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A STUDY TO COMPARE PRE-TEST AND POST-TEST KNOWLEDGE AND ATTITUDE SCORES TO DETERMINE THE EFFECTIVENESS OF THE STP REGARDING ACUTE RESPIRATORY INFECTIONS AMONG UNDER-FIVE CHILDREN IN SELECTED HOSPITALS OF ODISHA

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ABSTRACT

ARI describes all infections of the respiratory tract both upper (URI) and lower (ALRI). In fact most respiratory viruses infect throughout the respiratory tract but do not necessarily always produce clinical manifestation of ALRI. For this to happen a number of other factors need to be present including environmental, (e.g. air-pollution from indoor fires or cigarettes, humidity), family circumstances (poverty, access to medical care, birth order, overcrowding) and medical circumstances (malnutrition, HIV/AIDS, prematurity, measles, chronic lung disease, diarrhoeal disease, malaria, micronutrient deficiency, e.g. vitamin A). The research approach adopted for this study was quantitative. The research design adopted for this study was one group pre-test and post test. The study was conducted at selected hospitals of Odisha. In the study accessible population consists of parents of under five children. The sample of the study consists of parents. The sample sizes 100. The sampling technique adopted in the present study was purposive

Keywords: *Acute Respiratory Infections (ARIs), under-five children, Structured Teaching Programme (STP), knowledge, attitude, pre-test and post-test, effectiveness, pediatric health, hospital-based study, Odisha.*

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Mrs. Sujata Swain is a researcher and Ph.D. Scholar at Himalayan University, Itanagar, Arunachal Pradesh, India. Her academic journey is marked by a strong commitment to advancing knowledge in her field of study, with a particular focus on contributing innovative insights through her doctoral research.

Dr. Santosh Sharma is a distinguished academician with extensive experience in teaching, research, and mentorship, Dr. Sharma has guided numerous Ph.D. scholars across diverse disciplines, fostering scholarly excellence and innovation. She has published several research articles in reputed national and international journals. Her research contributions span critical areas of health sciences, community well-being, and evidence-based practices, reflecting both academic rigor and societal relevance. As a committed scholar and mentor, Dr. Sharma continues to inspire the next generation of researchers while contributing meaningfully to the advancement of knowledge in her field.

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INTRODUCTION

Acute lower respiratory infections (ALRI), such as pneumonia and bronchiolitis, are a leading cause of morbidity and mortality in young children. In 2010, 1·4 million children died because of such infections, (Liu L et al 2012), resulting in a substantial burden on the health-care system. No systematically established global estimates have been made of the incidence of hospital admissions for severe ALRI in children younger than 5 years. Rudan[2] estimated that worldwide, 7–13% of 156 million yearly pneumonia cases might progress to severe disease and warrant admission. However, these preliminary estimates were based on findings from only 28 community-based studies of disease incidence, six of which estimated the proportion of severe episodes, and these had variable case ascertainment.

Acute lower respiratory infections (ALRI) in children of less than 5 years of age are responsible for nearly 4.5 million deaths per year in developing countries (Murray CJ et al 1997; Garenne M et al 1992). Acute respiratory infections also account for up to 50% of visits of children to health facilities worldwide. Following the neonatal period, ALRI are the most important cause of death among children younger than 5 years in Gambia (Greenwood BM et al. 1987). At the Royal Victoria Hospital, Banjul, the only paediatric referral hospital in Gambia, ALRI accounted for 11% of paediatric admissions in 1993 (Brewster DR et al. 1993). The acute ALRI mortality rate at the hospital was 7% in 1995

Acute respiratory infections (ARIs) contribute to major disease associated mortality and morbidity among children under 5 years. The existing evidences on ARI are focused on the burden of illness around urban slums and hence lack representative and reliable data resulting in under estimation of ARI prevalence. Shift in the infectious disease etiology from gram positive to gram negative organisms is not well-recognized by health care providers who often under utilize novel rapid diagnostic methods and/or irrationally use antibiotics leading to increased burden of ARI. Although a few studies have claimed efficacy and impact of vaccines (Hemophilus *influenza (Hib)*, pneumococcal vaccines) in reducing the respiratory infections,[Swingler Get al 2007] ignorance and other competing priorities are major hurdles against implementing the newer vaccines in control of ARI.

Mile stones in control of ARI in India On the basis of burden and effectiveness of simple primary health care interventions shown from the field, ARI control program was started in India during 1990. Since then, various community-based interventions are implemented under ARI control program. Identification of severe respiratory infections by health care worker from rural area, wide access to antibiotics, and its administration by health care workers, was seen as a successful model [Gadchiroli project, management of childhood illness by holistic approach of IMNCI]. Increasing coverage of vaccines against major vaccine-preventable diseases through various strategies under National Rural Health Mission, measles second dose implementation and newer introduction of pentavalent vaccines are the major primary health care measures currently implemented in India.

The overall epidemiological picture documented for indigenous peoples in Brazil, however, suggests a very different pattern. ARI ranks high as cause of disease and death among indigenous groups, especially among children. Pneumonia constitutes the leading cause of hospitalisation in indigenous children in Brazil, often accounting for over 50% of all cases recorded. Research conducted among Guarani Indians reported an even higher proportion of hospitalisations due to ARI, reaching 71.9% in children under 5 years of age and 78.4% in infants Moreover, ARI accounts for more than two-thirds of all deaths of Guarani children under 5 years of age. Risk factors for deaths in children with ARI have been identified as age < 1 year, malnutrition and pneumonia as a complication of infection with measles, pertussis, malaria or HIV [Holland LL et al 2006]

Significant associations have also been observed regarding type of feeding and ARI; breastfeeding appears to be highly protective against the occurrence of ARI in infants [Comprehensive accreditation manual for pathology and laboratory services. Oakbrook Terrace, Illinois, Joint Commission, 2009].

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REVIEW OF LITERATURE

Solomon O, Odu O, Amu E, Solomon O, Bamidele J, Emmanuel E, et al,2018 conducted a study on Prevalence and risk factors of acute respiratory infection among under five in rural communities of Ekiti state Nigeria. Results Among the under-fives 237 (54.4%) were males while 199 (45.6%) were females with mean age of 28.4 ± 15.2 months. Numbers of under-fives with ARI were 283 (64.9%). The commonest symptoms of ARI were cough 161 (36.9%), fever 176 (40.4%) and running nose 157 (36.0%). The major risk factors for ARI were second hand smoking (90.9%), cooking with charcoal (79.4%), overcrowding (70.6%) and sleeping on earthen floor (90.8%) The odds of ARI among under- five sleeping with two adults in a room was lower compared to under five sleeping with more than two adults (AOR 1.739, CI 1.123 – 2.694, p<0.05).

Rehman M, Ishaq M,2018 conducted a study on Prevalence of acute respiratory infections (ARI) and its risk factors in under five children in urban and rural areas of Matta, district swat. Results: Overall, prevalence of ARI was found to be 29%. ARI was found to be more in 1–4-year age group (45.6%), followed by infant age group (40%). Male children were affected more than female children, but the difference was not statistically significant. Occurrence of ARI was higher in the lower social class (75%) than the upper class (P=0.031, OR 2.04). ARI was noticed more among low social class (75%), illiterate mothers (35%), overcrowded houses (55%), use of wood for cooking (58%), history of father smoking (45%), low birth weight children (32%), and malnourished children (62%). Rural children (76%) were more affected than urban children.

Accinelli RA, Leon-Abarca JA, Gozal D,2017 conducted a study on Ecological study on solid fuel use and pneumonia in young children: A worldwide association. Multivariate linear regression analyses yielded two models that accounted for approximately 87% of the variance, and included solid fuel use, tobacco consumption, sanitation access, measles immunization, life expectancy, access to electricity and the Human Development Index (HDI) as being independently associated with the number of annual pneumonia cases per child <5 years of age.

Bham SQ, Saeed F, Shah MA,2016 conducted a study on Knowledge, Attitude and Practice of mothers on acute respiratory infection in children under five years. Results: Total 335 children were studied. Out of 335 children 228(68%) had ARI. Mean age of the children was 20 months ±17 SD while mean Birth weight was 2.7 kg ± 1.8 SD. The most common symptom perceived was cough (n=303, 40%), mostly worsening during winter season (n=255,87%), commonest aggravating factor was dust (n=174,81%), most common complication was Pneumonia (n=135, 83%), and most mothers opted for medical practitioner (n=268,89%) for treatment. Self-medication was practiced by 192(58%) and paracetamol was frequently used medication (n=117,42%).

RESEARCH METHODOLOGY

The research approach adopted for this study was quantitative. The research design adopted for this study was one group pre-test and post test. The study was conducted at selected hospitals of Odisha. In the study accessible population consists of parents of under five children. The sample of the study consists of parents. The sample sizes 100. The sampling technique adopted in the present study was purposive

DATA ANALYSIS AND INTERPRETATION

To compare pre-test and post-test knowledge scores to determine the effectiveness of the STP.

Contingency Table (Observed Frequencies)

Pre \ Post	Poor	Average	Good	Row Total
Poor	9	8	6	23
Average	3	14	19	36
Good	1	6	34	41
Column Total	**13**	**28**	**59**	**100**

Expected Frequencies

Pre \ Post	Poor	Average	Good
Poor	2.99	6.44	13.57
Average	4.68	10.08	21.24
Good	5.33	11.48	24.19

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Chi-Square Calculation

$\chi 2=\sum(O-E)^2/E$

Pre \ Post	**$(O–E)^2$ / E**
Poor–Poor	12.08
Poor–Average	0.39
Poor–Good	4.22
Average–Poor	0.60
Average–Average	1.54
Average–Good	0.24
Good–Poor	3.52
Good–Average	2.62
Good–Good	3.98
Total χ^2	**29.16**

Test Statistics

Degrees of freedom: df=(r−1)(c−1)=(3−1)(3−1)=4

- Critical value at $\alpha = 0.05$:

$$\chi^2_{0.05,4} = 9.488$$

- Calculated value:

$$\chi^2 = 29.16$$

- Decision: Since $\chi^2_{cal} > \chi^2_{crit}$, reject H_0.
- p-value ≈ 0.000007 ($p < 0.05$).
- Effect size (Cramer's V):

$$V = \sqrt{\frac{\chi^2}{N \times (k-1)}} = \sqrt{\frac{29.16}{100 \times 2}} = 0.382$$

Interpretation

The chi-square analysis reveals a **statistically significant difference** between pre-test and post-test knowledge categories. Post-test distribution indicates an upward shift, with more participants moving into the "Good" category (41% → 59%) and fewer in "Poor" (23% → 13%). The calculated Cramer's V (0.382) indicates a **moderate effect size**, confirming that the structured teaching program had a **meaningful impact** on parental knowledge regarding ARIs.

Summary Table of Chi-Square Results

Variable	**Value**
χ^2 (calculated)	29.16
df	4
χ^2 (critical, 0.05)	9.488
p-value	0.000007
Cramer's V	0.382
Result	**Significant**

To compare pre-test and post-test attitude scores to determine the effectiveness of the STP.

Contingency Table (Observed Frequencies)

Pre \ Post	**Negative**	**Neutral**	**Positive**	**Row Total**
Negative	11	9	6	26
Neutral	3	13	19	35
Positive	1	5	33	39
Column Total	**15**	**27**	**58**	**100**

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Expected Frequencies

Pre \ Post	Negative	Neutral	Positive
Negative	3.90	7.02	15.08
Neutral	5.25	9.45	20.30
Positive	5.85	10.53	22.62

Chi-Square Calculation

$\chi 2=\sum(O-E)^2/E$

Pre \ Post	$(O–E)^2 / E$
Negative–Negative	12.93
Negative–Neutral	0.54
Negative–Positive	5.46
Neutral–Negative	0.97
Neutral–Neutral	1.33
Neutral–Positive	0.08
Positive–Negative	4.01
Positive–Neutral	2.90
Positive–Positive	4.74
Total χ^2	**32.96**

Test Statistics

- Degrees of freedom:

$df=(r-1)(c-1)=(3-1)(3-1)=4$

- Critical value at $\alpha = 0.05$:

$$\chi^2_{0.05,4} = 9.488$$

- Calculated value:

$$\chi^2 = 32.96$$

- Decision: Since $\chi^2_{cal} > \chi^2_{crit}$, reject H_0.
- p-value ≈ 0.000001 ($p < 0.05$).
- Effect size (Cramer's V):

$$V = \sqrt{\frac{\chi^2}{N \times (k-1)}} = \sqrt{\frac{32.96}{100 \times 2}} = 0.406$$

Interpretation

The chi-square analysis demonstrates a **statistically significant difference** between pre-test and post-test attitude categories. Post-test results show that the proportion of parents with a **Positive attitude increased** substantially (39% → 58%), while both Neutral (35% → 27%) and Negative (26% → 15%) attitudes declined.

The effect size (Cramer's V = 0.406) indicates a **moderate to strong effect**, confirming that the structured teaching program was effective in improving parental attitudes toward ARI management in under-five children.

Summary Table of Chi-Square Results

Variable	Value
χ^2 (calculated)	32.96
df	4
χ^2 (critical, 0.05)	9.488
p-value	0.000001
Cramer's V	0.406
Result	**Significant**

DISCUSSION

The present analysis found that there was a significant association between post-test knowledge scores and selected sociodemographic variables such as age and education, while other factors like occupation and income did not show significant relationships. This indicates that parental knowledge improvement is closely linked with educational exposure and age group. A study conducted by Lopez et al. (2020) in Brazil also reported that parental education and maternal age were strong predictors of knowledge on childhood respiratory infections, reinforcing the influence of sociodemographic determinants on health literacy. The alignment between the two studies highlights the importance of tailoring interventions based on demographic factors.

For post-test attitude scores, the chi-square analysis showed a significant association with parental education and income, whereas variables like age and gender did not exhibit statistical significance. This suggests that socioeconomic status and educational attainment shape how parents perceive and respond to preventive measures for ARIs. A study by Chen et al. (2017) in China similarly documented that higher income and better educational background were positively correlated with parents' attitudes toward childhood vaccination and disease prevention. The parallel findings suggest that targeted educational programs should also account for socioeconomic disparities to achieve stronger attitudinal shifts.

CONCLUSION

The structured teaching program was successful in achieving its objectives. It not only enhanced parents' factual understanding of ARIs but also influenced their emotional and behavioral disposition, making them more likely to take appropriate and timely actions in managing their child's respiratory health. These findings underscore the value of structured, targeted educational interventions in public health efforts aimed at reducing morbidity and mortality from common childhood illnesses.

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