

East African Medical Journal Vol. 93 No. 5 May 2016

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ABSTRACT

Background: Mortality from pneumonia can be prevented by prompt recognition of symptoms of pneumonia by caregivers at home and appropriate seeking for medical care in a health facility. Active participation in pneumonia control by caregivers is dependent on the extent to which the members of the community are aware of features of pneumonia and recognising that the child needs medical attention.

Objective: To document the knowledge of community members about pneumonia using traders (market women and men in a popular market in Benin City, Nigeria).

Design: A descriptive cross-sectional study.

Setting: Edaiken market, Benin City, Nigeria.

Subjects: All traders, women and men in Edaiken market Benin City Nigeria.

Results: Of the 1374 respondents, 1220(88.8%) about pneumonia. Of these 1220, 57.9% correctly identified that pneumonia affects the lungs and exposure to breeze was the risk factor of pneumonia (86.7% of respondents). Knowledge score for pneumonia was generally low with most respondents 1140(93.5%) scoring < 10 (Poor); and 79(6.5%) had scores 10–14 (Fair). Only one person (0.1%) had a score ≥ 15 (Good knowledge). Married individuals were five times more likely to have fair knowledge of pneumonia when compared to the unmarried individuals (OR = 5.0, $p = 0.01$). Also statistical significant proportion of respondents with presence of an under-five year old in the household had fair knowledge of childhood pneumonia when compared with household with no child younger than five years ($p = 0.00$).

Conclusion: General knowledge of the traders in Benin City about childhood pneumonia was poor. There is need for improved public awareness on childhood pneumonia in this community.

INTRODUCTION

Pneumonia is the inflammation of the lung tissue leading to ventilation-perfusion mis-match which manifests clinically with cough, difficulty with breathing and others. Pneumonia affects all age group,(1) and is a major contributor to under-five mortality world-wide. It accounts for 80.0% of all death from infection in children (1-4). The common causes of infectious pneumonia in children are viruses (70%–80% cases), bacterial (18.0%–30.0%) and fungi (rare in well-nourished children) (1,2). Examples of these organisms include *Streptococcus pneumoniae*, *Haemophilus influenzae* type b (Hib), *Staphylococcus aureus*, *Respiratory syncytial virus*, *Pneumocystis jiroveci* (infants infected with human immunodeficiency virus), *Mixed bacterial and viral infections* (23.0%–33.0% of cases), *Mycoplasma pneumoniae* (Atypical organism up to a third of cases), *Influenza A*, *Parainfluenza virus*

(PIV) 1,2, and 3 and others (1). Most of risk factors for pneumonia are preventable, and include host factors such as malnutrition, not being exclusively breast fed, no immunisation and immunodeficiency states (congenital or acquired as in HIV) (3,4). Other environmental factors as indoor air pollution (use of wood or dung biomass as domestic fuel), over-crowding, passive smoke exposure and poverty have been implicated in pneumonia (1).

Features of childhood pneumonia include fever, cough, fast breathing, difficulty with breathing (chest in-drawing), noisy breathing (wheeze, stridor), refusal to suck in infants or not able to feed, cyanosis (3,4). Death from pneumonia can be prevented by prompt recognition of symptoms of pneumonia by caregivers at home and appropriate medical care in a health facility (5-8). This active participation in pneumonia control by caregivers is dependent on the extent to which the members of the community are aware

of features of pneumonia and recognising that the child needs medical attention (6). There have been varying reports on active participation of caregivers on pneumonia management and control. In a study by Khamqaonkar *et al* (7) in Nanded city in India, nearly half of the 635 mothers in a community survey could not identify at least one symptom of pneumonia whereas in the study of Al-jouf, Saudi Arabia showed that 75.0% of mothers had good knowledge of symptoms of pneumonia in their children (5). The difference in these findings may be due to the study locale (rural or urban), the respondents' level of education, and the health information available to caregivers/ respondents.

There is paucity of community-based research on mothers' / caregivers' knowledge about childhood pneumonia in Nigeria. The available reports were mainly hospital-based and some were carried out nearly a decade ago (8,9). The most recent research on this subject in Nigeria was by Ekure *et al* (8) in 2011 which showed that mothers' / caregivers' knowledge of childhood pneumonia was low. Following this publication, there have been intensified efforts on nation-wide public campaigns on pneumonia in the media, in various child welfare clinics in the hospitals and high level advocacy to the country policy makers by the Paediatrics Association of Nigeria (PAN) (8). The present study, therefore, was carried out to document the knowledge of community members about pneumonia using traders (market women and men in a popular market in Benin City, Nigeria) as a case study. The study was aimed at documenting whether there is improvement on knowledge of pneumonia by community members following these nation-wide interventional possible awareness strategies on childhood pneumonia.

MATERIALS AND METHODS

This was a descriptive cross-sectional study and was carried out in Edaiken market, Benin City, Nigeria in November as part of the Institute of Child Health (ICH), University of Benin celebration of the 2014 world pneumonia day. Edaiken market is one of the oldest and biggest markets in Benin City and has lock-up shops, stalls and stands. Although the market shops/ stalls were predominantly owned by the Binis, people from the major tribes of the country namely Ibo, Yoruba and Hausa as well as individuals from neighbouring communities in Edo State also own shops, stalls, and stands in the market. This is due to the strategic location of the market along the busy Benin-Lagos Express way. The market has 1,000 lock-up shops and 500 stalls/ stands and these are arranged in rows and columns. Each row is meant to deal with different items; for example, there were rows for perishable goods, sundries, household accessories and others.

Study participants were all traders (women and

men) and were recruited consecutively provided the study participants gave verbal consent and were currently occupying/ performing their daily business within the market (lock-up, stalls or stands).

Data collection was done by research assistance by researcher-administered questionnaire method. The questionnaire was prepared after extensive literature search and was pre-tested at the Child Welfare Clinic of the ICH, University of Benin, Benin City. The research assistances were trained on data collection using the prepared questionnaire. The interviews were conducted using 'Pidgin English', English and Bini languages depending on the preference of the respondent. This was to ensure that appropriate data were obtained from the study participants. The questionnaire was used to obtain information on the demographic characteristics of the study participants, information on what part of the body pneumonia affects, risk factors for pneumonia, symptoms, treatment options and preventive measures.

Ethical clearance for this study was obtained from the Research and Ethics Committee of College of Medical Sciences, University of Benin, Benin City. The research team paid courtesy visit to the Chairman and members of the executive committee of the traders' union of the market. During the visit, the purpose and procedure of the study was explained. Written permission was then obtained from the Chairman of the union for the study. The informed consent was read and explained in English or translated into 'Pidgin English' or Edo languages where indicated to each study participants who was then recruited into the study when he/she affirms verbally to the read out consent.

Data analysis: Data obtained were entered into the Statistical Package for Social Sciences (SPSS) version 16.0 (Inc Chicago, Illinois, USA) data base and analysis were done using the same package. Quantitative variables were summarised using means and standard deviations.

There were twenty (20) questions to assess the 'knowledge of pneumonia' (Table III on the result section). Each correct answer to each question was awarded one mark. The maximum attainable score was 20 marks. Performance scale of knowledge was then classified as 'Good' if the study participants scored 15 – 20 marks, 'Fair' if the study participants scored 10 – 14; and 'Poor', if the score was less than 10. The proportion of the study participants in each category was recorded and associations with variables such as gender, marital status, level of education, presence of under-five in the household and whether the respondent has had a child who had suffered pneumonia. The significance of association between variables was done using chi-square. The test of significance of each variable was set at $p < 0.05$.

RESULTS

There were 1374 respondents, 155(11.3%) males and 1219(88.7%) females; the mean age [SD] was 39.0 ± 12.7 years. The socio-demographic characteristic (gender, age group, marital status and level of education) of the respondents is shown in Table I.

Of these 1374 respondents, 1220 (88.8%) respondents had heard about pneumonia while 154(11.2%) had not heard about pneumonia. The most common place where the respondents heard about pneumonia was in the hospital (either one of their children or their neighbour's child suffered the disease) in 837 (68.6%); followed by television 135(11.1%), immunisation clinic 104(8.5%), antenatal clinic 38(3.1%), radio 34(2.8%) while 72(5.9%) was unknown. The mean [SD] age of the respondents who had heard about pneumonia was 39.3 ± 12.8 years and this was significantly higher than 36.9 ± 12.7 years of the respondents who had not heard about pneumonia ($t = 2.14$, 95%CL 0.21, 4.69, $p = 0.03$). The socio-demographic factors of the respondents and whether or not they had heard about pneumonia is shown in Table II. Respondents with tertiary education ($\chi^2 = 21.15$, $p = 0.000$) and those with presence of an under-five in the household ($\chi^2 = 6.30$, $p = 0.02$) were statistically significantly more likely to have heard about pneumonia prior to this study. Of the 1220 who had heard about pneumonia, 188(15.4%) had children who had suffered pneumonia in the past.

Concerning the knowledge about pneumonia, 706(57.9%) respondents correctly identified that pneumonia is a disease affecting the lungs while 42.1% did not. Most of the respondents 995(81.6%) agreed that pneumonia could kill, while 163(13.4%) did not think pneumonia could kill and 62(5.0%) respondents did not give any response.

Figure 1 shows the causes of childhood pneumonia as identified by the respondents. The most common cause of pneumonia mentioned was cold weather / breeze by 1076(88.2%). Only 33(2.7%) identified that pneumonia is caused by germs infecting the lungs.

Most of the respondents 1060(86.7%) said that exposure to too much cold was the most common risk factor to pneumonia. Other risks factors are as shown in Table III. Difficulty with breathing was the most common symptom of pneumonia identified by the respondents 660(54.1%). Others were cough 375(30.7%), fast breathing 360(29.5%), fever 216(17.7%), noisy breathing 152(12.5%), chest in-drawing 109(9.0%).

Concerning treatment of pneumonia, 1077(88.3%) respondents agreed that taking a child with symptoms of pneumonia to the hospital / health centre was the appropriate health seeking behaviour; some also stated that taking the child to a herbalist 84(6.9%),

praying for the child (pastors / neighbours) by 41(3.4%) and others (asking for help from neighbours, procuring drugs from the patent medicine store and use of home remedy such as rubbing 'shea butter' and other balm) 18(1.4%) were other responses to pneumonia sufferers. Most common treatment modalities mentioned by the respondents was keeping the child warm 553(45.3%); and followed by antibiotic use; 434(35.6%). Other treatment modalities are shown in Figure 2.

Although most of the respondents; 874(71.6%) agreed that pneumonia can be prevented; 'avoidance of exposure to cold' was the most common preventive measures volunteered by 732(83.8%); followed by, 'stop the use of fan / air-condition in homes' by 460(52.6%); and 'constant use of antibiotics' by 151(17.3%). The most common appropriate preventive practices mentioned by the respondents was vaccination / immunisation against pneumonia agents by 164(18.8%). However, only 40(24.4%) of these 164 mentioned correctly at least one vaccine that can be used to prevent pneumonia. Common vaccines mentioned included pneumococcal vaccine, pentavalent vaccine, measles vaccine, bacilli calmette Guerin (BCG) and diphtheria pertussis tetanus (DPT) vaccines.

The response of the study participants to question on 'knowledge of pneumonia' is shown in Table III. Respondents scored high (88.3%) in health seeking behaviour for childhood pneumonia; followed by knowing that pneumonia kills in 81.6%, and knowing that pneumonia is preventable by 71.6%. However, most other responses regarding cause, risks factors, symptoms and preventive measures of pneumonia were below 50.0%. Knowledge score for pneumonia was generally low with most respondents 1140(93.5%) scoring < 10 (Poor); and 79(6.5%) had scores 10 – 14 (Fair). Only one person (0.1%) had a score ≥ 15 (Good knowledge). Table IV shows the association between awareness and socio-demographic characteristic of study participants (age, marital status, educational level, presence of under-five in the household and previous pneumonia morbidity in the household). Respondents at their middle age statistically significantly had fair knowledge of pneumonia when compared to the individuals younger than 50 years ($\chi^2 = 0.37$, $p = 0.001$). The table showed that the statistical significant highest proportion of respondents with fair knowledge of pneumonia were married and that married individuals were 5 times more likely to have fair knowledge of pneumonia when compared with the unmarried individuals ($\chi^2 = 6.27$, OR = 5.0, $p = 0.01$). Also statistical significant proportion of respondents with presence of an under-five in the household had fair knowledge of childhood pneumonia when compared with household with no child younger than 5 years ($\chi^2 = 0.21$, $p = 0.00$).

Table 1
Socio-demographic characteristics of the respondents

Socio-demographic characteristic	N = 1374 (%)
Gender	
Male	155 (11.3)
Female	1219 (88.7)
Age group (Years)	
18 – 33	511 (37.2)
34 – 49	527 (38.4)
50 and above	280 (20.4)
No response	56 (4.0)
Marital status	
Single	187 (13.6)
Married	1155 (84.1)
No response	32 (2.3)
Level of education of the respondents	
Tertiary	194 (14.1)
Secondary	785 (57.1)
Primary	243 (17.7)
No formal	85 (6.2)
No response	67 (4.9)
Presence of a child younger than 5 years in household	
Yes	301 (21.9)
No	976 (71.0)
No response	97 (7.1)

Table 2
Socio-demographic characteristics of study participants (those who had heard about pneumonia versus those who have not heard about pneumonia)

Socio-demographic factor	Had heard about pneumonia		χ^2	OR	p-value
	Yes (%)	No (%)			
Gender					
Male (n = 155)	140 (90.3)	15 (9.7)	0.26	1.2	0.61
Female (n = 1219)	1080 (88.6)	139 (11.4)			
Age Group (Years)					
18 – 33 (n = 511)	441 (86.3)	70(13.7)	8.49	-	0.01
34 – 49 (n = 527)	483 (91.7)	44 (8.3)			
50 and above (n = 280)	254 (90.7)	26 (9.3)			
Missing data (n =56)					
Marital status					
Single (n = 187)	158 (84.5)	29 (15.5)	3.61	0.6	0.06
Married (n = 1155)	1034 (89.5)	121 (10.5)			
Missing data (n = 32)					
Level of education					
Tertiary (n = 194)	184 (94.8)	10 (5.2)	21.15	-	0.000
Secondary (n = 785)	707 (90.0)	78 (10.0)			
Primary (n = 243)	201 (82.7)	42 (17.3)			
No formal (n = 85)	70 (82.4)	15 (17.6)			
Missing data (n = 67)					
Presence of a child younger than 5 years in household					
Yes (n = 301)	280 (93.0)	21 (7.0)	6.30	2.0	0.01
No (n = 976)	855 (87.6)	121 (12.4)			
Missing data (n = 97)					

Table 3

Variables about awareness of pneumonia assessed and the responses of the study participants regarding pneumonia, risk factors, symptoms, treatment modalities and preventive options of childhood pneumonia

Childhood pneumonia	Response (N = 1220)*	
	Yes n (%)	No n (%)
What is pneumonia?		
Pneumonia affects the lung	706 (57.9)	514 (42.1)
Germs as cause of pneumonia	33 (2.7)	1187 (97.3)
Pneumonia kills	995 (81.6)	225 (18.4)
Risks factors assessed		
Exposure to smoke	67 (5.5)	1153 (94.5)
Over-crowding in homes	54 (4.4)	1166 (95.6)
Air-borne droplets	50 (4.0)	1170 (96.0)
Contact with person suffering pneumonia	17 (1.4)	1203 (98.6)
Symptoms of pneumonia		
Cough	375 (30.7)	845 (69.3)
Fast breathing	360 (29.5)	860 (70.5)
Difficulty with breathing	660 (54.1)	560 (45.9)
Noisy breathing	152 (12.5)	1068 (87.5)
Chest in-drawing	109 (9.0)	1111 (91.0)
Health seeking behavior		
Take the child to the health centre/ hospital	1077 (88.3)	143 (11.7)
Pneumonia prevention		
Can pneumonia be prevented?	874 (71.6)	346 (28.4)
Response (N = 874)*		
Preventive measures		
	Yes n (%)	No n (%)
Vaccination/ immunisation against pneumonia agents	164 (18.8)	710 (81.2)
Breast feeding	161 (18.4)	713 (81.6)
Improve personal hygiene (hand washing)	128 (14.6)	746 (85.4)
Avoid over-crowding in homes	109 (12.5)	765 (87.5)
Adequate ventilation and air in homes	101 (11.6)	773 (88.4)
Avoid smoke in the homes	97 (11.0)	777 (89.0)

(*) There were multiple responses

Table 4

Association between awareness of pneumonia and the socio-demographic characteristics of study participants

Socio-demographic factor	Awareness of pneumonia			OR	p-value
	Poor (%)	Fair (%)	χ^2		
Gender					
Male (n = 140)	133 (95.0)	7 (5.0)	0.37	1.4	0.54
Female (n = 1080)	1007 (93.2)	73 (6.8)			
Age Group (Years)					
18 – 33 (n = 441)	425 (96.4)	16 (3.6)	14.54	-	0.001
34 – 49(n = 483)	450 (93.2)	33 (6.8)			
50 and above (n = 254)	226 (89.0)	28 (11.0)			
Missing data (n =42)					
Marital status					
Single (n = 158)	155 (98.0)	3 (2.0)	6.27	4.0	0.01
Married (n = 1034)	960 (92.8)	74 (7.2)			
Missing data (n = 28)					
Level of education					
Tertiary (n = 184)	175 (95.0)	9 (5.0)	2.49	-	0.48
Secondary (n = 707)	662 (93.6)	45 (6.4)			
Primary (n = 201)	184 (91.5)	17 (8.5)			
No formal (n = 70)	64 (91.4)	6 (8.6)			
Missing data (n = 58)					

Presence of a child younger than 5 years in household

Yes (n = 280)	247 (88.2)	33 (11.8)			
No (n = 855)	821 (96.0)	34 (4.0)	21.78	0.3	0.00
Missing data (n = 85)					

Child had suffered pneumonia

Yes (n = 188)	177 (94.0)	11 (6.0)			
No (n = 959)	891 (93.0)	68 (7.0)	0.21	1.2	0.65
Missing data (n = 73)					

Figure 1
Causes of pneumonia in children as volunteered by the respondents

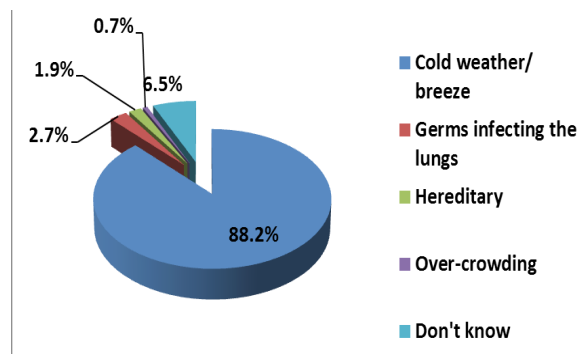
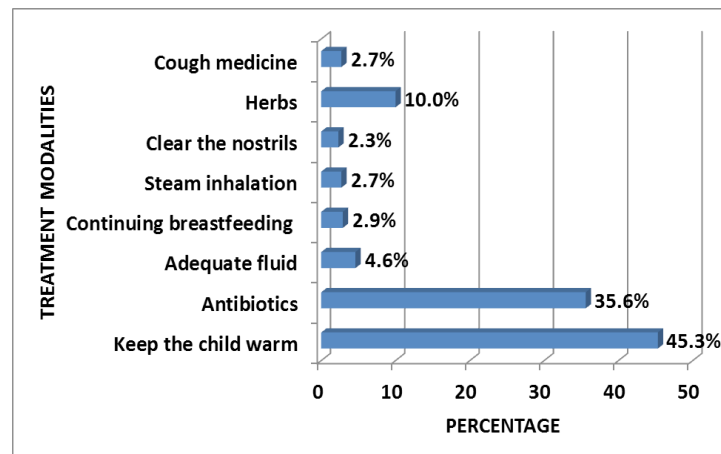


Figure 2
Treatment modalities of pneumonia as mentioned by the respondents



DISCUSSION

The study showed that most of the traders studied had poor knowledge about pneumonia. This finding was similar to findings documented by Ekure *et al* (8) in 2011 and similar to previous documentation in most communities with high burden of pneumonia. (9-12). Most of the respondents though, recognised pneumonia as a killer disease and agreed that taking the child to the health facility is an important health seeking behaviour in management of pneumonia. An important finding in this study is the poor knowledge about the symptoms of pneumonia. Recognition of symptoms of pneumonia and instituting appropriate medical care have been found to reduce mortality. (1,8,12). In this study, only half of the respondents recognised difficulty with breathing as a symptom of pneumonia; and symptoms such as cough, fast

breathing and chest in-drawing which are other cardinal features of pneumonia were recognised by less than one-third respondents. Failure to recognise these symptoms of pneumonia would delay seeking for prompt medical care with resultant poor outcome. This may be compounded by the fact that some of the treatment modalities mentioned by the respondents were inappropriate; for example keeping the child warm and antibiotics which in most cases are procured from untrained healthcare providers.

Fair knowledge of pneumonia was significantly associated with being married and the presence of under-five in the household of the respondents. Pneumonia is common in children (1,4). Married individuals are more likely to have children or have taken care of children who may have suffered the disease than unmarried persons. They are also more likely to be the ones who will be in the hospital while

their children are hospitalised and have interacted with the healthcare providers about the child's illness. This is corroborated by the finding in this study that the hospital was cited as the commonest place where the respondents heard about pneumonia for the first time. The fact that there was generally poor knowledge about pneumonia among the respondents calls for the review of the content of health information provided by healthcare providers to caregivers when their child is hospitalised (13). Previous studies have shown that health information passed to caregivers had resulted in significant improvement in pneumonia deaths when such information emphasised the need for prompt referral to the health facility when the caregiver observes fast or difficult breathing (9-11). These information should also be made available to all regardless of marital status and could result in fewer mortality from the disease.

Although about half of the respondents recognised pneumonia as a disease that affects the lungs, however, small number of respondents was able to mention the correct causes and risk factors of pneumonia. Majority of the respondents referred to cold weather / breeze as the cause of pneumonia. This is in keeping with findings documented in previous studies in Nigeria, (8,9) and some parts of Africa (6) It is observed that many respondents did not think that pneumonia is caused by infectious agents and as such air-borne droplets and over-crowding were not considered as major risk factors to pneumonia. The fact that this finding is independent of the educational status of the respondents calls for urgent review of the strategy and the content of the public enlightenment campaign on pneumonia. Failure to recognise risk factors will affect preventive strategies employed against pneumonia. In this study, most of the respondents mentioned avoidance of exposure to cold and not using fans / air-conditions as important preventive measures reflecting the widely held view that pneumonia results from exposure to cold air. This has been reported previously among Nigerian and Saudi Arabian women (5,8,9). It is important to note that despite the public awareness on risks and preventive measures against pneumonia; factors that will prevent a child from acquiring infections such as exclusive breast feeding, personal / hand hygiene and immunisation against infectious agents causing pneumonia were mentioned by small number of respondents. Emphasis on the preventive measures including the role of immunisation on prevention of childhood pneumonia should be emphasised. This is important especially following the recent introduction of the penta valent and pneumococcal vaccines against the two major causative organisms (*Haemophilus influenzae* Type B and *Streptococcus pneumoniae*) of pneumonia in children.

ACKNOWLEDGMENTS

To members of staff at the Institute of Child Health, University of Benin, Benin City Nigeria for their

immense contribution in data collection. The authors also appreciate the management of Cipla Evans Nigeria Limited, Lagos for their financial support for the logistics aspect of this research. This included printing of questionnaires and transportation of research assistance to and from the study locations.

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