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Research Article

Knowledge, Attitude and, Practice among Mothers of Under- Five Children about Acute Lower Respiratory Tract Infections an a Locality in Khartoum Urban Area, Sudan

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1. Introduction

Acute respiratory tract infections are classified into two groups according to the anatomy of the respiratory tract: upper and lower respiratory tract infections. The term lower respiratory tract infection is usually used as a synonym for pneumonia, can also be applied to other types of infection including lung abscess and acute bronchitis, those infections include many diseases but our main focus will be in diseases associated with a high mortality rate in children mainly pneumonia and acute bronchitis [1].

The causative organism could be bacteria, viruses or parasites. Most of the community-acquired pneumonia are bacterial in origin usually following a viral upper respiratory tract infection [2]. S. pneumoniae is the most common cause of community-acquired acute pneumonia. S.aureus is an important cause of secondary bacterial pneumonia in children it is associated with a high incidence of complications such as lung abscess and empyema [3]. Other important organisms causing pneumonia: H.influenzae ,M.catarrhalis , k.pnemoniae ,P.aeruginosa ,L.pneumophila. The onset of symptoms in pneumonia is usually abrupt with high

fever, shaking chills, pleuritic chest pain, and productive cough. The diagnosis of pneumonia in developing countries is mainly clinical but in advanced setting, laboratory diagnosis could be attempted. Pneumonia can be prevented by immunization, adequate nutrition, and by addressing environmental factors. Acute bacterial pneumonia should be treated by antibiotics, antibiotic of choice is amoxicillin tabs [4].

The diagnosis mainly depends on clinical symptoms and signs but the doctor may order some tests like: chest x-rays to check for pneumonia, blood cultures, or mucous samples to check for bacteria and viruses, for treatment of those infections sometimes they are self-limited disease so intervention needed or simple measures like over the counter drugs, rest, and drinking plenty of fluids, in bacterial infections antibiotics are needed, in severe cases hospitalization of the patients is needed and IV fluids and breathing support.

Most of lower respiratory tract infections go uncomplicated but when the complications occur they can be serious and include the following: congestive heart failure, respiratory failure or arrest, sepsis leading to organ shutdown, lung abscesses, under-five children are a risk group for complications so a consultant must be seen in these cases [5]
most of the researches done in the field of control of the spread of acute respiratory tract infection was focusing on assessing the knowledge, attitude, and practice gaps in the community to determine where and in which steps intervention is needed, and to raise the awareness of the general population about such diseases.

Acute lower respiratory tract infections represent an increasing threat. The disease is one of the leading causes of mortality and morbidity in under 5 children. In Sudan pneumonia is the third cause of deaths in under 5 children and in 2018 pneumonia led to 19,029 deaths representing 8.97% of total deaths. The age-adjusted death rate is 52.66 per 100,000 of population ranks Sudan #63 in the world [6]. The knowledge, attitude, and practice of mothers about the disease causation, risk factors, complications, and about disease levels that need hospitalization and those can be treated at home is an essential step for better management of the disease among children. In addition, the misuse of antibiotics is a rising problem and the appearance of new antibiotic-resistant bacteria is further complicated the situation [7]. This study aims to assess the knowledge, attitude, and practice of mothers of under-five children about acute lower respiratory tract infection.

2. Educational Aims of the Article

- The research was conducted to build up knowledge about the general situation of respiratory awareness in society.
- Also one of the aims was to correct the misconception about antibiotics use in all cases of respiratory infections without prescription.
- Assessment of the association between sociodemographic data and level of knowledge, attitude and practice.
- Assessment of the effect of the media in raising awareness.

3. Methods

3.1 Study design

This is a descriptive quantitative cross-sectional, community-based study which was carried out in Khartoum State.

3.2 Study area

The study was conducted in Al-Haj Yousuf administrative, Sharg-Alneel Locality, Khartoum state. The area has a diverse socioeconomic status and a population with a different ethnic background. The population of Sharg Al-Neel represents 14% of the general population of Khartoum state with the highest population in AlHaj Yusuf administrative unit.

3.3 Study population

Mothers of under-five children who have a child or more were included in the study.

3.4 Sampling and Sample size

The sample was calculated to be 399 using the formula: n=N/1+N e2 but only 300 mothers were included in this study and were chosen to represent areas of low, medium, and high socioeconomic status.

Three residential neighborhoods were chosen (Alqadisiyah – Alfayhaa – and the 8th block) those neighborhoods represent high, medium, and low socioeconomic state respectively, and the questionnaires were distributed equally, 100 for each simple random sampling was done for choosing the participants.

3.5 Study variables

Age, the weight of the child, age of the mother, educational level of the mother, mother's occupation, duration of the marriage, monthly outcome, and housing.

3.6 Data collection tools

Data was collected using a self-structured questionnaire, which covers sociodemographic data of the mother and her child, knowledge of mothers about acute lower respiratory tract infections assessed by 10 questions, the attitude of the mothers towards their child sickness assessed by 3 questions, and finally the practice when the child is sick.

3.7 Data analysis

Data was entered and encoded by trained personnel and the data was analyzed using SPSS software (version 22), in a shape of descriptive statistics as follows:1- categorical variables (frequencies and percentages) 2-continuous variables (mean-standard deviation-median-minimum and maximum values), for the assessment of association chi-square test was used to test the differences between categorical variables (p-value less than .05 is considered to be significant) and data was presented using tables.

4. Results

4.1 Sociodemographic characteristics of the population under study

The study included 300 mothers the maximum age was 48 years, and the minimum was 21 years with the mean of 31.9, regarding the age of the children the maximum was 59 months and the minimum was 0 because of the missing data with a mean of 28.19, about the weight of the children the maximum was 56kg and the minimum was 4 kg with a mean of 11.49. income was divided into low (692 USD and below), medium (693-1724 USD), high (1725-1900) according to world bank about Sudan 2019.

Question	Options	Frequency	Percent
Sex of the child	male	140	46.7
	female	160	53.3
Educational level of the mother	Illiterate	6	2
	Preschool	10	3.3
	Primary school	53	17.7
	Secondary school	86	28.7
	University	128	42.7
	Higher studies	17	5.7
Mother's occupation	Housewife	277	75.7
	Worker	9	3
	Employee	57	19
	Others	7	2.3
Income	Low	35	11.7
	medium	248	82.7
	high	17	5.7
House	Rent	75	25
	Private property	132	44
	Others	93	31

Table 1: Demonstrating socioeconomic data of the population under study.

4.2 Knowledge of mothers about acute lower respiratory tract infections (pneumonia, acute bronchitis)

Regarding knowledge about pneumonia 226 mothers (88.7%) said that they know what is pneumonia, only 34 mother (11.3%) said that they haven't hear about it (Table 2), the knowledge score was assessed using 10 multiple choice questions, 22 points were blotted as the highest knowledge score and 7 as the lowest ,depending on the literature 16 was chosen as the cutoff point between good knowledge –score above 16-and poor knowledge-below 16- .

In general more than two thirds of the mothers had poor knowledge regarding recognition of symptoms, complications and risk factors (Table 3), association was found between knowledge and sociodemographic data (Table 4).

Question	Options	Frequency	Percent
Have you ever heard about the term "pneumonia "? "	Yes	266	88.7
	No	34	11.3
Mention the symptoms of pneumonia in under 5 children? "more than one answer"	Very rapid and difficult breathing		
	yes	163	61.3
	no	103	38.7
• For people who answer yes in the last Q	Wheezing		
	yes	47	17.7
	no	219	82.3
	Fever		
	yes	198	74.4
	no	68	25.6
	Poor feeding or loss of appetite		
	yes	96	36.1
	no	170	63.9
	Coughing and vomiting		
	yes	145	54.5
	no	121	45.5
	Checking chills		
	yes	8	3
	no	258	97
Have you ever heard about the term " acute bronchitis"?	Yes	217	72.3
	No	83	27.7
Symptoms and signs of acute bronchitis? "	Cough		
	yes	115	53
	no	102	47
• Only people who answer yes in the last Q	Runny nose		
	yes	100	46.1
	no	117	53.9
	Fever		
	yes	144	66.4
	no	73	33.6
	Fatigue		
	yes	60	31.8
	no	148	68.2
	Muscle pain		
	yes	34	15.7
	no	183	84.3
Causes of pneumonia?	Bacterial	120	40
	Viral	155	51.1
	Parasitic	7	2.3
	did not answer	18	6
Do you think the treatment differs according to the causative agent?	Yes	261	87
	no	28	9.3
	did not answer	11	6
What are the risk factors of respiratory tract infection?	Cigarette smoking		
	yes	155	51.7
	no	145	48.3
	Low resistance		
	yes	182	60.7
	no	118	39.3
	Continuous exposure to irritants		
	yes	256	85.3
	no	44	14.7
Mention complications of acute lower respiratory tract infection in under 5 children ?	Bacteremia		
	yes	113	16.7
	no	187	83.3
	Abscess of the lung		
	yes	50	16.7
	no	250	83.3
	Pericarditis		
	yes	34	11.3
	no	266	88.7
	Endo bronchial obstruction		
	yes	164	54.7
	no	136	45.3
	Endo bronchial obstruction		
	yes	92	30.7

	no	208	69.3
Source of information:	TV		
	yes	176	58.7
	no	124	41.3
	Radio		
	yes	26	8.7
	no	274	91.3
	Internet		
	yes	104	34.7
	no	196	65.3
	Family and friends		
	yes	104	34.7
	no	196	65.3
	Others "define		
	yes	59	19.7
	no	241	80.3
Antibiotics should be used in all cases of pneumonia	Yes	96	32
	no	193	64.3
	did not answer	11	3.7

Table 2: Demonstrating the knowledge among mothers about acute lower respiratory tract infection.

Variable	**Frequency**
Good knowledge	77
Poor knowledge	223

Knowledge score above16 is considered “good” and below 16 as “poor”.

Table 3: Frequency of knowledge among mothers.

Question	**Options**	**Knowledge**		**p – value**
		good knowledge	**bad knowledge**	
Educational level of the mother	Illiterate	1	5	.000*
	Preschool	9	1	
	Primary school	23	30	
	Secondary school	24	62	
	University	17	111	
	Higher studies	3	14	
Mother’s occupation	Housewife	67	160	.003*
	Worker	4	5	
	Employee	4	53	
	Others	2	5	
Income	Low	18	17	.001*
	medium	57	191	
	high	2	15	
House	Rent	22	53	.609
	Private property	34	98	
	Others	21	72	

Table 4: demonstrating the association between knowledge and sociodemographic data, and p-value for chi square test with significance level .05.

Question	Options	frequency	Percent
Do you think consulting a physician is necessary in cases of pneumonia?	yes	273	91
	no	12	4
	did not answer	15	5
When do you think we should see doctor in cases of acute bronchitis?	If the condition last more than 3 weeks		
	yes	70	23.3
	no	230	76.7
	If it prevents sleeping		
	yes	238	79.3
	no	62	20.7
	Production of discolored mucous or blood		
	yes	107	35.7
	no	193	64.3
	If it is associated with wheezing and shortness of breath		
	yes	205	68.3
	no	95	31.7
	If fever is higher than 38		
	yes	300	100
	no	0	0
attitude when your under 5 child has acute lower respiratory tract infection?	Consulting a physician		
	yes	272	90.7
	no	28	9.3
	Treat at home using over the counter drugs “paracetamol, ibuprofen”		
	yes	133	44.3
	no	167	55.7
	Use antibiotics found at home		
	yes	41	13.7
	no	259	86.3
	Using at home remedies		
	yes	132	44
	no	168	56
	Alternative and traditional medicine		
	yes	130	43.3
	no	170	56.7
	Do nothing and wait until it resolves by it self		
	yes	14	4.7
	no	286	95.3

Table 5: Demonstrating attitude of mothers towards acute lower respiratory tract infections.

4.3 Attitude of mothers towards acute lower respiratory tract infections

Attitude of assessed using 3 multiple choice questions, 9 was blotted as the highest score and 3 as the lowest ,6 was the cutoff point between good attitude –above 6-and bad attitude –below 6-. 273 mother (91%) think that consulting a physician is important when they suspect their child might have pneumonia 12 of them (4%) think it is not necessary, and 15 of them (5%) actually did not know. Alternative and traditional medicine was the favorable choice by 130 mother (43.3%), 41 mother think using antibiotics found in home is a better choice (13.7%), 14 mother think that they should leave the condition to resolve by itself (4.7%) (Table 5). The attitude of mother in general was bad regarding what they think about seeking medical help (Table 6). A statistical association was found between attitude and sociodemographic data of the mothers (Table 7).

Variable	**Frequency**
Good attitude	146
Bad attitude	154

Attitude score above 6 is considered "good " and below it as "bad"

Table 6: Frequency of attitude among mothers.

Question	**Options**	**Attitude**		**p – value**
		good attitude	**bad attitude**	
Educational level of the mother	Illiterate	1	5	.000*
	Preschool	9	1	
	Primary school	5	48	
	Secondary school	5	81	
	University	3	125	
	Higher studies	0	17	
Mother's occupation	Housewife	20	207	.003*
	Worker	3	6	
	Employee	0	57	
	Others	0	7	
Income	Low	23	12	.000*
	medium	0	284	
	high	0	17	
House	Rent	6	69	.002*
	Private property	3	129	
	Others	14	79	

Table 7: Demonstrating the association between attitude and sociodemographic data, and p-value for chi square test with significance level .05.

4.4 Practice of the mothers when their child is having acute lower respiratory tract infection

The practice of mothers when they were asked about what they actually do when their child is sick 270 of them (90%) said that they consult a pedestrian when symptoms and signs begin, 152 mother (50.7%) said that they ask the physician about home remedies and herbs, 102 others (34%) chose to practice self-medication by using over the counter drugs and antibiotics already found at home, 75 mother (25%) said they ask family and friends about what should be done , 64 others (21.3%) said they ask the physician or the pharmacist to prescribe antibiotics (Table 8), the cutoff point to differentiate between good and bad practice was regarded as 3, mothers scored less than 3 were considered as having bad practice seeking medical help when their child is sick , so the practice in general was bad (Table 9) , and statistical association was found between the practice of mothers and their sociodemographic data (Table 10).

Question	Options	Frequency	Percent
What do you do when your under 5 child has acute lower respiratory tract infection?	Practicing self-medication		
	yes	102	34
	no	198	66
	I consult pedestrian when symptoms and signs begin		
	yes	270	90
	no	30	10
	I ask the physician or pharmacist to prescribe antibiotics		
	yes	64	21.3
	no	236	78.7
	I ask physician about home remedies and herbs		
	yes	152	50.7
	no	148	49.3
	I ask family and friends about what should be done		
	yes	75	25
	no	225	75

Table 8: Demonstrating the practice of mothers when their child is sick.

Variable	Frequency
Good practice	77
Bad practice	223

Practice score above 3 is considered “good” and below it “bad”.

Table 9: Frequency of practice among mothers.

Question	Options	Practice		p – value
		good practice	bad practice	
Educational level of the mother	Illiterate	3	3	.001*
	Preschool	1	9	
	Primary school	26	27	
	Secondary school	49	37	
	University	66	62	
	Higher studies	1	16	
Mother's occupation	Housewife	121	106	.041*
	Worker	3	6	
	Employee	19	38	
	Others	3	4	
Income	Low	10	25	.016
	medium	130	118	
	high	6	11	
House	Rent	36	39	.466
	Private property	60	72	
	Others	50	43	

Table10: Demonstrating the association between practice and sociodemographic data, and p-value for chi square test with significance level .05.

5. Discussion and Limitations

The study was conducted in AlHaj Yusuf administrative unit, Sharg Alneel district, Khartoum state, Sudan. describing the level of knowledge, attitude, and, the practice of mothers about pneumonia in their under-five children. The participants were 300 mothers interviewed by self-structured questionnaire, the study showed that the age of mothers was between 21 and 48 years old and a good proportion (42.7%) of them had their education until university, the majority of them were housewives (75.7%), the duration of marriage was maximum of 35 years and a minimum of 2 years, most of the families had medium monthly outcome (82.7%) and 44% of their houses were private property.

5.1 Knowledge

In steps to assess knowledge of mothers about acute lower respiratory tract infections they were asked in details about pneumonia and acute bronchitis, first starting by pneumonia, regarding the causative organism mothers could tell those different organisms cause it which is a good indicator for knowledge, and most of them think that it is commonly viral which is basically true because the most common cause of pneumonia in under five are viruses followed by pneumococcus and Haemophilus influenza, in contrast, to study conducted in maternal and child hospital in Sakaka city, the hospital serves for the population of Al _jouf area in Saudi Arabia in 2012 _2013, 160 mothers were interviewed, 51.15% of them knew that pneumonia is caused by a germ or microorganism but they couldn't tell wither its virus

or a bacteria [8], also in contrast to different results found in a study conducted in pediatrics clinics of logos university teaching hospital in Nigeria November 2011, hundred and seven caregivers participated in the study, 23.1% of the participants chose germs as the cause of pneumonia and 74.7% identified exposure to cold as the cause [9], but close results to this research were found in a study conducted in 2013 in Daraga district, Wad Madani, most of the respondents chose virus 70.3% as the commonest cause of pneumonia [10].

88.7% said they know what pneumonia is, and when asked about the symptoms of its fever and rapid and difficult breathing were mentioned by most of the mothers 74.4% and 61.3% respectively, those results were found to somehow close across a sectional study conducted in Lima, Peru in august 2000, 84% of mothers said that they knew what is pneumonia, more than 80% of them correctly picked rapid breathing and chest retraction from a list of possible signs and symptoms of pneumonia [11]. And another study came with close results the study was conducted in maternal and child hospital in Sakaka city in 2012 _2013, the hospital serves for the population of Al _jouf area in Saudi Arabia, 160 mothers were interviewed, two-thirds of them (67.5%) and (66.25%) knew that chest pain, fever, cough, and fast breathing are main symptoms and signs of pneumonia [8], different results came from A cross-sectional stratified cluster sampling study was conducted in Baringo district, Kenya in the period from August to October 1990, 309 households were included in the study, 96.1% of them said they know the term pneumonia when asked to describe it only 18% did so satisfactorily, this included 5% of them mentioned increased respiratory rate, 10% difficulty in breathing and 3% cough and most of them 80% mentioned fever as the main symptoms of pneumonia which indicate poor knowledge [12].

About risk factors that could the child chance of having pneumonia, most of the mothers think that continuous exposure to irritants (85.3%) is a serious factor especially cold weather and dust, similar to across sectional study was done in Lima, Peru in august 2000, 501 mothers participated in this study, most of them think that pneumonia is caused by weather change and cold temperature [11].

About the knowledge of mothers about the complications of acute lower respiratory tract infections, endobronchial obstruction (54.75%) and atelectasis (30.7%) were the most common complications mentioned correctly by mothers.
Television was the main source of information for more than half of mothers (58.7%), this may reflect the impact of technology in raising the awareness of society. Regarding the treatment of pneumonia and if antibiotics should be used in all cases 64.3% of mothers answered no which is a good indicator for knowledge and can decrease the occurrence of antibiotics misuse and bacterial resistance.

Regarding knowledge about acute bronchitis, most of the mothers (72.3%) said that they have heard about the term bronchitis, when asked to describe it they mentioned fever (66.4%) and cough (53%) as the commonest symptoms, in contrast to another study where cough is the predominant and defining symptom of acute bronchitis [13]. 77 mother (25.7%) had good knowledge about acute lower respiratory tract infections, but most of them had poor knowledge (223 mothers,74.3%), the association is found

between the educational level of the mother and her level of knowledge (p-value was significant 0.000) also an association found between her occupation and her state of knowledge (p_ value was significant 0.003), regarding the association between the monthly outcome of the family and the level of mother's knowledge it was found to be significant (p-value 0.001).

5.2 Attitude

Most of the mothers (91%) think pneumonia is a dangerous disease and doctor must be seen immediately, but some of them think it can be treated at home using home remedies and herbs or over the counter drugs to decrease symptoms until the disease is relieved or it needs medical intervention, similar results came from an ethnographic study conducted in Punjabi population in Karachi, Pakistan, 90 mothers participated in this study, most mothers considered pneumonia as a potentially fatal disease, but generally the mothers consider it as a condition that can be treated at home and no need for a doctor unless the fever continued more than one day, and no need for hospital unless t exceeds doctor`s abilities [14].

And about the attitude towards children suspected to have acute bronchitis, mothers think a doctor must be seen in case of high-grade fever or the symptoms interferes with sleep. 146 mother (48.7%) had a good attitude about the disease, but more than half of them (154 mothers, 51.3%) had a bad attitude and an association was found between the educational level of the mother and her attitude towards the disease (p-value 0.000), another association was found between her occupation and the correct attitude and p-value was significant (0.003%), also association was found between the monthly outcome of the family and her attitude (p-value 0.000, significant).

5.3 Practice

Most mothers (90%) immediately consult a pedestrian when the signs and symptoms appear, and half of them would ask the physician about home remedies and herbs, only 77 mothers (25.7%) had good practice about consulting the doctor before taking any drug or using home remedies which may delay of the medical care-seeking behavior, close results came from A cross-sectional study conducted in Saudi Arabia from the period from February 2017 to June 2017 in twenty primary health care centers in 733 Saudi mothers seeking care for their children, 53.3% of mothers practiced self-medication without seeing a doctor, 61.85 of them would consult a pediatrician, 54.4% of them asked the physician to prescribe antibiotics, 77.8% of subjects do not ask the physician about using home remedies and herbs and use them by themselves [15], the difference that it is a facility-based study. An association found between the educational level of the mother and her practice when her child is sick (p-value 0.001), also an association was found between her occupation and her medical care-seeking practice (p-value 0.041), another association found between the monthly outcome of the family and the mothers' practice (p-value 0.16).

5.4 limitations to the study

399 mothers were supposed to be included in this study but due to limited time, deadlines, the cost of transportation, and questionnaire print- out only 300 mothers were included.

6. Conclusion and Recommendations

6.1 conclusion

This study was conducted in Al haj Yusuf administrative unit in Sharg Alneel district, Khartoum state, Sudan with 300 mothers participating in this study to study the knowledge, attitude, and practice of these mothers when their under-five child is having acute lower respiratory tract infection. The study was meant to assess the level of knowledge (the mean knowledge score was 7) with 77 participants having good knowledge about the disease and 223 participants with poor knowledge, and an association was found between the socioeconomic data of the mother and her level of knowledge.

The study found 146 mothers (48.7%) had a good attitude about the disease, but more than half of them (154 mothers, 51.3%) had a bad attitude and an association was found between the socioeconomic status of the mother and her attitude. Also, the study found that only 77 mothers (25.7%) had a good practice and 223 with a wrong practice that causes a delay in seeking medical help, and an association was found between the sociodemographic data of the mother and her practice. Since there is association between mothers KAP score and their sociodemographic data ,a generalization to the community can be done using this data.

6.2 Recommendations

we recommend campaigns should be done regularly in the society to raise awareness about serious diseases like acute lower respiratory tract infections especially in a vulnerable group like under-five children, and families should be enrolled in the process of change, and medical care centers should be more suitable for providing care, also More researches should be conducted to assess the knowledge gap.

Ethical Consideration

Ethical approval was obtained from the department of community medicine, faculty of medicine, University of Khartoum, and verbal consent were taken from mothers who participated in this study.

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