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EFFECTIVENESS OF NOCHI LEAVES INHALATION ON UPPER RESPIRATORY TRACT INFECTION SYMPTOMS ALLEVIATION AMONG CHILDREN

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ABSTRACT

The present study was conducted to evaluate the effectiveness of nochi leaves inhalation on upper respiratory tract infection symptoms alleviation among children 6-12 years of age. The statistical evidence of the study proved that the children with upper respiratory tract infections are needed interventions for the alleviation of upper respiratory tract infection symptoms. The nochi leaves inhalation to the children with upper respiratory tract infections was effective in alleviating the symptoms. Therefore the investigator felt more importance should be given for nochi leaves inhalation to alleviate the upper respiratory tract infection symptoms among children.

Key words: Nochi Leaves, Upper Respiratory Tract Infection, Children and Inhalation.

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INTRODUCTION

Children are in a dynamic process of growth and development, and are particularly vulnerable to acute and chronic effects of pollutants in their environment, which leads to diseases like respiratory tract infections, diarrhea ,etc. diseases can be devastating for anyone, but it seems particularly unfair when they attack children. Children are more susceptible to diseases for a number of reasons.[1]

Upper respiratory tract infections are the most frequent infectious disease in children, the average child contracting between six to twelve infections in a year. Upper respiratory tract infection in the children is common problem that general practitioners see in their practice. Although the complications are rare and antibiotics offer little or no benefit in uncomplicated cases, antibiotics prescribing has increased in recent years. This leads to certain complications and cause resistance to younger generation. The burden of respiratory tract infections in paediatrics is extremely high, in both industrialized and developing countries. In India nearly 80% of school children consult a doctor at least once a year, for upper respiratory tract infection symptoms such as cough, laryngitis, pharyngitis, tosillitis and high temperature. [2]

Recently, WHO (world health organization) estimated that 80 percent of people world wide rely on herbal medicines for some aspect of their primary health care needs.Many traditionally used plants hold importance in modern days medical regimen as they have been proved scientifically to posses various activity which are desirable, one of such plant is nochi (vitex negundo) which is distributed through out India. Nochi is a large aromatic shrub (commonly known as Nirgundi, five leaved chast tree) belonging to the family laminaceae. Almost all the parts of this plant posses great medicinal values and it is employed as a remedy in various traditional systems of medicine like ayurveda, Chinese, siddha and unani to treat various diseases. In India traditional medicine system Nochi (Vitex Negundo) is referred as 'sarvaroganivarani'- the remedy for all diseases. As popular local quote of the Bhangalis in the Western Himalayan region of India which translates- A man can not die of disease in an area where Vitex negundo Linn,Adhatoda vasica and Acorus calamus are found if he knows how to use them. Nirgundi in Sanskrit means which protects the body from diseases. [3]

Nochi is a woody, erect and large aromatic deciduous shrub which grows to small tree of height 2-5 m with quadrangular branches. The leaves are penta foliate and the leaflets are arranged palmetely and terminal leaflets are long (4-10cm) acute with (1-1.3 long), lanceolate, hairy beneath and both the ends are pointed. The flowers are neumerous which are bluish purple in colour and in branched in to mentose cymes and the fruits are round,succulent and black on ripening with four seeds. It grows in humid places or along water courses in wastelands and mixed open forests and globally distributed in Afghanistan, Pakistan, India, Srilanka, Thailand, Malasyia, China and West Indies, America. [4,5]

Almost all parts of the nochi plant are used in preparing herbal medicines. The plant is known to possess anti- inflammatory, anti-rheumatic, hepatoprotective,anti oxidant, and snake venome neutralization, mosquito repellent and anti- allergic activities. Phytochemical studies on nochi revealed the presence of volatile oil, tritepenes, diterpenses, sesquiterpenes, lignin, flavonoids, flavones and glycosides derivative. Objectives of this present study is to assess the level of Upper respiratory tract infection symptoms alleviation amongchildren 6-12 years of age.To evaluate the effectiveness of nochi leaves inhalation on upper respiratory tract infection symptoms alleviation among children 6-12 years of age and also to associate the level of upper respiratory tract infection symptoms alleviation among children 6-12 years of age with their selected socio demographic and clinical variables.

MATERIAL AND METHODS

The study was conducted among children 6-12 years of age with upper respiratory tract infection admitted in the pediatric Medical ward at Institute of child health and Research center, Government Rajaji Hospital, Madurai. The researcher conducted the study after the approval from the Ethical committee, Madurai Medical College, Madurai. Sample size comprises of 60 children who fulfill the inclusion criteria. Intervention group – 30 , Control group – 30, Total   – 60**.** Subjects was selected through probability (simple random-lottery method) as sampling technique.

Inclusion criteria
- Children who where admitted in paediatric medical ward between the age of 6- 12 years with upper respiratory tract infection.
- Children of both sex.

Exclusion criteria
- Critically ill children
- Previous history of allergic reaction
- Children who where getting nebulization

Description of tool

With extensive review of literature and consultation with experts and taking the opinion as guidance the tool is generated to gather the data. The Jackson cold severity score was developed by Jackson kinder on 1958. The scoring system includes measures for 12 separate symptoms. Symptoms included sneezing, runny nose, nasal congestion, cough, fever, headache, malaise, chilliness, scratchy throat, sore throat, hoarseness, and myalgias. To rate the severity of each of these symptoms using the scale: 0 = none, 1= mild, 2= moderate, and 3 = severe. [6]

Section-A: Socio demographic variables
Section-B: Clinical variables.
Section-C: The modified Jackson cold severity score represented in Table 1.

Scoring procedure

Upper respiratory tract infection symptoms

None	score '0'
Mild	score ' 1-12 '
Moderate	score ' 13– 24'
Severe	score ' 25 - 36 '

In this study the nochi leaves inhalation was given to the interventional group two times per day(8 am and 5 pm) 5 minutes for 5 consecutive days and the post test was done on the 6th day using the modified Jackson cold severity score. The results were duly recorded in the coding sheet immediately for enabling data analysis and further process of the study. [7,8 & 9]

The data collected was subjected to statistical analysis using descriptive and inferential statistics. Socio demographic and clinical variables of the subjects were analyzed using the methods of frequency and percentage distribution. Mean and standard deviation were used to analyze the severity of upper respiratory tract infection in intervention group and control group among children with 6-12 years who met the inclusion criteria. Student paired 't' test was used to evaluate the effectiveness of nochi leaves inhalation on upper respiratory tract infection symptom alleviation. Chi –square test was used to find out the association between the upper respiratory tract infection symptoms among 6-12 years of children with selected socio demographic and clinical variables.. The data collected were interpreted, organized and finalized under the following sections**.** Distribution of socio demographic variables and clinical variables among children with upper respiratory tract infection symptoms alleviation in intervention and control group as Section – I shown in table 2 and 3. Description of pre test level of upper respiratory tract infection symptoms alleviation of both intervention and control group among children with upper respiratory tract infection as Section – II shown in table 4 and 5. Effectiveness of nochi leaves inhalation on upper respiratory tract infection symptoms alleviation among children with upper respiratory tract infection as Section – III shown in table 6,7,8,9,10,11,12 and 13.

Association between the level of upper respiratory tract infection symptoms alleviation among children with their socio demographic and clinical variables in intervention and control group as Section IV. shown in table 14,15,16,and 17.

RESULTS AND DISCUSSION

With respect to age, in intervention group majority of the subjects, 18 (60.00%) were had in between 6-8 years, 7 (23.33%) were had in between 11-12 years and 5 (16.67%) were had in between 8-10 years. Whereas in control group majority of the subjects,23 (76.67%) were had in between6-8 years, 4 (13.33%) were had in between 11-12 years and 3 (10.00) were had in between 8-10 years.

When dealing with gender, in intervention group majority of the subjects,17 (56.67%) were male children and 13 (43.33%) were female children. Whereas in control group 15 (50.00%) were male children and 15 (50.00%) were female children.

While discussing the residential area,in intervention group majority of the subjects,14 (46.67%) were hailed from urban area,9(30.00%) were hailed from rural area,and 7 (23.33%) were hailed from suburban area. Whereasin control group majority of the subjects, 18 (60.00%) were hailed from urban area, 7 (23.33%) were hailed from rural area and5 (16.67%) were hailed from suburban area.

While considering the educational status of the father,in intervention group majority of the subjects, 19 (63.33%) were studied up to secondary education, 5 (16.67%) were studied up to higher secondary education, 4(13.33%) were studied up to primary education,2 (6.67%) were graduates and none of them non formal education. Whereas in control group majority of the subjects,18 (60.00%) were studied up to secondary education, 8 (26.66%) were studied up to higher secondary education, 2 (6.67%) were studied up to primary education, 2 (6.67%) were graduates and none of them non formal education.

Withregards to the educational status of the mother, in intervention group majority of the subjects,14(46.67%) were studied up to secondary education, 12 (40.00%) were studied up to higher secondary education, 4 (13.33%) were studied up to primary education and none of them studied up to graduate or non formal education. Whereas in control group majority of the subjects,13 (43.34) were studied up to higher secondary education, 10 (33.33%) were studied up to secondary education, 4 (13.33%) were studied up to primary education, 3 (10.00%) were graduates and none of them in non formal education.

As far as family monthly income, in intervention group majority of the subjects,15 (50.00%) were earned between Rs.5001-10,000, 15(50.00%) were earned between Rs.10,001-15,000, none of them earned less than Rs.5000 or more than Rs.15,000. Whereas in control group majority of the subjects, 17 (56.67%) were earned between Rs.5001- 10,000, 13 (43.33%) were earned between Rs.10,001- 15,000, and none of them earned less than Rs.5000 or more than Rs.15,000.

While discussing the type of family, in intervention group majority of the subjects, 23 (76.67%) were from nuclear family, 7 (23.33%) were from joint family and none of them from extended family. Whereas in control group majority of the subjects, 24 (80.00%) were from nuclear family, 6 (20.00%) were from joint family and none of them from extended family.

When dealing with the type of house, in intervention group majority of the subjects,16 (53.33%) were lived in tiled house, 11 (36.67%) were lived in concrete house, 2 (6.67%) were lived in other type of houses and 1 (3.33%) was lived in hut house.Whereas in control group majority of the subjects, 15(50.00%) were lived in tiled house, 15 (50.00%) were lived in concrete house and none of them lived in hut or other type of houses.

While mentioning the cooking fuel type, in intervention group majority of the subjects,27 (90.00%) were practiced L.P.G, 2 (6.67%) were practiced firewood,1 (3,33%) was practice kerosene and none of them practiced electricity. Whereas in control group the majority of the subjects, 30 (100.00%) were practiced L.P.G. and none of them practiced firewood or kerosene or electricity.

While stating the pet animals in home, in intervention group the majority of the subjects, 24 (90.00%) were had no pet animals, 3 (6.67%) were had other pet animals, 2 (6.67%) were had dog, 1 (3.33%) was had cat.Whereas in control group majority of the subjects, 25 (83.33%) were had no pet animals, 2 (6.67%) were had cats, 2 (6.67%) were had other pet animals and 1 (3.33%) was had dog [10,11&12].

Table 1. The Modified Jackson Cold Severity Score

Symptom	None " 0 "	Mild " 1"	Moderate " 2 "	Severe " 3 "
Sneezing	No sneezes	Few short episodes of sneezing	occasional sneezes	frequent sneezes
Running Nose	No runny nose	Had to wipe nose (or blow) nose rarely	Had to wipe(or blow) nose occasionally	Had to wipe(or blow) nose frequently
Nasal congestion	No congestion	Breathing through nose	Breathing through nose noisy, has "nasally"	Breathes through mouth almost all the time because of

		slightly	speech, breathes through mouth some	nasal congestion, speech very "nasally"
Cough	No cough	Few short episodes of coughing	Occasional coughs or rare episodes of prolonged coughing	Frequent coughs or atleast occasional episodes of prolonged coughing
Fever	No fever or looking flushed	Felt warm to the touch, no flushing	Felt very warm to the touch or temperature > 100.5°, slightly flushed	Felt hot to the touch or temperature > 102°, very flushed
"malaise"	No ill appearance or behavior	Slightly less active than normal	Activity reduced somewhat, not engaging in usual activities	Mostly in bed or lying down
Chill ness	No chilliness	Complaining about being cold, no extra clothing or blankets	Wearing extra clothes or using blanket to keep warm,	Very chilled, shivering, constantly under a blanket to keep warm
Headache	No headache	Mild Complaints of headache, no change in activity	Frequent complaints of headache, not as active because of headache	Mostly in bed because of headache
Myalgia	No muscle aches	Infrequent complaint of muscle aches or pains	Occasional complaint of muscle aches or pains	Frequent complaint of muscle aches or pains
Sore throat	No sore throat	Mild pain with swallowing	Moderate pain with swallowing	Very painful to swallow
"scratchy" throat	No throat pain	Infrequent complaint of pain in mouth or throat, discomfort mild	Occasional complaint of pain in mouth or throat, or moderate discomfort	Frequent complaint of pain in mouth or throat, or severe discomfort
Hoarseness	No change in voice	Speech is slightly hoarse or "husky"	Speech is very hoarse or "husky"	Can't speak above a whisper because or hoarseness

Table 2. Frequency and percentage distribution of children with upper respiratory tract infection according to their selected socio demographic variables   **n = 60**

Socio demographic variables		Group				χ2
		Intervention		**Control**		
		f	**%**	**f**	**%**	
Age	6-8 years	18	60.00%	23	76.67%	χ2= 1.92, p =0.38 (NS)
	8-10 years	5	16.67%	3	10.00%	
	11-12 years	7	23.33%	4	13.33%	
Gender	Male	17	56.67%	15	50.00%	χ2=0.26, p =0.60(NS)
	Female	13	43.33%	15	50.00%	
Residential area	Rural	9	30.00%	7	23.33%	χ2= 1.08 p = 0.58(NS)
	Urban	14	46.67%	18	60.00%	
	Sub urban	7	23.33%	5	16.67%	
Educational status of the father	No formal education	0	0.00%	0	0.00%	χ2=1.38, p = 0.70(NS)
	Primary education	4	13.33%	2	6.67%	
	Secondary education	19	63.33%	18	60.00%	
	Higher secondary education	5	16.67%	8	26.66%	
	graduate	2	6.67%	2	6.67%	
Educational status of the	No formal education	0	0.00%	0	0.00%	χ2= 3.70,
	Primary education	4	13.33%	4	13.33%	

mother	Secondary education	14	46.67%	10	33.33%	p=0.29(NS)
	Higher secondary education	12	40.00%	13	43.34%	
	graduate	0	0.00%	3	10.00%	
Monthly income	< Rs.5000	0	0.00%	0	0.00%	$\chi 2$=0.26 p =0.60(NS)
	Rs.5001- Rs 10,000	15	50.00%	17	56.67%	
	Rs.10001- Rs.15,000	15	50.00%	13	43.33%	
	>Rs.15,001	0	0.00%	0	0.00%	
Type of family	Nuclear family	23	76.67%	24	80.00%	$\chi 2$=0.10, P=0.75 (NS)
	Joint family	7	23.33%	6	20.00%	
	Extended family	0	0.00%	0	0.00%	
Type of house	Hut	1	3.33%	0	0.00%	$\chi 2$= 3.64, P= 0.30 (NS)
	Tiled	16	53.33%	15	50.00%	
	Concrete	11	36.67%	15	50.00%	
	others	2	6.67%	0	0.00%	
Cooking fuel type	Fire wood	2	6.67%	0	0.00%	$\chi 2$=3.15, P=0.21(NS)
	Kerosene	1	3.33%	0	0.00%	
	L.P.G	27	90.00%	30	100.00%	
	Electricity	0	0.00%	0	0.00%	
Pet animals in home	No pet animals	24	80.00%	25	83.33%	$\chi 2$=0.88, P=0.83(NS)
	Cat	1	3.33%	2	6.67%	
	Dog	2	6.67%	1	3.33%	
	others	3	10.00%	2	6.67%	

Table 3. Frequency and percentage distribution of children with upper respiratory tract infection according to their selected clinical variables in both intervention and control group   **n = 60**

Clinical variables		Group				$\chi 2$
		Intervention		Control		
		f	%	f	%	
Term of baby at birth	Full term	24	80.00%	27	90.00%	$\chi 2$=3.17, P=0.20(NS)
	Pre term	6	20.00%	2	6.67%	
	Post term	0	0.00%	1	3.33%	
Birth weight of the baby	<2 kg	4	13.34%	3	10.00%	$\chi 2$=3.14, P=0.37 (NS)
	2.1 kg- 2.5kg	10	33.33%	10	33.33%	
	2.6 kg- 3.0 kg	10	33.33%	15	50.00%	
	>3 kg	6	20.00%	2	6.67%	
Grading of malnutrition	Normal	9	30.00%	6	20.00%	$\chi 2$=0.84, P=0.65(NS)
	I^{0}degree malnutrition	17	56.67%	20	66.67%	
	II^{0}degree malnutrition	4	13.33%	4	13.33%	
	III^{0}degree malnutrition	0	0.00%	0	0.00%	
Anemia level	Normal	8	26.67%	11	36.67%	$\chi 2$=0.78, P=0.67(NS)
	Mild	19	63.33%	17	56.66%	
	Moderate	3	10.00%	2	6.67%	
	Severe	0	0.00%	0	0.00%	
Immunization status	Immunized	30	100.00%	30	100.00%	$\chi 2$=0.00, P=1.00(NS)
	Not immunized	0	0.00%	0	0.00%	
Co- morbid illness	**Leukemia**	**0**	**0.00%**	**0**	**0.00%**	$\chi 2$=0.00, P=1.00(NS)
	Anemia	0	0.00%	0	0.00%	
	Nephritic syndrome	0	0.00%	0	0.00%	
	Type 1 diabetes mellitus	0	0.00%	0	0.00%	
	No co morbid illness	30	100.00%	30	100.00%	

Table 4. Frequency and percentage distribution of pre test level of upper respiratory tract infection symptoms alleviation in both intervention and control group   **n=60**

Level of upper respiratory infection	Group

symptoms alleviation	Interventional		Control		χ2
	f	%	f	%	
None (0)	0	0.00%	0	0.00%	χ2 = 0.41, P = 0.52 (NS)
Mild (1-12)	5	16.67%	7	23.33%	
Moderate (13-24)	25	83.33%	23	76.67%	
Severe (25-36)	0	0.00%	0	0.00%	
Total	30	100.00%	30	100.00%	

p> 0.05 not significant, NS = not significant

Table 5. Comparison between mean pre test scores of upper respiratory tract infection symptoms alleviation in intervention group and control group

Test	Intervention group		Control group		Mean difference	Student Independent t-test
	Mean score	SD	Mean score	SD		
Pretest	21.07	2.82	20.67	2.32	0.08	t=0.59 P=0.56(NS)

P>0.05 not significant NS= not significant

Table 6. Comparison between pre test and post test level of upper respiratory tract infection symptom alleviation in intervention group n=30

Level of upper respiratory tract infection symptom alleviation	Intervention group				Extended McNemar's test
	Pre test		Post test		
	f	%	f	%	
None (0)	0	0.00%	0	0.00%	χ2 = 25.04, p= 0.001 *** (S)
Mild (1-12)	5	16.67%	30	100.00%	
Moderate (13-24)	25	83.33%	0	0.00%	
Severe (25-36)	0	0.00%	0	0.00%	
Total	30	100.00%	0	100.00%	

***P<0.001 very high significant   S= significant

Table 7. Comparison between Mean pre test and post test scores of upper respiratory tract infection symptom alleviation in intervention group n = 30

Intervention group	Mean score	Mean difference	Standard deviation	Student paired t - test
Pre test	21.07	11.87	2.82	t = 26.57 p = 0.001 *** (S)
Post test	9.20		1.51	

***P<0.001 very high significant   S= significant

Table 8. Comparison of pre test and post test level of upper respiratory tract infection symptoms alleviation in control group n=30

Level of upper respiratory tract infection symptoms alleviation	Control group				χ2
	Pre test		Post test		
	f	%	f	%	
None (0)	0	0.00%	0	0.00%	χ2 = 11.46, P=0.001 *** (S)
Mild (1-12)	7	23.33%	22	73.33%	
Moderate (12- 24)	23	66.67%	8	26.67%	
Severe (25-36)	0	0.00%	0	0.00%	
Total	30	100.00%	30	100.00%	

***P<0.001 very high significant   S= significant

Table 9. Comparison between mean pre test and post test scores of upper respiratory tract infection symptom alleviation in control group

Control group	Mean score	Mean difference	Standard deviation	Student paired t – test
Pre test	20.67	6.80	2.32	t = 11.46 p = 0.001 *** (S)
Post test	13.86		2.60	

***P<0.001 very high significant   S= significant

Table 10. comparison between post test level of upper respiratory tract infection symptom alleviation among children in intervention and control group   **n=60**

Level of upper respiratory tract infection symptom alleviation	Intervention group		Control group		χ2
	f	%	f	%	
None	0	0.00%	0	0.00%	χ2= 9.23 P=0.01 ** (S)
Mild	30	100.00%	22	73.33%	
Moderate	0	0.00%	8	26.67%	
Severe	0	0.00%	0	0.00%	
Total	30	100.00%	30	100.00%	

Table 11: Comparison between mean post test scores of upper respiratory tract infection symptom alleviation among children in both interventional and control group   **n= 60**

Group	Mean score	Mean difference	Standard deviation	Student independent 't' test
Intervention	9.20	4.66	1.51	t = 8.46 p = 0.001 *** (S)
Control	13.86		2.60	

***P<0.001 very high significant,   S= significant

Table 12: Effectiveness of nochi leaves inhalation among children with upper respiratory tract infection symptom in intervention and control group   **n= 60**

		Max score	Mean score	Percentage of symptom reduction score	Mean Difference of symptom reduction score with 95% Confidence interval	Percentage of symptom reduction score with 95% Confidence interval
Intervention	Pretest	36	21.07	58.53%	11.87	32.97%
	Posttest	36	9.20	25.56%	(10.95 – 12.77)	(30.42%–5.47%)
Control	Pretest	36	20.67	57.42%	6.80	18.89%
	Posttest	36	13.86	38.50%	(5.58 – 8.01)	(15.50%–2.25%)

Table 13. Comparison between mean pretest and post test scores of upper respiratory tract infection symptoms alleviation in intervention and control group

Group	Pretest		Posttest		Mean difference	Student paired t-test
	Mean score	SD	Mean score	SD		
Intervention	21.07	2.82	9.20	1.51	11.87	t=26.57,p=0.001 ***(S)
Control	20.67	2.32	13.86	2.60	6.80	t=11.46P=0.001***(S)

***P<0.001 very high significant   S= significant

Table 14. Association between post test level of upper respiratory tract infection symptoms alleviation among children with their socio demographic variables (Intervention group)   **n=60**

Socio demographic and clinical variables	none		mild		moderate		severe		n	χ2
	f	%	f	%	f	%	f	%		
1.Age a) 6- 8 years b) 9-10 year c) 11- 12 years	0 0 0	0.0% 0.0% 0.0%	18 5 7	100.00% 100.00% 100.00%	0 0 0	0.0% 0.0% 0.0%	0 0 0	0.0% 0.0% 0.0%	18 5 7	χ2=0.00 p=1.00 (NS)
2.Gender a) Male child b) Female child	0 0	0.0% 0.0%	17 13	100.00% 100.00%	0 0	0.0% 0.0%	0 0	0.0% 0.0%	1717 13 13	χ2=0.00 p=1.00 (NS)
3.Residential area a) Rural b) Urban c) Sub urban	0 0 0	0.0% 0.0% 0.0%	9 14 7	100.00% 100.00% 100.00%	0 0 0	0.0% 0.0% 0.0%	0 0 0	0.0% 0.0% 0.0%	9 14 7	χ2=0.00 p=1.00 (NS)
4.Education status of Father										

Clinical variables	f	%	f	%	f	%	f	%	n	χ2
a) No formal education	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	χ2=0.00 p=1.00 (NS)
b) Primary Education	0	0.0%	4	100.00%	0	0.0%	0	0.0%	4	
c) Secondary Education	0	0.0%	19	100.00%	0	0.0%	0	0.0%	19	
d) Higher secondary Education	0	0.0%	5	100.00%	0	0.0%	0	0.0%	5	
e) Graduate	0	0.0%	2	100.00%	0	0.0%	0	0.0%	2	
5.Educational status of mother										
a) No formal education	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	χ2=0.00 p=1.00 (NS)
b) Primary Education	0	0.0%	4	100.00%	0	0.0%	0	0.0%	4	
c) Secondary education	0	0.0%	14	100.00%	0	0.0%	0	0.0%	14	
d) Higher secondary Education	0	0.0%	12	100.00%	0	0.0%	0	0.0%	12	
e) Graduate	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	
6.Monthly income										
a) < Rs.5000	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	χ2=0.00 p =1.00 (NS)
b) Rs.5001-10000	0	0.0%	15	100.00%	0	0.0%	0	0.0%	15	
c) Rs.10001-15,000	0	0.0%	15	100.00%	0	0.0%	0	0.0%	15	
d) > Rs.15,000	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	
7.Type of family										
a) Nuclear family	0	0.0%	20	83.33%	4	16.67%	0	0.0%	24	**χ2=6.13 p=0.02 *(S)**
b) Joint family	0	0.0%	2	33.33%	4	66.67%	0	0.0%	6	
c) Extended family	0	0.0%	0	0.0%	0	0.00%	0	0.0%	0	
8.Type of house										
a) Hut	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	**χ2=6.15 p=0.05 * (S)**
b) Tiled	0	0.0%	8	53.33%	7	46.67%	0	0.0%0.0%	15	
c) concrete	0	0.0%	14	93.33%	1	6.67%	0	0%	15	
d) others	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
9.Cooking fuel type										
a) Fire Wood	0	0.0%	2	100.00%	0	0.0%	0	0.0%0.0%0.0%0.0%	2	χ2=0.00 p=1.00 (NS)
b) Kerosene	0	0.0%	1	100.00%	0	0.0%	0		1	
c) L.P.G	0	0.0%	27	100.00%	0	0.0%	0		27	
d) Electricity	0	0.0%	0	0.00%	0	0.0%	0		0	
10.Pet animals in home										
a) No pet animals	0	0.0%	24	100.00%	0	0.0%	0	0.0%	24	χ2=0.00 p=1.00 (NS)
b) Cat	0	0.0%	1	100.00%	0	0.0%	0	0.0%	1	
c) Dog	0	0.0%	2	100.00%	0	0.0%	0	0.0%	2	
d) Others	0	0.0%	3	100.00%	0	0.0%	0	0.0%	3	

Table 15. Association between post test level of upper respiratory tract infection symptoms alleviation among children with clinical variables (Intervention group)   n=30

Clinical variables	none		mild		moderate		severe		n	χ2
	f	%	f	%	f	%	f	%		
1.Term of baby at birth										
a) Full term	0	0.0%	24	100.00%	0	0.0%	0	0.0%	24	χ2=0.00 p=1.00 (NS)
b) Preterm	0	0.0%	6	100.00%	0	0.0%	0	0.0%	6	
c) post term	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	
2.Birth weight of baby										
a) <2 kg	0	0.0%	4	100.00%	0	0.0%	0	0.0%	4	χ2=0.00 p=1.00 (NS)
b) 2 .1kg – 2.5 kg	0	0.0%	10	100.00%	0	0.0%	0	0.0%	10	
c) 2.6 – 3 kg	0	0.0%	10	100.00%	0	0.0%	0	0.0%	10	
d) >3 kg	0	0.0%	6	100.00%	0	0.0%	0	0.0%	6	
3.Grading of malnutrition										
a) No malnutrition	0	0.0%	6	100.00%	0	0.00%	0	0.0%	6	**χ2=6.98**

b) I^0 malnutrition	0	0.0%	15	75.00%	5	25.00%	0	0.0%	20	**p=0.03[*]**
c) II^0 malnutrition	0	0.0%	1	25.00%	3	75.00%	0	0.0%	4	**(S)**
d) III^0 malnutrition	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
4.Anemia level										
a) Normal	0	0.0%	8	100.00%	0	0.0%	0	0.0%	8	$\chi2=0.00$
b) Mild	0	0.0%	19	100.00%	0	0.0%	0	0.0%	19	p=1.00
c) Moderate	0	0.0%	3	100.00%	0	0.0%	0	0.0%	3	(NS)
d) Severe	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	
5.Immunization status										$\chi2=0.00$
a) Immunized	0	0.0%	30	100.00%	0	0.0%	0	0.0%	30	p=1.00
b) Not immunized	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	(NS)
6.Co- morbid conditions										
a) Leukemia	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	$\chi2=0.00$
b) Anemia	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	p=1.00
c) Nephrotic syndrome	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	(NS)
d)Type1 diabetes mellitus	0	0.0%	0	0.00%	0	0.0%	0	0.0%	0	
e) No co-morbid illness	0	0.0%	30	100.00%	0	0.0%	0	0.0%	30	

Table 16. Association between post test level of upper respiratory tract infection symptoms among children with their socio demographic variables (Control group) n=30

Socio demographic variables	none		mild		moderate		severe		n	$\chi2$
	f	%	f	%	f	%	f	%		
1.Age										$\chi2=1.05$
a) 6- 8 years	0	0.0%	15	65.21%	8	34.79%	0	0.0%	23	p=0.58
b) 9-10 year	0	0.0%	3	100.00%	0	0.00%	0	0.0%	3	(NS)
c) 11- 12 years	0	0.0%	4	100.00%	0	0.00%	0	0.0%	4	
2.Gender									15	$\chi2=0.68$
a) Male child	0	0.0%	12	80.00%	3	20.00%	0	0.0%	15	p=0.41
b) Female child	0	0.0%	10	66.67%	5	33.33%	0	0.0%	13	(NS)
3.Residential area										
a) Rural	0	0.0%	6	85.71%	1	14.29%	0	0.0%	7	$\chi2=1.07$
b) Urban	0	0.0%	12	66.67%	6	33.33%	0	0.0%	18	p=0.58
c) Sub urban	0	0.0%	4	80.00%	1	20.00%	0	0.0%	5	(NS)
4.Education status of Father										
a) No formal education	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	$\chi2=1.95$
b)Primary Education	0	0.0%	2	100.00%	0	0.00%	0	0.0%	2	p=0.58
c)Secondary Education	0	0.0%	13	72.22%	5	27.78%	0	0.0%	18	(NS)
d)Higher secondary Education	0	0.0%	5	62.50%	3	37.50%	0	0.0%	8	
e) Graduate	0	0.0%	2	100.00%	0	0.00%	0	0.0%	2	
5.Educational status of mother										
a) No formal education	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
b)Primary Education	0	0.0%	2	50.00%	2	50.00%	0	0.0%	4	$\chi2=4.57$
c)Secondary education	0	0.0%	9	90.00%	9	10.00%	0	0.0%	10	p=0.20
d)Higher secondary Education	0	0.0%	8	61.54%	8	38.46%	0	0.0%	13	(NS)
e) Graduate	0	0.0%	3	100.00%	3	0.00%	0	0.0%	3	
6.Monthly income										
a)< Rs.5000	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	$\chi2=0.15$
b) Rs.5001-10000	0	0.0%	12	70.59%	5	29.41%	0	0.0%	17	p=0.69
c) Rs.10001-15,000	0	0.0%	10	76.92%	3	23.08%	0	0.0%	13	(NS)
d) > Rs.15,000	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
7.Type of family										$\chi2=1.07$
a) Nuclear family	0	0.0%	20	83.33%	1	16.67%	0	0.0%	21	p=0.58

	f	%	f	%	f	%	f	%	n	
b) Joint family	0	0.0%	2	33.33%	6	66.67%	0	0.0%	8	(NS)
c) Extended family	0	0.0%	0	0.00%	1	100.00%	0	0.0%	1	
8.Type of house										
a) Hut	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	χ2=0.00
b) Tiled	0	0.0%	8	53.33%11	7	46.67%	0	0.0%	15	p=1.00
c) concrete	0	0.0%	15	00.00%	0	0.00%	0	0.0%	15	(NS)
d) others	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
9.Cooking fuel type										
a) Fire Wood	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	χ2=0.00
b) Kerosene	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	p =1.00
c) L.P.G	0	0.0%	22	73.33%	8	26.67%	0	0.0%	30	(NS)
d) Electricity	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
10.Pet animals in home										
a) No pet animals	0	0.0%	19	76.00%	6	24.00%	0	0.0%	25	χ2=4.12
b) Cat	0	0.0%	1	50.00%	1	50.00%	0	0.0%	2	p =0.24
c) Dog	0	0.0%	0	0.00%	1	100.00%	0	0.0%	1	(NS)
d) Others	0	0.0%	2	100.00%	0	0.00%	0	0.0%	2	

*Significant at P < 0.05, **Highly Significant at P < 0.01, *** Very Highly Significant at P < 0.001, NS= Not Significant

Table 17. Association between post test level of upper respiratory tract infection symptoms among children with clinical variables (Control group)   n=30

Clinical variables	none		mild		moderate		severe		n	χ2
	f	%	f	%	f	%	f	%		
1.Term of baby at birth										
a) Full term	0	0.0%	20	74.07%	7	25.93%	0	0.0%	27	χ2=0.92
b) Preterm	0	0.0%	1	50.00%	1	50.00%	0	0.0%	2	p =0.62
c) post term	0	0.0%	1	100.00%	0	0.00%	0	0.0%	1	(NS)
2. Birth weight of baby										
a) <2 kg	0	0.0%	1	33.33%	2	66.67%	0	0.0%	3	χ2=3.57
b) 2 .1kg – 2.5 kg	0	0.0%	8	80.00%	2	20.00%	0	0.0%	10	p =0.31
c) 2.6 – 3 kg	0	0.0%	12	80.00%	3	20.00%	0	0.0%	15	(NS)
d) >3 kg	0	0.0%	1	50.00%	1	50.00%	0	0.0%	2	
3.Grading of malnutrition										
a) No malnutrition	0	0.0%	5	100.00%	1	0.00%	0	0.0%	6	χ2=3.57
b) I^0 malnutrition	0	0.0%	15	75.00%	5	25.00%	0	0.0%	20	p=0.31(NS)
c) II^0 malnutrition	0	0.0%	1	25.00%	3	75.00%	0	0.0%	4	
d) III^0 malnutrition	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
4. Anemia level										
a) Normal	0	0.0%	8	72.73%	3	27.27%	0	0.0%	11	χ2=0.17
b) Mild	0	0.0%	13	76.47%	4	23.53%	0	0.0%	17	p =0.91
c) Moderate	0	0.0%	1	50.00%	1	50.00%	0	0.0%	2	(NS)
d) Severe	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
5. Immunization status										
a) Immunized	0	0.0%	22	73.33%	8	26.67%	0	0.0%	30	χ2=0.00
b) Not immunized	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	p=1.00(NS)
6. Co- morbid conditions										
a) Leukemia	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	χ2=0.00
b) Anemia	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	p=1.00
c) Nephrotic syndrome	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	(NS)
d) Type1 diabetes mellitus	0	0.0%	0	0.00%	0	0.00%	0	0.0%	0	
e) No co-morbid illness	0	0.0%	22	73.33%	8	26.67%	0	0.0%	30	

*Significant at P < 0.05, **Highly Significant at P < 0.01, *** Very Highly Significant at P < 0.001, NS= Not Significant

With regarding the term of baby at birth, in intervention group majority of the subjects, 24 (80.00%) were full term babies, 6 (20.00%) were preterm babies and none of them post term babies. Whereas in control group majority of the subjects, 27 (90.00%) were full term babies, 2 (6.67%) were preterm babies and 1(3.33%) was post term baby.

While discussing about the birth weight, in intervention group majority of the subjects, 10 (33.33%) were between 2.1 kg-2.5 kg, 10 (33.33%) were between 2.6kg- 3.0 kg, 6(20.00%) were more than 3 kg, 4 (13.34%) were less than 2 kg. Whereas in control group majority of the subjects, 15 (50.00%) were between 2.6 kg- 3.0 kg, 10 (33.33%) were between 2.1 kg – 2.5 kg, 3 (10.00%) were less than 2 kg, 2 (6.67%) were more than 3 Kg.

While comparing the grading of malnutrition, in intervention group majority of the subjects,17 (56.67%) were had I^0malnutrition, 9 (30.00%) were had no malnutrition, 4 (13.33%) were had II^0 malnutrition and none of them III^0 malnutrition. Whereas in control group the majority of the subjects, 20 (66.67%) were had I^0 malnutrition, 6 (20.00%) were had no malnutrition, 4 (13.33%) were II^0 malnutrition and none of them III^0 malnutrition.

While discussing about the anemia level, in intervention group the majority subjects, 19 (63.33%) were had mild level, 8 (26.67%) were had normal level, 3 (10.00%) were had moderate level and none of them had severe anemia. Whereas in control group the majority of the subjects, 17 (56.66%) were had mild level, 11 (36.67%) were had normal level, 2 (6.67%) were had moderate level and none of them had severe anemia.

While mentioning the immunization status, both in intervention group and control group majority of the subjects, 30 (100.00%) were immunized.

While discussing with co- morbid conditions, both in intervention group and control group majority of the subjects, 30 (100.00%) were not suffered with co-morbid illness [13,14].

In intervention group majority of the subjects, 25 (83.33%) were had moderate level of infection, 5 (16.67%) were had mild level of infection and none of them had severe infection or none. Whereas in control group the majority the subjects, 23 (76.67%) were had moderate level of infection, 7 (23.33%) were had mild level of infection and none of them had severe infection or none. Chisquare test reveals that, there is no significant difference between intervention and control group.

When comparing the level of upper respiratory tract infection symptoms in intervention group, the pre test mean score was 21.07 with standard deviation 2.82. Whereas in control group, pre test mean score was 20.67 with standard deviation 2.32 and the mean difference was 0.08. The Student Independent t-test revealed that the calculated 't' value was 0.59. The calculated 't' value is more than table value which is not significant at 0.05 level.

The 't' test reveals that there is no significant difference between pre test scores of upper respiratory tract infection symptoms in between intervention and control group [15,16].

In pre test majority of the subjects, 25 (83.33%) were had moderate level of infection, 5 (16.67%) were had mild level of infection and none of them had severe infection or none. Whereasin post test the majority of the subjects, 30 (100.00%) were had mild level of infection, and none of them hadmoderate or severe infection or none. Extended McNemar's test reveals that, there is a significant difference between pre test and post test level of upper respiratory tract infection symptoms alleviation in the intervention group [17].

In intervention group, pretest mean score was 21.07 with standard deviation 2.82 and the post test mean score was 9.20 with standard deviation 1.51 and the mean difference was 11.87. The student's paired 't' test reveals that the calculated 't' value was 26.57. The calculated 't' value was lesser than the table value which was significant at 0.001 level. The 't' test revealed that, there is a significant difference between pre and post test level of upper respiratory tract infection symptom alleviation in intervention group [18].

In pre test majority of the subjects, 23 (66.67%) were had moderate level of infection, 7 (23.33%) were had mild level of infection and none of them had severe infection or none. Whereas in post test the majority of the subjects, 22 (73.33%) were had mild level of infection, 8 (26.67%) were had moderate level of infection and none of them had severe infection or none. Extended McNemar's test reveals that, there is a significant difference between pre test and post test level of upper respiratory tract infection symptoms alleviation in the control group. In control group, pretest mean score was 20.67 with standard deviation 2.32 and the post test mean score was 13.86 with standard deviation 2.60 and the mean difference was 6.80. The student paired't' test reveals that the calculated 't' value was 11.46. The calculated 't' value was lesser than the table value which was significant at 0.001 level. Student paired 't' test revealed that, there is a significant difference between pre and post test level of upper respiratory tract infection symptom alleviation in control group [19].

In intervention group majority of the subjects, 30 (100.00%) were had mild level of infection, and none of them had moderate or severe infection or none. Whereas in control group majority of the subjects 22 (73,33%) were had mild level of infection, 8 (26.67%) were had moderate level of infection and none of them had severe infection or none [20,21]. Chi square test reveals that there is significant difference between post test level of upper respiratory tract infection symptoms alleviation in both intervention and control group. In intervention group, post test mean score was 9.20 with standard deviation 1.51 whereas in control group, the post test mean score was 13.86 with standard deviation 2.60.

The mean difference was 4.66. The student independent 't' test reveals that the calculated 't' value was 8.46. The calculated 't' value was lesser than the table value which was significant at 0.001 level.

Student independent 't' test revealed that, there is a significant difference between post test level of upper respiratory tract infection symptom alleviation in intervention and control group. An average symptoms score among children with upper respiratory tract infection symptoms in intervention was reduced by 32.97% than the control group children. On the other hand on an average, in control group was reduced by 18.89%.

Difference between the intervention group and control group post test score was analyzed using proportion with 95% confident interval and mean difference with 95% confident interval. This difference shows that the effect of nochi leaves inhalation on upper respiratory tract infection symptoms alleviation among children with upper respiratory tract infections.

When comparing the level of upper respiratory tract infection symptoms in intervention group, the pre test mean score was 21.07 with standard deviation 2.82. Whereas post test mean score was 9.20with standard deviation was 1.51, Mean difference was 11.87. The student's paired 't' test reveals that the calculated 't' value was 26.57. The calculated 't' value was lesser than the table value which was significant at 0.001 level. The 't' test revealed that, there is a significant difference between pre and post test level of upper respiratory tract infection symptom alleviation in intervention group. When comparing the level of upper respiratory tract infection symptoms in control group, the pre test mean score was 20.67with standard deviation 2.32. Whereas in the post test mean score was 13.86 with standard deviation 2.60, Mean difference was 6.80. The student's paired 't' test reveals that the calculated 't' value was 11.46. The calculated 't' value was lesser than the table value which was significant at 0.001 level [21].

The 't' test revealed that, there is a significant difference between pre and post test level of upper respiratory tract infection symptom alleviation in control group. In order to find out the association between the post test level upper respiratory tract infection symptoms alleviation among children in intervention group with their selected socio demographic variables, chi square test was used. Chi square analysis reveals that there was statistically significant association between the post test level of upper respiratory tract infection

symptoms and the childrenwho were from Nuclear family ($\chi2$=6.13), (p=0.02),Children living in tiled and concrete house ($\chi2$=6.15), (p=0.05). No other variable was not associated to the post test level of upper respiratory tract infection symptoms among children in intervention group [21].

In order to find out the association between the post test level upper respiratory tract infection symptoms alleviation among children in intervention group with their selected clinical variables chi square test was used. Chi square analysis reveals that there was statistically significant association between the post test level of upper respiratory tract infection symptoms and the children with I^{0}malnutrition ($\chi2$=6.98), (p=0.03). Whereas children who were had other degree of malnutrition were not associated to the post test level of upper respiratory tract infection symptoms alleviation among children in intervention group.

In order to find out the association between the post test level upper respiratory tract infection symptoms alleviation among children in control group with their selected socio demographic variables, chi square test was used. Chi square analysis reveals that there was no statistically significant association between the post test level of upper respiratory tract infection symptoms alleviation among childrenin control group with their selected socio demographic variables [11].

In order to find out the association between the post test level upper respiratory tract infection symptoms alleviation among children in control group with their selected clinical variables, chi square test was used. Chi square analysis reveals that there was no statistically significant association between the post test level of upper respiratory tract infection symptoms alleviation among childrenin control group with their selected clinical variables [21].

CONCLUSION

The statistical evidence of the study proved that the children with upper respiratory tract infections are needed interventions for the alleviation of upper respiratory tract infection symptoms. The nochi leaves inhalation to the children with upper respiratory tract infections was effective in alleviating the symptoms. Therefore the investigator felt more importance should be given for nochi leaves inhalation to alleviate the upper respiratory tract infection symptoms among children.

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