.3	14	46.7	df=1
	Joint	14	46.7	16	53.3	p-value=0.606
	Separated	0	0	0	0	
	Extended	0	0	0	0	
9	**Residence**					$X^2=0.577$
	Rural	25	83.3	27	90	df=1
	Urban	5	16.7	3	10	p-value=0.448

10	**Order of Birth**					$X^2=0$
	1st order	21	70	21	70	df=1
	2nd order	9	30	9	30	p-value=1.00
11	**No. of a Toddler in the Family**					
	1	8	26.7	2	6.7	$X^2=4.88$
	2	19	63.3	26	86.7	df=2
	3	3	10	2	6.7	p-value=0.087
12	**Religion**					
	Hindu	24	80	21	70	$X^2=0.978$
	Christian	4	13.3	5	16.7	df=3
	Muslim	2	6.7	4	13.3	p-value=0.613
	Others, Specify	0	0	0	0	
13	**Frequency of Respiratory Infection in last 3 months**					$X^2=0.071$
	Yes	11	36.7	12	40	df=1
	No	19	63.3	18	60	p-value=0.791
14	**Family History of Cigarette Smoking**					$X^2=5.71$
	Yes	7	23.3	16	53.3	df=1
	No	23	76.7	14	46.7	p-value=0.017
15	**Pet Animals in the Home**					$X^2=0.089$
	Yes	7	23.3	8	26.7	df=1
	No	23	76.7	22	73.3	p-value=0.766
16	**Type of Allergen**					$X^2=1.017$
	Dust	0	0	0	0	df=1
	House mite	1	3.3	0	0	p-value=0.313
	Food	0	0	0	0	
	No Allergy	29	96.7	30	10	

df- degree of freedom,

Table 1: The findings reveal that in the demographic profile in group 1(intervention group) the highest percentage of the children (63.3%) belong to the age between 2 years, 56.7% were females, 50% of children's fathers studied high school, 47.7% Children's mother studied high school, 70% children's mothers were Homemaker, 66.7% children's fathers were self-employee, 53.3% family income was greater than Rs.10000, 53.3% belong to the nuclear family, 90% were residing at rural respectively, 70% were the first child in the family, 76.7% of the child family had Two children, 70.0% were belongs to Hindu, 63.3% were exposed to

respiratory infection between one to two times, 53.3% are having a Family history of cigarette smoking, 76.7% are not having pet animals in their house and 96.7% are not having any allergy.

The demographic profile in group 2 (control group) the highest percentage of the children (63.3%) belong to the age 2 years, 50% were females, 46.7% of children's mothers studied high school, 50% children's father studied high school, 70% children mothers were Homemaker, 43.3% children fathers were coolie, 53.3% children's family income was below Rs.50000, 53.3% belong to joint family, 90% were residing at rural, 66.7% of the child were the first child in the family, 46.7% of the family had Two children in the family, 70% belong to Hindu, 53.3% were exposed to respiratory infection between one to two times, 53.3% were having a Family history of cigarette smoking, 73.3% were not having pet animals, and all children (100%) were not having any allergy.

Table: 2 frequency and distribution of the Respiratory status of toddlers with lower respiratory tract infection before and after intervention among both intervention and control groups.

GROUP	TEST	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	't' VALUE Paired - t-test	df	'p' VALUE
	Pretest	30.76	3.38	-10.0	-19.76	29	
Intervention Group	Posttest	40.13	3.01				0.000** HS
Control Group	Pretest	29.10	2.48	-1.86	-1.553	29	0.131* NS
	Posttest	30.96	6.54				

The above **Table -2.** show Comparison of pre and post test value of respiratory status among toddlers with lower respiratory tract infection in both intervention group and control group**.** During the pretest intervention group had the mean value and standard deviation of 30.76 ± 3.38. After the intervention the mean and standard deviation was 40.13 ± 3.01. The mean difference was 10. The paired 't' test was calculated (t = -19.76) which was *highly significant* at p< 000**.

During the pretest control group had the mean value and standard deviation of 29.10 ± 2.48. After the intervention the mean and standard deviation was 30.96 ± 6.54. The mean difference was 1.86 The paired 't' test was calculated (t = -1.553) which was *Non significant* at P<0.05*.*

Hence, It can be concluded that there was significant difference noted between pre and posttest value of intervention group.

Table: 3. There is a significant difference in the Respiratory status of toddlers with lower respiratory tract infection before and after intervention among both intervention and control groups.

TEST	GROUP	MEAN	STANDARD DEVIATION	MEAN DIFFERENCE	't' VALUE Independent -t-test	df	'p' VALUE
Pretest	**Intervention group**	30.13	3.38	1.033	1.349	58	**0.101**
	Control group	29.10	2.48				**NS**
Posttest	**Intervention group**	40.13	3.01	9.166	6.971	58	**0.000****
	Control group	31.96	6.54				**HS**

The above Table 10. show the comparison of selected nursing intervention (Back Massage) on respiratory status of toddlers with lower respiratory tract infection between intervention group and control group. During pretest, the intervention group toddlers had the mean and SD was 30.13 ± 3.38 and in control group the mean and SD was 29.10 ± 2.48. the mean difference was 1.033. the independent 't' test was 1.349 shows Non significant.

After the massage therapy intervention group toddlers had the mean and SD was 40.13 ± 3.01, but the control group toddlers had the mean and SD was 31.96 ± 6.54. The mean differences was 9.166. The calculated independent. 't' value of 6.791 was found to be *statistically highly significant* at P 0.000 level of significance. Hence, it was interpreted that the significant difference was noted between intervention and control group.

Table 4. association between the respiratory status of the toddler with lower respiratory tract infection before intervention and with selected demographic variables in both the intervention and control groups

INTERVENTION GROUP

DEMOGRAPHIC AND CLINICAL VARIABLEDS	Chi-square X^2	Degree of frequency	P - value
Age of the child in years	0.291	2	0.865 NS
Gender of the child	0.679	1	0.410 NS

Mother education status	3.12	4	0.537 NS
Father education status	2.58	5	0.764 NS
Occupation of mother	1.41	5	0.703 NS
Occupation of father	5.64	3	0.131 NS
Family monthly income	0.265	2	0.876 NS
Type of family	0.107	1	0.743 NS
Residence	1.20	1	0.273 NS
Order of birth	7.14	1	0.008** S
No. of children in the family	1.51	2	0.469 NS
Religion	0.600	2	0.741 NS
Frequency of respiratory infection in last 3 month	0.029	1	0.865 NS
Family history of cigarette smoking	0.037	1	0.865 NS
Pet animals in home	1.82	1	0.177 NS
Type of allergen	0.207	1	0.649 NS

The Above Table4. shows association between the respiratory status of the toddler with lower respiratory tract infection before intervention and with selected demographic variables intervention groups. Hence there is no significant association between demographic variable such as age, sex, parent education, occupation, residence, religion, order of birth, no of children in family, income, cigarette smoking, pet animal in house, and type of allergy. So the stated hypothesis is rejected.

CONTROL GROUP

Table 5

DEMOGRAPHIC AND CLINICAL VARIABLEDS	Chi-square X^2	Degree of frequency	P - value
Age of the child in years	0.639	1	0.424 NS
Gender of the child	0.682	1	0.409 NS
Mother education status	5.16	2	0.075 NS
Father education status	1.55	3	0.669 NS
Occupation of mother	1.26	3	0.737 NS
Occupation of father	0.214	2	0.898 NS
Family monthly income	0.049	1	0.825 NS

Type of family	0.36	1	0.544 NS
Residence	0.076	1	0.783 NS
Order of birth	0.130	1	0.719 NS
No. of children in the family	1.28	2	0.526 NS
Religion	0.548	2	0.760 NS
Frequency of respiratory infection in last 3 month	0.028	1	0.866 NS
Family history of cigarette smoking	1.09	1	0.295 NS
Pet animals in home	0.015	1	0.901 NS
Type of allergen	-	-	constant

The Above Table 5. shows association between the respiratory status of the toddler with lower respiratory tract infection before intervention and with selected demographic variables control groups. Hence there is no significant association between demographic variable such as age, sex, parent education, occupation, residence, religion, order of birth, no of children in family, income, cigarette smoking, pet animal in house, and type of allergy.

DISCUSSION:

Intervention Group

The findings of Intervention group toddler before and after the intervention. During the pre-test majority (83.3%) of toddler were having mild respiratory status, least percentage (16.7%) of toddler were having moderate respiratory status and none of them are in severe respiratory status and no respiratory status. After the intervention almost all (93.3%) of the toddler were having no respiratory status, and very minimum percentage (6.7%) of the toddler were having mild respiratory status and none of the toddlers were having moderate. Hence it is interpreted that intervention (back massage) reduces the respiratory distress and increases lung function.

Control Group

The findings of control group toddler before and after the intervention. During the pre-test majority (73.3%) of children were having mild respiratory status, quarter percentage (26.7%) of toddlers were having moderate respiratory status and none of them are in severe respiratory status and no respiratory status. After the routine treatment almost all (76.7%) of the toddler were having mild respiratory distress, and near quarter percentage (23.3%) of the toddler were having mild respiratory status and none of the toddlers were having moderate. Hence it is interpreted that routine treatment had mild improvement in improving the lung function.

The student paired 't' test was performed to assess the effectiveness of massage therapy before and after the intervention in both intervention and control group show that in intervention group, the significant mean difference 10.0 was noted before (30.76 ± 3.38) and after (40.13 ± 3.01) the massage therapy. The calculated 't' value was 19.76, which was highly significant at P<0.000** level. It can be concluded that back massage was effective among toddlers with lower respiratory tract infection.

In the control group there is no significant mean difference 1.86 was noted before (29.10± 2.48) and after (30.96±6.54) the routine treatment. The calculated 't' value was 1.553, which was not significant at P<0.05 level. It can be concluded that there is no difference in pretest and posttest in control group.

The independent 't' test was performed to assess the effectiveness of massage therapy between intervention and control group. During the pretest there was no significant mean difference 1.033 was noted between intervention (30.13±3.38) and control group(29.10±2.48). Whereas after the massage therapy, significant mean difference 9.166 was noted between intervention (40.13±3.01) and control group (31.96±6.54). The calculated independent 't'test value was 6.971at P<0.000 level of significant. It can he concluded that massage therapy was effective in toddlers with LRTI. Hence, the stated hypothesis "there is a significant difference noted during and after the intervention and between intervention and control group" was accepted.

However, when compared with the intervention and control group children are recovered from the respiratory status and one-fourth of the children are having mild distress. It was interpreted that back massage is more effective than the control group on children with LRTI.

The above the findings are consistence with the findings of following study:

 The above findings of the study similarly to randomized control study were conducted in China to systematically evaluate the efficacy of massage, a traditional treatment method of traditional Chinese medicine on children with asthma. A sample consisting of 120 children was selected randomly. the data were collected by using physiological parameters and asthmatic scores. The result showed that in the significantly higher efficacy in the massage group (RR 1.19; 95% CI 1.13–1.24; $p = 0.001$; $I^2 = 0\%$, 75.3%) and control group result showed Peak Expiratory Flow (PEF) (SMD: 0.83; 95% CI: 0.58 to 1.08; $p = 0.001^*$; $p = 0.001$; $I^2 = 29.7\%$,). The study concluded that massage therapy is an effective intervention in children with asthma[9]

CONCLUSION:

This study has proved that the back massage is highly effective in reducing the respiratory distress. Also, research recommends that the back massage can be practice at pediatric ward hospitalized children. It promotes the blood supply to the body and trigger the immune

system to respond the infection. So, the children have speedy recovery from the respiratory illness.

RECOMMENDATIONS:

- ❖ A study could be conducted with the larger scale

- ❖ A similar study could be performed for a longer duration

- ❖ A comparative study can also be done on the effectiveness of various non-pharmacological measures for improving lung function among children.

- ❖ A similar study can be performed for the various age group with larger sample size

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