KNOWLEDGE, PERCEPTION, AND HEALTH-SEEKING BEHAVIOUR OF MOTHERS CONCERNING PNEUMONIA AMONG UNDER-FIVE IN ALAKIA COMMUNITY OF EGBEDA LOCAL GOVERNMENT AREA, OYO STATE, NIGERIA

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ABSTRACT

Pneumonia is an acute respiratory infection caused by different infectious agents, including bacteria, viruses, and fungi. Nigeria is among the top five countries which constitute over half of the pneumonia deaths among under-five children. Anecdotal reports show that childhood pneumonia is a source of concern in Alakia, a peri-urban community in Ibadan. However, the health seeking behaviour and the antecedent factors related to the disease have not been well explored among mothers of under-five in this community. Yet, mothers of Under-five have pivotal roles to play in the prevention and management of pneumonia. This study was, therefore, designed to investigate the knowledge, perception, and health-seeking behaviour of mothers concerning pneumonia among under-five children in Alakia Community, Egbeda Local Government Area, Ibadan, Oyo State, Nigeria.

This study was a descriptive cross-sectional survey involving the use of a multi-stage sampling technique to recruit 389 mothers of under-fives in Alakia community. A validated semi-structured interviewer-administered questionnaire which included a 38-point knowledge scale was used for data collection. Knowledge scores 0 – 19, >19 -28.5 points, >28.5 points were categorized as poor, fair, and good respectively. A 17-point scale was used to determine the perception of mothers of under-fives and perception scores < 8.5 points were categorized as unfavourable while perception scores ≥ 8.5 were rated favourable. Descriptive statistics and inferential statistics were used to analyse the data.

The mean age of respondent is 32.7 ± 4.6 years. Most of the respondents (94.9%) were Yoruba, and almost all (98.5%) were married. About two-thirds (62.5%) of the respondents had secondary education; recipients of tertiary education constituted 33.4%. The mean knowledge score was 17.0 ± 3.6, and a majority (72.8%) of them had poor knowledge while 27.2% had fair knowledge; none of the respondents had good knowledge of the disease condition. The majority (61.4%) of the respondents had a favourable perception (i.e., perception in line with the biomedical world view). The mean perception score was 9.2 ± 2.0. The cooking methods reportedly used included the following: gas cooker (86.9%), stove (34.7%), electric cooker (24.7%) and firewood (3.9%). Most (95.9%) of the respondents had no smoker in their family. Three-quarter (75.0%) of the

respondents who had smokers in their family had one smoker. The mean number of smokers in the family was 1.4 ± 0.6. The majority (80.0%) of the respondents reported that they went to hospitals/clinics when pneumonia was suspected while 60.0% visited health care centres; a few (13.3%) of them visited PMV for treatment. Among respondents whose children had experienced pneumonia (3.9%), over 33.3% of them indicated that they visited a health facility while 6.7% used leftover medicines at home

Respondents' level of knowledge was noted to be generally poor, although their perception was generally favourable. Some health seeking behaviours were identified. Some of the mothers whose children had experienced pneumonia visited PMVs for treatment while a few made use of left over medicines. Public enlightenment, peer education, patient education, and community health education activities are recommended to address these concerns.

Keywords: Health-seeking behaviour, Pneumonia-related knowledge, Pneumonia-related perception, Pneumonia prevalence, Cooking methods

Word count: 496

DEDICATION

I dedicate this research to Almighty God for his Grace and strength that ensured the successful completion of this research. To Him alone be all the Glory.

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CERTIFICATION

I hereby certify that this study was carried out by Kayode Joseph Olatunji in the Department of Health Promotion and Education, Faculty of Public Health, College of Medicine, University of Ibadan, Nigeria under my supervision.

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AIDS	-	Acquired Immuno-Deficiency Syndrome
ALRI	-	Acute Lower Respiratory Tract Infection
ARI	-	Acute Respiratory Infections
CAC	-	Community–Acquired Childhood
CDC	-	Centres for Disease Control and Prevention
CFR	–	Case fatality rate
DHS	-	Demographic Health Surveys
FGD	–	Focus Group Discussion
HMB	-	Health Belief Model
IDI	–	In-depth Interview
IMCI	-	Integrated Management of Childhood Illnesses
IVAC	-	International Vaccines Access Centre
LMIC	-	Low and Middle-Income Countries
PCV	-	Pneumococcal Conjugate Vaccines
UNICEF	-	United Nations International Children's Emergency Fund
WHO	–	World Health Organization

OPERATIONAL DEFINITION OF TERMS

OPERATIONAL DEFINITION

Under-five children: Children aged 0-5 years.

Mothers of under-five: Any mother who has a child aged 0-5 years.

Health-seeking behaviour: This entails how mothers of under-fives engage with health systems and services in response to an illness.

Perception: This entails how people interpret a health condition and categorize it as serious or mild.

Knowledge: The facts and skills about a disease acquired through experience or education; the theoretical or practical understanding of a health condition.

Favorable perception: Perception that is in line with biomedical word view

Unfavorable perception: Perception that is not in line with biomedical word view

Face-me-I face you house: A house consisting of two wings of opposing rooms where occupants share the toilet, bathroom, and kitchen

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Pneumonia is a serious acute respiratory infection caused by different infectious agents which include bacteria, viruses, and fungi. It is the most severe form of respiratory infection among children. (UNICEF, 2015). The known most common causative agents include *Streptococcus pneumoniae, Haemophilus influenza* type b and *respiratory syncytial virus*. Of these pathogens, the most prevalent causative agent of the disease among children in the developing world is *Streptococcus pneumoniae* (Källander et al., 2008).

Malnutrition, low birth weight, indoor air pollution, non-exclusive breastfeeding, and over-crowding are some of the risk factors of pneumonia (Igor, Boschi-Pinto, Biloglav, Mulholland, & Campbell, 2008). The other risk factors include rainfall (humidity), vitamin A deficiency, and outdoor pollutions. (WHO., 2016)

The known symptoms of pneumonia include high fever, rapid breathing, cough, chills, headaches, loss of appetite, and wheezing (UNICEF/WHO, 2006). Children get infected in different ways or means. Pathogens which cause pneumonia sometimes get into the lungs through the nose or throats of children (WHO, 2016).

In 2010, a total of 140,000 out of 868,000 under-five deaths were as a result of pneumonia worldwide (Echick, Wonodi, & Privor-Dumn, 2012). The disease is the deadliest infectious cause of death among under-five children in developing countries (UNICEF, 2015). In the year 2015, one in six deaths among children was as a result of pneumonia worldwide (UNICEF, 2015). Presently, Nigeria is among the top five countries which account for over half of pneumonia deaths among under-five children (WHO, 2016).

In 2015, pneumonia accounted for 16% of under-five deaths in the world, making it the highest single cause of under-five mortality in the world (WHO, 2016). In 2016, pneumonia was responsible for the death of approximately 900,000 children worldwide, with most of the children aged less than two years old. Over 2500 children die from pneumonia daily (Campbell, Harry, Shams, O'Kelly, Bryce, Rudan, Qazi, et al., 2013).

There have been studies across different locations or settings aimed at documenting the burden of pneumonia nationally and globally. Rudan *et al.* (2013) conducted a systematic review which provided an estimated prevalence of childhood pneumonia across 192 countries. The findings from the review showed the incidence of Community-Acquired Childhood (CAC) pneumonia to be about 0.22 episodes per child per year; further review indicated that 11.5% of cases of childhood pneumonia progress to severe episodes.

Vitamin A supplementation is one of the protective interventions that can help save a child from developing pneumonia (WHO, 2016). Bacterial causes of childhood pneumonia can be prevented by immunizing a child with Haemophilus influenza type b (Hib) and pneumococcal conjugate vaccines (WHO, 2016). Some other innovative solutions have been developed to reduce childhood pneumonia deaths such as the use of clean cookstoves which reduce household air pollution, oxygen treatment innovations such as low-cost oxygen concentration, devices for diagnosing pneumonia efficiently, and use of amoxicillin dispersible tablets (WHO, 2016).

In Nigeria, the prevalence of pneumonia among under-fives has not been precisely determined. In addition, the knowledge, perception, and practices related to the disease among mothers of under-fives have not been adequately investigated in peri-urban communities where the factors which commonly lead to the disease often abound. Alakia located along Ibadan-Ife road is one of such communities. Alakia is characterized by living conditions which can promote the occurrence of the disease among under-fives.

However, information which is essential for the design of appropriate intervention programs for controlling or preventing the disease in the community is scarce. Such information relates to the knowledge, perception, and practices relating to pneumonia among mothers of under-five in the community. The reported prevalence of childhood pneumonia, the antecedent factors related to its occurrence as well as mothers' treatment seeking behaviour constitute the focus of the study.

1.2 Statement of the problem

A total of 920,163 children were estimated to have died as a result of pneumonia worldwide in 2015 (WHO, 2017). Pneumonia kills more children than any other illnesses, including AIDS, malaria, and measles combined (UNICE/WHO, 2016). According to

Wardlaw (2006), over two million children die from pneumonia each year worldwide. Yet, little attention has been paid to the prevention and control of the disease (UNICEF, 2016). According to the 2008 estimates, about 177,000 children under the age of five died of pneumonia in Nigeria. This number is highest in Africa and the second highest overall in the world (Black, Robert E, et al., 2008).

Pneumonia is an immunizable disease which is prevalent in Ibadan (Adekola, 2017), a city which consists of urban and peri-urban communities. The peri-urban communities show the same characteristics as typical rural communities in South Western Nigeria. Pneumonia is an economic burden for families and communities. Nursing mothers' knowledge and perception relating to the disease are crucial in the design of interventions to prevent and control its prevalence among the Under-five children (Siswanto, 2007).

Community-based studies have great potentials for yielding results for designing evidence-based and culturally appropriate pneumonia prevention and/or control interventions. However, not much community-based studies have been done relating to nursing mothers' level of knowledge, perception, and treatment seeking behaviour relating to pneumonia in peri-urban communities in Ibadan. The study was, therefore, conducted to address this challenge by probing into the knowledge, perceptions and health-seeking behaviour, including practices among nursing mothers in Alakia, a peripheral community in Egbeda LGA, in Ibadan.

1.3 Justification

The study has the potential for generating evidence-based information what will throw light on knowledge, perception, and health-seeking behaviour of mothers concerning pneumonia among under-five in Alakia community. The outcome of this study will help in the design of interventions and the formulation of policies for reducing childhood pneumonia in the study area.

The perception and knowledge of mothers of under-fives influence their health-seeking behaviour. Awareness of mothers' health care seeking behaviour is pivotal to the initiation of measures needed to reduce or avoid the complications associated with the disease among the under-five children.

1.4 Research Questions

This study was designed to answer the following questions relating to pneumonia among under-five children in Alakia community:

1. What is the reported prevalence of pneumonia among the under-five?
2. What is the mothers' level of knowledge of pneumonia?
3. What is the perception of nursing mothers relating to pneumonia among under-five?
4. What is the health seeking behaviour of nursing mothers relating to pneumonia among under-five?

1.5 Broad Objectives

The broad objective of this study was to investigate the knowledge, perception, and health-seeking behaviour of mothers concerning pneumonia among under-five children.

1.6 Specific Objectives

The specific objectives of this study were to:

1. Determine the reported prevalence of pneumonia among under-five children.
2. Assess the level of knowledge of under-five mothers relating to pneumonia.
3. Assess mothers' perception of pneumonia among under-five.
4. Identify the health-seeking behaviour of mothers whose children have previously experienced pneumonia.

1.7 Research Hypothesis

1.7.1 Null hypothesis

N_{o1} There is no significant association between respondents' knowledge and their age

N_{o2} There is no significant association between respondents' knowledge and their level of education

N_{o3} There is no significant association between respondents' perception and their level of education

N_{o4} There is no significant association between respondents' knowledge and their perception

1.7.2 Alternate Hypothesis

N_1 There is a significant association between respondents' knowledge and their age

N_2 There is a significant association between respondents' knowledge and their level of education

N_3 There is a significant association between respondents' perception and their level of education

N_4 There is a significant association between respondents' knowledge and their perception of pneumonia

1.8 Study Variables

The typologies of variables measured were as follow:

Independent Variables- The independent variables measured included the following: highest level of education, marital status, living condition, religion, ethnic group, and occupation.

Dependent Variables- The dependent variables assessed included the following: knowledge, perception and health care seeking behaviour relating to pneumonia among under-five children.

CHAPTER TWO

REVIEW OF LITERATURE

2.1 Conceptualization of Pneumonia

Pneumonia is defined as an infection of lung Parenchyma (alveoli) by microbial (Lodha et at 2010). Common symptoms in children and infants include difficult cough and wheezing (WHO, 2016). Pneumonia is the leading infectious killer of children worldwide; killing 2,500 children each day - more children than Malaria, TB, measles and AIDS combined. Despite causing 16% of all child deaths, pneumonia receives little and a tiny fraction of global public health investment - less than 2% of total global development funding for health (UNICEF, 2016)

Prospective studies have identified Streptococcus pneumonia as the leading cause of bacterial pneumonia among children in developing countries, responsible for 30-50% of pneumonia cases. The second most common is Haemophilus influenza type b (Hib; 10-30% of cases), followed by Staphylococcus aureus and Klebsiella pneumonia (Rudan, Boschi-Pinto et al. 2008). Other bacteria are Mycoplasma pneumonia and Chlamydia pneumonia, causing atypical pneumonia (Simoes, Cherian et al. 2006). When an individual has pneumonia, the alveoli in the lungs are filled with pus and fluid, which makes breathing painful and limits oxygen intake.

2.1 Prevalence and risk factors of Pneumonia

There have been studies across different locations or settings aimed at documenting the disease burden of pneumonia nationally and globally. Rudan *et al.* (2013) conducted a systematic review which was geared towards providing an estimated prevalence of childhood pneumonia across 192 countries. The findings from the review showed that the incidence of CAC pneumonia was about 0.22 episodes per child-year. The review also indicated that 11.5% of cases of childhood pneumonia progress to severe episodes. A comprehensive finding revealed a reduction of nearly 25% over the ten years, which is also consistent with the observed reduction in the risk factors for pneumonia throughout Low and Middle-Income Countries.

A study conducted in Dhaka, Bangladesh reported that 22% of childhood deaths occurred from a respiratory infection. Approximately 14–20% of children aged <2 years with respiratory infection in Bangladesh were never taken to any health care facilities. Malnutrition, overcrowding, and lack of healthcare facilities were factors which contributed to increased mortality of the young children from ARI (Homaira, 2012).

Another study revealed a case fatality rate of 14% among 401 children less than 5 years of age from Bangladesh (Rahman, 1990). A Study conducted by Chisti *et al.* (2011) also in Bangladesh identified several risk factors for pneumonia in under-5 children with severe underweight, hypoxemia and severe sepsis as independent risk factors for death in children with pneumonia.

Rudan, Boschi-pinto, Biloglav, and Campbell (2008) conducted a study on the epidemiology of childhood pneumonia on a global scale across developed and developing countries. It was found that childhood pneumonia is the single leading cause of mortality in children under the age of 5 years with a distinct difference between developing and developed countries with an estimated number of episodes put at 0.29 per child-year in developing and 0.05 episodes per child-year in developed countries. The developing countries had about 96% of new episodes globally. The countries with the highest number of cases were, India with 43 million cases, China with 21 million cases, and Pakistan recorded 10 million cases; Bangladesh, Indonesia, and Nigeria had 6 million cases each.

There were 7–13% pneumonia cases identified in communities of pneumonia that were determined to be severe enough to be life-threatening and required hospitalization. Furthermore, the study highlighted some factors which predict the high prevalence of pneumonia. These included the following: lack of exclusive breastfeeding; under-nutrition; low birth weight; indoor air pollution; crowding; and lack of measles immunization. Pneumonia was found to be responsible for about 19% of the mortality rate in children aged less than 5 years, with more than 70% of deaths taking place in sub-Saharan Africa and south-east Asia.

In India, the prevalence of ARI and pneumonia was assessed together with the influencing risk factors barriers to care seeking. This study was community-based and was carried out in two randomly selected slums of Dibrugarh town. The prevalence rate of pneumonia was

noted to be 16.34%. The identified influencing factors were: the education of mothers, socioeconomic status, complete immunization status, timely initiation of complementary feeding and indoor air pollution. The aforementioned factors were significantly associated with the prevalence of pneumonia.

Gritly, Elamin, Rahimtullah, and Haji (2018) conducted a similar study in Sudan on determinants of pneumonia among under 5 years children to pneumonia. It was found that low socioeconomic status and low educational level of mothers had a significant association with pneumonia prevalence. The prevalence of pneumonia was more in children younger than twelve months.

In Ethiopia, an investigation was conducted to determine the prevalence of pneumonia and associated factors among children aged 2 to 59 months old in Wondo Genet district. Prevalence of pneumonia was found to be 33.5%. The identified factors were found to be implicated with the disease included: the absence of a separate kitchen, the absence of a window in the kitchen for ventilation and breastfeeding of a child for less than a year (Abuka, 2017).

In South Africa, Roux, Myer, Nicol, and Zar (2015) compared pneumonia incidence using a facility-based surveillance system from June 2012 till September 2013.The study revealed that there were 306 pneumonia episodes detected among children under the age of 1 year. Also, an incidence of 0.20 episodes/child-year was noted. Furthermore, it was found that 18% of the pneumonia cases were noted to be severe compared to 23% in the birth cohort. It was concluded that facility-based pneumonia surveillance detected fewer numbers of pneumonia cases and fewer numbers of severe cases, compared to the corresponding cohort study.

In an attempt to assess the prevalence of pneumonia and its associated factors among under-five children in Northwest Ethiopia, Fekadu, Terefe, and Alemie (2014) carried out a study among 286 households with under-five children. The study showed that overall two-weeks prevalence of pneumonia in under-five children was 16.1%. Factors such as stunting, carrying the child on the back during cooking, using charcoal for cooking, keeping cattle inside the main house and living in the crowded house were the most important variables found to be associated with pneumonia among under-five children in the study.

In Nigeria, pneumonia has been found to be one of the five-child killer diseases, together with measles, diarrhoea, polio, and tetanus. A study conducted by Nafiu and Hamidu (2018) investigated the prevalence of these five-child killer diseases and its cause-effect on under-five mortality. They reported prevalence rates of the five disease were generally reduced. However, pneumonia recorded the highest prevalence and had the strongest significant relationship with under-five mortality.

A study carried out by Akinyemi and Morakinyo (2018) to describe the trends in the prevalence and factors associated with ARI symptoms among under-five children in Nigeria between the year 2003 and 2013 showed a decreasing prevalence of ARI from 2003 to 2013.

Another study was carried out in Ilorin by Abdulkarim, Ibraheem, Adegboye, Johnson, and Adeboye (2013) to document the socio-demographic, clinical signs and also the bacterial agents responsible for pneumonia in children as seen in the University of Ilorin Teaching Hospital. Results indicated that pneumonia accounted for 13.3% of all admissions during the study period, and this was found to be more prevalent among male patients and infants. Clinical signs include cough, fever, difficulty in breathing and chest wall recessions. Also documented was the duration of hospitalization among subjects, it was found that those who survived the illness had a significantly lower number of hospital duration at 6.5 ± 5.0 days than among subjects who died at 10.2 ±12.3 days.

Pneumonia has consistently been estimated as the single leading cause of childhood mortality. In a prospective cohort study carried out in Ilorin, the rate of acute respiratory infection was three (3) episodes per child per year with pneumonia responsible for 1.3 episodes per child per year. The study highlighted a seasonal variation in acute respiratory infections among Nigerian children, as evident with more episodes being recorded during the rainy season (Akanbi, Ukoli, Erhabor, Akanbi, & Gordon, 2009)

Onyango, Kikuvi, Amukoye, and Omolo (2012) carried out a case-control study in Port Harcourt to identify risk factors for severe pneumonia in children under the age of five (5) years. The study highlights comorbidity with other diseases like cough and catarrh, delay in seeking treatment for three days or more and contact with upper respiratory tract infection were independent risk factors for severe pneumonia.

From January 2010 to November 2011, a total of 3477 cases of Acute Respiratory Infections with higher number of male patients were recorded in Nigeria by Akanbi *et al.* (2009), the highest incidence of ARI was in the month of July, a period of the year which is the peak of the rainy season. Pneumonia was found to be one of the commonest ARI with the majority (90%) of them were under-five children (Eberechukwu, Ide, & Uchenwa-onyenegecha, 2015).

2.2 Knowledge of Mothers of Under-five relating to Pneumonia

Farhad, Malihe, Fatemeh, and Mahmood (2014) investigated the knowledge of 255 Iranian mothers on children's acute respiratory infections (ARI). It was found that the mother's knowledge was high. The mothers' age and nationality had a significant influence on their high knowledge.

A study to assess caregiver's knowledge and their recognition of pneumonia and its symptoms in children under the age of five years conducted in rural and urban immunization clinics within the teaching hospital in Lucknow, India. Findings showed that the majority of the subjects (87.5%) had heard about pneumonia. However, only 16.9 % gave a description of the illness as a chest infection, while about 40% identified rapid breathing as an indication of childhood pneumonia. The majority (74.1%) of the caregivers indicated prevention from exposure to cold as one of the preventive measure (Agarwal & Bajpai, 2015)

The Assessment of Tanzanian mothers' and caregivers' knowledge on symptoms and signs of Integrated Management of Childhood Illnesses (IMCI) strategy-addressed diseases showed that most mothers identified signs of childhood diseases like fever, diarrhoea, cough, inability to play, irritability and restlessness. Also, deadly symptoms of childhood diseases cited were convulsions, unconsciousness, breastfeeding or eating difficulties, difficulty in breathing and drowsiness (Juma, 2007).

Gálvez, Modeste, Lee, Betancourt, and Wilkins (2002) assessed Peruvian mothers' knowledge and recognition of pneumonia in children under the age of 5 years. More than 80% correctly picked rapid breathing and chest retraction from a list of possible signs and symptoms of pneumonia, and 94.6% said they were ready to take their child to the closest health centre if they thought their child had pneumonia.

Yahaya, Ekpenyong, and Obegu (2018) assessed caregivers' knowledge of pneumonia. The study poses that most caregivers were well aware of the pneumonia illness, but a vast proportion of them had poor knowledge of pneumonia. The overall occurrence of pneumonia, as indicated by caregivers among children under the age of five years, was 6.6%.

A multi-country study involving six countries was conducted. The countries were Central African Republic, Congo, Nigeria, Chad, Malawi, and Sierra Leone. The results showed that about 30% of caregivers were aware of at least one of the two key symptoms of pneumonia. Additionally, the study showed that in the Democratic Republic of the Congo and Nigeria, there was a significantly positive association between caregivers' knowledge of the key symptoms and their health care seeking behaviour. This was, however, not the case in the Central African Republic, Chad, Malawi, and Sierra Leone (Noordam, Sharkey, Hinssen, Dinant, & Cals, 2017).

Ekure *et al.* (2013) investigated Nigerian mothers living in Lagos on their knowledge about the definition, causes, risk factors and symptoms of childhood pneumonia; findings discovered that a small proportion (15%) of the mothers had not heard about pneumonia. Half of the mothers correctly identified fast and difficulty in breathing as signs and symptoms of pneumonia in children. Reducing exposure to cold and wearing warm clothes were the two commonest preventive practices mentioned by mothers against pneumonia.

A study was carried out in Enugu by Ndu *et al.* (2015) to determine knowledge of caregivers about the danger signs and key symptoms of pneumonia and the socio-demographic factors influencing knowledge of caregivers and health care seeking behaviour of caregivers. The result showed poor knowledge of epidemiology and key symptoms of pneumonia among caregivers. Residence in semi-urban areas was significantly associated with caregivers' knowledge of epidemiology, key symptoms, and vaccination of their children against pneumonia. Fast breathing and difficulty in breathing were the most commonly known and experienced.

The level of knowledge and perception regarding childhood pneumonia among Indian mothers of under-five children was assessed by Pradhan, Rao, Pattanshetty, and Nilima (2016) in India. It was noted that 41.3% and 41.5% of the mothers had fair knowledge and

perception about pneumonia, respectively. Statistical analysis showed that age and education level of mothers was significantly associated with their knowledge and also with their perception.

Aftab *et al.* (2018) studied the Pakistani caregivers' knowledge perceptions, and also determine how their knowledge and perceptions were related to care-seeking behaviour related to childhood pneumonia. It was observed that most caregivers could recognize or state the key signs and symptoms of pneumonia, such as breathing problems. A few numbers of caregivers (18%) have exhibited confidence in lady health workers' (LHWs) capability to treat childhood pneumonia.

In Thailand, a hospital-based study was conducted to identify the mother's knowledge and the mother's perception of pneumonia disease. It was found that around 66% of the mothers had a fair knowledge of pneumonia. While around 81% of the mothers had recorded good perception. No significant associations were found among the prevalence of pneumonia, mother's knowledge of pneumonia and mother's perception of pneumonia (Siswanto, 2007).

A formative study was conducted in Ghana to determine community perceptions of pneumonia. The majority (70%) of the respondents had never heard of the illness called pneumonia; neither did they know about the signs and symptoms of pneumonia. The few who had heard about pneumonia, however, attributed causes of pneumonia to coming into contact with cold temperature in various forms. (Abbey, Chinbuah, Gyapong, Bartholomew, & Borne, 2016).

2.3 Care seeking and treatment Behaviour of Mothers of Under-fives

Aftab *et al.* (2018), in their study among Pakistani women, found that caregivers preferred to seek health care from medical doctors, especially from private providers than public providers. Furthermore, health care was found, to begin with, home remedies, mostly and sometimes self-prescribed drugs. Treatment delays occur because of caregivers' inability to recognize the illness, use of home remedies, financial constraints, and low utilization of community-based LHW services. Caregivers do not seek care from LHWs because of lack of trust and their inability to provide medicines. It was revealed that if finances allow, private doctors, whom caregivers perceive as more responsive, are preferred over public sector doctors.

Simiyu, Wafula, and Nduati (2003) determined the knowledge, attitude and perception of Kenyan mothers regarding ARI in their children under the age of five years. A small proportion (18%) of mothers described pneumonia satisfactorily. However, 87.1% of the mothers said they would seek health care services in case of severe ARI. Formal education of the mothers had a positive influence on their knowledge, attitude, and perception.

Mahmood, Khan, Abbasi, and Sheraz (2017) investigated healthcare seeking trends among Pakistani children with acute respiratory infections using demographic health surveys (DHS) 2006-2007 and 2012-2013. Out of 2508 children in 2006-2007, there were 1590 with acute respiratory infections (ARI) compared to 2142 out of 3419 children in 2012-2013 DHS, whose data was analyzed. During 2006-2007, 69% of cases sought healthcare for Acute Respiratory Infection, which improved to 79% in 2012-2013. Additionally, it was revealed that when compared, improvement in care seeking practices was observed among illiterate mothers over the years while there were slight changes among literate mothers. Similarly, employed women showed an increase in healthcare-seeking behaviour from 67% to 79%. Furthermore, mothers who belonged to low and middle socio-economic class showed an increase in health-seeking behaviour when compared to mothers in the higher class who had no significant change.

Geldsetzer *et al.* (2014) conducted a systematic review to determine the percentage of caregivers in low and middle-income countries (LMICs) with a child less than 5 years who were able to recognize illness in their child and subsequently sought care from different types of healthcare providers. The recognition of diarrhoea, malaria, and pneumonia was found to be low. However, about 73% of caregivers sought for health care outside the home. Care seeking from community health workers and the use of oral rehydration therapy was found to be low.

A study was carried out among 278 caretakers in Mukono district of Uganda, to assess knowledge about key symptoms among under-five children with pneumonia and the actions taken to manage likely pneumonia. The lower chest wall was mentioned by only 9.4% of the caretakers. However, there was no caretaker who mentioned all the expected four standard key symptoms of the illness. Considering the practices embarked upon by the caretakers, most offered drinks (49.6%) and traditional herbs (45.3%) while, 31.7% gave antibiotics (Tuhebwe, Tumushabe, Leontsini, & Wanyenze, 2014).

Bruce *et al.* (2014) identified barriers to care seeking for pneumonia and diarrhoea among rural Guatemalan children. Findings showcased that half of the severe pneumonia cases had sought health care. However, a delay of two days was noted among 27% of the cases. The factors found to be independently associated with formal health care seeking, included: knowing the Community Emergency Plan; mother's perceived severity of illness; recognition of World Health Organization danger signs and symptoms; distance from the health centre and having someone to care for the family in an emergency.

Minz, Agarwal, Singh, and Singh (2017) carried out a study to determine the caregiver's care-seeking behaviour relating to the management and treatment of childhood pneumonia among rural and urban communities in Lucknow, India. Result showed 52% children had pneumonia within 2 weeks preceding the survey, and difficult and fast breathing was identified by 86.5% caregivers at the onset of the illness, but the majority of them did not perceive it as a serious condition and settled for home remedies. Only 9.6% of caregivers searched for appropriate care at the onset of the illness. The appearance of chest in-drawing in the child was identified by caregivers as a serious condition and sought treatment from outside. The time delay from onset of illness to the seeking care from health facility was found to be around 2½ days. These caregivers would prefer qualified private practitioners and the majority of the children received antibiotics for pneumonia treatment.

A study was conducted to investigate factors related to the help-seeking behaviour of mothers of children with an acute respiratory infection. The study was done using data from the 2011 Ethiopia Demographic and Health Survey. It was found that 7% of the children were reported to have symptoms of acute respiratory infection while treatment was found for only 27.2% of the cases. In the rural area, 25.2% of mothers sought for care and/or treatment compared to the 46.4% of mothers who were based in the urban area. Smaller family size, mothers' age and having had prenatal care had a statistically significant influence in urban and rural residences relating to the health seeking behaviour. Children from rural areas were found to be more at risk of acute respiratory infection while their mothers were less likely to seek help (Astale & Chenault, 2015).

There was a study which analyzed the status of acute respiratory tract infection among children in India using data extracted from the National Family Health Survey (2005-06) and District Level Health Survey (2007-2008). The study reveals that the wealth index

was a significant factor which positively influenced the health seeking behaviour of parents. Additionally, mothers' religion, caste, and tribe were also significantly associated factors with health-seeking behaviour. The gender of the child and the mothers' age were also important factors which determine health seeking behaviour (Kant & Prakash, 2014).

Abdulkadir, Abdulkadir, and Johnson (2016) determined health care-seeking behaviour of Nigerian parents whose children had pneumonia and socio-demographic factors that influence this behaviour. The pneumonia occurrence rate of 19.5 per 1000 children was noted. The proportion of parents seeking appropriate health care when their children had pneumonia was 36%. High level of education, health decision making by both parents (husband and wife) and belonging to the higher quintiles on a wealth index were factors that were found to positively influenced care-seeking behaviour. The health-seeking behaviour of the parents was found to be poor.

It has been noted that generally, wealthier families seek care or exhortation outside the home, compared with individuals from poorer homes (Filmer, 2005). According to the WHO (2002), many sick children do not reach health-care facilities, and children from poorer families are even less likely to get care from formal health care sources. In Bangladesh, for instance, just 8% of sick children are first taken to proper health offices (WHO, 2002).

A community-based investigation in Baringo District, Kenya, has revealed that health training to mothers improves knowledge of early indications of ARI, such as increased respiratory rate, encourage early appropriate health-seeking behaviour and discourages inappropriate health practices (Simiyu et al., 2003). The World Health Organization-sponsored ethnographic investigations that revealed that in many societies, individuals recognize mild and serious ARIs (Gove and Pelto, 1994).

Mothers' perception of signs and symptoms and healthcare-seeking practices associated with pneumonia as well as hindrances to seeking timely treatment for their under-5 children with pneumonia has been studied in Bangladesh. In spite of the fact that mothers portrayed pneumonia as a perilous infection in young children, a large portion of the mothers could not establish whether their child had pneumonia or not. Ecological factors, for example, dust particles, spread from coughing mother and drinking chilled water or

playing with water, were seen as the predisposing factors for pneumonia. Factors which adversely influenced the search for care included the perception of the disease as not serious, distance from a health care facility and lack of financial resources (Ferdous et al., 2014).

Another study aimed at investigating the caregivers' perceived barriers to seeking and getting health care for children under five years of age admitted to a referral doctor's facility for community-acquired pneumonia in the Peruvian Amazon Region has been conducted. Factors which were found to influence the search for appropriate care include self-medication, poor pneumonia recognition skills (Pajuelo et al., 2018).

2.4 ***Theoretical Framework***

Health Belief Model

The health belief model (HBM) remains one of the most widely used models in health behaviour. This theory was developed by a group of U.S Public Health Service psychologists in 1950s after discovering that few people were participating in programs which were aimed at preventing and detecting diseases (Rosentock, Derryberry and Carriger, 1959). The theory addresses issues concerning the perception of individuals of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy). The HBM is by far, one of the most commonly used models in Health Promotion and Education (Glanz, Rimer and Lewis, 2002). This theory has six main constructs. They have perceived susceptibility, perceived benefits, perceived barriers, perceived seriousness, modifying factors and cues to action.

Perceived susceptibility: An individual's assessment of his or her chances of getting a disease or become affected by a condition or phenomenon.

Perceived benefits- An individual's conclusion as to whether the new behaviour or innovation is better than what he or she is used to.

Perceived barriers- An individual's opinion of what is stopping him or her from adopting preventive mechanisms or cure. (New behaviour).

Perceived Seriousness:- An individual's judgment as to the severity of a disease or health-related conditions.

Modifying factors- An individual's personal factors that affect whether the new behaviour is adopted.

Cues to action- These factors will drive people towards changing behaviour.

Self-efficacy- Personal belief in one's own ability to do something than what he or she is already doing.

2.4.1. Application of HBM to the study

Perceived susceptibility- this tenet refers to the perception of mothers relating to the incidence of pneumonia among under-five children. It relates to mothers' belief that their children can contract pneumonia. Mothers are likely to adopt safety practices if they perceive that their children are vulnerable to pneumonia. Unfavourable perception could be corrected using training and public campaigns. The construct was used to develop some

of the perception questions in the questionnaire (See question "Under-five children are at greater risk of having pneumonia compared with other children").

Perceived severity- This is the belief about the seriousness of pneumonia incidence in relation to the loss of life and money. Mothers are likely to adopt good safety practices if they perceived pneumonia to be serious to the point of causing death or disability.

Perceived benefit- this construct refers to the perceived benefits associated with taking proper measures to prevent the occurrence of pneumonia. When people consider pneumonia safety precautions to be very beneficial in the areas of reducing disability and loss of lives, it will increase the likelihood of adopting pneumonia safety precautions.

Perceived barriers- this address an individual's view of what could hinder them from adopting prevention techniques of pneumonia. If the perceived barrier(s) outweighs the perceived benefit(s), they might not take up practices that help prevent pneumonia. This construct was used to formulate perception questions like question 21.3, "Sleeping in an overcrowded room cannot increase the chances of having pneumonia among under-five children."

Cue to action- This construct presents factors that motivate people to take up actions. It could be factors that help to motivate people to take appropriate pneumonia prevention techniques. It could be due to the influence of peers, mass media, campaigns, placement of posters related to pneumonia.

Modifying factors- these factors include variables such as age, ethnic group, living situation and educational status of mothers. This construct was used in the selection of the socio-demographic variable in section 1 of the questionnaire.

Self-efficacy- this was used to evaluate the ability of an individual to maintain their pneumonia preventive techniques.

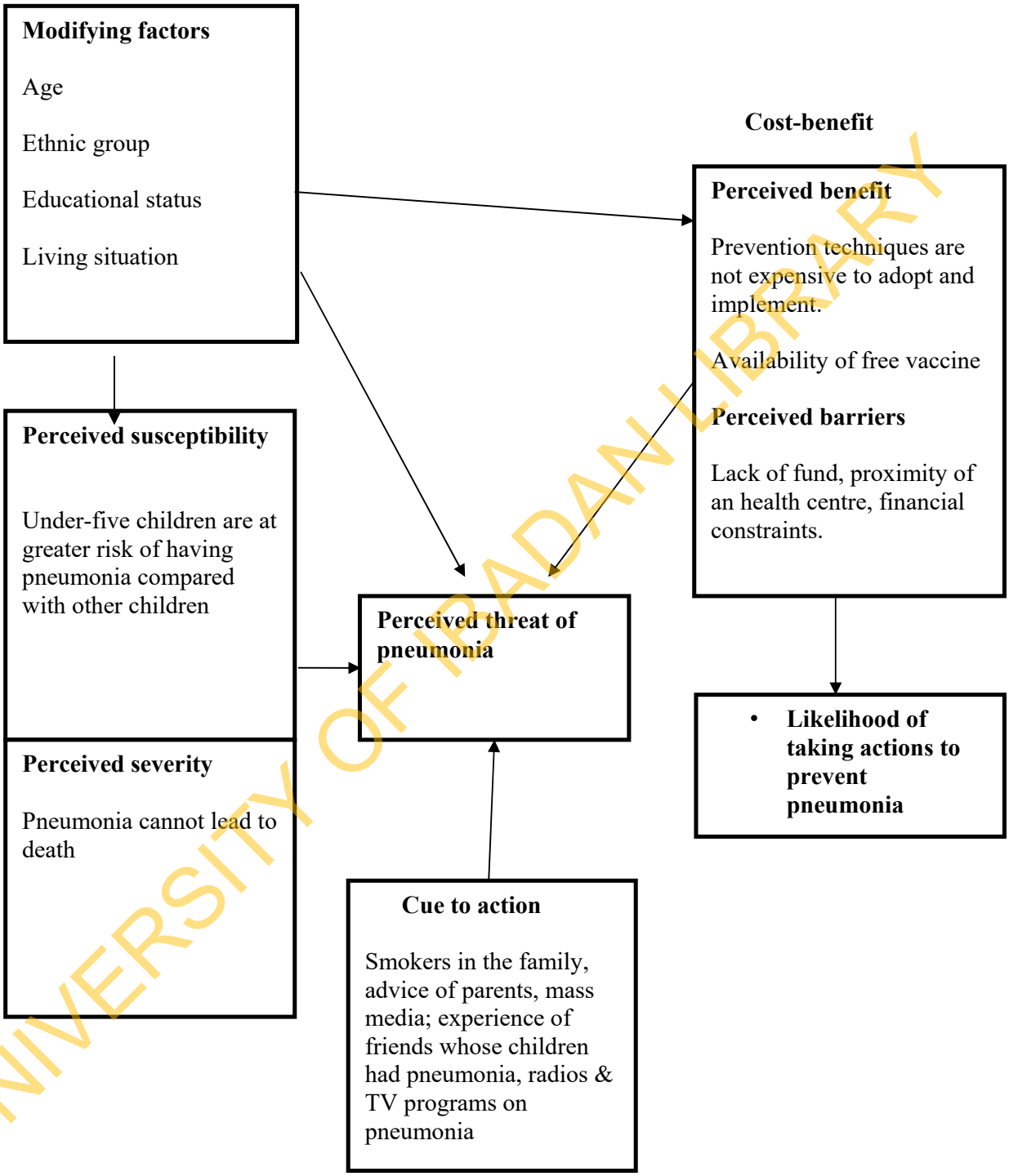

Figure 2.1 Health belief model applied to the study

CHAPTER THREE

METHODOLOGY

3.1 Study design

The descriptive cross-sectional survey design was used to facilitate the conduct of the study. The study was limited in scope to the investigation of the knowledge, perception, and health-seeking behaviour of mothers concerning pneumonia among under-five in Alakia community, Egbeda LGA, Oyo state, Nigeria.

3.2 Description of the study setting

The study was carried out in Alakia community, Egbeda LGA, Ibadan. Alakia is surrounded by communities such as Isebo, Adegbayi, and Wema. Alakia, the study setting, has many unpaved roads, Alakia market and one tarred road linking the community to Isebo. It also has a domestic airport, the Z.A. Adeyemi memorial Anglican Church and other important resources, landmarks, and social amenities.

The health care resources in the community include about 100 patent medicine vendors and a Primary Health Care centre located along Alakia-Isebo road. Some of the private hospitals in the community include Timileyin, Strong tower, and Ayodele. Alakia is divided into three regions; each region is further divided into zones. The Zones in each region are presented in Table 3.1 with region one having 17 zones, region 2 having 10 zones, and region three having five zones.

Most houses are residential apartments with the majority of them being a bungalow. There are many face-me-I-face-you type of building in the community. The major type of water supply used in the community is well water. The common health problems in the community include Malaria, Upper respiratory infections, including pneumonia and Diarrhoea. Commercial Motorcycles locally called *Okada* and Taxi are the common modes of transportation in Alakia.

Table 3.1: The distribution of the 32 zones by region in Alakia Community

S/N	Region1	Region 2	Region 3
	Ganilamo	Igbeyin-Adun	Alaja meta
	Temidire	Ifelodun	Oba bi olorun kosi
	Akanle	Olorunsogo	Alagba
	Seke-Apomu	Olarewanju	Oloyede
	Adati	Kekeseun	Papa Alanu
	Asipa –lamo	Lamo	
	Ife Sowapo	Onitade	
	Ore-Ofe	Balogun	
	Unity	ODK	
.	Olosan	Ifelajulo	
.	Isokan		
.	Eso-Oke		
.	Daramola		
.	Surulere		
.	Oluwatedo		
.	Elelu 1		
.	Elelu 2		

3.3 Study Population

Mothers of Under-five children in Alakia Community constituted the study population.

3.4 Sample Size Determination

The minimum sample size was calculated using the Leslie and Kish formula (1965) for descriptive studies

$$N = \frac{Z^2PQ}{e^2}$$

Z = 1.96 (confidence level at 95%)

p = 0.36 (Abdulkadir, 2016)

q = 0.64 (1-p)

e = 0.05 (level of precision)

$$N = \frac{1.96^2 \times 0.36 \times 0.64}{0.05^2} = 354$$

Attrition or incomplete response rate of 10% of 354 (35) was added to increase the sample size to 389.

3.5 Sampling Procedure

A multi-stage sampling technique was adopted.

Stage 1: The houses in the community were stratified by Zones, resulting in 32 natural strata. All Thirty-two (32) zones were eligible to be involved in the study (see Table 3.1).

Stage 2: Proportionate sampling was used to select the number of houses studied zone by zone. The number of houses in each zone was determined using the formula below:

$$\text{No of Houses to be selected} = \frac{\text{No of houses in each zone} \times 389}{\text{Total No of Houses}}$$

The total sample that was selected from each zone based on the aforementioned formula is shown in Table 3.2 For instance, in Ganilamo, there are 80 houses. The proportionate number of houses selected from it was, therefore, calculated to be 8.

Stage 3: The Epi-sampling technique and systematic sampling were used to select respondents for interviews.

Stage 4: In every house selected and visited, one eligible respondent was selected for an interview.

Table 3.2a: Sampling of the mothers of under-fives in Alakia

S/N	Name of Zone	Number of Houses in the zone	No of Houses to be selected	No of eligible Under-five Mothers in each zone
1.	Ganilamo	80	80 x 389 = 8.4 = 8 3683	8
2.	Temidire	160	160 x 389 = 16.9 = 17 3683	17
3.	Akanle	90	90 x 389 = 9.5 = 10 3683	10
4.	Seke-Apomu	80	80 x 389 = 8.4 = 8 3683	8
5.	Adati	280	280 x 389 = 29.6 = 30 3683	30
6.	Asipa –lamo	160	160 x 389= 16.9 = 17 3683	17
7.	Ife Sowapo	70	70 x 389 = 7.4 = 7 3683	7
8.	Ore-Ofe	80	80 x 389 = 8.4 = 8 3683	8
9.	Unity	70	70 x 389 = 7.4 = 7 3683	7
10.	Olosan	210	210 x 389 = 22.2 = 22 3683	22
11.	Isokan	65	65 x 389 = 6.9 = 7 3683	7
12.	Eso-Oke	160	160 x 389 = 16.9 = 17 3683	17
13.	Daramola	120	120 x 389 = 12.7 = 13 3683	13
14.	Surulere	110	110 x 389 = 11.6 = 12 3683	12
15.	Oluwatedo	100	100 x 389 = 10.6 = 11 3683	11
16.	Elelu 1	131	131 x 389 = 13.8 = 14 3683	14
17.	Elelu 2	280	280 x 389 = 29.6 = 30 3683	30
18.	Igbeyin-Adun	55	55 x 389 = 5.8 = 6 3683	6
19.	Ifelodun	85	85 x 389 = 9 3683	9
20.	Olorunsogo	75	75 x 389 = 7.9 = 8 3683	8
21.	Olarewanju	100	100 x 389 = 10.6 = 11 3686	11
22.	Kekeseun	55	55 x 389 = 5.8 = 6 3683	6

Table 3.2b: Sampling of the mothers of under-fives in Alakia

S/N	Name of Zone	Number of Houses in the zone	No of Houses to be selected	No of eligible Under-five Mothers in each zone
23.	Lamo	70	70 x 389 = 7.4 = 7 3683	7
24.	Onitade	85	85 x 389 = 9 3683	9
25.	Balogun	277	277 x 389 = 29 3683	29
26.	ODK	260	260 x 389 = 27 = 27 3683	27
27.	Ifelajulo	20	20 x 389 = 2.1 = 1 3683	2
28.	Alaja meta	55	55 x 389 = 5.8 = 6 3683	6
29.	Oba bi olorun kosi	75	75 x 389 = 7.90 = 8 3683	8
30.	Alagba	75	75 x 389 = 7.9 = 8 3683	8
31.	Oloyede	80	80 x 389 = 8.4 = 8 3683	8
32.	Papa Alanu	70	70 x 389 = 7.4 = 7 3683	7
Total		**3683**	**389**	**389**

Source: General Secretary Landlord association in the zones.

3.6 Inclusion Criteria and Exclusion Criteria

Inclusion Criteria

Participants eligible for this study were mothers of under-five children who were permanent residents of Alakia and who were willing to provide verbal or written informed consent to participate in the study. For the purpose of the study, a permanent was defined as a mother who had stayed continuously in the community for not less than five years.

Exclusion criteria

All mothers of under-five children who refused to provide informed consent to participate in the study were excluded from the study. Women who did not have under-five children were also not eligible to participate in the study.

3.7 Methods and Instruments for Data Collection

The semi-structured interview was used. The research instrument used for this study was a semi-structured interviewer-administered questionnaire. The questionnaire contains the following sections:

Section A: Socio-demographic characteristics of the respondents;

Section B: Living Situation of participants;

Section C: Knowledge of pneumonia;

Section D: Perception relating to pneumonia;

Section E: Prevalence of pneumonia, Help-Seeking behaviour and other pneumonia related practices

Section F: Smoking behaviour of family members.

The questionnaire was designed in English and then given to an expert in English and Yoruba to translate it to Yoruba. The Yoruba version was then given to another expert to translate it back to English. This was done to ensure the accuracy of the translation. The English and Yoruba versions of the questionnaire are contained in Appendices 2 and 3, respectively.

3.8 Validity and Reliability of the study instrument and training of field assistants

Validity:

In order to validate the instrument, recent literature materials were reviewed and used to design the instrument. The instrument was subjected to review by my supervisor and experts in Community Medicine, Institute of child health and Pediatrics. Their suggestions or inputs were used to improve the quality of the instrument.

Training of Field Assistants

Training of field research assistants is one of the vital steps taken to ensure the quality of the collected data. Five female research assistants were recruited and trained to help in data collection. The training focused mainly on the objectives and the importance of the study, the sampling process, techniques and ethical issues involved in securing respondents' informed consent and general interviewing skills. The research assistants were involved in the pre-test of the study instrument. The exercise enabled them to get themselves familiarized with the instrument and to acquire practical experiences relating to how the main study will be conducted.

***Reliability*:** This is the ability of an instrument to reproduce results consistently over time. In order to ensure the reliability of the instrument, a pre-test of the instrument was done among 10% of the total study population in a representative population. The pre-test was carried out among 39 mothers of under-five children in Akobo community, Lagelu LGA, Ibadan. The questionnaire was checked for completeness, and a serial number was assigned to each for easy identification and recall.

The responses in each questionnaire were coded, entered into a computer, facilitated by the use of SPSS version 21and analyzed. The reliability coefficient of the questionnaire was determined using Cronbach's Alpha model technique of SPSS (version 21). In this approach, a reliability coefficient of 0.5 is the minimum coefficient score that indicates the reliability of an instrument. The closer the value of the coefficient value is to 1, the more reliable the instrument is. In this study, a coefficient score of 0.65 was obtained, which indicates that the instrument was very reliable.

3.9 Data Collection Procedure

Prior to the commencement of the study, official permission was taken from Egbeda Local Government and the Chairmen of each zone in the community to avoid any hitch. The data were collected using the pretested semi-structured interviewer-administered questionnaire with the help of five trained research assistants. The administration of the questionnaire in the community was done between 8-11 am and 3-6 pm, when mothers are most likely to be around after their daily activities.

A combination of the Epi- and systematic random sampling techniques were used to facilitate data collection, taking into consideration the unplanned settlement pattern of the community. This was done as follow: In each zone, the investigator and research assistants identified the place or location which constitutes the centre. Then a coke bottle was spun and allowed to come to rest. Data collection started from whichever direction the mouth of the bottle was pointing. Every third house was visited for the identification of an eligible respondent for an interview until the end of the zone in the chosen direction is reached. Then the interviewers returned to the centre again and continued the interview in another direction. This process was repeated until the required number of respondents allocated to the zone was reached.

The process of data collection lasted for two weeks. Each participant was informed of the purpose, benefits and time that would be spent to complete the questionnaire. Consent of the participants was sought before the administration of the questionnaire. The researcher and the research assistants checked each copy of the administered questionnaire for proper recording and completeness.

3.10 Data Management and Analysis

The questionnaire was checked for completeness, and a serial number was assigned to each for easy identification and recall. The researcher hand-coded the questionnaire with the aid of a coding guide. A template was designed on SPSS (version 21) for entering of the coded data. Frequency, mean, median mode and other descriptive statistics were used to analyse the data. Inferential statistics such as Chi-square, t-test, and F-test were also used. The knowledge scores were categorized into poor (0-19 points), fair (>19-28.5 points) and good (>28.5-38points). Perception scores were categorized into appropriate or non-risky perception (<8.5) or inappropriate or risky perception (8.5-17 points).

3.11 Ethical Consideration

Ethical approval was sought from the Oyo State Ministry of Health Ethical Review Board before proceeding with data collection. Permission was also obtained from the Egbeda Local Government and the Chairmen of Each zone in Alakia Community. Participants were briefed about the purpose of the study, its objectives, methodology, the benefits and the inconveniences that might be encountered during the study. Informed consent was obtained from persons who agreed to participate in the study.

- **Confidentially of data**: Names of the respondents were not required in order to ensure the confidentiality of the participants. Each questionnaire was given a serial number for easy identification and recall. Information provided was stored on a password-protected computer, which was only assessable to the researcher.
- **Non-maleficence:** The research was not characterised with physical risk since it did not have to do with the use of invasive procedures. The safety of the participants was guaranteed. Participants were free to consider some questions as a violation of their privacy and so skip them if they so wish.
- **Beneficence to the participants**: The participants were informed that the study had no direct benefits to participants. However, the outcome of the research was useful in the design of educational interventions targeted at mothers of under-five children relating to pneumonia in the future. The participants were told that findings of the study would be made available to the various health committees of the LGA for necessary action.
- **Voluntary nature of participation:** The participants were informed that participation in the study was voluntary and that they were free to withdraw from the study at any time. Their written informed consent or verbal informed consent was obtained. Those who opted for verbal consent were, however, requested to thumbprint to indicate their willingness the space provided in the questionnaire. (see appendix II for the informed consent form)

3.12 Limitation of the study.

Some of the research participants were reluctant to answer some questions due to the supernatural belief that talking about the disease could expose them to such disease. The researcher convinced the mothers that talking about pneumonia does not mean their children would contract the disease. However, those that opted not to participate in spite of the explanation were excluded from the study.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of respondents

A total of 389 mothers participated in this study. Table 4.1 shows the socio-demographic characteristics of the respondents. The respondents' ages ranged from 22 – 56 years, with a mean of 32.7 ± 4.6. About two-thirds (65.8%) of the respondents were within the 25-34 years age group, followed by those in the 35-44 years age group, (31.6%). Most of the respondents (94.9%) were Yoruba, and almost all (98.5%) were married. About two-thirds were Christians (64.0%) while 36% were Muslims. About two-thirds (62.5%) of the respondents had secondary education; recipients of tertiary education constituted 33.4%. The majority (81.2%) of the respondents were traders while few were civil servants (10.9%) and artisans (8.7%). The mean number of respondents' children aged less than 5 years was 1.4 ± 1.0. (See table 4.1 for more details).

4.2 Respondents' Living Situation, mode of refuse disposal and cooking methods

Table 4.2 presents the respondents' living situation. Respondents with four persons living as a family (38.6%) topped the list, followed by those with three persons (24.9%) and five persons (21.1%) living as a family. The mean number of persons living in a family was 4.4 ± 1.6. The proportion of respondents who lived in a two-bedroom flat was 39.3%, followed by respondents who lived in self-contained flats (24.4%). (See table 4.2 for more details).

Respondents' mode of refuse disposal and cooking methods are shown in table 4.3. More than half (57.6%) of the respondents' disposed of waste twice a week to a waste disposal truck. The burning of waste and dumping of refuse on the street were practised by 29.0% and 9.5% of the respondents, respectively. The cooking methods respondents reportedly used include the following: gas cooker (86.9%), stove (34.7%), electric cooker (24.7%) and firewood (3.9%). (See table 4.3 for more details).

Table 4.1 Social-demographics characteristics of respondents

	N	%
Age (N= 389)*		
≤24	4	1
25-34	256	65.8
35-44	123	31.6
45-64	6	1.6
Ethnic group (N= 389)		
Yoruba	369	94.9
Hausa	9	2.3
Igbo	11	2.8
Marital status (N= 389)		
Married	383	98.5
Single	2	0.5
Divorced	2	0.5
Widowed	2	0.5
Religion (N= 389)		
Christianity	249	64.0
Islam	140	36.0
Level of Education (N= 389)		
No formal education	4	1.0
Primary	12	3.1
Secondary	243	62.5
Tertiary	130	33.4
Tertiary education (N=130)		
College of education	65	17.2
OND	25	6.4
HND	20	5.1
University Degree	18	4.6
Occupational Status (N=389)		
Trading	316	81.2
Civil service	39	10.0
Artisan	34	8.7
Number of children aged < 5 (N=389) **		
One	237	60.9
Two	138	35.5
Three	13	3.1
Four	2	0.5

*$\bar{x}$ = 32.7 ± 4.6

**$\bar{x}$ = 1.4 ± 1.0

Table 4.2 Respondents' living situation

N=389

	N	%
Number of Persons living in a family*		
≤ 3	99	25.4
4-6	268	68.9
≥7	22	5.7
Respondents type of house		
One room	14	3.6
Self-contained flats	95	24.4
Two bedrooms	153	39.3
Face-me-I-face you house	54	13.9
A room and a parlour	56	14.4
Three bedroom flats	17	4.4

*$\bar{x}$ = 4.4 ± 1.6

Table 4.3 Respondents' mode of refuse disposal and cooking methods

N=389

	Yes (%)	No (%)
Mode of Refuse Disposal		
Burning	113 (29.0)	276 (71.0)
Dumping of the refuse on the street	37 (9.5)	352 (90.5)
Disposing of waste using waste disposal truck	57.6 (57.6)	165 (42.4)
Dumping of refuse into a stream or the rain	12 (3.1)	377 (96.9)
Cooking Method		
Gas Cooker	338 (86.9)	51 (13.1)
Stove	135 (34.7)	254 (65.3)
Electric Cooker	96 (24.7)	293 (75.3)
Firewood	15 (3.9)	374 (96.1)

4.3 Respondents' Knowledge of pneumonia among under-five children

Table 4.4 highlights respondents' knowledge of the symptoms of pneumonia. The majority (74.8%) of the respondents correctly mentioned shortness of breath as a symptom of pneumonia, while 71.7% correctly stated that sharp chest pain is a symptom. Other correct responses stated by the respondents' included chest-in-drawing (68.9%), high fever (64.3%), headache (27.2%) and cough (18.3%) (See table 4.4 for more details).

The knowledge of respondents on the techniques for preventing pneumonia is shown in table 4.5. The majority (81.5%) of the respondents correctly stated that sleeping in well-ventilated rooms can prevent pneumonia. Immunization (78.7%), reduction of air pollution (76.6%), avoidance of smoking (73.8%) and eating of appropriate diet (57.1%) were also correctly mentioned techniques for preventing pneumonia. (See table 4.5 for more details). Figure 4.1 shows respondents' knowledge relating to vaccines that can prevent pneumonia. The majority (69.9%) of the respondents knew that there was a vaccine that can be used to prevent pneumonia. Table 4.6 presents respondents' responses relating to the name of vaccines that can be used to prevent pneumonia. However, none of the medicines mentioned by the respondents is a vaccine that can be used to prevent pneumonia. A majority (88.8%) could not even mention any medicine. (See table 4.6 for more details).

Respondents' knowledge of categories of persons at high risk of contracting pneumonia is highlighted in table 4.7. Most (96.1%) of the respondents correctly listed very young children aged 0-5 years. Other correct responses included the following; children not breastfed exclusively (84.8%), old people (82.3%) and persons with HIV/AIDS (81.2%). (See table 4.7 for more details). Respondents' knowledge of the causative agents of pneumonia is presented in table 4.8. A majority (80.5%) of them disclosed that pneumonia could be caused by a virus while 20.8% listed bacteria as a causative agent of pneumonia. Cold temperature change in weather was a partially correct response given by most (98.2%) of the respondents. (See table 4.8 for more details).

Respondents' knowledge of the mode of transmission of pneumonia is shown in table 4.9. Slightly above half (54.2%) correctly stated that inhalation of germs could cause pneumonia; 43.2% correctly stated that pneumonia could be transmitted through the exchange of blood between mother and child especially shortly after birth. The wrongly

mentioned mode of transmission of pneumonia included the following: through drinking cold water (96.4%), eating foods contaminated by houseflies (16.7%) and through mosquito bites (13.9%) (See table 4.9 for more details).

Figure 4.2 shows Respondents' knowledge relating to whether pneumonia can spread from one person to another. Majority (64.5%) of the respondents stated that the disease could not spread from one person to another (See table 4.11 for more details). Respondents' overall knowledge score is presented in figure 4.3. The mean knowledge score was 17.0 ± 3.6, and majority (72.8%) of them had poor knowledge while 27.2% had fair knowledge; No respondent had good knowledge of pneumonia

Table 4.4 Respondents' Knowledge of the Symptoms of pneumonia among Under-five children

N=389

Symptoms of pneumonia	**Responses**		
	True (%)	**False (%)**	**Don't know(%)**
High fever	250 (64.3)*	77 (19.8)	62 (15.9)
Shortness of breath	291 (74.8)*	32 (8.2)	66 (17)
Chest in-drawing	268 (68.9)*	40 (10.3)	81 (20.8)
Sharp chest pains	279 (71.7)*	39 (10.0)	71 (18.3)
Headache	106 (27.2)*	174 (44.7)	109 (28.0)
Vomiting	35 (9.0)	229 (58.9)*	125 (32.1)
Swollen feet	23 (5.9)	247 (63.5)*	119 (30.6)
Excessive feeding	60 (15.4)	203 (52.2)*	126 (32.4)
Cough	71 (18.3)*	201 (51.7)	389 (30.1)

*correct responses

Table 4.5 Respondents' Knowledge of Techniques for preventing Pneumonia

N=389

Techniques	Responses		
	True (%)	**False (%)**	**Don't know (%)**
Sleeping in well-ventilated rooms	317 (81.5)*	63 (16.2)	9 (2.3)
Reduce air pollution	298 (76.6)*	79 (20.3)	12 (3.1)
Avoid smoking	287 (73.8)*	85 (21.9)	17 (4.4)
Avoiding too much starchy food	52 (13.4)	274 (70.4)*	63 (16.2)
Treat worm infestation	171 (44.0)	167 (42.9)*	51 (13.1)
Seek spiritual protection	21 (5.4)	336 (86.4)*	32 (8.2)
Do good so as not to invite curses	19 (4.9)	336 (86.4)*	34 (8.7)
Prevent constipation	132 (33.9)	209 (53.7)*	48 (12.3)
Eat balanced/ appropriate diet	222 (57.1)*	123 (31.6)	44 (11.2)
Immunization	306 (78.7)*	56 (14.4)	27 (6.9)

* correct responses

N=389

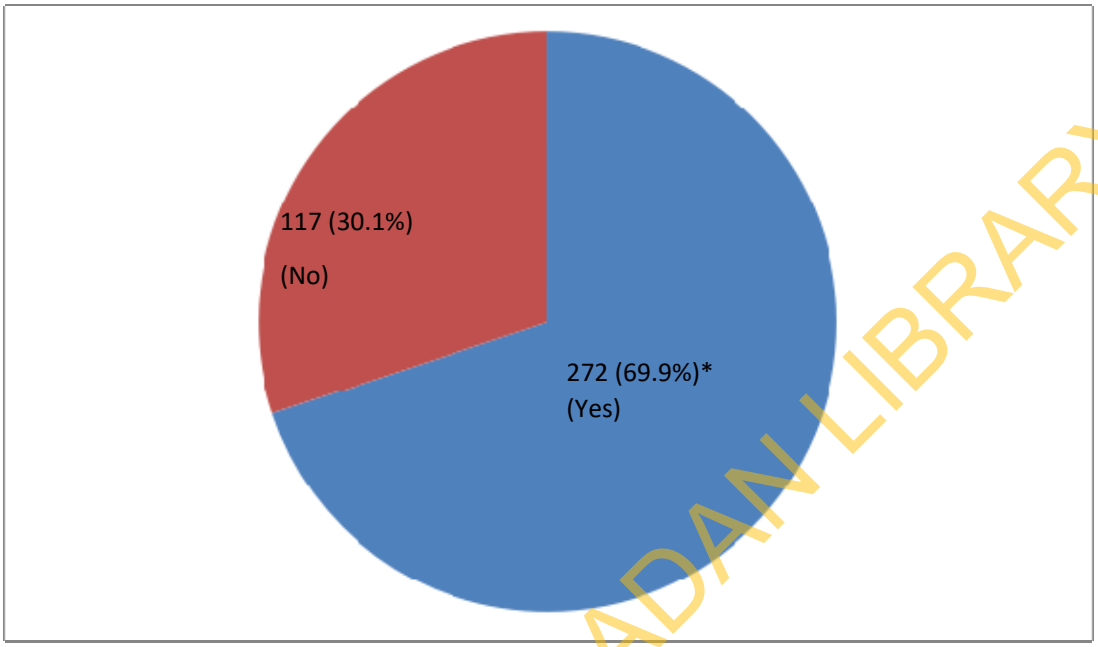

Figure 4.1 Respondents' knowledge in respect of whether there are vaccines that can prevent pneumonia

*Correct response

Table 4.6 Respondents' knowledge of the name of vaccines that can prevent pneumonia

n=272

Name of Pneumonia Vaccine	N	%
Paracetamol*	29	1.0
Ibuprofen*	2	0.74
Don't know	240	88.2
Bonababe*	1	0.4

*Not a vaccine

Table 4.7 Respondents' knowledge of categories of persons at high risk of contracting pneumonia

N=389

Persons at risk of Pneumonia	**Responses**		
	False (%)	**True (%)**	**Don't know (%)**
Very young children aged 0 – 5 years	4 (1.0)	374 (96.1)*	11 (2.8)
Young adults	13 (3.3)*	364 (93.6)	12 (3.1)
Pregnant women	23 (5.9)*	344 (88.4)	22 (5.7)
Old people	29 (7.5)	320 (82.3)*	29 (7.5)
Exclusively breastfed children	10 (2.6)*	367 (94.3)	12 (3.1)
Persons with HIV/AIDS	27 (6.9)	316 (81.2)*	46 (11.8)
Children not breastfed exclusively	24 (6.2)	330 (84.8)*	35 (9.0)

***correct responses**

Table 4.8 Respondents' knowledge on causative agents of Pneumonia

N= 389

Pneumonia Causative agents	**Responses**		
	True (%)	**False (%)**	**Don't know (%)**
Cold temperature/weather change	382 (98.2)*+	1 (0.3)	6 (1.5)
Bacteria	81 (20.8)*	258 (66.3)	50 (12.9)
Virus	21 (80.5)*	313 (5.4)	55 (14.1)
Fungi	9 (2.3)*	311 (79.9)	69 (17.7)
Witchcraft	18 (4.6)	278 (71.5)*	93 (23.9)

*correct responses

*+partially correct (could be an environmental predisposing factor)

Table 4.9 Respondents' knowledge of mode of transmission of pneumonia

N= 389

Mode of transmission	Responses		
	True (%)	False (%)	Don't know (%)
Through an exchange of blood between mother and child especially shortly after birth	168 (43.2)*	151 (38.8)	70 (18.0)
Through mosquito bites	54 (13.9)	322 (82.8)*	13 (3.3)
Inhaling germs that cause pneumonia	211 (54.2)*	158 (40.6)	20 (5.1)
Eating foods contaminated by houseflies	65 (16.7)	302 (77.6)*	22 (5.7)
Through drinking cold water	375 (96.4)	6 (1.5)*	8 (2.1)
Not washing hands regularly, especially after "blowing" one's nose	19 (4.9)*	294 (75.6)	76 (19.5)
Through skin to skin contact	31 (8.0)	268 (68.9)*	90 (23.1)

*correct responses

N= 389

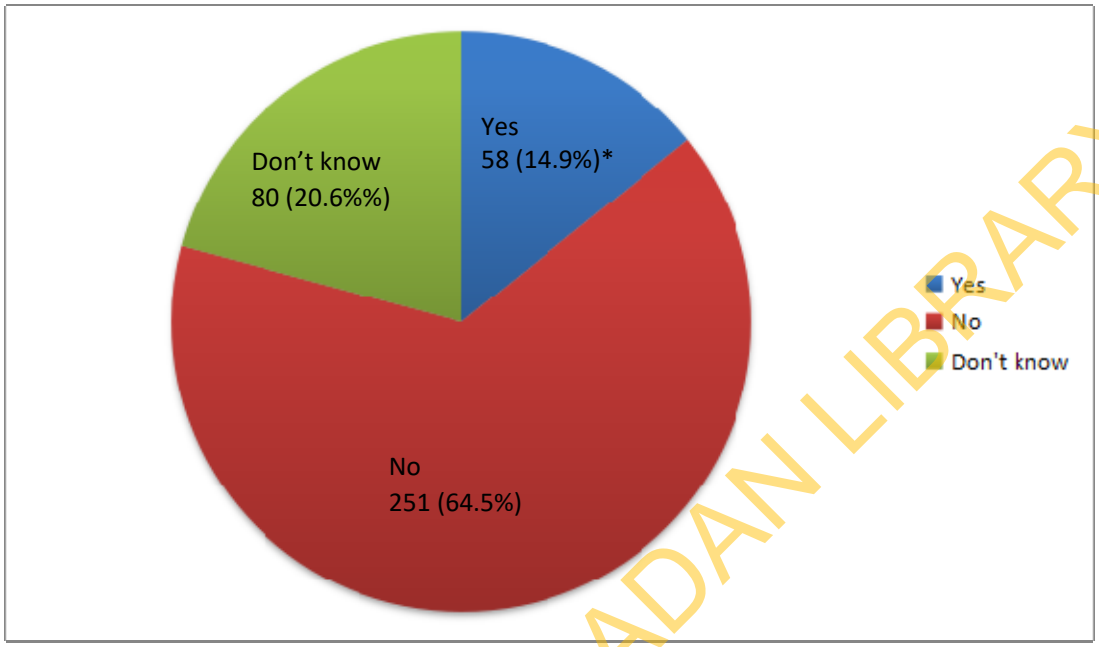

Figure 4.2 Respondents' knowledge of whether pneumonia can spread from one person to another

***Correct response**

N = 389

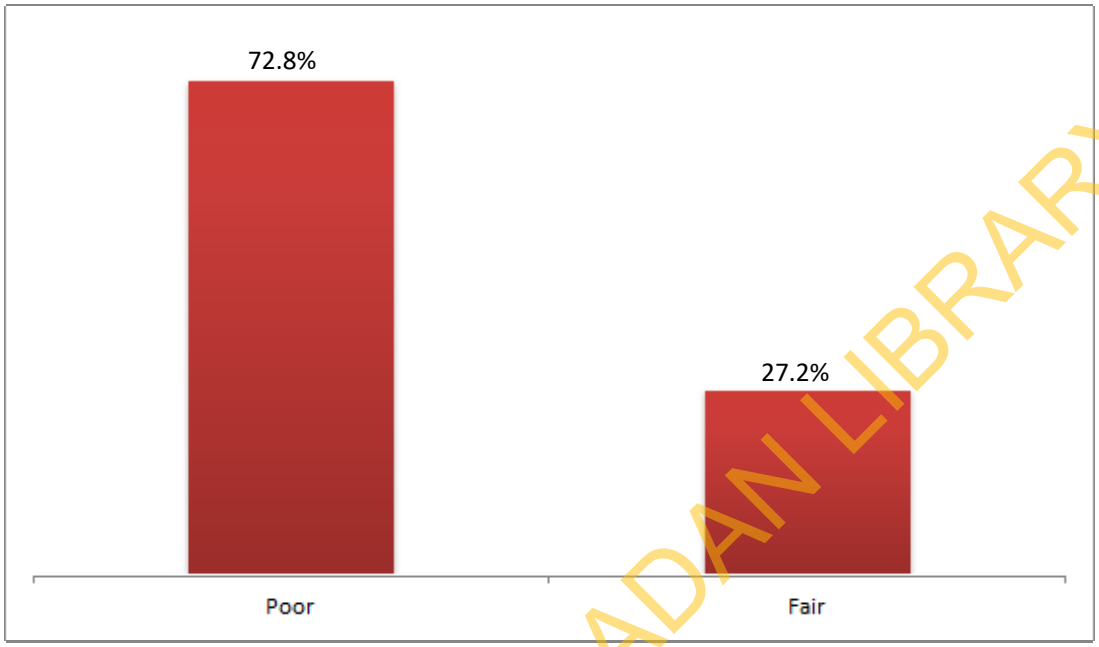

Figure 4.3 Respondents Overall Knowledge of Pneumonia

Mean Knowledge Score = 17.0 ± 3.6

4.4 Perception of Respondents relating to pneumonia

This section presents the three typologies of respondents' perception relating to pneumonia. These typologies are as follow perceived vulnerability to pneumonia; perceived seriousness of pneumonia; and perception relating to the prevention and treatment of pneumonia. The respondents' perception relating to the vulnerability of pneumonia is presented in table 4.10. The table also indicates perceptions that are in line with the biomedical world view. Most (96.1%) of them were of the view that exposure to extreme cold can cause pneumonia among under-five children.

Majority (85.3%) of the respondents did not share the view that pneumonia only affects children who do not eat well. The perception of 38.0% was that under-five children are at greater risk of having pneumonia compared with other children while 15.2% of the respondents share the view that the chances of having pneumonia are higher among children who are not exclusively breastfed. (See details in table 4.10)

Table 4.11 shows respondents' perception relating to the seriousness of pneumonia. Most (97.2%) of the respondents did not share the view that pneumonia only affects older people. The proportion of respondents that was opposed to the view that pneumonia cannot lead to death was 94.6%. Most respondents (90.7%) was also opposed to the perception that pneumonia is a mild illness. Several respondents (24.7%) were of the perception that pneumonia is a serious disease for all under-five children; however, 45% were of the view that pneumonia is a common problem that mothers should not worry about; this perception is not in-line with the biomedical world view. (Details are contained in table 4.11)

Respondents' perception relating to the prevention and treatment of pneumonia is depicted in table 4.12. Most (96.9%) of the respondents did not share the perception that there is nothing one can do to prevent Pneumonia. The perception of 94.6% of them was that pneumonia in children would not go away without treatment. Several respondents (39.6%) were of the view that hand-washing after going to public places could prevent pneumonia among under-five children. One-third (33.2%) of the respondents were opposed to the view that local herbs are more effective for treating pneumonia, while 60.2% opposed the view that adequate nutrition cannot prevent pneumonia among under-five children. (See table 4.12 for more details).

Fig. 4.4 shows respondents' overall perception scores with 61.4% having the favourable perception (i.e., perception in line with the biomedical world view). The mean perception score was 17.0 ± 3.6.

Table 4.10 Respondents' perception relating to vulnerability to pneumonia

N=389

Vulnerability to pneumonia	**Responses**		
	Agree (%)	**Not sure (%)**	**Disagree (%)**
Exposure to extreme cold can promote the occurrence of pneumonia among under-five children	374 (96.1)*	3 (0.8)	12 (3.1)
Pneumonia only affect children who do not eat well	31 (8.0)	26 (6.7)	332 (85.3)*
Sleeping in an overcrowded room cannot increase the chances of having pneumonia among under-five children	183 (47.0)	43 (11.1)	163 (41.9)*
The chances of having pneumonia are higher among children who are not exclusively breastfed	59 (15.2)*	66 (17.0)	264 (67.9)
Under-five children are at greater risk of having pneumonia compared with other children	148 (38.0)*	41(10.5)	200 (51.4)

*Perception in line with biomedical world view

Table 4.11 Respondents' perception relating to the seriousness of pneumonia

N= 389

Perceived seriousness of pneumonia	**Responses**		
	Agree (%)	**Not sure (%)**	**Disagree (%)**
Pneumonia is a mild illness	26 (6.7)	10 (2.6)	353 (90.7)*
Pneumonia cannot lead to death	7 (1.8)	14 (3.6)	368 (94.6)*
Even without treatment, pneumonia disappear after some days	9 (2.3)	11 (2.8)	369 (94.9)*
Pneumonia only affects older people	6 (1.5)	5 (1.3)	378 (97.2)*
Pneumonia is a common problem that mothers should not worry about	175 (45.0)	18 (4.6)	196 (50.4)*
Pneumonia is a serious disease for all under-five children	96 (24.7)*	63 (16.2)	230 (59.1)

* Perception in line with biomedical world view

Table 4.12 Respondents' Perception relating to prevention and treatment of pneumonia

N= 389

Prevention and treatment of pneumonia	Agree (%)	Undecided (%)	Disagree (%)
Hand-washing after going to public places can prevent pneumonia among under-five children	154 (39.6)*	31 (8.0)	204 (52.4)
There is nothing one can do to prevent Pneumonia	5 (1.3)	7 (1.8)	377 (96.9)*
Avoiding places with inadequate air ventilation during cold is a good way to prevent Pneumonia	230 (59.1)*	19 (4.9)	140 (36.0)
Pneumonia in children goes away after some time on its own even without treatment	6 (1.5)	14 (3.6)	369 (94.6)*
Local herbs are more effective for treating pneumonia	226 (58.1)	34 (8.7)	129 (33.2)*
Adequate nutrition cannot prevent pneumonia among under-five children	131 (33.7)	24 (6.2)	234 (60.2)*

* Perception in line with biomedical world view

N= 389

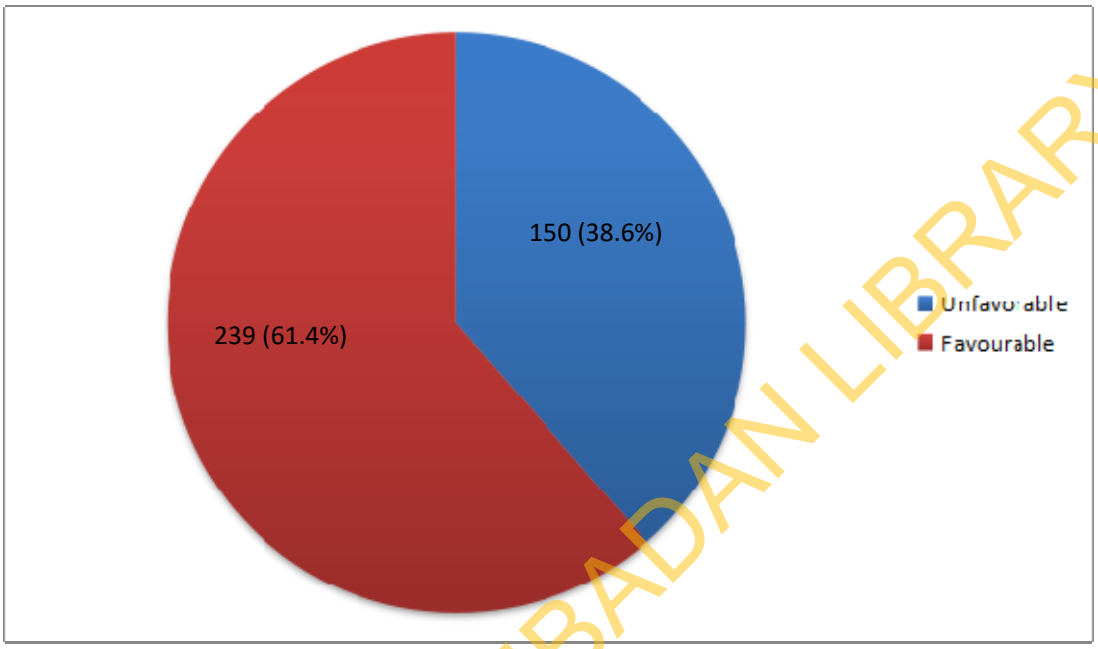

Figure 4.4 Respondents Overall Perception towards Pneumonia

Mean Perception Score = 9.17 ± 2.0

4.5 Prevalence of pneumonia, Help-Seeking behaviour and other pneumonia related practices

The reported prevalence of pneumonia among children aged <5years was 3.9%. The actions initiated by respondents when their children were suspected of having pneumonia are summarized in figure 4.5. (See figure 4.5 for more details). These actions included the use of leftover medicines at home (6.7%), consultation of nurse for treatment (6.7%) and visit of a PMV for treatment (13.3%)

Table 4.13 highlights symptoms that prompt respondents to visit a health facility. To determine whether the condition being experienced by a child was pneumonia or not, the symptoms highlighted included the following: difficulty in breathing (97.9%), sharp chest pain (96.1%), in-drawing of the chest (95.9%), fever (95.1%) and the inability of the child to drink and/or breastfeed (93.1%) (See table 4.14 for more details).

Respondents' pneumonia-related prevention practices/ methods are shown in table 4.14. Most (99.7%) of the respondents reported they clothed their children properly to prevent cold. Most 98.7% also reported that they ensure that there is adequate ventilation in the house to remove smoke and dust. Exclusively breastfeeding for those aged six months or less and immunizing children against pneumonia were the practices listed by 94.3%. (See table 4.14 for more details).

Figure 4.6 shows respondents' intended health-related actions if they noticed that any of their children is suspected to be having pneumonia. Majority (74.6%) of the respondents' reported that they would take the child to the hospital while 23.9% would take to self-medication using western medicines. However, a few (1.5%) would use local herbs. (See figure 4.6 for details).

The Pattern of smoking among respondents' family members is presented in table 4.15. Most (95.9%) of the respondents had no smoker in their family. Three-quarter (75%) of the respondents who had smokers in their family had one smoker, 18.8% had two while 6.2% had three smokers; the mean number of smokers in the family was 1.4 ± 0.6. Slightly above two-thirds (68.8%) of this group have husbands that smoke (See table 4.15 more details).

N=15

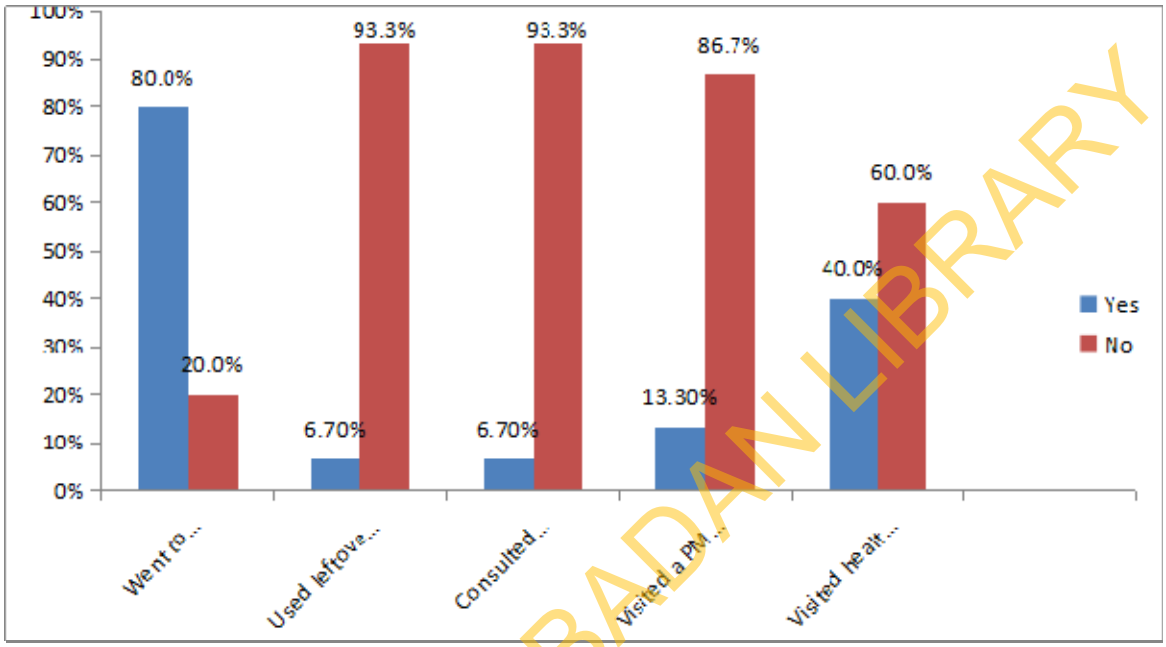

Figure 4.5 Action initiated by respondents' when the child was suspected of having pneumonia

Table 4.13 Symptoms that prompt respondents' to visit a health facility to determine whether the condition being experienced by the child is pneumonia or not.

N=397

Symptoms	Yes (%)	No (%)
The child is unable to drink or breastfeed	362 (93.1)	27 (6.9)
Fever (Increased body temperature)	370 (95.1)	19 (4.9)
The child breaths fast	371 (95.4)	18 (4.6)
The child has difficulty in breathing	381 (97.9)	8 (2.1)
Sharp Chest Pain	374 (96.1)	15 (3.9)
In-drawing of chest	373 (95.9)	16 (4.1)

Table 4.14 Respondents' pneumonia related prevention practices/ methods

N=389

Preventive Practices/Methods	Yes (%)	No (%)
Clothing child properly to prevent cold	388 (99.7)*	1 (0.3)
Ensuring there is adequate ventilation in the house to remove smoke and dust	384 (98.7)*	5 (1.3)
Exclusively breastfeeding for those aged six months or less	367 (94.3)*	22 (5.7)
Ensuring proper waste disposal	329 (84.6)	60 (15.4)
Immunizing children against pneumonia	367 (94.3)*	22 (5.7)
Using herbs to prevent pneumonia	294 (75.6)	95 (24.4)
Sleeping under a Mosquito net to prevent pneumonia	287 (73.8)	102 (26.2)

*Appropriate pneumonia related preventive practices

N=389

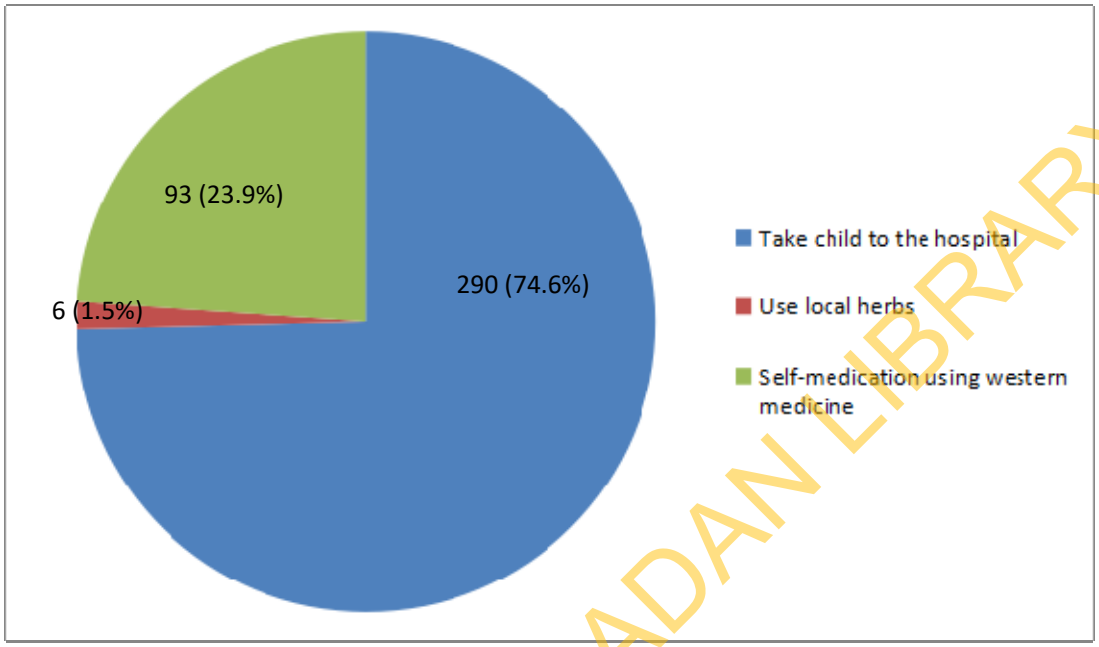

Figure 4.6 Respondents' intended health-related actions if a child is suspected to be having pneumonia

Table 4.15 Pattern of smoking among respondents' family members

Pattern of smoking	N	%
Presence of smokers in respondents' family (N=389)		
Yes	16	4.1
No	373	95.9
Number of smokers in respondents family* (n = 16)		
1	12	75.0
2	3	18.8
3	1	6.2
Whether respondents' husband smokes (n = 16)		
Yes (smoke)	11	68.8
No (smoke)	5	31.2
The smoking habit of respondents (n = 16)		
Yes	1	6.2
No	15	93.8

*$\bar{x}$ = 1.4 ± 0.6

4.6 Comparisons of Respondent's Knowledge and Perceptions

Table 4.16 summarizes the comparison of respondents' knowledge by socio-demographic characteristics. The results show that there were no statistically significant differences in the mean knowledge scores of respondents compared with the socio-demographic characteristics. For instance, the mean knowledge scores were as follow with almost no significant difference 16.9 ±3.8 among those aged <32 years and 17.1 ± 3.6 among those aged ≥ 32 years. The comparison of respondents' knowledge by the prevalence of pneumonia among under-five is shown in table 4.17. Respondents whose under-five children had experienced pneumonia had a higher score (19.0 ± 3.2) than those whose children have not experienced it (16.9 ± 3.6). There was a statistically significant difference in the mean knowledge scores with a p-value of 0.031.

The comparison of respondents' knowledge by the perception of the seriousness of pneumonia is presented in table 4.18. The result shows that there is no statistically significant difference between the mean knowledge scores and perception of the seriousness of the disease as the p-value was higher than 0.05. Table 4.19 presents the comparison of respondents' knowledge by the perception of vulnerability to pneumonia. There is a statistically significant difference between their knowledge and their perceived vulnerability to pneumonia with a p-value of 0.000. (See table 4.19 for details).

The comparison of respondents' perception by socio-demographic characteristics is summarized in table 4.20. The result showed a statistically significant difference in the perception scores of respondents based on religion, occupational status and number of children aged <5 years. Respondents' practising Islam had a higher mean perception score of 9.81 ± 2.0 compared to those practising Christianity with a mean score of 8.8 ± 1.9. Respondents who were artisans had a better perception of 10.6±1.5 compared to those who are trading with a mean per cent score of 8.9 ± 1.9 and civil servants with a mean score of 10.2 ± 2.4. Respondents with more than one under-5 children had a higher mean perception score 9.7 ± 1.7 compared to those with one under-5 child with a mean score of 8.8 ± 2.1. (See table 4.20 for details).

Table 4.16 Comparison of Respondents' knowledge by Socio-Demographic Characteristics

	No	$\bar{x}$ knowledge score	Std. Deviation	df	F/t-test	P value
Age group						
< 32	164	16.89	3.765	387	0.555*	0.579
≥ 32	225	17.10	3.553			
Ethnicity						
Yoruba	369	17.05	3.626	387	0.959*	0.338
Ethnic Minorities	20	16.25	3.919			
Marital Status						
Married	383	17.03	3.652	387	0.911*	0.363
Single Parents	6	15.67	2.658			
Religion						
Christianity	249	17.18	3.770	387	1.261*	0.208
Islam	140	16.70	3.388			
Level of Education						
Below Secondary	16	16.88	4.177	2, 386	0.498**	0.608
Secondary	243	17.15	3.804			
Tertiary	130	16.76	3.254			
Total	389	17.01	3.640			
Occupational Status						
Trading	316	17.03	3.766	2, 386	2.280**	0.104
Civil Service	39	17.74	2.403			
Artisan	34	15.94	3.455			
Total	389	17.01	3.640			
Number of children aged <5years						
One	237	17.05	3.797	387	0.244	0.807
Two and above	152	16.95	3.393			

*Results are based on t-test analysis

**Results are based on F-test analysis

Table 4.17 Comparison of Respondents' knowledge by Reported Prevalence of Pneumonia among U5

Prevalence of Pneumonia among U5	No	$\bar{x}$ knowledge score	Std. Deviation	df	t-test	P value
Yes	15	19.00	3.207	387	2.169	0.031*
No	374	16.93	3.638			

* Statistically Significant

The mean knowledge scores among those whose under-5 children had experienced pneumonia and those whose under-5 children have not experienced the disease are 19.3.2, and 16.3.6, respectively, with a significant difference.

Table 4.18 Comparison of Respondents' knowledge by the perception of the seriousness of Pneumonia

Perception	No	$\bar{x}$ knowledge score	Std. Deviation	df	F-test	P value
Agree	96	16.28	3.547	2,387	2.715	0.067
Not Sure	63	17.46	3.605			
Disagree	230	17.19	3.661			

The mean knowledge scores among those who agreed, not sure and disagreed that pneumonia is a serious illness are 16.3 ± 3.5, 17.5 ± 3.6 and 17.2 ± 3.7 respectively with no significant difference.

Table 4.19 Comparison of Respondents' knowledge by the perception of vulnerability to Pneumonia

Perception	No	$\bar{x}$ knowledge score	Std. Deviation	df	F-test	P value
Agree	148	17.60	3.107	2,387	13.930	0.000*
Not Sure	41	14.34	4.252			
Disagree	200	17.12	3.651			

* Statistically Significant

The mean knowledge scores among those who agreed, not sure and disagreed that under-5 children are vulnerable to pneumonia illness are 17.6 ± 3.1, 14.3 ± 4.2 and 17.1 ± 3.6 respectively with a significant difference.

Table 4.20 Comparison of Respondents' Perception by Socio - Demographic Characteristics

	No	$\bar{x}$ perception score	Std. Deviation	df	F/t-test	P value
Age group						
< 32	164	9.16	2.110	387	0.094*	0.926
≥ 32	225	9.18	1.921			
Ethnicity						
Yoruba	369	9.18	2.018	387	0.504*	0.615
Ethnic Minorities	20	8.95	1.669			
Marital Status						
Married	383	9.17	2.002	387	0.415*	0.679
Single Parents	6	8.83	2.041			
Religion						
Christianity	249	8.81	2.008	387	4.847*	0.000+
Islam	140	9.81	1.827			
Level of Education						
Below Secondary	16	9.56	1.632	2, 386	0.705**	0.495
Secondary	243	9.09	1.989			
Tertiary	130	9.28	2.065			
Total	389	9.17	2.001			
Occupational Status						
Trading	316	8.91	1.900	2, 386	16.551**	0.000+
Civil Service	39	10.08	2.399			
Artisan	34	10.59	1.500			
Total						
Number of children aged <5years						
One	237	8.83	2.091	387	4.313*	0.000+
Two and above	152	9.70	1.726			

*Results are based on t-test analysis

**Results are based on F-test analysis

+Statistically Significant

4.7 Test of Hypotheses

4.7.1 Hypothesis 1

Table 4.21 Association between Respondents' Knowledge and their age

Age	Knowledge level		Chi-square	Df	p-value
	Poor (%)	Fair (%)			
			0.000	1	0.986
<32 years	100 (61.0)	64 (39.0)			
`>=32 years	137 (60.9)	88 (39.1)			

(p>0.05)

Table 4.21 shows the result of the testing of the null hypothesis, which states that "there is no significant association between respondents' knowledge and their age." More respondents aged <32 years had poor knowledge (61.0%) compared with those aged ≥ 32 years with poor knowledge score of 60.9%. The proportion of respondents with fair knowledge was 39.0% among those aged <32 years and 39.1% among those aged ≥32 years. The result showed that there was no significant association between knowledge and the age of the respondents. (X^2= 0.000, df = 1, p-value = 0.986). Hence, the null hypothesis (Ho) is not rejected.

4.7.2 Hypothesis 2

Table 4.22 Association between Respondents' Knowledge and their Education level

Education level	Knowledge level		Chi-square	df	p-value
	Poor (%)	Fair (%)			
			2.368	2	0.306
Below secondary	10 (62.5)	6 (37.5)			
Secondary	141 (58.0)	102 (42.0)			
Tertiary	86 (66.2)	44 (33.8)			

(p>0.05)

The result of the testing of the null hypothesis, which states that "there is no significant association between respondents' knowledge and their level of education is presented in table 4.22. More respondents who had tertiary education had poor knowledge (66.2%) compared to those having below secondary (62.5%) and secondary education level (58%). The proportion of respondents with fair knowledge was 37.5% of those with an education level below the secondary school, 42% of those with secondary education and 33.8% of those with tertiary education. The result shows that there is no statistically significant association between knowledge and education level of respondents'. (X^2= 2.368, df = 2, p-value = 0.306). The null hypothesis (Ho) is, therefore, not rejected.

4.7.3 Hypothesis 3

Table 4.23 Association between Respondents' Perception and their Education level

Education level	Perception		Chi-square	df	p-value
	Unfavourable (%)	Favourable (%)			
			0.679	2	0.712
Below secondary	5 (31.3)	11 (68.8)			
Secondary	92 (37.9)	151 (62.1)			
Tertiary	53 (40.8)	77 (59.2)			

(p>0.05)

Table 4.23 highlights the result of the testing of the null hypothesis, which states that "there is no significant association between respondents' perception and their level of education." More respondents who had tertiary education had the unfavourable perception (40.8%) compared to those who had below secondary education (31.3%) and secondary education level (37.9%). The proportion of respondents with favourable perception was 68.8% of those with an education level below the secondary school, 62.1% of those with secondary education and 59.2% of those with tertiary education. The result shows that there is no statistically significant association between perception and education level of respondents'. (X^2= 0.679, df = 2, p-value = 0.712). The null hypothesis (Ho) is, therefore, not rejected.

4.7.4 Hypothesis 4

Table 4.24 Association between Respondents' Knowledge and their Perception

Perception	Knowledge level		Chi-square	df	p-value
	Poor (%)	Fair (%)			
			1.323	1	0.250
Unfavourable	86 (57.3)	64 (42.7)			
Favourable	151 (63.2)	88 (36.8)			

(p>0.05)

Table 4.24 presents the result of the testing of the null hypothesis, which states that "there is no significant association between respondents' knowledge and their perception." The result shows that there is no statistically significant association between knowledge and perception of respondents'. (X^2= 1.323, df = 1, p-value = 0.250). The null hypothesis (Ho) is, therefore, not rejected.

CHAPTER FIVE

DISCUSSION, CONCLUSION, AND RECOMMENDATION

This chapter focuses on the major findings of the study. It is organized into the following sub-sections: Socio-demographic characteristics; respondents' living situation; respondents' knowledge of pneumonia; perception of pneumonia among respondents; the prevalence of pneumonia and help-seeking behaviour among respondents. Other sub-sections are the implications of the findings for health promotion and education, conclusion and recommendations.

5.1 Socio-demographic characteristics of respondents

The respondents mean age was 32.7 ± 4.6, with many of them aged 25-34 years. A similar age range was reported in a study conducted in Kaduna state by Yahaya et al., (2018). This age range falls within the reproductive age of women, which is 15-49 years (WHO). Most (94.9%) of the respondents were Yoruba, and 98.5% were married. Alakia is predominantly a Yoruba speaking community. A cultural value among the Yoruba, including residents of Alakia, is for ladies to get married as early as possible and have children. This makes giving birth to children out of wedlock unattractive. A majority (64.0%) of the respondents were Christians, while 36.0% were Muslims. It should be noted that Christianity and Islam are the most dominant religions in the study area. The highest level of education of many of the respondents was secondary education, and most were traders.

Socio-demographic characteristics such as age, level of education, marital status and occupation revealed in this study are very important in the design and implementation of educational programs targeted at mothers of under-five. They should be used to guide the selection of educational methods, strategies, and educational aids for implementing interventions relating to the prevention/control and management of pneumonia among under- five in the study area.

5.2 Respondents' Living Situation

The mean number of persons living in respondents' dwelling unit was 4.4 ± 1.6. The number of persons living in a dwelling unit has implications for the occurrence of

pneumonia; overcrowding and poor ventilation is associated with the occurrence of pneumonia (Onyango et al., 2012). Many of the respondents live in two bedroom and self-contained flats. However, some of the dwelling units are houses of the "*face-me-I-face-you*" type which involves people living in a room or a room and parlour. Having 4.4 ± 1.6 persons living in a dwelling unit as it prevails in Alakia constitutes overcrowding, which is a risk factor for pneumonia. The cooking methods used by the majority (86.9%) of the mothers is pollution free as only a few (3.9%) use firewood, which leads to the pollution of the air.

Several respondents (29.0%) indulge in the burning of refuse, which also contributes to air pollution. Air pollution is one of the risk factors for pneumonia (Karki et al., 2014). The type of housing design, mode of refuse disposal as well as the use of biomass as the source of energy for cooking in some of the dwelling units in the study area have the potential for enhancing the vulnerability of under-5 five children to pneumonia. The implication of this is that environmental control measures are needed to complement health-seeking behaviours/practices such as immunization and healthy eating in the prevention and control of pneumonia among the under-fives.

5.3 Respondents' knowledge of pneumonia

The results show that there are several gaps in respondents' knowledge relating to pneumonia. For instance, some mothers erroneously regarded vomiting, swollen feet, and excessive feeding as symptoms of pneumonia. The associations of pneumonia with taking too much starchy food, worm infestation, and constipation are other indicators of misconceptions relating to the prevention of the disease among under-five. Despite these misconceptions, the majority were able to correctly identify shortness of breath (74.8%), chest in-drawing (71.7%) and sharp chest pains (68.9%) as symptoms of pneumonia. Studies carried out in India reported that a small proportion of mothers was able to state the symptoms of the disease as a chest infection (16.9%) and rapid breathing (40%) (Agarwal & Bajpai, 2015).

Peruvian mothers, however, had better knowledge according to Gálvez et al., (2002) who reported that more than 80% of mothers of under-five identified rapid breathing and chest retraction as symptoms of pneumonia. A Study conducted in Lagos State, Nigeria reported that half of the mothers correctly identified fast and difficult breathing as a symptom of

pneumonia in children (Ekure *et al.* 2013). Memon *et al.* (2013) also reported gaps in mothers' knowledge relating to the symptoms of pneumonia. For instance, 42% of mothers in their study population reported fast breathing, difficulty breathing (61%) and severe cough (26.5%) as signs/symptoms of pneumonia. The findings show that mothers of under-five had inadequate knowledge about the cardinal signs of pneumonia, which include fast breathing/difficult breathing and chest retraction. It has been stated that recognition of signs and symptoms of pneumonia is the most critical step in the effective management of the disease (Keter, 2015); ability to recognise the signs/symptoms of pneumonia also facilitates the initiation of prompt treatment-seeking behaviour.

More than two-thirds (69.9%) of the respondents in the study knew that there is a vaccine that could prevent pneumonia; however, none of them could give the correct name of the vaccine. Studies carried out in Kaduna, Nigeria among rural and urban mothers similarly reported low-level knowledge of pneumonia vaccine among respondents as only 9% of the respondents was aware of the vaccine (Yahaya et al., 2018). The implication of this is that the names of the vaccines which are Pneumococcal Conjugate Vaccine (PCV) and pneumococcal polysaccharide vaccine (PPV) may be difficult for many mothers who are not in health-related fields to recall. What nursing mothers should just be made to know is "*pneumonia vaccine"*; the socio-marketing of the term (pneumonia vaccine) should be aggressively conducted. Majority of the respondents in the study had a good knowledge of categories of persons at high risk of contracting pneumonia who are under-five children, old people, persons living with HIV/AIDS and children not well breastfed. The consequences of pneumonia on these populations should be included in educational interventions in the community.

Most of the respondents identified low temperature/cold weather (98.2%) and virus (80.5%) as causes of pneumonia. A study conducted in India similarly reported that most mothers believed pneumonia is caused by "cold temperatures/weather" while a few stated that dust/germs, bacteria, and fungi could cause the disease (Agarwal & Bajpai, 2015). A study carried out at Lagos University Teaching Hospital (LUTH) by Ekure *et al.* (2013) as well as the report of a formative study carried out in Ghana by Abbey et al., (2016) revealed that majority of mothers reported that cold is a cause of pneumonia. It should be noted that it is not cold or cold weather that causes pneumonia; cold weather, however, promotes the vulnerability of under-five children to the factors which cause the disease

Several gaps in knowledge were revealed by the study. For instance, less than half of the respondents were able to correctly identify the exchange of blood between mother and child especially shortly after birth a possible mode of transmission of pneumonia while over half know that inhalation of germs could lead to childhood pneumonia. Gaps in knowledge were noted relating to the association of hand washing with the transmission of pneumonia. Previous studies similarly revealed gaps in knowledge relating to the mode of transmission of the disease. For instance, very few respondents identified hand washing as a preventive practice against pneumonia in studies conducted in Kaduna and Lagos, Nigeria. (Yahaya et al., 2018; Ekure *et al.* 2013)

Overall, the level of knowledge of pneumonia among the respondents was poor. Previous studies conducted in Nigeria and elsewhere have similarly revealed inadequate knowledge of pneumonia among mothers of under-5 (Yahaya et al., 2018; Pradhan et al., 2016; Ekure *et al.* 2013).

5.4 Perception of Respondents Relating to Pneumonia

The perceptions of about two-thirds (61.4%) of the respondents were in line with the biomedical world view. Typical perceptions include the views or beliefs that extreme cold could lead to pneumonia and that pneumonia is not a mild disease and that it can lead to death. Perceptions which are factual should be promoted. The deductions from this and previous studies conducted elsewhere relating to mothers' knowledge and perception of pneumonia are worth noting. One of the deductions is that mothers' perceptions vary, in terms of prevalence and frequency from setting to setting. In this study, the proportion of those with favourable perception (perception in-line with a scientific view) was 61.4% .

A study conducted in Indian by Pradhan (2016) showed that over half of mothers had good (favourable) perception while in Thailand the prevalence or proportion of mothers with good/favourable perception was 81% (Siswanto, 2007). Another important deduction is that mothers' perception of pneumonia could be at variance with their knowledge. In this study, for instance, while the overall perception of the disease among mothers was favourable, their knowledge was generally found to be poor. It could be concluded that favourable perception may not translate to good knowledge of pneumonia among mothers of under-five.

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5.5 Prevalence of pneumonia and health-Seeking behaviour among respondents

The study revealed pneumonia reported an prevalence rate of 3.9% among children <5years. Similarly, a prevalence of 6.6% was reported in the community-based cross-sectional study carried out in Kaduna, Nigeria (Yahaya et al., 2018). However, a higher prevalence rate of 33.5% was reported in a study carried out in Ethiopia (Abuka, 2017). A prevalence of 23% was reported in a facility-based surveillance system in South Africa. In Kenya, 29.1% of mothers had had children with pneumonia (Keter, 2015).

Several factors could be responsible for the observed variation in prevalence. These include variation in the level of knowledge and variation in the study settings. In this study, the 3.9% reported prevalence obtained might be a tip of the iceberg. Some mothers of under-fives may not be familiar with the distinguishing symptoms for making a definitive diagnosis of pneumonia and so might not have noted that their children had pneumonia at one point or the other. The setting in which the study took place is different; why this study was community-based, the one that took place in South Africa was facility-based (le Roux et al., 2015).

Over 33.3% of mothers who had managed a child with pneumonia indicated that they visit a health facility. This pattern of behaviour should be encouraged because of the seriousness of the disease. However, treatment of pneumonia using herbs as reported by 53.3% should be discouraged because of the associated harmful effects Use of herbs and resort to the use of antibiotics by some of the respondents are risk-laden and so should be discouraged. Use of antibiotics falls outside the primary health care management of childhood diseases.

Almost all mothers engage in one prevention practice or the other against pneumonia. The preventive practices reported by most of the respondents are the protection of children from protecting the child from cold (99.7%) and ensuring adequate ventilation (98.7%). This perception is wild because of the belief that exposure to cold is a cause of pneumonia.

5.6 Implications of the findings for Health Promotion and Education

Findings from this study have health promotion and education implications; they suggest the need for multiple interventions directed at mitigating the effect of pneumonia. Health education is any planned combination of learning experiences designed to predispose,

enable and reinforce voluntary actions, conducive to health in individuals, groups or communities (Green and Kreuter, 1999). Health promotion is the process of deliberate and purposeful dissemination of health information and policy measures which enables all members of the communities and individuals to make informed health decision and thereby improving their health status (Federal Ministry of Health, 2007).

Health education principles, methods, and strategies can be used to address the challenges and gaps in knowledge identified in this study. This implies that people's capacities need to be enhanced for the prevention and treatment of pneumonia. This has to do with improving the level of knowledge of mothers on the aetiology of the disease, appropriate prevention pathways, and improving their skills related to help-seeking behaviour. Possible health promotion strategies that can be used include public enlightenment, training, and community mobilization. These strategies will be discussed one after the other:

Public Enlightenment

Public enlightenment is an organized communication activity designed primarily to raise awareness, induce behaviour change and improve quality health outcomes for individuals and populations. Awareness of palliative care and quality of care can be improved by this strategy (Seymour, 2017). According to Seymour (2017), the strategy can involve awareness creation in schools. The programme should target recognition of causative agents, symptoms, mode of transmission and prevention techniques relating to pneumonia among under-five so that mothers can take proper steps to prevent and manage the disease. This approach is needed to avoid the disease and the associated adverse health effects of the condition (Yahaya et al., 2018).

Public enlightenment should also focus on the motivation of caregivers with special reference to nursing mothers to take their children to health facilities immediately symptoms of pneumonia are suspected instead of resorting to self-medication involving either western or traditional herbal medications or both. The awareness creation relating to pneumonia through public enlightenment activities have the potential for promoting nursing mothers' knowledge of the disease.

Training

Training is an educational process designed for helping people to carry out some tasks well. Training can be used to address the gaps in knowledge revealed in this study. Mothers should be trained on modifiable behavioural risk factors relating to the prevention of pneumonia. Training to educate parents is important for reducing mortality and morbidity related to acute respiratory infection, including pneumonia (Karki et al., 2014). A preliminary community diagnosis in Alakia revealed that there are several Patent medicine vendors in the community. Such informal health care providers should also be trained on the recognition and referral of pneumonia cases to appropriate formal health care facilities.

Community Mobilization

Community mobilization within the context of health promotion and education is a process through which action is stimulated by the community itself or by groups and organizations with a view to enhancing the overall standard of living in the community (Concha, 2001). Communities can be mobilized to reduce or stop activities that could lead to environmental pollution, which increases the susceptibility of under-five to pneumonia. Community mobilization intervention includes those targeting smoking, burning of refuse, cooking with firewood or biomass. Other healthy practices such as the promotion of breastfeeding, community-based treatment, and vaccination have been proven to be efficacious in the reduction of pneumonia prevalence rates (Niessen et al., 2009)

5.7 Conclusion

The level of knowledge of the symptoms, causative agents, transmission route, prevention and vaccination for pneumonia was generally poor among mothers of children of under-five. Overall, the majority of the nursing mothers had perceptions that were in line with the biomedical view relating to pneumonia. Pneumonia is perceived to be serious. Some of the study population, visit PMVs for treatment while a few make use of herbs; these are risk-laden health or treatment-seeking behaviour. Factors which have the potential for putting children at risk of pneumonia are prevalent in the study community.

5.8 Recommendations

The following recommendations are made based on the findings of the study:

1. There should be a well-designed community-based educational programme aimed at addressing the gaps in knowledge and misconceptions and risky practices associated with the occurrence of pneumonia in the study area.
2. Patent Medicine Vendors in the study area should be trained to recognize and refer cases of pneumonia among the under-five to appropriate to health care facilities as they constitute the first point of call for many mothers seeking for healthcare for their under-five children.
3. Public enlightenment programme involving a combination of appropriate media used by mothers in the study as sources of health information should be used to disseminate factual information relating to knowledge of the symptoms, causative agents, transmission route, prevention and vaccination for pneumonia.
4. Mothers should be encouraged to take all routine vaccines, including Pneumonia vaccine, which is one of the vaccines given to under-five in Nigeria.
5. Mothers and other caregivers should reduce environmental pollution activities in homes and places where under-five children are kept.

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APPENDIX 1: QUESTIONNAIRE

Knowledge, Perception and Health Seeking Behaviour of Mothers Concerning Pneumonia among Under-5 children in Alakia, Egbeda Local Government Area, Ibadan, Nigeria

Questionnaire

Dear Respondent,

My name is _____, of the Department of Health Promotion and Education, Faculty of Public Health, University of Ibadan. The purpose of this study is to investigate knowledge, perception, and health-seeking behaviour of mothers concerning pneumonia among under-five children in Alakia, Egbeda Local Government Area in Ibadan. Your participation in this study is **voluntary.** I implore you to answer the questions as honest as possible. The findings from this study will help in the design of programs and formulation of policies aimed at preventing/controlling pneumonia among under-five children. All information gathered during the course of this study will be kept secret or confidential. Note that you do not have to write your name on this questionnaire. Your willingness to answer these questions implies you have consented to participate in this study.

Thanks for your cooperation.

Kindly indicate your willingness to participate by ticking *(√)* the BOX below

☐

Section A: Socio-demographic Information

INSTRUCTION: In this section, please tick (√) any of the responses that apply to you in the options provided or complete the blank spaces provided

1. Age as at last birthday in years: _____
2. Ethnicity: 1. Yoruba ☐ 2. Hausa ☐ 3. Igbo ☐ 4. Any Other(s) (specify)_____

3. Marital status: 1. Married ☐ 2. Single ☐ 3. Divorced ☐ 4. Widowed ☐
   5. Separated ☐ 6. Others (specify)_____
4. Religion: 1. Christianity ☐ 2. Islam ☐ 3. Traditional religion ☐
   4. Other(s) (specify)_____
5. The highest level of education (Completed): 1. No formal education ☐ 2. Primary ☐
   3. Secondary ☐ 4. College of education ☐ 5. OND ☐ 6. HND ☐
   7. University Degree ☐ 8. Any other (specify)_____
6. Occupational status: 1. Trading ☐ 2. Civil service ☐ 3. Farming ☐ 4. Artisan ☐
   5. Others (specify)_____
7. How many children below the age of five do you have? _____

Section B: Living Situation of Participant

Instruction: For each of the questions in this section, please complete the blank spaces provided or tick (√) the appropriate boxes provided

8. Name of Area of residence/neighbourhood _____
9. Total number of persons living in your family_____
10. Type of house living in, please tick *(√)* as appropriate
    1.) One room ☐
    2.) Self-contained flats ☐
    3.) Two bedrooms ☐
    4) Face me; I face you ☐
    5) A room and parlour ☐
    6) Any other (specify) _____
11. How do you dispose of your refuse? (Please tick ***(√)***) 1. Burning ☐ 2) Dumping of the refuse on the street ☐ 3) disposing of twice a week to the waste disposal truck ☐
    4) Dumping of the refuse in the stream or the rain ☐
12. What do you use to cook? (Please tick *(√) all that you use)*) 1) Gas cooker ☐ 2) Firewood ☐ 3) Stove ☐ 4) Electric Cooker ☐

SECTION C: Knowledge on Pneumonia

INSTRUCTION: For the questions in this section, please tick (√) the appropriate alternative response; in some cases, however, simply supply the needed information in the blank spaces provided.

13. **Table 1** ***contains some symptoms. For each condition, tick (√) either 'True' if it could be suggestive of pneumonia or 'False' if it is not suggestive of pneumonia among under-five children. If you are not sure, tick (√) 'Don't know.'***

Table 1

S/N	Symptoms of pneumonia among Under-five children	*Tick(√)*		
		True	**False**	**Don't know**
13.1	High fever			
13.2	Shortness of breath			
13.3	Chest in-drawing			
13.4	Sharp chest pains			
13.5	Vomiting			
13.6	Swollen feet			
13.7	Excessive feeding			
13.8	Drowsiness			
13.9	A cough			

14. ***Table 2 contains some ways or techniques for preventing pneumonia in children. For each technique, tick (√) "True" if it can be used to prevent pneumonia. If it cannot be used to prevent pneumonia, tick (√)" False". If you are not sure, tick (√) "Don't know."***

Table 2

S/N	Techniques for preventing pneumonia	Tick (√)		
		True	**False**	**Don't know**
14.1	Sleeping in well-ventilated rooms			
14.2	Reduce air pollution (e.g. too much dust, smoke)			
14.3	Avoid smoking			
14.4	Avoiding too much starchy food			
14.5	Treat worm infestation			

14.6	Seek spiritual protection			
14.7	Do good so as not to invite curses			
14.8	Prevent constipation			
14.9	Eat a balanced diet			
14.10	Immunization			

15. Can vaccination help prevent pneumonia 1) Yes ☐ 2) No ☐ ***if No, skip to question 17***

16. ***If yes to question 15,*** state a vaccine that can be used to prevent pneumonia _____

17. ***Table 3 contains groups of people. For each statement, tick (√ "True") if it is at high risk of having pneumonia, tick (√) "False" if it is not at high risk of having pneumonia. If you are not sure, tick (√) "I don't know".***

Table 3

S/N	**Group of people or persons**	**Tick (√) (whether at high risk of getting pneumonia**		
		True	**False**	**I Don't know**
17.1	Very young children and babies aged 0 – 5 years			
17.2	Young adults			
17.3	Pregnant women			
17.4	Old people			
17.5	Exclusively breastfed children			
17.6	Persons with HIV/AIDS			
17.7	Children not breastfed exclusively			

18. ***Table 4 contains groups of causative agents of different diseases. For each group, tick (√) "True" if it can cause pneumonia, tick (√) "false" if it cannot cause pneumonia; If you are not sure, tick (√) 'Don't know.'***

Table 4

S/N	Causative agents of Pneumonia	Tick (√)		
		True	**False**	**Don't know**
18.1	Cold temperature/weather change			
18.2	Bacteria			
18.3	Virus			
18.4	Fungi			
18.5	Witchcraft			

19. Table 5 contains the modes of spread of diseases. ***For each mode, tick (√) "True" if it can lead to the spread of pneumonia; tick (√) "False" if it cannot spread pneumonia. If you are not sure, tick (√) 'Don't know.'***

Table 5

S/N	Mode or ways of spreading pneumonia	Tick (√)		
		True	**False**	**Don't know**
19.1	Through the exchange of blood between mother and child especially shortly after birth			
19.2	Through mosquito bites			
19.3	Inhaling germs that cause pneumonia			
19.4	Eating foods contaminated by houseflies			
19.5	Through drinking cold water			
19.6	Not washing hands regularly, especially after "blowing" your nose			
19.7	Through skin to skin contact			

20. Some types of pneumonia can spread from one person to another. A) Yes ☐ b) No ☐ c) Don't know ☐

SECTION D: Perception of Mothers relating to Pneumonia

21. **Table 6 contains statements relating to vulnerability or the possibility of getting pneumonia. For each statement,** ***please kindly tick [√] "Agree", or "Disagree"; if you cannot make up your mind, tick (√) "Not sure".***

Table 6

S/N	**Possibility / vulnerability of getting pneumonia**	**Tick (√)**		
		Agree	**Not Sure**	**Disagree**
21.1	Exposure to extreme cold can cause pneumonia among under-five children			
21.2	Pneumonia only affect children who do not eat well			
21.3	Sleeping in an overcrowded room cannot increase the chances of having pneumonia among under-five children			
21.4	The chances of having pneumonia are higher among children who are not exclusively breastfed			
21.5	Under-five children are at greater risk of having pneumonia compared with other children			

22. **Table 7** ***contains statements relating to the seriousness of pneumonia. For each statement, please kindly tick [√] "Agree" or "Disagree"; If you cannot make up your mind, tick [√] "Not Sure."***

Table 7

S/N	**Perceived seriousness**	**Tick (√)**		
		Agree	**Not Sure**	**Disagree**
22.1	Pneumonia cannot lead to death			
22.2	Even without treatment, pneumonia disappear after some days			
22.3	Pneumonia only affects older people			
22.4	Pneumonia is a common problem that mothers should not worry about			
22.5	Pneumonia is a serious disease for all under-five children			
22.6	Pneumonia is a mild illness			

23. **Table 8** ***contains perception statements relating to the prevention and treatment of pneumonia. For each statement tick (√) whether you "Agree" or whether you "Disagree"; if you are not sure, tick (√) "Undecided."***

Table 8

S/N	Perception relating to prevention and treatment of pneumonia	Tick (√)		
		Agree	Undecided	Disagree
23.1	Hand-washing after going to public places can prevent pneumonia among under-five children			
23.2	There is nothing one can do to prevent Pneumonia			
23.3	Avoiding places with inadequate air ventilation during cold is a good way to prevent Pneumonia			
23.4	Pneumonia in children goes away after sometime on its own even without treatment			
23.5	Local herbs or Agbo are more effective for treating pneumonia			
23.6	Adequate nutrition cannot prevent pneumonia among under-five children			

SECTION E: Prevalence of pneumonia, Help-Seeking behaviour and other pneumonia related practices

Instruction: ***For the questions in this section, please tick (√) the appropriate alternative response; in some cases, however, simply supply the needed information in the blank spaces provided***

24. Has any of your children below the age of five ever had pneumonia?

a) Yes ☐ b) No ☐ ***If no, go to question 26***

25. If yes to question 24, what action(s) have you ever taken when you suspected that your child had pneumonia? (***use table 9 for your answer***)?

Table 9

S/N	Action initiated when child had pneumonia	Tick (√)	
		Yes	No
25.1	Did nothing		
25.2	Went to clinic/ hospital		
25.3	Used leftover medicines stored at home		

25.4	Consulted a nurse at home for treatment		
25.5	Used local herbs/traditional medicine		
25.6	Consulted a herbalist		
25.7	Visited a patent medicine store for treatment		
25.8	Visited a health care centre		

26. Sometimes children have severe illnesses and so should be taken immediately to a care centre. Which of the symptoms in table 10 will make you take a child under the age of 5 years to a health facility immediately? ***(For each symptom, tick (√) either Yes or No).***

Table 10

S/N	**Symptoms/Sign**	**Tick (√)**	
		Yes	**No**
26.1	Child is unable to drink or breastfeed		
26.2	Fever (Increased body temperature)		
26.3	The child breaths fast		
26.4	The child has difficulty in breathing		
26.5	Sharp Chest Pain		
26.6	In-drawing of chest		

27. ***Table 11 contains methods of preventing pneumonia. For each method, tick (√) whether "Yes" if you use it to prevent pneumonia among under-five children or tick(√) "No" if you do not use it.***

Table 11

S/N	/methods	**Tick (√)**	
		Yes	No
27.1	Clothing child properly to prevent cold		
27.2	Ensuring there is adequate ventilation in the house to remove smoke and dust		
27.3	Exclusively breastfeeding for those aged six months or less		
27.4	Ensuring proper waste disposal		
27.5	Immunizing children against pneumonia		
27.6	Using herbs to prevent pneumonia		
27.7	Sleeping under Mosquito net to prevent pneumonia		

SECTION F: Smoking Behaviour of Family Members

28. Is there any smoker in your family? 1)Yes ☐ 2)No ☐

If yes to question 28 answer question 29, **if answer is NO, stop the interview**

29. How many smokers are there in your family? _____

30. Do you smoke? 1) Yes ☐ 2) No ☐

31. Does your husband smoke? 1) Yes ☐ 2) No ☐

APPENDIX II: IBERE

Imo, Iro Ati Ìwádìí Ìlera Ti Awọn Iya Lori Otitu Aya Ti Awon Omo Labe Odun Marun Ni Alakia, Ipinle Ijoba Agbegbe Egbeda, Ni Ibadan, Ipinle Oyo

Olufẹ,

Orukọ mi ni _____, lati Eka Ilera ti igbega ati eko, sakaani ti ilera gbogbogbo, fasiti ti ilu Ibadan. Idi ti iwadi yi ni lati ṣawari Imo, Iro ati iwádìí ilera ti awọn Iya lori Otutu Aya ti awon omo labe odun marun ni Alakia, ipinle ijoba agbegbe Egbeda, ni Ibadan, Ipinle Oyo. Ifarahan rẹ ninu iwadi yii jẹ atinuwa. **Mo bẹ ọ lati dahun awọn ibeere bi otitọ bi o ti ye. Awọn awari lati inu iwadi yii yoo ṣe iranlọwọ ninu awọn eto ati agbekalẹ ti imulo eleto dena / akoso otutu Aya laarin awọn ọmọde.**

Gbogbo alaye ti o wa ni akoko iwadi yii ni ao pamọ ni asiri. Akiyesi pe o koni ni lati kọ orukọ rẹ lori iwe-ibeere yii. Ifarahan rẹ lati dahun ibeere wọnyi tumọ si pe o ti gbagbọ lati kopa ninu iwadi yii.

O ṣeun fun ifowosowopo rẹ.

Fowo si itọkasi ifarahan rẹ lati kopa nipasẹ fifi ami sinu (√) apoti ti o wa ni isalẹ.

☐

Abala A: Alaye ti agbegbe-ara-ẹni

Ilana: Ni apakan yii, jọwọ fi ami si (√) eyikeyi awọn idahun ti o kan si ọ ninu awọn aṣayan ti a pese tabi pari awọn aaye alafo ti a pese.

1. Ojo ori: _____
2. Eya: 1. Yoruba ☐ 2. Hausa ☐ 3. Igbo ☐
   4. Eyikeyi (pato)_____
3. Ipo igbeyawo: 1. Ti gbeyawo ☐ 2. Apon ☐ 3. Ikọsilẹ ☐ 4. Opo ☐
   5. Iyara ☐ 6. Eyikeyi (pato) _____
4. Ẹsin: 1. Onigbagbọ ☐ 2. Musulumi ☐ 3. Ẹsin ti aṣa ☐
   4 Eyikeyi (pato) _____
5. Ipele ẹkọ ti o ga julọ (Ti pari) : 1. Ko si ẹkọ ☐ 2. parari ☐ 3. Sekondiri ☐
   4. Ile ẹkọ nla ☐ 5. OND ☐ 6. HND ☐ 7 .digiri fasiti
   8. Eyikeyi (pato) _____

6. Iṣẹ: 1. okowo ☐ 2. Osise ijoba ☐ 3. Ogbin ☐
5. Ise owo ☐ 6. Eyikeyi (pato) _____

7. Awọn ọmọde labe ọdun marun melo ni o ni?_____

Abala B: Ipo Agbegbe ti Olukopa

Ilana : Fun ibeere kọọkan ninu abala yii, jọwọ pari awọn aaye alafo ti a pese tabi fi ami si (√) awọn aṣayan ti o yẹ

8. Orukọ ti Ipinle ti ibugbe / agbegbe _____

9. Iye awọn eniyan ti o ngbe ni ile rẹ _____

10. Iru ile ti ngbe ni, jọwọ samisi bi o yẹ

1.) yara kan ☐
2.) Awọn ile ti fulati ☐
3.) Awọn yara iwosun meji ☐
4) Ile Mo doju kọ ọ ☐
5) Iyẹwu ati palo ☐
6) Eyikeyi (ṣafihan) _____

11. Bawo ni o ṣe so awọn ohun idoti rẹ nu? (Jọwọ fi ami si ***(√)*** 1. Sisun ☐ 2) idale si ori ita ☐ 3) nlọ ni ẹẹmeji ni ọsẹ si inu ọkọ idale ☐ 4) dida le si inu odo tabi si agbara

Kini o nlo lati dana? (Jọwọ fi ami si *(√) gbogbo ohun ti o lo*) 1) gaasi-idana kuka ☐ 2) igi-idana ☐ 3) sitofu ☐ 4) kuka tina joba ☐

IPIN C : Imọ lori Otutu Aya

Ilana: Fun awọn ibeere ni apakan yii, jọwọ fi ami si (√) idaamu ti o yẹ; ni awọn igba miiran, sibẹsibẹ, fi alaye ti o nilo ni awọn aaye alaiye ti a pese.

13. **Tabili:** ***Ni diẹ ninu awọn aami aisan . Fun ipo kọọkan, fi ami si (√) boya 'Otitọ' ti o ba le jẹ abawọn ti otutu aya tabi 'Iro'' ti o ko ba le ni imọran ti Otutu aya laarin awọn ọmọ labe odun marun-un . Ti ko ba da ọ loju, fi ami si (√) 'Mi o mo . '***

Tabili kinni

S / N	**Awọn aami Otutu aya labe awọn ọmọ odun marun-un**	***Fi ami si (√)***		
		Otitọ	**Iro**	**Mio o mọ**
13.1	Iba			
13.2	Kuru ìmí			
13.3	Imi aya			
13.4	Aya riro			

13.5	Orififo			
13.6	Ebi			
13.7	Esẹ wiwu			
13.8	Ounje pipo			
13.9	Ikọra			
13.10	Iko			

14. ***Tabili 2: ni dịẹ ninu awọn imuposi fun idilọwọ awọn otutu aya larin awọn ọmọde. Fun ilana kọọkan, fi ami si (√) "Otitọ" ti o ba le lo lati dènà otutu aya. Ti ko ba le dènà otutu aya, fi ami si (√) "Iro". Ti o ko ba da ọ loju, fi ami si (√) "Mio mọ."***

Tabili keji

S / N	**Awọn imọran fun idekun Otutu aya**	**Fi ami si (√)**		
		Otitọ	**Iro**	**Mi o mọ**
14.1	Sùn ni awọn yara ti kosi ategun			
14.2	Din idoti afẹfẹ ku (fun apẹẹrẹ eruku pupọ, ẹfin)			
14.3	Yẹra fun siga			
14.4	Yẹra fun ounjẹ sitashi pupọ			
14.5	Toju aran ara			
14.6	S ișe aabo ti ẹmí			
14.7	Șe rere ki o má ba gba epe			
14.8	Șe idiwọ àìrígbẹyà			
14.9	Je ounjẹ iwontunwonsi			
14.10	Ajesara			

15. Șe o le șe iranlọwọ lati dẹkun Otutu aya 1) Bẹẹni ☐ 2) Bẹẹkọ ☐
Bẹẹkọ , foju si ibeere 1 7
16. ***Ti o ba jẹ bẹ si ibeere 15,*** șe abere ajesara kan ti a le lo lati dènà otutu aya _____

17. ***Tabili*** keta ***ni awọn ẹgbẹ ti eniyan. Fun ikọọkan gbólóhùn, fi ami (√ "Otitọ") ti o ba jẹ ewu ati ni Otutu aya, fi ami (√) "iro" ti o oba jẹ ewu lati ni Otutu aya. Ti o ko ba da ọ loju, fi ami si (√) "Emi ko mọ " .***

Tabili keta

S / N	**Ewu ti o wa nini Otutu aya**	**Fi ami si (√)**		
		Otitọ	**Iro**	**Emi ko mọ**
17.1	Awọn ọmọde kekere ati awọn ọmọ ikoko ti ajasara ko ni idagbasoke			
17.2	Ọmọ ọdọ			
17.3	Awọn obinrin aboyun			
17.4	Awọn agbalagba			
17.5	Ti o ni iyọọda awọn ọmọde			
17.6	Awọn eniyan ti o ni HIV / AIDS			

18. ***Table kerin: Ni awọn ẹgbẹ ti awọn aṣoju ayanmọ ti awọn aisan orişirişi. Fun ẹgbẹ kọọkan, fi ami si (√) " Otitọ " ti o ba le fa otutu aya, fi ami si (√) " iro " ti ko ba le fa ki otutu aya; Ti o ko ba da ọ loju, fi ami si (√) 'Ko mọ .'***

Tabili kerin

S / N	**Awọn aṣoju ti Otutu aya**	**Fi ami si (√)**		
		Otitọ	**Iro**	**Mi omọ**
18.1	Iwọn otutu/ iyipada oju ojo			
18.2	Awon Alamo			
18.3	Kokoro arun			
18.4	Awọn ipele			
18.5	Aję			

19. **Table karun ni awọn ipo ti itankale awọn arun .** ***Fun ipo kọọkan, fi ami si (√) " Otitọ " ti o ba le ja si itankale ti Otutu aya; fi ami si (√) "iro " ti o ko ba le tan otutu aya. Ti o ko ba daju ,*** **fi** ***ami si (√) 'Mi o mọ .'***

Tabili karun

S / N	**Itankale Otutu aya**		**Fi ami si (√)**	
		Otitọ	**Iro**	**Mio mọ**
19.1	Nipasẹ awọn pasipaarọ ti ẹję laarin iya ati omo paapa kukuru lẹhin ibi			
19.2	Nipasẹ efon			
19.3	Fifa simu idoti ti on fa Otutu aya lara eni ti o ni arun na nipa sisin			
19.4	Nję ounję ti o ti baje nipasẹ awọn kokoro ile			
19.5	Nipasẹ mimu omi tutu			
19.6	Lai fo ọwọ rẹ nigbagbogbo, paapaa lẹhin fifun imu rẹ			
19.7	Nipa awọ ara si ara			

20. Dię ninu awọn ęya ara ti Otutu aya le tan lati ọkan si ęnikeji. A) Bęęni ☐ b) Bęękọ ☐ c) Mi o mọ ☐

IPIN D: Iro awon Iya ti o jọmọ Otutu aya

21. **Tabili 6 ni awọn gbolohun ti o jọmọ ipalara si Otutu aya. Fun alaye kọọkan,** ***jọwọ fi ami [√] " Gba " , tabi " mi o gba " ; ti o ko ba le ṣe iranti rẹ , fi ami si (√) " ko da ju " .***

Tabili kefa

S / N	**Awọn ipinlẹ fun akiyesi**		**Fi ami si (√)**	
		Gba	**Ko daju**	**Mio gba**
21.1	Ifihan si ohun tutu le fa ki Otutu aya larin awọn ọmọde labe odun marun-un			

21.2	Awọn ọmọde ti ko jẹun daradara lo n ma ni Otutu aya			
21.3	Sùn ni ibi yara ti awon eniyan posi ko le mu leke okun fa Otutu aya larin awọn ọmọde labe odun marun-un			
21.4	Awọn anfani ga julọ nipa Otutu aya laarin awọn ọmọde ti a ko fun loyan daradara			
21.5	Awọn ọmọde labe odun marun-un ti igbewon wan ko ni idagbasoke patapata ni o ni ewu ti o pọ julọ lati ni ewu Otutu aya			

22. **Tabili 7:** ***ni awọn gbolohun ti o nii ṣe pẹlu ironu ijile ti Otutu aya. Fun alaye kọọkan, jẹ ki o fi ami si[√] " Gba " tabi "mi o gba" ; Ti o ko ba le ṣe iranti rẹ, fi ami si [√] " Ko Daju. "***

Tabili keje

S / N	**Ironu jile**	**Fi ami si (√)**		
		Gba	**Ko daju**	**Mi ogba**
22.1	Otutu aya ni a ìwọnba àìsàn			
22.2	Otutu aya ko le ja si iku			
22.3	Paapaa lai ni itọju, awọn aami aisan ti Otutu aya farasin lẹhin ọjọ diẹ			
22.4	Otutu aya nikan yoo ni ipa lori awọn agbalagba			
22.5	Otutu aya jẹ iṣoro wọpọ ti awọn iya ko yẹ ki o ṣe aniyan nipa			
22.6	Otutu aya jẹ arun pataki fun gbogbo awọn ọmọde labe odun marun-un			

23. **Tabili 8** ***ni awọn gbolohun ọrọ ti o jọmọ idena ati itọju ti awọn otutu aya. Fun gbólóhùn kọọkan fi ami (√) boya "Ogba " tabi boya "mi o gba"; ti o ko ba da ọ loju, fi ami si (√) "*** **Mi ole so"**

Tabili kejo

S / N	**Imọ ti o jọmọ idena ati itọju ti Otutu aya**	**Fi ami si (√)**		
		Gba	**Mi ole so**	**Mi o gba**
23.1	Fifo ọwọ lẹhin n lọ si gbangba le jẹ ki adekun Otutu aya laarin awọn ọmọde labe odun marun-un			
23.2	Ko si ohun ti ọkan le ṣe lati dena Otutu aya			
23.3	Sisa kuro nibiti kosi ategun ninu otutu je ohun to da julo lati dekun Otutu aya			
23.4	Otutu aya ninu awọn ọmọde n lọ lẹhin igba diẹ lori ara rẹ paapa laisi itọju			
23.5	Awọn ewebe agbegbe jẹ diẹ munadoko fun itọju Otutu aya			
23.6	Ounjẹ to dara deedee ko le dẹkun Otutu aya laarin awọn ọmọde labe odun marun-un			

SECTION E : Iro awon Iya ti o jọmọ Otutu aya

Ilana : ***Fun awọn ibeere ni apakan yii, jọwọ fi ami si (√) idaamu ti o yẹ; ni awọn igba miiran, sibẹsibẹ, fi alaye ti o nilo ni awọn aaye alafo ti a pese***

24. Ṣe eyikeyi ninu awọn ọmọ rẹ ti o wa labe ọdun marun ti ni Otutu aya ?

a) Bẹẹni ☐ b) Bẹẹkọ ☐ ***Ti ko ba si, lọ si ibeere 26***

25. Ti o ba fi ami si bẹẹni fun ibeere 24, kini igbese ti o ti mu nigba ti o ba fura pe ọmọ rẹ ni otutu aya ? (*lo tabili 9 fun idahun rẹ*) ?

Tabili kesan

S / N	**Ise ti a se nigbati ọmọ ba ni Otutu aya**	**Fi ami si (√)**	
		Bẹẹni	**Beeko**
25.1	mase ohunkohun		
25.2	Lọ si ile iwosan / ile iwosan		
25.3	Lo awọn oogun ti a fipamọ ni ile		
25.4	Loba nọọsi ni ile fun itọju		
25.5	Lo awọn ohun elo agbegbe / oogun ibile		
25.6	Kan si onisegun		
25.7	Ṣabẹwo si itaja itọju egbogi fun itọju		
25.8	Losi ile itoju ara		

26. Nigba miran awọn ọmọde ni awọn aisan buburu ati oyẹ ki wan lo si ile itoju ara. Ewo ni awọn aami aisan ni tabili 10 yoo ṣe awọn ọmọ labẹ odun marun lati de ile itoju ara? ***(Fun aisan kọọkan, fi ami si (√) boya Bẹẹni tabi Bẹẹkọ).***

Table 10

S / N	**Awọn aami aisan**	**Fi ami si (√)**	
		Bẹẹni	**Beekoomi**
26.1	Awọn ọmọ ti o lagbara lati mu omi tabi oômu		
26.2	Iba (ara gbegbona)		
26.3	Ọmọ naa nmí ni kiakia		
26.4	Ọmọ naa ni isoro ninu mimi		
26.5	Aya didun tole		
26.6	Ifiwe-inu ti àyà		
26.7	Awọn ẹlomiiran (pato)		

27. Tabili kesan ni awọn ọna tabi awọn iṣẹ . Fun ọna tabi iwa, tọka (√) boya " Bẹẹni " ti o ba lo o lati dena Otutu aya laarin awọn ọmọde labe odun marun-un tabi ami si (√) " Bẹẹkọ " ti o ko ba lo won .

Table kesan

S / N	Ilana / awọn ọna	**Fi ami si (√)**	
		Bẹẹni	*Bẹẹkọ*
27.1	Wiwo aso fun ọmọ daradara lati dena otutu		
27.2	Ṣe idaniloju pe ategun wa deede ni ile lati yọ ẹfin ati eruku		

27.3	Oyan fifunni lorekore fun awọn ti o kere ju osu meje lọ		
27.4	Ida lenu to peye		
27.5	Gbigba ajesara to le dekun Otutu aya		
27.6	Lilo awon ewebẹ lati ṣe idena fun Otutu aya		
2.7	Sùn labẹ neti lati daabobo Otutu aya		

SECTION F: Iwa siga mimu larin Awọn ọmọ Ẹbi

28. Ṣe oni eniti n fa siga ninu ẹbi rẹ? 1) Bẹẹni ☐ Ti o baje beeni, Dahun Q29 2) Bẹẹkọ ☐ ti ko ba si, ma tesiwaju ninu iwe ibeere na

29. Melo ni awọn eniyan ti nmu siga ni idile rẹ ? _ _____

30. Ṣe o mu siga? 1) Bẹẹni ☐ 2) Bẹẹkọ ☐

31. Ṣe ọkọ rẹ mu siga? 1) Bẹẹni ☐ 2) Bẹẹkọ ☐

Informed Consent Form

IR Research Approval Number: _____
This approval will elapse on:
Title of research: Knowledge, Perception and Health Seeking Behavior of Mothers concerning Pneumonia among Under-5 Alakia, Egbeda Local Government Area, Ibadan
Name of Researcher: This study is being carried out by Kayode Olatunji, a post-graduate student of Health Promotion and Education, Faculty of Public Health.
Purpose of the research: The purpose of this research is to investigate Knowledge, Perception and Health Seeking Behavior of Mothers concerning Pneumonia among Under-5 Alakia, Egbeda Local Government Area, Ibadan
The procedure of the research: A total of 389 nursing women will be recruited for this study using a multi-stage sampling technique.
Expected duration of research and participant(s) involvement: this research will last for approximately 2 months. You will be required to fill a questionnaire for a duration of 10 minutes.
Risks: There is no risk involved in this study. However, there are some questions which some respondents may be uncomfortable with.
Cost to participating in joining the research: Participating in this study comes at no cost.
Benefits: The research would provide more insight into the health seeking behaviour of mothers, and the result will be useful for the design of intervention aimed at preventing and controlling of pneumonia.
Confidentially: You will not be required to write your names or addresses on the questionnaire. This will ensure that the answers you provide cannot be linked to you in any way.
Voluntariness: You are free to choose whether to participate in this study or not.
Consequences of participants' decision to withdraw from the research and procedure for withdrawal: You are free to withdraw from the study at any time. Any information that you have provided prior to withdrawal and have been used for publication cannot be removed. The information provided by you will not, however, be attributable to you. The researcher will ensure that your confidentiality is maintained and secure.

Statement of Person Obtaining Inform Consent

I have fully explained this research to _____ and have given sufficient information including the benefits to make informed-decision

DATE _____ SIGNATURE _____

NAME _____

Statement of Person giving Consent

I hereby certify that I have read conduct of the informed consent form or the content of the informed consent form has been read to me by the data collector.I understand what the research is all about. Therefore, I have decided to:

1. I agree to participate in the study (tick √) _____

2. I do not want to participate in the study (tick √) _____

and I confirm my participation with the following signature: _____

Thank You for willingness to participate

Name of the interviewer: _____Signature. _____

Date of interview_____ Name of the supervisor: _____ Signature of Supervisor. _____ Date_____

APPENDIX V: CODE GUIDE

ITEMS	VARIABLES	CODE
	SECTION A: Socio-Demographic Characteristics of Respondents	
Q1	**Age**	Actual figure
Q2	**Ethnicity**: Yoruba Hausa Igbo	1 2 3 No response = 99
Q3	**Marital Status:** Married Single Divorced Widowed Separated	1 2 3 4 5 No response = 99
Q4	**Religion:** Christianity Islam Traditional	1 2 3 No response = 99
Q5	**Highest level of education**: No formal education Primary Secondary Tertiary	1 2 3 4 No response = 99
Q5b	**If Tertiary** College of education OND HND University Degree	1 2 3 4 77 = Not applicable No response = 99
Q6	**Occupational Status**: Trading Civil Servant Farming Artisan	1 2 3 4 No response = 99
Q7	**Number of Children below the age of 5**	Actual Figure
	SECTION B: Living Situation of participant	
Q8	**Name of Area of Residence**	Actual Response
Q9	**Total number of persons living in your home**	Actual Response
Q10	**Type of home living in:** One room Self-contained flats Two bedrooms Face me; I face you A room and parlour Three bedroom flat	1 2 3 4 5 6 No response = 99

Q11	**How do you dispose of your refuse:** Burning Dumping of the refuse on the street Disposing of twice a week to the waste disposal truck Dumping of the refuse in the stream or the rain	 1 2 3 4 No response = 99
Q12	**What do you use for cooking:** Gas cooker Firewood Stove Electric Cooker	 1 2 3 4
	SECTION C: Knowledge on causes, symptoms, prevention, treatment and consequences of pneumonia	
Q13	**Symptom(s) of pneumonia**	
13.1	High fever	(for each) True = 1 False = 2 Don't Know = 3 No Response = 99
13.2	Shortness of breath	
13.3	Chest in-drawing	
13.4	Sharp chest pains	
13.5	Vomiting	
13.6	Swollen feet	
13.7	Excessive feeding	
13.8	Drowsiness	
13.9	Cough	
Q14	**Techniques for preventing pneumonia in children**	(for each) True = 1 False = 2 Don't Know = 3 No Response = 99
14.1	Sleeping in well-ventilated rooms	
14.2	Reduce air pollution (e.g. too much dust, smoke)	
14.3	Avoid smoking	
14.4	Avoiding too much starchy food	
14.5	Treat worm infestation	
14.6	Seek spiritual protection	
14.7	Do good so as not to invite curses	
14.8	Prevent constipation	
14.9	Eat balanced diet	
14.10	Immunization	
Q15	**Can vaccination help prevent pneumonia**	(for each) Yes = 1 No = 2 No Response = 99
Q16	**state a vaccine that can be used to prevent pneumonia**	(for each) Yes = 1 No = 2 No Response = 99
16.1	Paracetamol	
16.2	Ibuprofein	
16.3	Don't know	

16.4	Burnerbabe	
16.5	Others	
16.6	Non applicable	
Q17	**Risk of contracting pneumonia**	
17.1	Very young children and babies whose immune systems are not fully developed	(for each) False = 1 True = 2 Don't Know = 3 No Response = 99
17.2	Young adults	
17.3	Pregnant women	
17.4	Old people	
17.5	Exclusively breastfed children	
17.6	People with HIV/AIDS	
17.7	Children not breastfed exclusively	
Q18	**Causative agents of Pneumonia**	
18.1	Cold temperature/weather change	
18.2	Bacteria	(for each) True = 1 False = 2 Don't Know = 3 No Response = 99
18.3	Virus	
18.4	Fungi	
18.5	Witchcraft	
Q19	**Spread of Pneumonia**	
19.1	Through the exchange of blood between mother and child especially shortly after birth	(for each) True = 1 False = 2 Don't Know = 3 No Response = 99
19.2	Through mosquito bites	
19.3	Inhaling germs that causes pneumonia from the sneeze of infected persons	
19.4	Eating foods contaminated by houseflies	
19.5	Through drinking cold water	
19.6	Not washing your hands regularly, especially after blowing your nose	
19.7	Through skin to skin contact	
Q20	Some types of pneumonia can spread from one person to another	(for each) True = 1 False= 2 Don't Know = 3 No Response = 99
	SECTION D: Perception of Mothers relating to Pneumonia	
Q21	**vulnerability to pneumonia**	
21.1	Exposure to extreme cold can cause pneumonia among under-five children	(for each) Agree = 1 Not sure = 2 Disagree = 3 No response = 99
21.2	Pneumonia only affect children who do not eat well	
21.3	Sleeping in an overcrowded room cannot increase the chances of having pneumonia among under-five children	
21.4	The chances of having pneumonia are higher among children who are not exclusively breastfed	

21.5	Under-five children whose immune systems are not fully developed are at greater risk of having pneumonia	
Q22	**Perceived seriousness to pneumonia**	(for each) Agree = 1 Not Sure = 2 Disagree = 3 No response = 99
22.1	Pneumonia is a mild illness	
22.2	Pneumonia cannot lead to death	
22.3	Even without treatment, symptoms of pneumonia disappear after some days	
22.4	Pneumonia only affects older people	
22.5	Pneumonia is a common problem that mothers should not worry about	
22.6	Pneumonia is a serious disease for all under-five children	
Q23	**Perception relating to prevention and treatment of pneumonia**	(for each) Agree = 1 Undecided = 2 Disagree = 3 No response = 99
23.1	Hand-washing after going to public places can prevent pneumonia among under-five children	
23.2	There is nothing one can do to prevent Pneumonia	
23.3	Avoiding places with inadequate air ventilation during cold is a good way to prevent Pneumonia	
23.4	Pneumonia in children goes away after sometime on its own even without treatment	
23.5	Local herbs are more effective for treating pneumonia	
23.6	Adequate nutrition cannot prevent pneumonia among under-five children	
	SECTION E: Prevalence of pneumonia, Help-seeking behavior and other pneumonia related practices	
Q24	Has any of your children below the age of five ever had pneumonia? Yes No	1 2
Q25	If yes to question 24, where was the child treated?	(for each) Yes = 1 No = 2 No Response = 99 NA = 77
25.1	The child was treated with hearbs	
25.2	The child was taken to the hospital	
25.3	The child was given antibiotics	
25.4	Not applicable	
Q26	**How many times have you experienced pneumonia in the last 6 months?**	(for each) Yes = 1 No = 2 No Response = 99 NA = 77
26.1	Zero	
26.2	Once	
26.2	Twice	
Q27	**If yes to question 24, what action(s) have you ever taken when you suspected that your child had pneumonia?**	(for each) Yes = 1 No = 2
27.1	Did nothing	
27.1	Went to clinic	
27.3	Used leftover medicines stored at home	
27.4	Consulted a nurse at home for treatment	

27.5	Used local herbs/traditional medicine	No Response = 99 NA = 77
27.6	Consulted a herbalist	
27.7	Visited a patent medicine store for treatment	
27.8	Visited a health care center	
Q28	**Sometimes children have severe illnesses and so should be taken immediately to a care center. Which of the symptoms in table 10 will make you take a child under the age of 5 years to a health facility immediately?**	(for each) Yes = 1 No = 2 No Response = 99
28.1	Child is unable to drink or breastfeed	
28.2	Fever (Increased body temperature)	
28.3	The child breaths fast	
28.4	The child has difficulty in breathing	
28.5	Sharp Chest Pain	
28.6	In-drawing of chest	
29	**Methods and practices to prevent pneumonia among under-five**	(for each) Yes = 1 No = 2 No Response = 99
29.1	Clothing child properly to prevent cold	
29.2	Ensuring there is adequate ventilation in the house to remove smoke and dust	
29.3	Exclusively breastfeeding for those aged six months or less	
29.4	Ensuring proper waste disposal	
29.5	Immunizing children against pneumonia	
29.6	Using herbs to prevent pneumonia	
29.7	Sleeping under Mosquito net to prevent pneumonia	
30	**What would you do if you have a sick child with fever and/or a suspected case of pneumonia?**	(for each) Yes = 1 No = 2 No Response = 99
30.1	Take the child to the hospital	
30.2	Self-medication at home	
30.3	Use Local Herbs	
30.4	Use drugs	
31	**How is pneumonia commonly treated in this community? (Please tell me as much as you can)**	(for each) Yes = 1 No = 2 No Response = 99
31.1	Take the child to the health centre	
31.2	Massage the child with robb	
31.3	Clothe the child properly to prevent cold	
31.4	Self-Medication	
31.5	Don't know	
32	**Is there any smoke in your family?**	Yes = 1 No = 2 No Response = 99
33	**How many smokers are there in your family?**	Yes = 1 No = 2 No Response = 99

34	**Do you smoke?**	Yes = 1 No = 2 No Response = 99
35	**Does your husband smoke?**	Yes = 1 No = 2 No Response = 99

APPENDIX VI: KNOWLEDGE SCALE/MARKING SCHEME

S/N	Knowledge of Pneumonia	Response	Response	Response	Maximum Score
1	**Symptoms of Pneumonia**	Tick ( ) True	Tick ( ) False	Tick ( ) Don't Know	
	High fever	CORRECT	INCORRECT	INCORRECT	1
	Shortness of breath	CORRECT	INCORRECT	INCORRECT	1
	Chest in-drawing	CORRECT	INCORRECT	INCORRECT	1
	Sharp chest pains	CORRECT	INCORRECT	INCORRECT	1
	A headache	CORRECT	INCORRECT	INCORRECT	1
	Vomiting	INCORRECT	CORRECT	INCORRECT	1
	Swollen feet	INCORRECT	CORRECT	INCORRECT	1
	Excessive feeding	INCORRECT	CORRECT	INCORRECT	1
	Cough	CORRECT	INCORRECT	INCORRECT	1
					9
2	**Techniques for preventing pneumonia in children**	Tick ( ) True	Tick ( ) False	Tick ( ) Don't Know	
	Sleeping in well-ventilated rooms	CORRECT	INCORRECT	INCORRECT	1
	Reduce air pollution (e.g. too much dust, smoke)	CORRECT	INCORRECT	INCORRECT	1
	Avoid smoking	CORRECT	INCORRECT	INCORRECT	1
	Avoiding too much starchy food	INCORRECT	CORRECT	INCORRECT	1
	Treat worm infestation	INCORRECT	CORRECT	INCORRECT	1
	Seek spiritual protection	INCORRECT	CORRECT	INCORRECT	1
	Do good so as not to invite curses	INCORRECT	CORRECT	INCORRECT	1
	Prevent constipation	INCORRECT	CORRECT	INCORRECT	1
	Eat balanced diet	CORRECT	INCORRECT	INCORRECT	1
	Immunization	CORRECT	INCORRECT	INCORRECT	1
					10
3	**Risk of Contracting pneumonia**	Tick ( ) False	Tick ( ) True	Tick ( ) Don't Know	
	Very young children and babies whose immune systems are not fully developed	INCORRECT	CORRECT	INCORRECT	1
	Young adults	CORRECT	INCORRECT	INCORRECT	1
	Pregnant women	INCORRECT	CORRECT	INCORRECT	1

	Old people	INCORRECT	CORRECT	INCORRECT	1
	Exclusively breastfed children	CORRECT	INCORRECT	INCORRECT	1
	People with HIV/AIDS	INCORRECT	CORRECT	INCORRECT	1
	Children not breastfed exclusively	INCORRECT	CORRECT	INCORRECT	1
					7
4	**Causative agents of Pneumonia**	Tick ( ) True	Tick ( ) False	Tick ( ) Don't Know	
	Cold temperature/weather change	INCORRECT	CORRECT	INCORRECT	1
	Bacteria	CORRECT	INCORRECT	INCORRECT	1
	Virus	CORRECT	INCORRECT	INCORRECT	1
	Fungi	CORRECT	INCORRECT	INCORRECT	1
	Witchcraft	INCORRECT	CORRECT	INCORRECT	1
					5
5	**Spread of Pneumonia**	Tick ( ) False	Tick ( ) True	Tick ( ) Don't Know	
	Through the exchange of blood between mother and child especially shortly after birth	INCORRECT	CORRECT	INCORRECT	1
	Through mosquito bites	CORRECT	INCORRECT	INCORRECT	1
	Inhaling germs that causes pneumonia from the sneeze of infected persons	INCORRECT	CORRECT	INCORRECT	1
	Eating foods contaminated by houseflies	CORRECT	INCORRECT	INCORRECT	1
	Through drinking cold water				1
	Not washing your hands regularly, especially after blowing your nose	INCORRECT	CORRECT	INCORRECT	1
	Through skin to skin contact	CORRECT	INCORRECT	INCORRECT	1
					7
		Total Maximum Score			**38**

POINTS	QUANTITATIVE ASSESSMENT/EVALUATION	CODE
<19	POOR	1
19-28.5	FAIR	2
>28.5	GOOD	3

PERCEPTION SCALE/MARKING SCHEME

S/N	Perception of Mothers relating to Pneumonia	Response	Response	Response	Maximum Score
1	**vulnerability to pneumonia**	Tick ( ) Agree	Tick ( ) Undecided	Tick ( ) Disagree	
	Exposure to extreme cold can cause pneumonia among under-five children	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
	Pneumonia only affect children who do not eat well	UNFAVOURABLE	UNFAVOURABLE	FAVOURABLE	1
	Sleeping in an overcrowded room cannot increase the chances of having pneumonia among under-five children	UNFAVOURABLE	UNFAVOURABLE	FAVOURABLE	1
	The chances of having pneumonia are higher among children who are not exclusively breastfed	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
	Under-five children whose immune systems are not fully developed are at greater risk of having pneumonia	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
					5
2	**Perceived seriousness to**	Tick ( ) Agree	Tick ( ) Undecided	Tick ( ) Disagree	

	pneumonia				
	Pneumonia is a mild illness	UNFAVOURABLE	UNFAVOURABLE	FAVOURABLE	1
	Pneumonia cannot lead to death	UNFAVOURABLE	UNFAVOURABLE	FAVOURABLE	1
	Even without treatment, symptoms of pneumonia disappear after some days	UNFAVOURABLE	UNFAVOURABLE	FAVOURABLE	1
	Pneumonia only affects older people	UNFAVOURABLE	UNFAVOURABLE	FAVOURABLE	1
	Pneumonia is a common problem that mothers should not worry about	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
	Pneumonia is a serious disease for all under-five children	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
					6
3	**Perception relating to prevention and treatment of pneumonia**	Tick ( ) Agree	Tick ( ) Undecided	Tick ( ) Disagree	
	Hand-washing after going to public places can prevent pneumonia among under-five children	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
	There is nothing one can do to prevent Pneumonia	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
	Avoiding places with inadequate air ventilation during cold is a good way to prevent Pneumonia	FAVOURABLE	UNFAVOURABLE	UNFAVOURABLE	1
	Pneumonia in	FAVOURABLE	UNFAVOUR	UNFAVOURAB	1

	children goes away after sometime on its own even without treatment		ABLE	LE	
	Local herbs are more effective for treating pneumonia	FAVOURABLE	UNFAVOUR ABLE	UNFAVOURAB LE	1
	Adequate nutrition cannot prevent pneumonia among under-five children	FAVOURABLE	UNFAVOUR ABLE	UNFAVOURAB LE	1
					6
		Total Maximum Score			**17**

POINTS	QUANTITATIVE ASSESSMENT/EVALUATION	CODE
<8.5	UNFAVOURABLE	1
≥8.5	FAVOURABLE	2