Quality of Nursing Care provided to Children with Pneumonia

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Abstract

Background: Pneumonia is an infection of the small air sacs of the lungs (alveoli) and the tissues around them, and is one of the most common causes of death worldwide. **Aim of study:** Was to evaluate quality of nursing care provided to children with pneumonia. **Subject and method: Research design:** A descriptive design was used in the current study. **Setting:** This study was conducted at Children Hospital at Zagazig University and EL- Ahrar hospital. **Subject:** Purposive sample of 100 nurses who work at pediatric departments and neonatal intensive care unit. **Tool of data collection:** Two tools of data collection was used. **Tool (I)**: Was structure interview sheet to collected data about personal characteristics of the studied nurses. **Tool (II):** Was observational checklist to evaluate nurse's care providing to children with pneumonia. **Result:** Revealed that 41% of the studied nurses had good practice score, 43% had fair practice score and 16% had poor practice score**. Conclusion:** Total practice score of studied nurses about pneumonia was good. **Recommendations:** Continuous training program for all nurses about standard care for children with pneumonia.

Key words: ,quality , Nursing care, Children, pneumonia.

Introduction

Pneumonia is a form of acute respiratory infection that affects the lungs. The lungs are made up of small sacs called alveoli, which fill with air when a healthy person breathes. When an individual has pneumonia, the alveoli are filled with pus and fluid, which makes breathing painful and limits oxygen intake.([1])

Pneumonia killed 808 694 children under the age of 5 in 2017, accounting for 15% of all deaths of children under five years old. Pneumonia affects children and families everywhere, but is most prevalent in South Asia and sub-Saharan Africa. ([2])

The etiology of pneumonia in the pediatric can be classified by age-specific versus pathogen-specfic organisms. Neonates are at risk for bacterial pathogens present in the birth canal, this includes organisms such as group B streptococci, klebsiella, Escherichia coli, and listeria monocytogenes. streptococcus pneumonia, streptococcus pyogenes, and Staphylococcus aureus can be identified in late onset neonatal pneumonia. Viruses are the main cause of pneumonia in older infants and toddlers between 30 days and 2 years old ([3])

The signs and symptoms of pneumonia vary from mild to severe, depending on factors such as the type of germ causing the infection, and age and overall health. Mild signs and symptoms often are similar to those of a cold or flu. It may include chest pain when the child breathe or cough, which may produce fatigue, fever, sweating and shaking chills, nausea, vomiting or diarrhea and shortness of breath[(4)].

Pneumonia is classified according to the types of germs that cause it and where child got the infection. Community-acquired pneumonia is the most common type of pneumonia; It occurs outside of hospitals or other health care facilities. It may be caused by bacteria**.**. Fungi this type of pneumonia is most common in child with chronic health problems or weakened immune systems, and in child who have inhaled large doses of the organisms. The fungi that cause it can

be found in soil or bird droppings and vary depending upon geographic location [5].

Hospital acquired pneumonia occur during child stay in hospital for another illness. Hospital-acquired pneumonia can be serious because the bacteria causing it may be more resistant to antibiotics . children who are on breathing machines ventilators, often used in intensive care units, are at higher risk of this [6].

The children greater risk of pneumonia if they in a hospital intensive care unit, especially if they on a machine that helps breathe a ventilator, chronic disease, children are more likely to get pneumonia [7].

Physical exam should include observation for signs of respiratory distress including tachypnea, nasal flaring, lower chest in-drawing, or hypoxia on room air note that infants may present with reported inability to tolerate feeds, grunting or apnea. Auscultation for rales or rhonchi in all lung fields with the appropriately sized stethoscope can also aid in diagnosis [8].

Treatment should be targeted to a specific pathogen that is suspected based on information obtained from history and physical exam. Supportive and symptomatic management are key and include supplemental oxygen for hypoxia, antipyretics for fever, and fluids for dehydration. This is especially important for non-infectious. Cough suppressants are not recommended. Give antibiotic). [9]

Neonates should receive ampicillin . Atypical pneumonia is common in infants 1 to 3 months old, and this group should have additional antibiotic coverage with erythromycin. [8].

Prevention of pneumonia in children include, vaccination . Doctors recommend a different pneumonia vaccine for children younger than age 2 and for children ages 2 to 5 years who are at particular risk of pneumococcal disease. Practice good hygiene to protect the children against respiratory infections that sometimes lead to pneumonia, wash children hands regularly and get enough sleep and eat a healthy diet [10].

Nurse role for children with pneumonia start with an assessment of the patient' medical history, performing respiratory assessment every four (4) hours, physical examination, and ABG measurements. Supportive interventions include oxygen therapy, suctioning, encourage coughing, deep breathing, adequate hydration, and make cold compress [11].

Significance of the study

In Egypt, it was estimated that 10% of children death below the age of 5 year is likely caused by pneumonia [12].. Pneumonia is the number one infectious killer of children under age 5 globally, killing an estimated 935, 000 children each year, that's more than 2500 per day. Pneumonia causes 15% of all deaths in children under age 5 worldwide[13].In addition The mortality rate of young children under five years in most developing countries ranges from 60 to 100 per 1000 live births, 21% of these deaths are due to pneumonia. [14].

Aim of the Study

This study aims to:

Assess quality of nursing care provided to children with pneumonia

Research Questions:

1-What is quality of nurses' practice provided to children with pneumonia?

Subject and Methods

Research design:

A descriptive design was used in this study

Settings:

Study was conducted at the following settings:

1. Emergency unit, Allergy & Chest unit and Neonatal intensive care unit in Children Hospital Zagazig University.
2. Emergency unit, Pediatric department and Neonatal Intensive care unit in AL-Ahrar Hospital

.**Study Subject:**

The subject of this study was composed of purposive sample of 100 nurses in the previously mentioned setting who fulfilled the following criteria:

-Accept to participate in the study
-Provide direct care to children
- Years of experience more than 6months

Tools of data collection:

Tool I: A questionnaire interview sheet:

It was developed by the researcher and assesses the characteristics of the studied nurses such as age, year of experience, qualification, and received training courses for pneumonia and work department.

Tool II: Observational check list:

It was developed by the researcher after reviewing related procedure from Bowden & Greenberger .[15] and Wong & Hess [16]. This tool included 5 procedures was used to evaluate nursing care given to children suffering from pneumonia. The checklist consists of 67 items including the following: O2 therapy (21 items), suctioning (17items), chest physiotherapy (7 items), I.V therapy (9 items) and measuring vital signs (13 items).

Scoring system:

Scoring system for observational check list

Regarding observational checklist about pneumonia each items was scored "1''for complete practice "0'' for incomplete practice The total score of nurse's practice was (67) classified as follow:

Poor <60%, fair 60-<80%, good 80-100%

Content Validity and reliability

Tools were developed after a thorough review of the related literature and then submitted to a jury of three experts (one professor of pediatric nursing at faculty of nursing, one professor of medical & surgical nursing at faculty of nursing, one professor of community health nursing). Reliability of tool was done by using Cronbach's Alpha test reliability coefficient which revealed that each items of the utilized tools consisted relatively homogeneous items. The reliability of observational checklist about pneumonia was 0.91.

Field work:

Data was collected within two month starting in the period from beginning of January 2019 to end of February the data was collected at every day (Sunday , Monday and Tuesday) from al-ahrar hospital and(saturday, wednesday thursday) from children hospital zagazig university 9:00 am to1:00 pm. And in good afternoon shift from 2 pm to 8 pm . And in night shift from 8 pm to 8 am. The researcher explained the study aim and procedure, as well as data collection forms to the directors of selected hospital then introducing herself and explaining the aim of study for selected nurses and obtaining their verbal consent assured that data collection will be confidential and would be used only to achieve the purpose of the study. The questionnaires were read, explained and the nurses were asked to fill in the questionnaire sheet and pneumonia observational checklist was taken without observation from nurses under the guidance of the researcher after taken their oral approval. The nurse took 10 to15 minutes for answering the questions.

Pilot study:

It was carried on 10% of the total sample (10 nurses) after tools were developed and before starting the data collection to test the applicability, consistency, clarity and the feasibility of the study tools as well as to determine the required time to fulfill the tools. No modification was done to the tool; nurses who shared in the pilot study were excluded from the study sample.

Administrative design and Ethical considerations:

An official permission for data collection was obtained from the education directorate at zagazig city based on letter from the post graduate affairs, faculty of nursing explaining the aim of the present study to obtain permission for data collection. Ethical considerations: All ethical issues were taken into consideration during all phases of the study. The research approval will be obtained from ethical committee before starting study. An oral consent will be obtained from the nurses to accept to participate in the study and confidentiality any obtained information will be ensured. The researcher was started by explaining the purpose of the study briefly to the participants Participants reassessed about the confidentiality of any obtained information. Nurses were notified that they

can withdraw from the study at any time without giving any reason.

Statistical analysis:

Data entry and statistical analysis were done by the SPSS version 20. Data were presented by frequency table with percentages for qualitative variables and means and standard deviations for quantitative variables. The chi-square test was used to fin the significant association between the demographic and total knowledge and practice scores. Multiple linear regression was also used to predict factors affecting total practice score. Cronbach alpha coefficient was calculated to assess the reliability of the scales through their internal consistency. (level of significance; significant at P<0.05 and highly significance at P >0.01).

Results

Table (1) shows characteristics of studied nurses**.** It was found that 51% of studied nurses their age were 25-29 years old with mean age 25± 9.1years. Regarding Qualification it was found that 46% of nurses had complete their Nursing Technician Institute while 46% had finished their education at faculty of Nursing . Their mean years of experience was 11± 3.1 years and 38% of them working at Neonatal Intensive care unit .When nurses was asked if they attended any training courses about pneumonia ,87 % was reported that they did not attended any training courses.

Table(2) nurses' practice regarding oxygen mask**.** When nurses were observed before procedure, it was reported that 59% didn't complete hand washing. While, 86% completed preparing the equipment. During procedure, 94%, 81% and 69% placed the mask, turned on the oxygen to the prescribed concentration and observed child condition respectively. After procedure, 58% and 92% were observed to complete hand washing and documentation respectively.

Table (3) reveals nurses' practice regarding suctioning (Endo-tracheal suctioning)**.** When nurses were observed before procedure, it was found that 57% and 67% completed hand washing and preparing the equipment respectively. During procedure, it was observed that 70%, 84% and 80% wore sterile gloves, instilled 0.025-2ml of normal saline into E.T.T.to soothing the secretion and applied suction respectively. Beside, 92% and 91% attached ETT to a manual resuscitation bag and ventilate the child and rinsed the catheter with sterile saline respectively. After procedure, 83% and 93% were observed to complete hand washing and documentation respectively

Table (4) nurses' practice regarding physiotherapy **.**When nurses were observed before procedure, it was found that 66% didn't complete hand washing. During procedure, it was observed that 69% and 90% placed the child in up right setting position and used a cupped hand for percussion on each lung respectively. In addition, 69% and 98% performed suctioning or encouraged coughing up and returned the child to comfort position respectively. After procedure, 56% and 80% were observed to complete hand washing and documentation respectively.

Table (5) clarifies nurses' practice regarding IV therapy**.** When nurses were observed before procedure, it was found that 57% and 88% completed hand washing and preparing the equipment respectively. During procedure, it was observed that 59%, 100% and 92% labeled the container, hanged solution bottle intravenous stand and squeezed a drip champers and filled the drip champers with one third to half of solution. Beside, 98% and 78% started to drop and set IV flow rate and observed site of infusion respectively. After procedure, 66% and 96% were observed to complete hand washing and documentation respectively.

Table (6) nurses' practice regarding axillary temperature**.** When nurses were observed before procedure, it was found that 72% didn't complete hand washing. While, 85% completed preparing the equipment. During procedure, it was observed that 89% placed the thermometer under arm for 5 minutes. After procedure, 56% and 87% were observed to complete hand washing

and documentation respectively.

Table (7) represents total score of practice of the studied nurses about care of children with pneumonia**.** It was reported that 41% and 43% had good and fair scores respectively, compared to 16% had poor score.

Table (8) shows relation between characteristics of studied nurses and total score of practice**.** It was found that there was statistically highly significant relation (p= 0.006) between qualification and total score of practice. Where, most of nurses who had good to fair score of practice were graduated from Nursing Technician Institute**.**

Discussion

The results of the current study revealed that, half of studied nurses their age was 25-29 years old with mean age 25± 9.1years. Their mean years of experience was 11± 3.1 years and more than one third of them working at neonatal intensive care unit. This means that most of the nurses are juniors and the nurses in young age are full of energy and hyperactivity which is always required in such criticial department. These results similar with the result of study performed by Abdel-Fattah et al,[17], they nearly the same result of present study.

In the same field, Aziz and Mansi [18] studied and found that the mean age of studied nurses was 28.13±1.74 and the mean years of experience was 12.55+ 5.87 years.

Regarding to qualification it was found that less than half of nurses had complete their nursing technician institute while slightly more than two fifth of them had finished their education at faculty of nursing. These results might be due to that study conducted at critical areas which required high qualified nurses. These results were acc ordance with Khanali et al., [19]. which reported that less than half of nurses under the study had technical nursing degree.

On other hand, Mojen et al, [20] revealed that more than half of the studied nurses had Bachelor nursing degree.

According to attendance of training courses, the finding of the current study revealed that, the majority of studied nurses did not attend any training courses. This may be due to work pressure, increased burden and a noticeable shortage of nurses. These results approved with the study performed by Ameri et al [21]. stated that more than half of studied nurses didn't attend a training course in NICU.

In contrast, Gibson et al, [22] found that more than half of school nurses attended training courses.

Related to nurses' practice regarding oxygen mask, the finding of the current study found that more than two third of nurse practice score was good. These results agree with the study performed by Chaves et al. [23] found that more than two thirds of nurses under study were competent regarding to practical skills about oxygen mask. Also this results go with Graham et al. [24] who carried out study to assess Oxygen therapy for children.

The results of the present study may be due to the positive effect of good level of knowledge about the purpose and ways to give oxygen for infants with respiratory problems on the nurses' performance regarding oxygen mask .

Hakim [25] reported that more than half of studied nurses had good performance regarding ETT suction technique. This result agree with finding of the current study, which found that more than half of nurse practice score was good regarding ETT. These result may be due to good experience of nurses practice regarding ETT suction technique.

Concerning to nurses' practice regarding physiotherapy, the finding of the current study found that less than half of nurse practice score was good& this low percentage may be due to that the branch didn't include in their curriculum.

These results supported with the study done by Chaves et al[23] . who found that less than half of the studied nurses had competent level of practice regarding physiotherapy. In contrast, Ali and Morsy [26]

who stated that more than two thirds of the studied nurses are incompetent regarding performing chest physiotherapy.

Morgaonkar et al. [27] found that more than three quarters of studied nurses were competent regarding intravenous .These go on line with finding of current study regarding IV therapy which found that more than three quarters of nurses practice score was good. These results may be due to the IV line routinely made it by nurses.

According to nurse's practice regarding axillary temperature, the finding of the current study found that more than three quarter of the nurse practice score was good. These results agreement with Wood, Heitschmidt and Fogg [28] reported that more than two thirds of studied sample were competent regarding axillary temperature measurement. This is may be due to that nurses routinely make it.

Regarding to the relation between characteristics of studied nurses and total score of practice about pneumonia, the present study showed that there was statistically highly significant relation between qualification and total score of practice. This might be explained as, most of nurses who had good to fair score of practice were graduated from nursing technician institute. This means that most of the nurses are juniors and the nurses in young age are full of energy and hyperactivity This results agree with Ibrahim, Refaat, & Amin, reported [29] that nurses' qualification had a significant effect on their Performance. In the same field, Williams et al,[30] found that there was significant relation between total nurses' practice regarding to pneumonia precautions for children and their educational level.

Conclusion:

Based up on findings of the present study, it be concluded that total practice score of studied nurses about pneumonia was good.

Recommendation

Up on the finding of present study the following recommendation are suggest:

1-Continuous training program for all nurses about standard care for children with pneumonia.

2- Continuous training program for all nurses about physiotherapy and should be include in nursing curriculum.

3- Booklet about pneumonia should be found as a teaching aid in the unit.

Table (1) : Characteristics of studied nurse. N=100

Nurses Knowledge	N (100)	%
1-Age in years		
• 20-	12	12
• 25-	51	51
• ≥30	37	37
Mean ± SD	25± 9.1	
2- Qualification:		
• Nursing Diploma	10	10
• Nursing Technician Institute	46	46
• Bachelor of Nursing	42	42
• Other mentions	2	2
3- years of experience		
• >5 years	20	20
• 5-10 years	65	65
• More than 10 years	24	24
Mean ± SD	11±3.1	
4-Received training courses for pneumonia		
• Yes	13	13
• No	87	87
5- Work department :		
• Emergency unit	22	22
• Chest and Allergy	4	4
• Pediatric department	36	36
• Neonatal Intensive care unit	38	38

Table (2) : Nurses' practice regarding oxygen mask. N=100

1. Nasal prong or nasal cannula:	**Not complete**		**Complete**	
	N (10٠)	**%**	**N**	**%**
-Before procedure:				
- Hand washing.	59	59	41	41
-Prepare the equipment	14	14	86	86
- During procedure:				
-place the mask and tighten it.	6	6	94	94
-Turn on the oxygen to the prescribed concentration**.**	19	19	81	81
-Observe child condition	31	31	69	69
-**After procedure:**				
-Hand washing	42	42	58	58
Documentation	8	8	92	92

Table (3)**:** Nurses' practice regarding Endo-tracheal suctioning. N=100

1. **Suctioning (Endo-tracheal suctioning).**	**Not complete**		**Complete**	
Before procedure:	**N(10٠)**	**%**	**N(10٠)**	%
-Hand washing.	43	43	57	57
-Prepare the equipment**.**	33	33	67	67
During procedure:				
- Wear sterile gloves.	30	30	70	70
- Instill.,025-2ml of normal saline into E.T.T.to soothing the secretion.	16	16	84	84
- Apply suction no longer than 10-15second	10	10	80	80
-Attach ETT to a manual resuscitation bag and ventilate the child	8	8	92	92
-Rinse the catheter with sterile saline and repeat suctioning until air way is clear**.**	9	9	91	91
-After procedure:				
- Hand washing	17	17	83	83
-Documentation	7	7	93	93

Table (4): Nurses practice regarding physiotherapy. N=100

Physiotherapy	Not complete		Complete	
-**Before procedure:**	**N (10٠)**	**%**	**N (10٠)**	`
- Hand washing.	66	66	34	34
-During procedure:				
-Place the child in up right setting position, consider alternates the position	31	31	69	69
- Using a cupped hand for percussion on each lung. Then a shaking motion using an open hand..	10	10	90	90
- Perform suctioning or encourage coughing up	31	31	69	69
-Return the child to comfort position.	2	2	98	98
-**After procedure:**				
-Hand washing	44	44	56	56
-Documentation	20	20	80	80

Table (5): Nursing practice regarding IV therapy . N=100

I**V therapy**	Not complete		Complete	
-Before procedure:	N(10٠)	%	N(10٠)	%
-Hand washing.	43	43	57	57
-Prepare the equipment.	12	12	88	88
During procedure:				
- Label the container.	41	41	59	59
- Hang solution bottle intravenous stand..	0	0	100	100
- Squeeze a drip champers and fill the drip champers with one third to half of solution.	8	8	92	92
-Start to drop and set IV flow rate	2	2	98	98
-Observes site of infusion.	22	22	78	78
-**After procedure**:				
- Hand washing	34	34	66	66
- Documentation	4	4	96	96

Table(6): Nursing practice regarding axillary temperature. . N=100

Axillary temperature	Not complete		Complete	
	N (10٠)	%	N (10٠)	%
-Before procedure:				
-Hand washing.	72	72	28	28
-Prepare the equipment.	15	15	85	85
- During procedure:				
-Place the thermometer under arm for 5 minutes	11	11	89	89
After procedure:				
-Hand washing	44	44	56	56
Documentation	13	13	87	87

Table (7): Total score of practice of the studied nurses about care of children with pneumonia. . N=100

Level of practice	N(100)	%
-Poor <60 %	16	16.0
-Fair (60- <80%)	43	43.0
-Good (80-100%)	41	41.0

Table (8): Relation between characteristics of studied nurses and total score of practice. N=100

Characteristics `	Total score of practice						χ^2	P
	Poor N(16)		Fair N(43)		Good N(41)			
	N	%	N	%	N	%		
1-Age in years								
• 20-	1	6.2	2	4.7	9	22.0	7.958	0.093
• 25-	7	43.8	26	60.5	18	43.9		NS
• ≥30	8	50.0	15	34.9	14	34.1		
2- Qualification:								
• Nursing Diploma	5	31.2	5	11.6	0	0.0	17.906	0.006**
• Nursing Technician Institute	3	18.8	22	51.2	21	51.2		
• Bachelor of Nursing	8	50.0	16	37.2	18	43.9		
• Others	0	0.0	0	0.0	2	4.9		
3- years of experience								
• Less than 5 years	4	25.0	8	18.6	8	19.5	6.306	0.177
• (5 - 10 years)	5	31.2	28	65.1	23	56.1		NS
• 10 years and over	7	43.8	7	16.3	10	24.4		
4-Received training courses for pneumonia								
• Yes	3	18.8	5	11.6	5	12.2	0.563	0.755
• No	13	81.2	38	88.4	36	87.8		NS
5- Study Location								
• Zagazig University Hospital	8	50.0	24	55.8	21	51.2	0.247	0.884
• Al-Ahrar Teaching Hospital	8	50.0	19	44.2	20	48.8		NS
6- Work department:								
- Emergency Unit	3	18.8	6	14.0	13	31.7	5.547	0.476
- Chest and Allergy	0	0.0	2	4.7	2	4.9		NS
- Pediatric department	7	43.8	18	41.9	11	26.8		
- Neonatal Intensive Care	6	37.5	17	39.5	15	36.6		

NS: non significant (p>0.05) **: statistically highly significant (p<0.01)

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