Home Health Care for the Children with Pneumonia

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Abstract

Pneumonia is an Inflammation of the lung parenchyma and it is one of the leading cause of mortality in children aged less than five years. **Aim:** assess home Health Care for the Children with Pneumonia. **Research design:** A Descriptive design was conducted for this study. **Setting:** pediatric outpatient clinicat el Rahmanya hospital at el Bauhira Governorate, M.C.H center affiliated to hospital and home visiting. Sample: a purposive sample composed of 315 children diagnosed with pneumonia. **Tools: first tool:** An interviewing questionnaire to assess a) socio demographic characteristics of mothers, b) demographic characteristics of children c) mothers' knowledge d) mothers' behavior e) mothers' practice**. Second tool,** consisted of Home environmental observational checklist**. Third tool,** physical assessment sheet to assess growth and development and vital signs. **Results:** More than two fourths of studied mothers had poor knowledge. More than three fourths of studied mothers had a negative behavior. More than half of studied mothers had unsatisfactory level of practice .About three fourths of families had problems in home environment. **Conclusion:** there was highly statistically significant relation between mother's knowledge about pneumonia and their socio demographic characteristics (age, educational level and occupation). Also, there was highly statistically significant relation between mother's knowledge and their practice. Moreover, there was highly statistically significant relation between mother's knowledge and their environmental health problems. **Recommendations:** Use of active teaching and learning strategies for mothers and Training needs could be extended to nursing staff.

Keywords: Pneumonia - Children - Home healthcare**.**

Introduction:

Pneumonia is an illness usually caused by infection, where the lungs become inflamed and congested, thus reducing oxygen exchange and leading to cough and breathlessness. It's the leading cause of mortality among children less than five years of age, despite effective vaccines and nutritional and environmental interventions **(Scott et al., 2018).**

Pneumonia is responsible for about 19% of all deaths in children aged less than 5 years. Childhood pneumonia incidence is estimated to be 0.29 episodes per child-year in developing and 0.05 episodes per year in developed countries. 7-13% of all the community cases are severe enough to be life threatening thus requiring hospitalization **(De Antonio et al., 2016).**

Children whose immune systems are compromised are at higher risk of developing pneumonia. A child's immune system may be weakened by malnutrition or undernourishment, especially in infants who are not exclusively breastfed. Pre-existing illnesses, such as symptomatic HIV infections and measles, also increase a child's risk of contracting pneumonia.Environmental factors also

increase a child's susceptibility to pneumonia indoor air pollution,living in crowded homesand parental smoking**(Eduardo et al.,2016).**

Diagnosis of pneumonia consists of two very important parts; first is to determine the syndrome by history clinical examination and chest radiology; and secondly is to determination of etiology by laboratory tests. Intensive physical examination should be done with the respiratory system being the main center of attention or focus. Important information can be gained through careful observation and it is of great importance especially in very young children asthey difficult to examine**(Zar et al.,2017).**

Pneumonia should be treated with antibiotics. The antibiotic of choice is amoxicillin dispersible tablets. Most cases of pneumonia require oral antibiotics, which are often prescribed at a health center. These cases can also be diagnosed and treated with inexpensive oral antibiotics at the community level by trained community health workers.Hospitalization is recommended only for severe cases of pneumonia ***(Chen et al., 2019).***

Prognosis of pneumonia is good in early diagnosis &early initiation of treatment in appropriate time otherwise leads to serious complications and may have fatal outcome.As prevention is better than cure, the rate of incidence can be reduced by giving adequate knowledge regarding the risk factors,etiology,clinical manifestation, prevention &when to seek medical help**(Jena,2014).**

Recognizing symptoms of pneumonia is a major first step in reducing pneumonia deaths among children under five years. Parents or guardians have a critical role to play in recognizing signs and symptoms of pneumonia and seeking medical attention for their sick children. Another crucial aspect of recognizing the symptoms is the risk pneumonia poses to the health of their children thus the parents should really understand the importance of pneumonia **(Gilbert et al.,2015).**

Significance of the study:

Pneumonia is the number of infectious killer of children under age 5 globally, killing an estimated 935,0002 children each year, that's more than 2500 per day > pneumonia causes 15% of all deaths in children under age 5 worldwide. Increase the capability of families to recognize danger signs of pneumonia in children and to encourage appropriate and early care – seeking behavior is important **(Abuka, 2017)**. Therefore it is necessity to assess home health care for children with pneumonia.

Aim of the Study:

The study was aimed to assess home health care for children with pneumonia through:

1) Assess mother's knowledge toward their children with pneumonia.

2) Assess mother's practice toward their children with pneumonia.

3) Assessment of health problems and health needs regarding children with pneumonia at home.

Research question:

1. Is there a relation between mother's knowledge about pneumonia and their socio demographic characteristics?

2. Is there a relation between mother's knowledge and their practice toward their children with pneumonia?

3. Is there a relation between mother's practice and health problems of their children with pneumonia?

4. Is there a relation between mother's knowledge and health needs of their children with pneumonia?

5. Is there a relation between home environment and prevention of pneumonia?

Subjects and Methods:

The study was aimed to assess home health care for children with pneumonia through assessing mother's knowledge toward their children withpneumonia, mother's practice toward their children with pneumonia and health problems and health needs regarding children with pneumonia at home.

The subjects recruited and methods used for achieving the study were elaborated under the following (4) designs:-

I) Research design

II) Operational design.

III) Administrative design

IV) Statistical design

I-Technical design:

The technical design used for the study discussed the following four categories, research design, setting of the study, subjects of the study and tools for data collection.

Research design:

A descriptive design was used to conduct this study.

Study Setting:

This study was conducted in pediatric outpatient clinic in EL-Rahmaniya hospital, Al Bahayrah governorate,Egypt andMaternal and health center affiliated in the hospital for home visiting, result from the high prevalence of attendance for children suffering from pneumonia especially during the winter season and providing care in rural setting.

Subject:

A purposive sample composed of 315 children diagnosed with pneumonia. The attendance rate of children through the years 2015 and 2016 was 1050,the study sample was from total number that equal 315 child and their mothers attending the previous mentioned setting over a period of 6 months during the winter and autumn season. This period corresponds to the peak of acute respiratory infection in the region.

Sample Criteria:

Mothers are accompanying their children in the previously mentioned setting and satisfying the following inclusion criteria:

- Age (3-5) years.

- Registered for follow up.

- Free from other diseases.

•Tools for data collection:-

-Data will be collected through the following tools:-

• **First tool:** -An interviewing questionnaire adapted from **(James, 2012)** and written in a simple Arabic

language after reviewing the related literature. It included the following parts:-

Part (1A): It was concerned with the socio demographic characteristics of mothers such as age, level of education, occupation, family size, number of children and monthly income of the family. It includes 6 closed ended questions (Q 1-6).

Part (1B): It was concerned with Socio demographic characteristics for preschool children as age, gender, birth order and previous exposure to infection. It included 4 closed ended questions (Q 7-10).

Part (2): It was concerned with assessing mothers level of knowledge about pneumonia which include definition, predisposing factors, signs and symptoms, mode of transmission, prevention and source of information. It includes 8 open ended questions (Q 11-18).

Scoring system for knowledge:-

For mothers' knowledge, complete correct answer was scored two, incomplete correct answer was scored one and incorrect answer was scored Zero. Total question items for knowledge 8 questions. The total score of the questionnaire responses were three score levels were made accordingly:

- Considered Poor if (<13).
- Considered Average (13 - <18).
- Considered Good (18 -26).

Part (3): Mothers' behavior toward nutrition and hygiene of their children. It includes 8 closed ended questions in table (Q 1 to 8).

Scoring system for behavior:

For Mothers' behavior, never was scored zero, sometimes was scored one and always was scored two. These scores were summed -up and converted into a percent score.

Part (4): it is concerned with assessing Mothers' practice toward their children with pneumonia which include assessing fever by measuring temperature, making cold compressing and medication compliance.it includes 14 closed ended questions in table (Q 1 to 14).

Scoring system for practice:-

For mothers' practice, done correctly was scored one and not done was scored zero. These scores were summed -up and converted into a percent score.

-Score from < 60 referred to not done correctly.

-Score from ≥60 referred to done correctly.

Second tool: Home environmental observational checklist adapted from ***Stanhope and Lancaster (2013)***for assessment of (sanitation, ventilation, crowding index, water supply, sewage disposable,… etc) in the child's home environment. It includes 14 closed ended questions (Q 1-14).

In this part: Family Crowding Index(FCI)adapted from ***(AAPOR, 2007):*** family crowding index= number of persons in a household /number of rooms used for sleeping; less than three was considered 'not crowded ' and more than three was considered 'over crowded'.

Third tool:- This tool was adapted from ***Lise et al. (2014)***and was modified by investigator for assessing growth &development and vital signs for studied children.

Body mass index was calculated as following: according to ***(Theodore & Elena, 2009).***

BMI= weight (kg)/ Height $(m)^2$

Body Mass Index (BMI) was categorized as following:

Underweight 16-18.4, normal 18.5-24.9 and overweight 25-29.9 and obesity 30 and more.

For vital signs, normal temperature is 37,normal pulse is (80-120) and normal respiratory rate (20-30).

Content validity:

Tools of the study were reviewed by five expertise in Faculty of Nursing, Ain Shams University from community health nursing to test the content validity. Content validity was checked before the pilot study and the actual data collection through distribution of the tools to five experts in the field of the with a covering letter and an explanation sheet that explained the study purpose, objectives and other related information to ensure appropriateness, relevance, clarity and completeness of the tool. Most of the tool items had consensus from the group of experts. Minimal modifications and changes were applied as required.

Reliability:

Test – retest reliability was applied, the tool proved to be strongly reliable (r-0.8333).

IV-Statistical design:

The collected data were organized, categorized, tabulated and statistically analyzed using the Statistical Package for Social Science (SPSS) version to assess mother's level of knowledge behavior,practice regarding their children with pneumonia and to assess health problems regarding children with pneumonia at home in rural area,assess home environment and physical examination of studied children. Data were presented in tables and graphs. The statistical analysis included; percentage (%), the arithmetic mean ±Standard Deviation (SD), and Pearson correlation (R).

The observed differences and associations were considered as follows-:

- P. > 0.05 Non- significance (No difference).
- P. ≤ 0.05 significance difference.
- P. ≤ 0.001highly significance difference.

Results

Table (1): Distribution of Studied Mothers according to their Socio Demographic Characteristics (no=315).

Items	NO	%
1. Age/ Years:		
< 20	96	30.5
20-<25	104	33.0
25-<30	73	23.2
> 30	42	13.3
Mean ± SD	23.9±4.5	
2. Educational level:		
Illiterate	109	34.6
Read or write	88	27.9
Secondary ed.	74	23.5
University ed	44	14.0
3-Occupation:		
Work	124	39.5
Not work	191	60.5
4-Type of work: (n=124)		
government employee	94	75.8
private sector	30	24.2
5-Care provider during work: (n=124)		
Relatives	31	25.0
Go Nursery	93	75.0
6- Number of family members		
3-4	69	21.9
5-9	246	78.1
Mean ±SD	3.9±0.4	
7- Number of children		
1-3	212	67.3
> 3-7	103	32.7
Mean ±SD	3.0±1.4	
8- Monthly income		
1000 - <1500	**108**	**34.3**
1500- <2500	207	65.7
Mean ±SD	1742±356.5	

Table (1) reveals that age of 33% of studied mothers was (20-<25) years with a mean 23.9±4.5,34.6% of them were illiterate,as regarding work 60.5% of mothers were not working,meanwhile78.1%of number of family members was more than 5 with a mean 3.9±0.4,the monthly income of 65.7% of families was(1500-<2500) with a mean 1742±356.5.

Figure (1): Distribution of the Studied Mothers according their Total Knowledge Score (n=315).

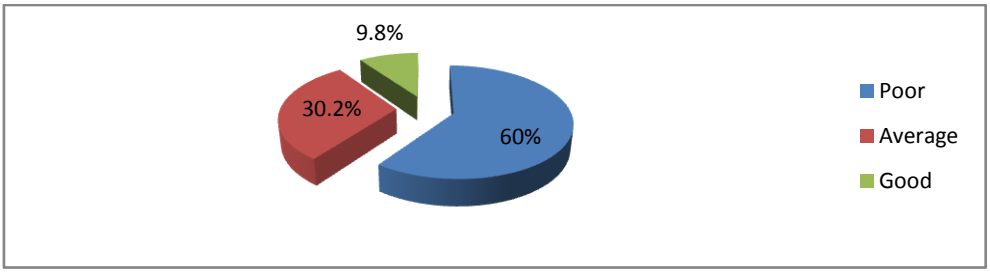

Fig. (1): shows that 60% of the studied mothers had poor knowledge related to pneumonia while 9.8% of them had good knowledge.

Figure (2): Assessment of Total Level of Mothers' Behavior toward their Children with Pneumonia (n= 315)

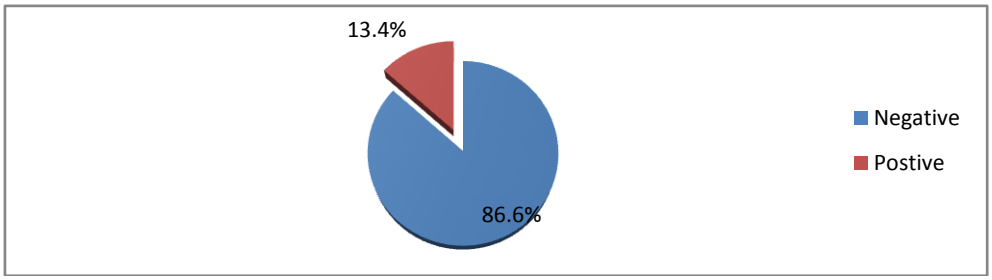

Fig. (2): this figure reports that 86.6% of studied mothers had a negative behavior toward their children while 13.4% of them had a positive behavior toward their children with pneumonia.

Figure (3): Assessment of total level of mothers' practices regarding their children with pneumonia.

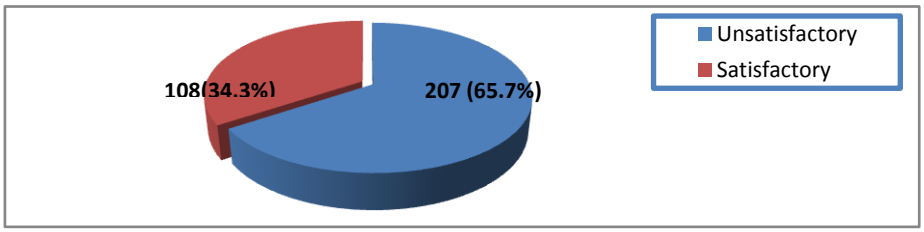

Fig. (2): Illustrates that represents that 65.7% of studied mothers had respectively unsatisfactory level of practice while 34.3% of them had satisfactory level of practice toward their children of pneumonia at home.

Table (2): Relation between mother's knowledge about pneumonia and their socio demographic characteristics.

Mothers characteristics	Total NO	Mother's knowledge			R
		Poor n=189	Average n=95	Good n=31	P-Value
1. Age\ Years:					
< 20	96	84	10	2	0.81**
20-<25	104	40	51	13	
25-<30	73	39	24	10	
> 30	42	26	10	6	
2. Educational level:					
Illiterate	109	88	20	1	0.84**
Read or write	88	64	19	5	
Secondary ed.	74	35	33	6	
University ed	44	2	23	19	
3-Occupation:					
Work	124	71	25	28	0.96**
Not work	191	118	70	3	
4-Person caring for the child during the mother job: (n=124)					
One of the relatives	31	17	12	2	0.97**
Go Nursery	93	72	83	29	
5- Number of family members					
3-4	69	16	26	27	0.95**
5-9	246	173	69	4	
6- Number of children in the family					
1-3	212	90	91	31	0.99**
> 3-7	103	99	4	0	
7- monthly income					
1000 - <1500	108	96	10	2	0.97**
1500- <2500	207	93	85	29	

Table (2) showed the result found that there were highly statistically significant relation betweenmother's knowledgeabout pneumonia and their socio demographic characteristics.

Related to Research Question no (2): Is there a relation between mother's knowledge and their practice toward their children with pneumonia?

Table (3): Relation between mother's knowledge and their practice toward their children with pneumonia.

Mother's knowledge	Mother's Practice		Total NO	r P-Value
	Unsatisfied n= 193	Satisfied n=122		
Total Level of mother's knowledge				
Poor	157	32	189	
Average	31	64	95	0.83**
Good	5	26	31	

(**)P <0.001 highly significant

Table (3) showed that there was a highly statistically significant relation between mother's knowledge and their practice toward their children with pneumonia with p-value (0.001).

Table (4): Relation between mother's knowledge and their behavior toward health needs of their children with pneumonia.

Related to Research Question no (3): Is there a relation between mother's knowledge and their behavior toward health needs of their children with pneumonia?

Mother's knowledge	Mother's behavior		Total	r
	Negative 273=n	Positive n=42	NO	P-Value
Total Level of mother's knowledge				
Poor	184	5	189	
Average	82	13	95	0.97**
Good	7	24	31	

(**)P <0.001 highly significant

Table (4) showed the result found that was highly statistically significant relation between mother's knowledge and their behavior toward health needs of their children with pneumonia with p-value (0.001).

Table (5): Relation between mother's Practice and their environmental problems toward their children with pneumonia.

Related to Research Question (4): Is there a relation between mother's practice and their environmental problems toward their children with pneumonia?

Mother's Practice	Environmental health problems		Total	r
	Absent n=81	Present n=234	NO	P-Value
Total Level of mother's Practice				
Unsatisfactory	**9**	**184**	**193**	**0.82****
Satisfactory	**72**	**50**	**122**	

(**)P <0.001 highly significant

Table (14) showed that there was a highly statistically significant relation between mother's Practice and their environmental health problems toward their children with pneumonia.

Discussion:

Pneumonia is the acute infection of lower respiratory tract that mostly affects the lungs. In pneumonia, the alveoli of the lungs fill up with pus or fluid as such leads to difficulty in breathing. And, as such gaseous exchange does not occur like in normal condition. A large number of children die due to pneumonia making it the single largest infectious cause of death even more than AIDS, measles, and malaria combined. In the year 2013, pneumonia killed about a million children in the age group of 0–5, about 15% of deaths of children under 5 years old was due to pneumonia ***(Susan et al., 2016).***

Part (1): Socio demographic characteristics of studied mothers and children:

Regarding Characteristics of studied mothers it was observed in the current study findings that one third of mothers their age are between 20-<25 years **(table 1)**. This finding was agreed with **(Hossie et al., 2017)**, who illustrated in a study about Pneumonia of Children under 5 Years of Age in Brazzaville (Republic of Congo) that more than two thirds of mothers their age were (20-34).

In relation to educational level, more than one third of studied mothers were illiterate **(Table1)**. This findings was in the same line with ***Getanehet al. (2019)*** who conducted a study about Determinants of pneumonia among 2–59 months old children at DebreMarkos referral hospital, Northwest Ethiopia: a case-control study, they stated that, more than two thirds of mothers were not read or write.

In the investigator's point of view, assessment of mothers' education is essential because low educational attainment was the strongest predictor of child disease.

As regard to occupation, more than half of studied mothers were not working **(table 1).** This finding was consistent with ***Getanehet al. (2019)*** **who conducted a study about** Determinants of pneumonia among 2–59 months old children at DebreMarkos referral hospital, Northwest Ethiopia: a case-control study,they found that more than one fourth of mothers were housewives.

As regard to monthly income, the current study revealed that two thirds of families their monthly income was 1000-<1500 with a mean±SD1742±356.5 **(table1).** This findings is consistent with **(Grithly et al., 2018)** Who found that, in a study about Risk Factors of Pneumonia Among Children Under 5 Years at a Pediatric Hospital in Sudan, more than half of families had lower monthly income and there was relation between the family income and pneumonia as pneumonia was higher among families who have lower income.

Regarding socio-demographic characteristics of studied children:

The current study results shows that, more than two thirds of studied children were 3-<4 years with mean age of 3.8±0.5 and more than half of them were males **(table 2)**. These findings were agreed with ***Van et al. (2019)*** who found that, in a study about Risk Factors for Severe Pneumonia According to WHO 2005 Criteria Definition Among Children <5 Years of Age in Thai Binh, Vietnam: A Case–Control Study, children aged 12-59 months accounts more proportion of surveyed children and male accounts more than half of studied children.

As regard to child ranking, more than two fifth of studied children were arranged as a second child in the family and more than three quarter of them had repeated common cold infections**(table2).** These findings consistent with ***Rasheedat et al. (2017)*** who found that, in a study about Socio-demographic and clinical factors predicting time to presentation for children with pneumonia in Ilorin, Nigeria, more than one fourth of studied children was ranked as second child and more than half of them had repeated respiratory infections.

Part 2) knowledge of studied mothers toward their children with pneumonia:

As regard to level of mothers' knowledge about pneumonia, more than

half of mothers had a poor knowledge concerning definition, method of transmission, causes, signs and symptoms, complications and prevention **(table 4).** This findings supported with ***Mercy et al. (2016)*** who conducted a study about Community perceptions and practices of treatment seeking for childhood pneumonia: a mixed methods study in a rural district, Ghana, they found that two thirds of the mothers had a poor knowledge as they never heard the name of pneumonia and did not know signs and symptoms of pneumonia.

These findings were incompatible with ***Florida et al. (2017)*** who in a study of mothers' understanding of childhood pneumonia symptoms and health care seeking in Kilimanjaro region, Tanzania illustrated that more than half of studied mothers had a good knowledge.

These findings also was contraindicated with ***EI Sayed and Farouk,(2014):***who conducted a study about Pneumonia in South East Asia Region: Public health perspective, they found that the majority of mothers with good knowledge their children have got pneumonia and had good level of knowledge about acute respiratory infection especially pneumonia regarding simple signs and symptoms, causes and factors, simple assessment and prevention of pneumonia.

Part 3) Behaviors of studied mothers toward their children with pneumonia:

As regard to mothers' behaviors,the majority of studied mothers had a negative behavior while more than one fifth of them had positive behavior toward nutrition and hygiene of their children with pneumonia (figure 2). This result was agreed by ***Pandy et al. (2019)*** who conducted a study about Health seeking behaviour of parents for children with pneumonia In Nepal, they found that more than three quarters had a negative behavior toward their children with pneumonia and were not provide adequate care to them.

On the other hand, this result disagreed by ***Siswanto et al. (2017)*** who conducted a study about Community perceptions about acute respiratory infections in Pakistan; they found that more than two thirds of mothers had a positive behavior toward feeding and hygiene of their children.

Part 4) Practices of studied mothers toward their children with pneumonia:

As regard to mothers' practice, two thirds of studied mothers had unsatisfactory level of practice while more than one third of them had satisfactory level of practice toward their children with pneumonia at home **(table 5).** These findings were supported by ***Anurag et al. (2017)*** who pointed out that, in a study of Care seeking for childhood pneumonia by rural and poor urban communities in Luck now: A community-based cross-sectional study, the majority of studied mothers had satisfactory level of practice toward their children with pneumonia at home.

This result was disagreed with ***Keter (2015)*** who conducted a study about Knowledge, Attitudes and Practices of Mothers in relation to Childhood Pneumonia and factors associated with Pneumonia and Seeking Health Care in Kapsabet District Hospital in Nandi County, Kenya and found that more than three quarters of studied mothers had satisfactory level of practice toward cold application, treatment compliance at home.

Regarding studied subjects' home environment:

In relation to home type, more than half of studied children lived in a private housing. The majority of housing had a proper sanitation. About two thirds of houses discarded of their wastes every two days about two thirds of houses had sun light enter the house. More than half of houses had enough sources of ventilation as windows about three fourths of houses had smokers and more than half of them were smoked inside home. The majority of houses had a water source inside home **(table 9).**

In the investigator's point of view, assessment of surrounding environment is important because lack of sanitary infrastructure has the potential to promote infectious diseases like pneumonia. These findings were incompatible with ***Sandar et al. (2016)*** reported that in a study about Internal living environment and respiratory disease in children: findings from the Growing Up in New Zealand longitudinal child cohort study: prevalence and risk factors, environmental conditions (seasonality, crowding, air pollution, household pollution, and smoking) are greatly related to pneumonia.

Regarding relation between socio-demographic characteristics of studied mothers and their knowledge about pneumonia (research question NO.1):

The current study results clarified that, there was a highly statistically significant relation between mother's knowledge about pneumonia and their socio demographic characteristics **(table10).** This finding was in the same line with **Qassim et al. (2016)** who stated that, in a study about Knowledge, Attitude and Practice of mothers on acute respiratory infection in children under five years, there was a significant association between socio-demographic characteristics of studied mothers and their knowledge about pneumonia.

Regarding relation between mother's knowledge and their practice toward their children with pneumonia (research question NO.2):

The current study revealed that, there was highly statistically significant relation between mother's knowledge and their practice toward their children with pneumonia **(table 11).** This finding was consistent with ***Farzana et al. (2014)*** who found that, in a study of Mothers' Perception and Healthcare Seeking Behavior of Pneumonia Children in Rural Bangladesh, there was a strong positive correlation with a highly statistical significant difference between the studied mothers and their practice toward their children with pneumonia at home. In investigator's point of view, it can be due to that knowledge has an effect on enhancing practice.

Regarding relation between mother's knowledge and their behavior toward health needs of their children with pneumonia (research question NO.3):

The current study revealed that there were highly statistically significant relation between mother's knowledge and their behavior toward health needs of their children with pneumonia **(table 13).**

This finding was agreed with ***Sisay (2017)*** who conducted a study about Assessment of Mothers/Care Givers Health Care Seeking Behavior for Childhood Illness in Rural Ensaro District, North Shoa Zone, Amhara Region, Ethiopia, they found that there was a significant association between

mother's knowledge and their behavior toward health needs of their children with pneumonia.

Regarding relation between mother's practice and their environmental problems toward their children with pneumonia (Research question 4):

This result showed that there was a highly statistically significant relation between mother's Practice and their environmental health problems toward their children with pneumonia **(table14)**. This findings is agreed with ***Assefa et al. (2018)*** who conducted a study about Mothers' health care seeking behavior for childhood illnesses in Derra District, North Shoa Zone Ethiopian, they found that there was a strong positive correlation with a highly statistical significant difference between practice of studied mothers and their environmental health problems.

In the investigator's point of view, it can be due to that environmental problems as crowding house and bad ventilation may effect on practice of mothers and caring of their children.

Conclusion:

On the light of the current study results, it can be concluded that, there was highly statistically significant relation between mother's knowledge about pneumonia and their socio demographic characteristics (age, educational level and occupation). Also, there was highly statistically significant relation between mother's knowledge and their practice. Moreover, there was highly statistically significant relation between mother's knowledge and their environmental health problems.and that there was highly statistically significant relation between mother's knowledge and their behavior toward health needs of their children.

Recommendations:

In the light of the study findings, the following recommendations were suggested:

- planning and Developing a health educational program for mothers who should informed about all aspects regarding causes of pneumonia in children, risk factors, prevention and care of their children through maternal and child centers counseling.

- An Arabic self-learning package as a part of educational program is needed to be developed for raising awareness of mothers and correct their knowledge and practice toward their children with pneumonia.

- Improving the mothers' knowledge, practice and behavior toward their children with pneumonia through mass media such as posters, booklets, television and newspapers.

- Further studies should be conducted to improve the mothers' knowledge, behaviors and practices for proper caring of their children and increase their awareness about pneumonia.

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Conflict of interest

No

References

Abuka, T. (2017): Prevalence of Pneumonia and Factors associated among Children 2-59 months old in Wondo Genet district, Sidama Zone, SNNPR, Ethiopia. CurrPediatr Res; 21:19-25.

Anurag M, Monika A, Singh JV, Singh VK (2017): Care seeking for childhood pneumonia by rural and poor urban communities in Lucknow: A community-based cross-sectional study; doi: 10.4103/2249-4863.219987; 6(2): 211–217.

Assefa T, Belachew T, Tegegn A and Deribew, (2018): Mothers' health care seeking behavior for childhood illnesses in Derra District, North Shoa Zone Ethiopian Journal of Health Science 2018;18 (3):87-93.

Chen JC, Jenkins-Marsh S, Flenady V, Ireland S, May M, Grimwood K and Liley HG, (2019). Early-onset group B streptococcal disease in a risk factor-based prevention setting: A 15-year population-based study. Aust N Z J ObstetGynaecol. 2019 Jun; 59 (3): 422-429.

DeAntonio R, Yarzabal JP, Cruz JP, Schmidt JE, Kleijnen J (2016): "Epidemiology of community-acquired pneumonia and implications for vaccination of children living in developing and newly industrialized countries: A A systematic literature review". Human Vaccines &Immunotherapeutics. 12 (9): 2422–40.

Eduardo J, Gonçalves M, Albuquerque M, Lopes M, Serra G, Lima D, Correia J (2016): Risk factors for community-acquired pneumonia in children under five years of age in the post-pneumococcal conjugate vaccine era in Brazil: a case control studyd,2016; 16: 157;doi: 10.1186/s12887-016-0695-6.

El Sayed F.& and Farouk S, (2014): Mothers' Learning Needs Assessment Regarding Pneumonia among Children Less than Five Years at Saudi Arabia; DOI: http: /dx. doi. org/10. 14303/JRNM. 2014. 020, Vol. 3 (5) pp. 85-93.

Farzana F, Fahmida DF, Shahnawaz A, Sumon KD, Mohammad AM, Jui D, Abu Syed GF, Mohammod JC (2014): Mothers' Perception and Healthcare Seeking Behavior of Pneumonia Children in Rural Bangladesh; http://dx.doi.org/10.5402/2014/690315.

Florida Muro, Judith Meta, Jenny Renju, AdielMushi, Hilda Mbakilwa, RaimosOlomi, Hugh Reyburn& Helena Hildenwall (2017): mothers' understanding of childhood pneumonia symptoms and health care seeking in Kilimanjaro region, Tanzania, BMC Int Health Hum Rights 17, 27 (2017). https: //doi. org/10. 1186/s12914-017-0135-1.

Getaneh S, Alem G, Meseret M, Miskir Y, Tewabe T, MollaG and AbebeY Belay (2019): Determinants of pneumonia among 2–59 months old children at DebreMarkos referral hospital, Northwest Ethiopia: a case-control study, doi: 10. 1186/s12890-019-0908-5; 19: 147.

Gilbert, G G.; Sawyer, R G.; McNeil, E B,(2015): Health education: creating strategies for school and community health. Third edition. USA: Jones and Bartlett Publishers, pg 13. Consulted 30.10.2015.

Gritly, Mohamed Osman Elamin, HatimRahimtullah, Abdikani Y. Haji Ali1, Abdi Hassan DhiblaweYabarow, Ebtihal A. Mohamed and HamedAdemolaAdetunji, (2018): Risk Factors of Pneumonia Among Children Under 5 Years at a Pediatric Hospital in Sudan, Int J Med Res Health Sci 2018, 7 (4): 60-68

Hossie, I. C. N'djobo-Mamadoud, E. Moyen, G. EkouyaBowassa, G. Moyen,(2017): Pneumonia of Children under 5 Years of Age in Brazzaville (Republic of Congo),DOI: 10.4236/ojped.2017.73021.

Jena, M.(2014): Effectiveness of Information Booklet on Knowledge &Practice about Prevention of Pneumonia among Mothers of Under Five Children. IOSR Journal of Nursing and Health Science (IOSR-JNHS);3(1)25-30.

Keter, (2015): Knowledge, Attitudes and Practices of Mothers in relation to Childhood Pneumonia and factors associated with Pneumonia and Seeking Health Care in Kapsabet District Hospital in Nandi County, Kenya; 2015, available at http: //hdl. handle. net/123456789/1740.

Mercy Abbey, Margaret A. Chinbuah, Margaret Gyapong, L. Kay Bartholomew & Bart van den Borne (2016): Community perceptions and practices of treatment seeking for childhood pneumonia: a mixed methods study in a rural district, Ghana, BMC Public Health 16, 848 (2016). https: //doi. org/10. 1186/s12889-016-3513-z.

Pandey KR, Jha AK, Dhungana R and Lamsal R, (2019): Health seeking behaviour of parents for children with pneumonia. JNMA J Nepal Med Assoc 2019; 48: 131-4.

Qassim SH, Farhan S, and Manzar (2016): Knowledge, Attitude and Practice of mothers on acute respiratory infection in children under five years; doi: 10. 12669/pjms. 326. 10788, 2016 Nov-Dec; 32 (6): 1557–1561.

Rasheedat M., Ibraheem, Mohammed B., Abdulkadir, Aishat A., Gobir, Wahab B.R., Johnson, (2017): Socio-demographic and clinical factors predicting time to presentation for children with pneumonia in Ilorin, Nigeria; https://doi.org/10.1016/j.ajme.2017.05.013.

Sandar Tin Tin, Alistair Woodward, RajneetaSaraf, Sarah Berry, Polly Atatoa Carr, Susan M. B. Morton & Cameron C. Grant, (2016): Internal living environment and respiratory disease in children: findings from the Growing Up in New Zealand longitudinal child cohort study 2016;369:155–63.

Scott, J A G.; Brooks, W A.; Peiris, J S M.; Holtzman, D.; Mulholland, E K. (2018): Pneumonia research to reduce childhood mortality in the developing world. Journal of clinical investigation, Vol. 118, 1291-1299.

Sisay, Endalew&Hadgu, (2017): Assessment of Mothers/Care Givers Health Care Seeking Behavior for Childhood Illness in Rural Ensaro District, North Shoa Zone, Amhara Region, Ethiopia, G. J. L. S. B. R., Vol. 3 (1): 1-14.

Susan Mary Pradhan, Arathi P Rao, Sanjay M Pattanshetty, AR Nilima, (2016): Knowledge and perception regarding childhood pneumonia among mothers of under-five children in rural areas of UdupiTaluk, Karnataka: A cross-sectional study; DOI: 10.4103/2349-5006.183690, vol 9, P.p 35-39.

Van TH, Thi LD, Philippe M, Duy CN, Nang TH, Van Nghiem DP (2019): Risk Factors for Severe Pneumonia According to WHO 2005 Criteria Definition Among Children <5 Years of Age in Thai Binh, Vietnam: A Case–Control Stud;https://dx.doi.org/10.2991/jegh.k.191009.001.

Zar HJ, Andronikou S and Nicol MP (2017): Advances in the diagnosis of pneumonia in children. BMJ.; 358:j2739. doi: 10.1136/bmj.j2739.