



Intervention For Community Acquired Pneumonia- A Pilot Study Report

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ABSTRACT

Introduction: Respiratory issues encompassing a range of conditions, stand as a prominent factor driving the mortality and morbidity in children. Among these, pneumonia assumes a significant role, accounting for 16% of mortality in children. Instilling awareness through Information, Education, and Communication (IEC) initiatives targeting mothers of children under the age of five becomes indispensable, ensuring timely engagement with healthcare services. The primary objective of this pilot version of the study is to assess the feasibility of Community-Based Intervention on health-seeking behaviour, knowledge, and practice measures concerning management and prevention of pneumonia in children.

Methodology: The pilot study replicated the procedures of the main study. The investigation took place in two villages, each randomly designated as experimental group and control group. A total of 12 mothers with under-five children who were affected by community-acquired pneumonia, were chosen using a simple random technique from experimental and control group. Mothers were interviewed using a structured questionnaire that focused on health-seeking behaviour, knowledge, and practices related to management and prevention of pneumonia. The mother's in the experimental group received community-based intervention and those in the control group practice the routine. The post test data were collected from the mothers in both groups at 2nd, 4th, and 6th months of intervention. The data analysis was made using SPSS software version 28.

Results: The Mann Whitney test and Kruskal wallis analyses indicated a notable and statistically significant shift in health-seeking behavior, knowledge, and practices pertaining to management and prevention of pneumonia in children ($P < 0.05$) among mothers of under-five children in experimental group than control group.

Conclusion: The community-based intervention is a need of an hour to prevent the mortality and morbidity in children. The report of the pilot study shows that the study is feasible to proceed.

INTRODUCTION

Respiratory issues significantly contribute to both child mortality and morbidity. A range of respiratory problems affect the under five children, where pneumonia being the most prevalent among them. Pneumonia involves the consolidation and exudation of lung tissue. Several factors contribute to the onset of childhood pneumonia, including seasonal variations, inadequate ventilation, substandard living conditions,

cross-infections, low immunity, and insufficient child care. The prevention of community-acquired pneumonia relies heavily on the role of caregivers, particularly mothers [1].

Pneumonia in children is a preventable condition and is possible through immunization, adequate balanced nutrition and with hygiene environment [2]. WHO's global prevention of Pneumonia and Diarrhea in children put forth its recommendations to enhance



access to health care, improve nutrition, promote exclusive breastfeeding and upgrade the living condition that contributes to reduction in the burden of childhood pneumonia. It also suggested that the counselling interventions at the door step of the Pneumonia and Diarrhoea are the twin diseases that are considered as major killers which accounts for 29% of deaths in under-five children. Globally, every year almost 2 million under-five children were died due to Pneumonia [4]. The major challenge and regional inequities focused in low and middle income countries as compared to high income countries were 81% of death due to severe pneumonia occurred outside the hospital and was mainly because of delay in access to health care services [5]. In addition to the mortality, pneumonia contribute to morbidity in children due to long term chronicity of lung dysfunction. The severe or recurrent pneumonia resulted in chronic impairment of lung tissue [6]. Most of the lower respiratory tract infections go uncomplicated but when the complications occur they can be serious complications such as congestive heart failure, respiratory failure or arrest, sepsis which results in collapse and lung abscesses. Usually, under-five children are most vulnerable group for development of complications [7]. A Retrospective study along with time series research scrutinized underline factors of incidence and occurrence of pneumonia in children (1-59 months of age) such as seasonality, climate region from 243,000 verbal autopsies, reported that, Streptococcus Pneumonia was a main cause for 40,600 deaths, 20,700 deaths were due to RSV and 12,600 were due to influenza. Low socio economic (51%), Poor Vaccination Status (61%) and Low Knowledge, Attitude and Practice related to prevention and Management of pneumonia among Mothers (63%) and poor sanitary Habits of children (55%) were the responsible factors identified [8].

In one of the cross-sectional study it was reported that a significant portion of mothers (41.3%) possessed fair knowledge about pneumonia, while 41.5% exhibited a fair perception of the disease. It also identified a noteworthy association between mothers' age, education level, knowledge, and perception regarding childhood pneumonia. Additionally, a significant correlation exists between the level of knowledge and the fair perception of childhood pneumonia [9].

The perception and healthcare-seeking behaviours of mothers for their under-five children in rural Bangladesh revealed that a majority of rural mothers lacked sufficient and accurate knowledge and perceptions concerning childhood pneumonia. Alarming, many of these mothers did not seek appropriate care even when their children were suffered with severe or very severe pneumonia. It recommended the implementation of health education initiatives,

community and in health care facilities like health centers and hospitals for the needy would be helpful to bring down the incidence of community acquired pneumonia [3].

either at the household or community level, or through mass education campaigns thereby to disseminate the information so as to warrant immediate treatment at healthcare facilities [10].

Though the government has initiated many health care facilities for the children, to reduce the disease burden, its reachability matters a lot. Lack of awareness of the facilities available, lack of knowledge on identification, management and prevention of pneumonia, Lack of consistent practice of household and environmental hygienic measures of mothers pose a threat to Community Acquired Pneumonia in under-five children [9]. Based on the gaps identified the study was proposed to identify the impact of intervention for health seeking behaviour, knowledge and practice of mothers with under-five children on Community Acquired Pneumonia. As a pilot version the study was conducted in small scale to check the feasibility of the intervention.

METHODOLOGY

Institutional Ethical Clearance was obtained from Government Medical College, Hassan. The study was conducted in selected village of Hassan district. For the pilot study, the intervention group was allotted through random assignment. From each village the mothers of under-five children with pneumonia were selected using simple random sampling. The total sample inflicted for the main study was 60 in each group. For this pilot version, as a rule of one tenth of sample was selected (i.e 6 mothers in each group). Mothers of under-five children who were diagnosed with pneumonia, who can understand and communicate in Kannada were included for the study. The study carefully excluded mothers of children suffering from severe pneumonia or other respiratory illnesses to maintain precision.

The mothers were interviewed using structured questionnaire. The questionnaire was developed by the investigator initially in English and translated to Kannada and retranslation was made for their accuracy. The reliability of the Healthcare seeking behaviour and Practice checklist was assessed using inter-rater reliability method and found to be reliable ($r=0.74$ & $r=0.76$). Whereas split half method was used for the knowledge questionnaire with $r=0.74$. The validity of the questionnaire was obtained from the domain experts. The structured questionnaire includes four parts. Part A dealt with Baseline variables of mother and child, Socio Economic variables, Variables related to environmental hygiene. Part B dealt with Healthcare seeking Behaviour checklist (7 items), Part C includes the Knowledge on Management and Prevention of



Pneumonia in children (26 items) which contains Multiple Choice Questions and Part D examines the Practice checklist for mothers on personal hygiene, environmental hygiene, hand washing and steam inhalation (20 items).

Followed with pre-test data, the intervention was given for the mother at their doorstep using flash cards to enhance their knowledge on management and prevention of pneumonia, Danger signs of pneumonia and hygienic measures and demonstrated the method of hand washing and steam inhalation. Mothers were instructed to follow the intervention for a week and post test was conducted after 2 months, 4 months, and 6 months from the pre-test. The collected data was analysed using SPSS software version 28. The categorical data were discussed using frequency and percentage, whereas the continuous data were explained using mean, median and median rank. The comparison within the group was carried out using Kruskal Wallis and between groups was by Mann Whitney U test.

RESULTS

As the sample size was small Non parametric tests were used for the analysis. In the table 1, Fisher exact test for the demographic characteristic of mothers of under-five showed similarity between the groups in terms of all the included characteristics. Similarly, the table 2, which showed comparison of health care-seeking behaviour between the experimental and control group using Mann Whitney U test revealed a significant difference ($P < 0.05$) between post-test mean ranks of experimental and control group. Significant changes in the health care seeking behavior of mothers in experimental group was observed in taking decision about child treatment, type of utilization of health services and onset of symptom

and reasons for delay in seeking health care. This infers that the intervention was effective in improving Health seeking behavior of mothers of under-five children with pneumonia in experimental group.

Further, it was noticed that after the intervention the Parents and Health worker were the Decision Makers in the experimental group. Whereas, in the control group the decision makers were still the grant parents ($P < 0.05$). The mothers in the control group seeks health care services once the child was affected with pneumonia. Moreover, Private Clinic was utilized for the health services by the mothers in experimental group. Government and Private Hospitals were utilized for health services by the mothers in control group ($P < 0.05$). The experimental Group mothers seek health care for their children within 2 days of illness than the control group. The cost of consultation and treatment, both parents are working and long waiting time were the reasons for delay in seeking health care among mothers in experimental group. Appointment issues and no competent physician were the reasons for delay in seeking health care in control group.

The Knowledge of mothers in pretest was computed using mean rank and it was 5.83 for mothers in experimental group and 7.17 for mothers in control group. The mean rank values were compared between the groups using Mann Whitney (U- 14, $P > 0.05$) test which did not reveal significant difference in knowledge before the intervention between the groups and were comparable. In the similar way, pre-test mean rank for practice was 5.17 for mothers in the experimental group and it was 7.83 in the control group. Here also, the analysis did not revealed significant difference (U- 10, $P > 0.05$) in practice level between the groups and hence the groups were comparable.

Table 1: Distribution of Socio demographic variables between Experimental and Control Group.

Socio demographic Variables	Experimental Group f (%)	Control Group f (%)	Fisher Exact value
1. Age of the mother			0.5
a. 20-25years	2(33.33)	4(66.67)	
b. 26-30years	3(50)	2(33.33)	
c. 31-35years	0	0	
d. Above35years	1(16.7)	0	
2. Religion			1
a. Hindu	5(83.3)	5(83.3)	
b. Christian	0	0	
c. Muslim	1(16.7)	1(16.7)	
3. Type of family			1
a. Nuclear	3(50)	3(50)	
b. Joint	3(50)	3(50)	
4. Monthly income of the family			1
a. Rs.47,348 and above	1(16.7)	1(16.7)	
b. Rs.23,674-47,347	1(16.7)	1(16.7)	
c. Rs. 17,756-23,673	0	0	
d. Rs.11,837-17,755	2(33.3)	2(33.3)	
e. Rs. 7102-11836	1(16.7)	1(16.7)	



f. Rs. 2391-7101	1(16.7)	1(16.7)	
5. Educational status of the mother.			
a. Illiterate.	1(16.7)	1(16.7)	
b. Primary education	1(16.7)	1(16.7)	
c. High-school education	2(33.3)	2(33.3)	
d. Higher secondary Education	1(16.7)	1(16.7)	1
e. Diploma and above	1(16.7)	1(16.7)	
6. Occupation of the mother			
a. Semiskilled worker	2(33.3)	2(33.3)	
b. Unskilled worker	2(33.3)	2(33.3)	
c. Unemployed	2(33.3)	2(33.3)	1
7. Number of children			
a. One	2(33.3)	2(33.3)	
b. Two	4(66.67)	4(66.67)	1
8. Experience of Respiratory Infections			
a. Yes	2(33.3)	2(33.3)	
b. No	4(66.67)	4(66.67)	
			1
Socio demographic Variables	Experimental Group f(%)	Control Group f(%)	Fisher Exact value
9. Source of information			
a. News paper	1(16.7)	1(16.7)	
b. Mass media	0	0	1
c. Health professional	4(66.67)	4(66.67)	
d. Family members	0	0	
e. Others	1(16.7)	1(16.7)	
10. Immunization status as on age			
a. Yes	5(83.3)	5(83.3)	1
b. No	1(16.7)	1(16.7)	
11. Type of house			
a. Pucca	3(50)	5(83.3)	
b. Semi-pucca	2(33.3)	0	1
c. Katcha	1(16.7)	1(16.7)	
12. Presence of Separate Kitchen			
a. Yes	5(83.3)	5(83.3)	1
b. No	1(16.7)	1(16.7)	
13. Information about environmental health issue.			
a. Local news paper	1(16.7)	1(16.7)	
b. Social media	1(16.7)	1(16.7)	1
c. Healthcare provider	4(66.67)	4(66.67)	
14. Using a woods to vein our home			
a. Yes	3(50)	3(50)	1
b. No	3(50)	3(50)	
15. Presence of Exhaust Fan in Kitchen			
a. Yes	5(83.3)	5(83.3)	1
b. No	1(16.7)	1(16.7)	

P>0.05 - Non Significant

Table 2: Comparison of Health seeking Behavior between experimental and control group in the posttests

Socio Demographic Variables	Median Rank-EG	Median Rank-CG	U value	P value
1. Recently seek health care facility				
a. Yes	5.5	3.5	0.4	0.3
b. No	3.5	5.5	0.4	0.3
2. Decision about child Treatment				
a. Previous experience	2.5	6.5	0	0.01
b. Parents	6	3	2	0.04
c. Grand parents	2.5	6.5	0	0.01



d. Health worker	6	3	2	0.04
3.Type of Preferences				
a. Allopathic medicine	5.12	3.88	5.5	0.43
b. Alternative medicine	4.5	4.5	8	1
c. Traditional healers	4.5	4.5	8	1
4. Type of Utilization of Health Service				
a. Government hospitals	2.5	6.5	0	0.01
b. Government clinics	4.5	4.5	8	1
c. Private hospitals	2.5	6.5	0	0.01
d. Private clinic	6.5	2.5	0	0.01
5. Stage of illness on admission				
a. Breathing difficulty	5	4	6	0.68
b. Episodes of cough	5	4	6	0.68
c. Chest in drawing	4	5	6	0.68
d. Refusal of feeds	4.5	4.5	8	1
e. Fever	2.5	6.5	0	0.08
f. Vomiting	4.5	4.5	8	1
6. Onset of symptom and seeking health care				
a. After 1 to 2 days	6	3	2	0.04
b. After 3 to 4 days	3	6	2	0.04
7. Reason for delay in seeking health care				
a. Cost of consultation and treatment	6	3	2	0.04
b. Both parents are working	6.5	2.5	0	0.01
c. Long waiting time	6.5	2.5	0	0.01
d. Appointment issues	2.5	6.5	0	0.01
e. No competent physician nearby	2.5	6.5	0	0.01
f. Others specify	2.5	6.5	0	0.01

EG- Experimental Group, CG- Control Group

Table 3: Effectiveness of Intervention on knowledge regarding management and prevention of pneumonia in children

Assessments	N	Experimental Group Mean Rank	Value	Control Group Mean Rank	Value
Pre-test	6	3.5	19.5 P<0.001	8.92	2.89 P>0.05
Post-test 1	6	10.5		11.92	
Post-test 2	6	20.5		15.42	
Post-test 3	6	15.5		13.75	

Table 3, compared the mean rank of knowledge in different point of assessment using Kruskal wallis test. It revealed a significant difference (19.5 $P<0.001$) in knowledge of mothers in experimental group on management and prevention of pneumonia after the intervention in different point of post assessment. This

infers that the intervention was effective in improving the knowledge. However, the mothers in the control group who practices the routine care did not showed any improvement (2.89, $P>0.05$) in their knowledge in the post assessments.

Table 4: Effectiveness of Intervention on practice regarding management and prevention of pneumonia in children

Data Points	N	Experimental Group Mean Rank	Value	Control Group Mean Rank	Value
Pre-test	6	3.5	20.188 P<0.001	10.25	0.677 P>0.05
Post-test 1	6	11.33		11.92	
Post-test 2	6	13.67		12.67	
Post-test 3	6	21.5		15.17	



The table 4, depicted the statistically significant difference (20.18, $P < 0.001$) in the practice of mothers regarding management and prevention of pneumonia after the intervention at different time of post assessment revealed that the intervention was effective in the experimental group. Whereas, the practice of mothers in the control group was not significantly different (0.677, $P > 0.05$) in the post assessments. The post-test mean rank values compared between the control groups. This revealed no notable change in their practice regarding management and prevention of pneumonia in children.

Further analysis showed that there was no significant association exists between the pretest knowledge and practice with selected socio demographic variables.

DISCUSSION

Baseline Data of mothers of children with pneumonia

The baseline data provided a comprehensive understanding of the socio-demographic variables among mothers of under-five children with pneumonia in both experimental and control group. This information is crucial in assessing the initial similarities and differences between the groups, ensuring a balanced starting point for any intervention or study.

The socio demographic variables characteristics both experimental and control group are same. The obtained Fisher exact value showed non-significant difference in the distribution. Hence the both groups are homogeneous.

As a result of it, in experimental and control group around fifty percentages were 26-30 years. Majority of them were Hindus. Fifty percentages of them from nuclear family and fifty from joint family. Around one third of them monthly income were Rs.11837-17755 and their educational status is in high school education category. Equally the mother's occupational status categorized into skilled, semi-skilled and un-skilled. Most of them having two children. Majority of them received the information from health professionals. Mostly all the children immunized. Equally the mothers were residing in pucca and kacha house. Most of the health related information of mothers received from health care provider. Majority of them having exhaust fan in their kitchen.

The pre-test value shows that in both experimental and control group was same in both knowledge and practice. Mann Whitney U test analysis shows that both are same level of mean rank and there is no significant difference ($P > 0.05$) A study conducted in Pune city to assess the knowledge regarding pneumonia among 100 parents of under-five children supports the present study findings. Similar demographic characteristics were observed in which, majority of mothers were in the age-group of 25-30yrs of age (59%), 54% of them were from nuclear

family, 41% of mothers were with secondary education, 25% of mothers were in self-service, 36% of fathers had secondary education and 53% of fathers were with self-services.

Overall, the baseline data demonstrates a striking similarity in socio-demographic characteristics, pre-test values, and healthcare-related variables between the experimental and control groups. This homogeneity lays a robust foundation for subsequent comparative analyses, ensuring that any observed changes or outcomes can be more confidently attributed to the intervention or control measures rather than initial group disparities.

The current study observed improvement in the health seeking behaviour, knowledge and practice after the implementation of the intervention for mothers of under-five children in the experimental group in comparison with mothers of under-five children in control group who practices the routine care for their children affected with pneumonia. Similar findings were found in the study conducted in Lucknow, in which, the facility based intervention compared with village based intervention on pneumonia and found that the village based intervention (79.3%, $P < 0.01$) was effective than the facility based intervention (68.9%, $P < 0.005$). In another study conducted by Purnima Sahoo and colleagues reported that in the pre intervention the mothers had poor knowledge whereas, in post-intervention, the knowledge level showed significant improvement and this supports the present study findings [11].

In this pilot version of the study higher statistical analysis could not be used because of small sample size. However, from this pilot study, the implementation of interventions at the community was feasible and practicable.

CONCLUSION

The outcome of the pilot test showed its feasibility and practicality. The study concludes that the interventions like Information, Education and Communication (IEC) and demonstration of practices at their doorstep for the mothers of under-five children with pneumonia will definitely bring down the incidence. The pilot version of the study acknowledges limitations due to the small sample size, restricting the use of higher statistical analyses. However, despite this limitation, the study found the implementation of interventions at the community level feasible and practical.

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