



Caregiver's Knowledge about Childhood Pneumonia: A Study from Rural Areas and Urban Slums of Lucknow

Anurag Minz¹, Monika Agarwal², Jai Veer Singh², Vijay Kumar Singh³, Rajesh Sahu⁴

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Author's Affiliation:

¹Junior Resident; ²Professor; ³Associate Professor; ⁴ICMR Research Fellow, Dept of Community Medicine, King George's Medical University, Lucknow

Correspondence

Dr. Anurag Minz
anuragminz0386@gmail.com

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ABSTRACT

Background: India bears highest burden of childhood morbidity and mortality due to childhood pneumonia. The study was conducted with aim to assess caregivers' knowledge about signs/symptoms of childhood pneumonia and their perception about its risk factors and preventive measures.

Methodology: This community based cross sectional study was carried out among 568 caregivers of 1065 under-five children. A pretested, semi-structured questionnaire was used to collect information about bio-social profile, caregivers' knowledge about signs & symptoms, danger signs, risk factors and preventive measures of pneumonia.

Results: Majority of the respondents (88.7%) identified "cough/cold" as sign and symptom of pneumonia, followed by "chest in-drawing" (85.7%) and "fast/difficult breathing" (77.8%). Only few caregivers (9.3%) perceived "fast/difficult breathing" as danger sign and only 12% and 16.1% respectively had adequate knowledge about risk factors and preventive measures of childhood pneumonia. The study found statistically significant association between parent's education status and knowledge about risk factors, preventive measures and ability to recognize early danger signs of childhood pneumonia.

Conclusions: The study identified significant lack of knowledge about childhood pneumonia among caregivers. Strengthening of IMNCI and community-based health education programs need to be promoted to ensure better health practices and appropriate care seeking for childhood pneumonia.

Keywords: Caregiver, Childhood pneumonia, Risk factors, Preventive measures, slum

INTRODUCTION

Worldwide, pneumonia is the leading and single most important cause of death among under-five children in developing countries.^{1, 2} Globally, pneumonia is responsible for about 19% of all under-five deaths.³ To reduce deaths among children under-five with pneumonia WHO/UNICEF identified three essential steps viz. firstly, recognize a child is sick; secondly, to seek appropriate care and thirdly to treat appropriately with antibiotics.³ Prognosis of pneumonia is good when early diag-

nosis and early initiation of the treatment are carried out in an appropriate time, otherwise it may lead to serious complications and may have fatal outcome.

Prompt and appropriate care seeking is difficult in developing countries due to poor availability of healthcare facilities.^{4, 5} Lack of education and knowledge about the danger signs and symptoms among the caregivers causes further delay in care seeking.^{6- 9} Results from UNICEF multiple indicator cluster surveys show that key pneumonia

symptoms (difficult and/or fast breathing) are not widely recognized: only about one in five caregivers recognize these danger signs.³ A study in Bangladesh found that most of the rural mothers could not recognise whether their child had pneumonia or not. Mothers bought their children in late stages of illness when they detected that their child either was not breathing properly or had convulsions or was unable to take or stopped taking food.¹⁰

Early recognition of the signs/symptoms by the caregivers is the most crucial step in providing effective management of pneumonia to the children.³ However, little is known about caregiver's knowledge of signs and symptoms, their perception about the causes, danger signs of pneumonia, risk factors and preventive measures from rural areas and urban slums in Uttar Pradesh.⁴ From this perspective, the present study was conducted to assess caregiver's Knowledge about signs and symptoms of pneumonia and their perception about danger signs, risk factors and preventive measures to be taken for childhood pneumonia.

MATERIALS AND METHODS

This community based cross sectional study was conducted in rural areas and urban slums of Lucknow district of Uttar Pradesh from September 2014 to August 2015. The district consists of eight rural community blocks and six municipal zones. As per Census 2011, the total population of the district was 45,89,838 with the majority (30,38,996 or 66.2%) of them living in urban areas. The average literacy rate was 77.29% with a female literacy rate of about 71%. The study population comprised of under-five children from the selected Slums/Villages. Only those households were included, where children aged between 02 months and 59 months were present.

The study employed a Multi-stage Random sampling technique to select the required sample size. Six slums were taken from urban areas and four villages taken from rural areas for equal representation in a random manner. Considering the prevalence of childhood pneumonia in Uttar Pradesh around 8% (NFHS-3), the final sample size was calculated to be 1118 (~1100) under-five children. These 1100 under five children were found in 583 households visited during house to house survey.

The data was collected using a pre-tested, semi-structured questionnaire. All the details of the study were briefed to the caregivers before the collection of the data and informed consent was taken. Throughout the process of data collection, privacy and confidentiality of information were ensured. The questionnaire had 4 main sections- i) Source of information for knowledge about pneu-

monia ii) Knowledge about signs& symptoms and its danger signs iii) Perception about risk factors iv) Perception about preventive measures. Caregiver's knowledge about risk factors and preventive measures was scored based on the numbers of their correct answers and then categorized into three grades; good, fair and poor.

Scoring for knowledge about risk factors and preventive measures:

Ten separate questions were asked to measure caregivers' knowledge about risk factors and preventive measures of childhood pneumonia. **Likert scale** was used to measure the answers. The score of 1 was given for each correct answer, and 0 for no answer or wrong answer. The maximum score was 10 for each category. Caregivers' knowledge was categorized as adequate (score: 8-10) and inadequate (score: less than 8).

The study was approved by King George's Medical University UP, Lucknow. Caregivers were informed about the purpose of study and informed Consent was taken before collection of the data.

A total of 583 caregivers of under-five children were interviewed during the survey. Out of these, 15 of the caregivers left the interview in between, so final analysis was done on 568 caregivers (250 from rural areas and 318 from urban slums). The collected data was cross checked for completeness and correctness. We used SPSS version 24 for analysis of data. Descriptive statistics such as mean, standard deviation (SD) & frequencies were used for the calculation of continuous variables and proportions were used for the categorical variables. P values were calculated to test the statistical significance at the 5% significance level. Chi Square test was used to determine the association between dependent and independent variables.

RESULTS

Biosocial characteristics of study population:

Majority of the caregivers were from joint families (62.9%). Nearly four fifths of them belonged to Hindu families (79.8%). Around 40% households were from ST/SC social group and the majority of them belonged to lower socio-economic class (79.9%). Mothers were main respondents (~71%) in both rural areas and urban slums, followed by grandparents (15.1%) and fathers (10.4%). The mean age of mothers was around 27 years (26.7±5.2). Majority of the mothers were illiterate (60.2%) and housewives (93.0%) by occupation. Majority of the fathers were illiterate (38.0%) and unskilled worker (62.3%) by occupation. A mean number of family members were 6.9±2.9 (mean±2SD).

Table 1: Caregiver's knowledge about causes, mode of transmission and source of information for childhood pneumonia

Characteristics	Urban (n=318) (%)	Rural (n=250) (%)	Total (n=568) (%)	p value
Ever heard about pneumonia				
Yes	300 (94.3)	237(94.8)	537 (94.5)	0.85
No	18 (5.7)	13 (5.2)	31 (5.5)	
Source of information about pneumonia*				
Family members	299 (94.0)	230 (92.0)	529 (93.1)	0.4
Doctor	56 (17.6)	49 (19.6)	101 (18.5)	0.58
Television	14 (4.4)	6 (2.4)	20 (3.5)	0.25
Health workers	5 (1.6)	12 (4.8)	17 (3.0)	0.04
News paper	1 (0.3)	1 (0.4)	2 (0.4)	1.0
Others	0 (0.0)	3 (1.2)	3 (0.5)	-
Knowledge about causes*				
Exposure to cold	301 (94.7)	223 (89.2)	524 (92.3)	0.01
Germs/microorganisms	47 (14.8)	34 (13.6)	81 (14.3)	0.71
Air pollution	44 (13.8)	35 (14.0)	79 (13.9)	1.0
Dust	41 (12.9)	26 (10.4)	67 (11.8)	0.43
Don't know	14 (4.4)	19 (7.6)	33 (5.8)	0.14
Others	0 (0.0)	6 (2.4)	6 (1.1)	-
Knowledge about mode of transmission*				
Playing with sick child	162 (50.9)	126 (50.4)	288 (50.7)	0.93
Not aware	141 (44.3)	115 (46.0)	256 (45.1)	0.73
Touching sick child	132 (41.5)	107 (42.8)	239 (42.1)	0.79
Sharing utensils with sick child	52 (16.4)	58 (23.2)	110 (19.4)	0.04
Others	5 (1.6)	9 (3.6)	14 (2.5)	-

*Multiple responses

Table 2: Caregiver's knowledge about sign/symptom and danger signs of childhood pneumonia in under-five children

Characteristics	Urban (n=318) (%)	Rural (n=250) (%)	Total (n=568) (%)	p value
Common sign and symptoms of pneumonia*				
Cough/cold	284 (89.3)	220 (88.0)	504 (88.7)	0.68
Chest in-drawing	271 (85.2)	216 (86.4)	487 (85.7)	0.71
Fast/difficult breathing	250 (78.6)	192 (76.8)	442 (77.8)	0.61
Fever	72 (22.6)	45 (18.0)	117 (20.6)	0.21
Don't know	33 (10.4)	24 (9.6)	57 (10.0)	0.78
Others	1 (0.3)	4 (1.6)	5 (0.9)	-
First sign to be present in pneumonia*				
Cough/cold	94 (29.6)	83 (33.2)	177 (31.2)	0.27
Chest in-drawing	81 (25.5)	61 (24.4)	142 (25.0)	
Fast/difficult breathing	66 (20.8)	55 (22.0)	121 (21.3)	
Don't know	50 (15.7)	41 (16.4)	91 (16.0)	
Fever	27 (8.4)	10 (4.0)	37 (6.5)	
Danger signs of pneumonia*				
Unable to eat/drink/breastfeed	250 (78.6)	173 (69.2)	423 (74.5)	0.01
Chest in-drawing	232 (73.0)	177 (70.8)	409 (72.0)	0.57
Vomits everything	111 (34.9)	72 (28.8)	183 (32.2)	0.12
Unconsciousness	119 (37.4)	59 (23.6)	178 (31.3)	0.01
Don't know	34 (10.7)	44 (17.6)	78 (13.7)	0.02
Fast/difficult breathing	36 (11.3)	17 (6.8)	53 (9.3)	0.08
Convulsions	21 (6.6)	19 (7.6)	40 (7.0)	0.74
Others	3 (0.9)	5 (2.0)	8 (1.4)	-

*Multiple responses

Accessibility to television by the households was 37.3% and 24.8% of households had radio or accessibility to FM through mobile phones. Only 1.3% of the caregivers in urban slums and 6.4% in rural areas had accessibility to the newspaper.

Mean age of children was 32.3±1.7 months (mean±2SD). Half of the children were females.

Sixty six percent children were fully immunized for the age, one fourth of the children was partially immunized for their age and 11.2% were unimmunized. Overall 59.4% of children were immunized for measles. About three fourth children in rural areas and about half of the children in urban slums had received measles immunization. Only

half of the children had received Vitamin A supplementation.

Knowledge about causes, mode of transmission and source of information for childhood pneumonia:

Knowledge about causes, mode of transmission and source of information for childhood pneumonia is shown in Table 1. Family members and neighbours were prime sources for information, however, utilization of health workers as a source of information was very low (only 3%). Most of the caregivers (92.3%) cited exposure to cold as for cause and perceived that sharing utensils among siblings is an important mode of transmission for childhood pneumonia which was found to be significant.

Caregiver’s Knowledge about Signs/ Symptom and Danger Signs of Pneumonia:

Caregivers quoted that if the child is unable to eat/drink and/or unconsciousness as important

danger signs (Table 2), even 13.7% had no idea about danger signs and these were found to be statistically significant which may influence care seeking.

Table 3: Level of knowledge about danger signs, risk factors and preventive measures of childhood pneumonia among caregivers of under-five children

Level of knowledge	Urban (n=318)(%)	Rural (n=250)(%)	Total (n=568)(%)
Recognition of early danger sign (fast breathing)			
Yes	36 (11.3)	17 (6.8)	53 (9.3)
No	282 (88.7)	233 (93.2)	515 (90.7)
About risk factors			
Adequate	28 (8.8)	40 (16.0)	68 (12.0)
Inadequate	290 (91.2)	210 (84.0)	500 (88.0)
About preventive measures			
Adequate	43 (13.5)	49 (19.6)	92 (16.2)
Inadequate	275 (86.5)	201 (80.4)	476 (83.8)

Score- Adequate- 8-10, Inadequate- <8

Table 4: Association of caregiver’s knowledge about danger sign, risk factors and preventive measures of childhood pneumonia with biosocial characteristics

Characteristics	Respondents	Know about danger sign		Know about risk factors		Know about preventive measures	
		No. (%)	p value	No. (%)	p value	No. (%)	p value
Area of residence							
Urban	318	36 (11.3)	0.06	28 (8.8)	0.009	43 (13.5)	0.05
Rural	250	17 (6.8)		40 (16.0)		49 (19.6)	
Religion							
Hindu	453	48 (10.6)	0.05	61 (13.5)	0.29	74 (16.3)	0.85
Muslim	115	5 (4.3)		7 (6.1)		18 (15.6)	
Social group							
General	119	18 (15.1)	0.04	24 (29.2)	0.008	33 (27.7)	<0.001
OBC	221	16 (7.2)		21 (9.5)		35 (15.8)	
ST/SC	228	19 (8.3)		23 (10.1)		24 (10.5)	
Type of family							
Nuclear	211	17 (8.0)	0.42	19 (9.0)	0.09	27 (12.8)	0.09
Joint	357	36 (10.0)		49 (13.7)		65 (18.2)	
Socio-economic status							
Low	560	50 (8.9)	0.03	63 (11.3)	0.001	89 (15.9)	0.12
High	8	3 (37.5)		5 (62.5)		3 (37.5)	
Mother’s educational status							
Illiterate	341	17 (4.9)	<0.001	24 (7.0)	<0.001	30 (8.8)	<0.001
Literate	227	36 (15.9)		44 (19.3)		62 (27.3)	
Mother’s occupation							
Housewife	527	51 (9.7)	0.41	65 (12.3)	0.45	88 (16.7)	0.37
Working	41	2 (4.9)		3 (7.3)		4 (9.7)	
Father’s educational status							
Illiterate	208	11 (5.3)	0.012	12 (5.8)	0.001	18 (8.7)	<0.001
Literate	360	42 (11.7)		56 (15.6)		74 (20.6)	
Father’s occupation							
Unemployed	7	1 (14.3)	0.49	0 (0.0)	1.0	0 (0.0)	0.6
Working	561	52 (9.3)		68 (12.1)		92 (16.4)	
Exposure to any kind of media							
Yes	212	23 (10.8)	0.33	32 (15.1)	0.07	56 (26.4)	<0.001
No	356	30 (8.4)		36 (10.1)		36 (10.1)	

Caregiver's level of knowledge about early danger sign, risk factors and preventive measures for childhood pneumonia:

Overall, caregivers had very poor knowledge about early danger signs (9.3%), risk factors (12.0%) and preventive measures (16.2%) of childhood pneumonia (Table 3). Low Birth Weight (56.2%) was perceived as an important risk factor for pneumonia with significant rural and urban difference (44.7% vs 67.6%). It was good to see that community was aware that immunization (80.9%) and hand hygiene (77.4%) are important factors for prevention of childhood pneumonia, but Vit A supplementation (only 1.7%) was not perceived important at all.

DISCUSSION

Our study highlights poor knowledge of caregivers regarding causes, mode of transmission, risk factors, early danger sign recognition and preventive measures of childhood pneumonia.

Other studies from developing countries also found that mothers or primary caretakers of pneumonic children had inadequate knowledge about pneumonia.¹¹⁻¹⁴ Our study found that the majority of respondents were aware of the term pneumonia but correct knowledge regarding the cause of pneumonia was very low. Common causes of pneumonia cited were exposure to cold (92.3%), germs/organisms (14.3%), air pollution (13.9%) and exposure to dust (11.8%). Similar results were found in a study from urban Multan, Pakistan which reported that 84% of the caretakers thought that pneumonia in children was caused by exposure to "thand", (cold).¹⁵ Another study from Thailand showed that only 21% of mothers answered all the questions correctly in term of causes and factors related to pneumonia.¹⁶ However, 57.8% of the mothers gave correct answers about germs as the cause of pneumonia. A study from rural Bangladesh also reported poor knowledge about pneumonia among mothers.¹⁷ Environmental factors such as dust particles, spread from coughing mother, and drinking cold water or playing with water were perceived as the causes for pneumonia.

In our study, more than 80% care givers identified cough/cold and chest in-drawing, followed by fast/difficult breathing (77.8%) and fever (20.6%) as signs and symptoms of pneumonia. In a study from Mirpurkhas, Pakistan fast breathing & chest in-drawing were reported symptoms for pneumonia by 59.4% mothers.¹⁷ A study from Lagos hospital, Nigeria also reported that about half of the participants correctly identified fast/difficult breathing as suggestive of pneumonia.¹⁸ Another study

from Pakistan also showed that prominent symptom mentioned for the recognition of pneumonia was difficulty in breathing (27%).¹⁹ A study from Mumbai, Maharashtra reported lack of knowledge among mothers about simple signs and symptoms of pneumonia.²⁰ Another researcher from New Delhi in his study reported that about 59.4% mothers recognized pneumonia by rapid breathing and 43.4% recognized by difficulty in breathing.²¹

About three fourth of caregivers in the present study identified fast/difficult breathing as a sign of pneumonia but only 21.3% could identify it as the 'first sign' or an early sign of pneumonia. Chest in-drawing and inability to drink or breastfeed were identified as danger signs of pneumonia by three fourth of the caregivers in a rural area as well as in urban slums. However, only 9.3% of caregivers identified fast/ difficult breathing as a danger sign of pneumonia. The study by **Wardlaw T et al** was in agreement with our study and reported that only one fifth of caregivers knew about danger signs of pneumonia viz. fast breathing (17%) and difficult breathing (21%).¹ **Anwar-ul-Haq et al** also reported similar findings that mother's awareness of danger signs of childhood illness was poor.²² In contrast **Ekure E N et al** reported that about half of the participants correctly identified fast/difficult breathing as suggestive of pneumonia.¹⁸

In this study, the mean time taken by caregivers to initiate treatment after recognition of the symptoms was 2.6+0.9 days (mean+2SD). Only 40% of the mothers of the children diagnosed with pneumonia had initiated treatment other than home remedies on the appearance of fast breathing while half of the mothers sought treatment on the appearance of chest in-drawing in the child. When asked about the reasons for this delay in initiating the treatment, the majority of mothers responded that they did not perceive fast breathing as a sign of the seriousness of the illness. This shows that most of the caregivers did not perceive fast breathing as a danger sign. **Firdous et al** found that most of the mothers could not recognize whether their child had pneumonia or not.¹⁰ Most of them waited to develop chest in-drawing to detect that their child had pneumonia.

Researchers in the present study observed that only 12% of caregivers had adequate knowledge about risk factors. In the study exposure to cold weather followed by malnutrition were most commonly cited risk factors for pneumonia. However, inadequate ventilation and smoking inside the house were identified as a risk factor by only one third of the mothers. Most (84.0%) of the caregivers also had inadequate knowledge regarding preventive measures for childhood pneumonia. No significant difference in knowledge was observed

between rural and urban slum caregivers. Only 16.2% of caregivers had good or adequate knowledge of preventive measures. **Siswanto E. et al** also reported that 19% of mothers had good knowledge, 66% of mothers had fair knowledge, and 15% had poor knowledge.¹⁶ Around 58% of mothers in the study gave the correct answers for all the questions in term of pneumonia prevention. Another researcher from Bhubaneswar, Odisha (by **Jena et al**) reported that more than half (52%) mothers had no knowledge regarding prevention of pneumonia.²³ A study from rural area of Mangalore (by **Asha D'Souza et al**) reported that the pre-test knowledge score was adequate for 14% of mothers and 84% had average knowledge on prevention and management of respiratory tract infection.²⁴ Routine immunization was identified as one of the preventive measures by 88% of the rural caregivers and 73% of the caregivers from urban slums. However, a wide gap was observed in knowledge and practice with only sixty percent of the children found to be appropriately immunized for their age at the time of interview. Previous findings from the same study also highlight the significant gap in the utilization of existing services, provider practices as well as family practices in seeking care.²⁵ No difference in knowledge of caregivers from a rural area and urban slums was observed but knowledge about risk factors and preventive measures was significantly higher in households with literate mothers and fathers. For only 3% of caregivers, health workers were a source of information about pneumonia. 40% of the caregivers reported any kind of media exposure but media role was negligible as a source of information in both rural and urban slum areas.

CONCLUSIONS

Most of the caregivers both from rural as well as urban did not have adequate knowledge of causes of pneumonia, mode of transmission, risk factors and preventive measures of childhood pneumonia. Their knowledge about early and danger signs of pneumonia was also quite low.

RECOMMENDATIONS

Caregiver's inability to recognise early signs of pneumonia is known to be a very important factor in increasing severity of the illness or fatal outcome. To reduce the rate of incidence of childhood pneumonia, adequate knowledge regarding the early signs and symptoms, risk factors, causes, preventive measures and appropriate place where caregivers can go to seek care should be provided to the caregivers. Health education programs or campaigns at the community level will be one of

the most effective ways to disseminate knowledge about the signs and symptoms including danger signs of pneumonia. Visits of the mother to the Village Health Nutrition days or home visits of the ASHAs/ANMs are other opportunities to make mothers aware of childhood pneumonia.

REFERENCES

1. Wardlaw T, Salama P, Johansson EW, and Mason E. Pneumonia: The Leading Cause of Children. *Lancet*. 2006;368(9541):1048-50.
2. Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE, et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *The Lancet*. 2012;379(9832):2151-61. Epub 2012/05/15. doi: 10.1016/S0140-6736(12)60560-1.
3. Pneumonia: The Forgotten Killer of Children. The United Nations Children's Fund (UNICEF) September 2006.
4. Mathew JL, Patwari AK, Gupta P, Shah D, Gera T, Gogia S, et al. Acute respiratory infection and pneumonia in India: a systematic review of literature for advocacy and action: UNICEF-PHFI series on newborn and child health, India. *Indian pediatrics*. 2011;48(3):191-218.
5. Ghimire M, Bhattacharya SK, Narain JP. Pneumonia in South-East Asia Region: Public health perspective. *Indian J Med Res*. 2012;135(April):459-68.
6. Kallander K, Hildenwall H, Waiswa P, Galiwango E, Peterson S, and Pariyob G. Delayed care seeking for fatal pneumonia in children aged under-five years in Uganda: a case-series study. *Bulletin of the World Health Organization*. 2008;86(5):332-38.
7. Noordam AC, Carvajal-Velez L, Sharkey AB, Young M, Cals JWL. Care seeking behaviour for children with suspected pneumonia in countries in Sub-Saharan Africa with high pneumonia mortality. *PLoS One*. 2015 Feb 23;10(2):e0117919.
8. Onyango D, Kikui G, Amukoye E, Omolo J. Risk factors of severe pneumonia among children aged 2-59 months in western Kenya: a case control study. *Pan Afr Med J*. 2012;13:45.
9. Colvin CJ, Smith HJ, Swartz A, Ahs JW, De Heer J, Opiyo N, et al. Understanding care seeking for child illness in sub-Saharan Africa: A systematic review and conceptual framework based on qualitative research of household recognition and response to child diarrhea, pneumonia and malaria. *Social Science & Medicine*. 2013;86:66-78.
10. Ferdous F, Dil Farzana F, Ahmed S, Das SK, Malek MA, Das J, et al. Mothers' Perception and Healthcare Seeking Behavior of Pneumonia Children in Rural Bangladesh. *ISRN Fam Med*. 2014;690315:1-8
11. Black RE, Cousens S, Johnson HL, Lawn JE, Rudan I, Bassani DG, et al. Global, regional, and national causes of child mortality in 2008: a systematic analysis. *The Lancet*. 2010;375(9730):1969-87. doi: 10.1016/S0140-6736(10)60549-1.
12. Chisti MJ, Duke T, Robertson CF, Ahmed T, Faruque AS, Bardhan PK et al. Co-morbidity: exploring the clinical overlap between pneumonia and diarrhoea in a hospital in Dhaka, Bangladesh. *Annals of Tropical Paediatrics*. 2011; 31(4): 311-9
13. Black RE, Morris SS, Bryce J. Where and why are 10 million children dying every year? *The Lancet*. 2003;361(9376):2226-34.

14. Chisti MJ, Ahmed T, Faruque AS, Abdus Salam M. Clinical and laboratory features of radiologic pneumonia in severely malnourished infants attending an urban diarrhea treatment center in Bangladesh. *Pediatr Infect Dis J*. 2010;29(2):174-7
15. Iqbal I, Malik AY, Anwar M, Khan SP. Community perceptions about acute respiratory infections (ari) in multan, pakistan. 2010;2(1):2-9.
16. Siswanto E, Bhuiyan SU, Chompikul J. Knowledge, and Perception of Pneumonai Disease among Mothers of Children under-five Years attending Nakhon Pathom General Hospital, Thailand. *Journal of Public Health and Development*. 2007;5(2)
17. Memon KN, Shaikh K, Pandhiani BS, Usman G. How do mothers recognize & treat pneumonia in their children at home? A study in Union Council Jhudo, district Mirpurkhas. *J Liaquat Univ Med Heal Sci*. 2013;12(3):208-13.
18. Ekure EN, Ci E, Oo O, Ai O, Esangbedo DO. Mothers and childhood pneumonia: what should the focus of public campaigns be? *Nigerian Journal of Paediatrics* 2013 ;40(1): 24-9.
19. Iqbal I, Malik AY, Anwar M, Khan SP. Community perceptions about acute respiratory infections (ari) in multan, pakistan. *Nishtar Medical Journal*. 2010;2(1):2-9.
20. Kambli S. Knowledge of Bronchopneumonia among Caretakers of Infants. *International Journal of Science and Research*. 2014;3(7):5.
21. Kapoor SK. Knowledge attitude and practices regarding acute respiratory infections. *India J Pediatr*. 1990;57(5):33-5.
22. Haq Anwar, Durrani HM, Kumar R, Durrani SM. Recognizing the Danger Signs and Health Seeking Behaviour of Mothers in Childhood Illness in Karachi, Pakistan. *Universal Journal of Public Health*. 2015;3(2): 49-54.
23. Jena M. Effectiveness of Information Booklet on Knowledge & Practice about Prevention of Pneumonia among Mothers of under-five Children. *IOSR Journal of Nursing and Health Science*. 2014;3(1):25-30.
24. D'Souza Asha, Joy A, Karkada A, Jacob J, Sebastian M, Joseph ST, et al. Knowledge of mothers regarding respiratory tract infection in children. *International Journal of Recent Scientific Research*. 2014;5:2188-91
25. Minz Anurag, Agarwal Monika, Singh JV, Singh VK. Care seeking for childhood pneumonia by rural and poor urban communities in Lucknow: A community-based cross-sectional study. *J Family Med Prim Care*. 2017 Apr-Jun; 6(2): 211-217.