Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 6 No. 6 (2025): April 2025 Issue
https://doi.org/10.51168/sjhrafrica.v6i6.1536
Original Article

FACTORS CONTRIBUTING TO PNEUMONIA AMONG CHILDREN UNDER 5 YEARS AT NAGURU HOSPITAL, NAKAWA DIVISION IN KAMPALA DISTRICT, A CROSS-SECTIONAL STUDY.

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ABSTRACT

Background

Pneumonia accounts for 10% of deaths in children under five in Uganda, with at least 25 children dying from it every day. Since 2012, the Government of Uganda has been scaling up strategies to prevent and treat pneumonia among young children. However, national targets remain unmet. This study, therefore, aimed at determining the factors contributing to pneumonia among children under 5 years old at Naguru Hospital in Kampala district.

Methodology

A descriptive cross-sectional design involving the Questionnaire method of data collection was employed. A stratified random sampling method was used to select 100 respondents. The data was analyzed using SPSS and presented in tables, pie charts, and graphs using Microsoft Excel 2016.

Results

Most caregivers, 40 (40%), only attained primary education, while 13 (13%) had attained tertiary education. It was observed that 64 (64%) of the caregivers did not have a proper method of fecal disposal, and 48 (48%) were surrounded by smokers and other pollutants, passively affecting their under-five children. Socio-economic factors like poor ventilation, 70 (70%), and living in extended populations, 68 (68%) contributed to community-acquired pneumonia among the under-five children. Additionally, 50 (50%) of the respondents obtained income from casual labor, indicating low socio-economic status. 48 (48%) of the respondents had poor health-seeking behavior, a probable reason as to why 31% did not have access to health education.

Conclusion

The study concluded that environmental factors like poor waste disposal. There was poor health-seeking behavior among the caregivers concerning their under-five children. Poor ventilation and low income indicated a low socio-economic status among the caregivers, posing a great risk of pneumonia.

Recommendation

Ensure mass sensitization and health education of the community on hygiene and sanitary measures like proper toilet facilities to minimize the incidences of Pneumonia.

Keywords: *Pneumonia, Naguru Hospital, Nakawa Division.*
Submitted: *2025-01-12* ***Accepted:*** *2025-04-20* ***Published:*** *2025-06-30*

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BACKGROUND OF THE STUDY

Globally, in 2000, approximately 156 million cases of pneumonia occurred each year in under five children, of which 151 million episodes were in developing countries, and about 1.2 million of them ended in death. There was a reportedly higher magnitude of childhood pneumonia, with an estimated 61 million and 35 million annual cases in Southeast Asia and Africa, respectively (Paganino C et al., 2017).

Pneumonia remains a critical global health challenge, particularly among children under five years of age. Pneumonia is the single largest infectious cause of child mortality worldwide. In 2019 alone, it claimed the lives of 740,180 children under five, representing 14% of all deaths in this age group, with an even higher proportion (22%) of deaths occurring in children aged one to five years. The burden of pneumonia is disproportionately felt in southern Asia and sub-Saharan Africa, highlighting significant regional disparities in child health outcomes (Karim et al., 2023).

In sub-Saharan Africa, pneumonia is responsible for approximately 750,000 child deaths annually. A major factor contributing to this high mortality rate is the lack of access to timely and effective treatment. Community case management of pneumonia (CCMp) has emerged as a viable strategy to combat this issue, employing trained community health workers (CHWs) to administer antibiotics in rural and underserved areas. This approach has garnered support from global health organizations, including the WHO and UNICEF, which advocate for its

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expansion to address other diseases as well (Druetz et al., 2015).

In Uganda, pneumonia is one of the leading causes of death among children under five, with approximately 1.6 million deaths attributed to this illness annually (Tuhebwe et al., 2015). The high incidence of pneumonia deaths represents a significant barrier to achieving sustainable development goal 3, which aims to reduce child mortality by two-thirds by 2015. A critical factor in mitigating pneumonia-related deaths is the ability of caregivers to recognize the symptoms and danger signs of pneumonia, seek prompt medical treatment, and provide adequate home care, including adherence to treatment protocols and proper nutrition.

Recent data from the Uganda National Institute of Public Health highlights the incidence of pneumonia admissions among children under five from 2013 to 2021 was notably highest in districts such as Kotido and Gulu, with rates ranging from 14,209 to 19,000 cases per 100,000 children (Wanyana et al., 2024). This information underscores the urgent need for targeted interventions and enhanced healthcare strategies to reduce the incidence and mortality associated with pneumonia in Uganda and across sub-Saharan Africa.

Despite efforts employed by the Government and stakeholders, addressing pneumonia in these contexts requires a multifaceted approach, including improving access to healthcare, educating caregivers on symptom recognition, and leveraging community health systems to ensure timely and effective treatment. This study aimed to assess the factors contributing to pneumonia among children under 5 years old at Naguru Hospital, Nakawa Division.

METHODOLOGY

Study Design and Rationale

A descriptive survey was used to conduct the study whereby mothers of children under five years in Paediatric ward were involved. The greatest advantage of this type of design is the flexibility and broadness of scope. Mothers of children under 5 years were interviewed at Naguru General Hospital, Kampala District.

Study Area

The study was conducted at Naguru General Hospital, which serves Entebbe, Kanara, and Kibuuku Town councils and Nombe and Kisesi in Kampala district. The facility offers inpatient and outpatient services like ANC, laboratory, HIV/AIDS and youth-friendly services, and Maternal and child MCH services, not forgetting community outreach services.

Study Population

The study was carried out among mothers of children under five years of age at Naguru General Hospital who were confirmed to have pneumonia. Both outpatient and admitted patients qualified for the study.

Sample size determination

The sample size was determined using the formula of Kish-Lei Sly (1965).

N = Z2PQ/D2 Where;

N = sample size

Z = standard normal deviation set at 95 % (1.96) confidence level

P = prevalence of pneumonia among under-fives seeking medical services at Naguru Hospital.

Since it is unknown, 70% was taken, which was equal to 0.7

D = Standard error allowed in the study set at 10%.

Therefore, n = ([1.96]2 X 0.7 X 0.7)/0.12

= 1.8823 / 0.01 = 188.02, Thus N = 100

In this regard, 100 study respondents were selected as the sample size.

Sampling Technique

A random stratified sampling method was used for the study because of the number of mothers with children under 5 years.

Research instruments

Questionnaires were used to collect information from respondents. A questionnaire consisted of a set of structured questions to which 100 respondents were expected to respond appropriately. The items in the questionnaire were derived from the objectives of the study and research questions. The responses of the subjects during the interview were recorded using ticking against the set questions until the entire questionnaire was complete.

Validity of the research instruments

The questionnaire was pretested at the nearby Ruby Hospital in Kampala, which is similar to the actual sample planned to be included in the study to determine its validity. Procedures used in pre-testing the questionnaire were identical to those, which were used during the actual data collection.

Reliability of Research Instruments

The test-retest method was used to determine the reliability of the study instrument. The questionnaires were administered to a group of 5 subjects on two different occasions. A period of 7 days was allowed between the two administrations of the instrument.

Data Collection Procedure

An introductory letter from the Dean-Mildmay Uganda School of Nursing and Midwifery was obtained. This was used to request permission from the medical director of Naguru Hospital. Thereafter, self-introduction to the in charge of the pediatric department and individual facility in charge before embarking on data collection. Questionnaires were administered after consent was secured. The questionnaires were collected from the respondents as soon as they finished answering.

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Data Management

The filled questionnaires were numbered to avoid double entry and checked at the end of each day to ensure completeness, and no additional information was added after data collection. The questionnaires were kept under lock and key after analysis of data for future reference.

Inclusion Criteria

All mothers of children under five years of age attending Naguru General Hospital consented to recruitment in the study.

Exclusion Criteria

All mothers with children under 5 years who were critically ill and needed emergency care.

Data Analysis.

Data was analyzed using the Microsoft Excel program and presented in the form of tables, figures, graphs, and pie charts.

Ethical Consideration.

Before data collection, ethical clearance was obtained from the Research Ethical Committee, Mildmay Uganda School of Nursing and Midwifery gave an introductory letter. Respondents were informed about the purpose of the study. Written Informed consent from every participant was obtained before conducting the study. The address and name of the respondents were not included for the sake of confidentiality. The participants' privacy was by interviewing the respondents in privacy. The participants were assured that there were no rewards/incentives for participating in the study or harm for not participating or refusing to participate in the study.

INFORMED CONSENT

There was full disclosure and full comprehension, and respondents voluntarily consented to participate in the study.

Study Variables

Dependent variables

The Dependent variables of the study include Pneumonia in children below 5 years.

Independent variables

The independent variables of the study were factors contributing to pneumonia among children under 5 years.

RESULTS

Table 1: Showing demographic characteristics of the respondents, n=100.

Variables	Frequency (n)	Percentage (%)
None	9	9%
Primary	40	40%
Secondary	38	38%
Higher	13	13%
Total	**100**	**100%**

Source: Primary data (2024)

Table 1 shows that most of the respondents, 40 (40%), had primary education while the few respondents, 13 (13%), had attained a higher educational level.

Table 2: Showing distribution of respondents by response on source of water used, n=100.

Category	Frequency (n)	Percentage (%)
Tap water	70	70%
Borehole	2	2%
Well water	10	10%
Dam water	18	18%
Total	**100**	**100%**

Source: Primary data (2024)

Table 2 shows that the majority of the respondents, 70 (70%) use tap water while the minority of the respondents, 2 (2%) use dam water.

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Table 3: Showing distribution of respondents by response on method of fecal disposal, n=100.

Category	Frequency (n)	Percentage (%)
None	64	64%
Pit Latrine	20	20%
Toilets	16	16%
Total	**100**	**100%**

Source: Primary data (2024)

Table 3 shows that most of the respondents, 64 (64%), did not have a proper method of fecal disposal, while the few respondents, 36 (36%), had proper methods of fecal disposal, either pit latrines or toilets.

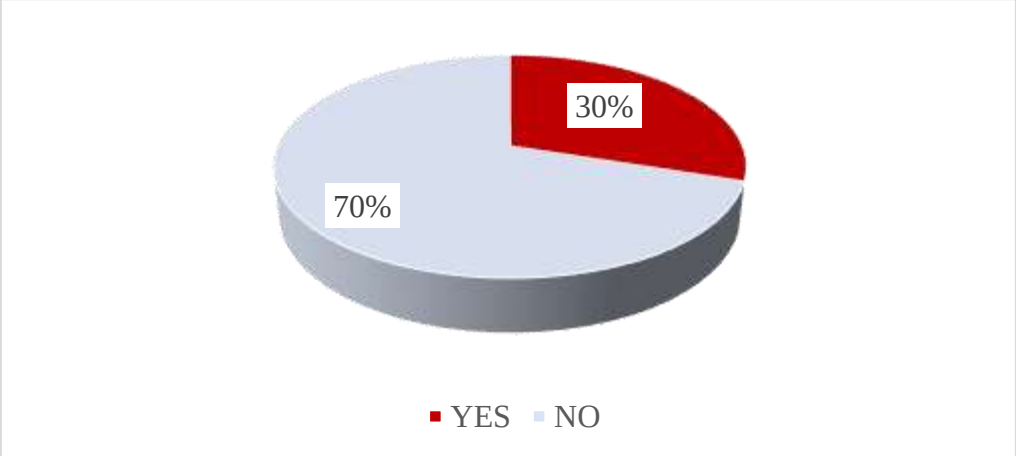
Table 4: Showing distribution of respondents by response on number of mothers with children under 5 years living with family members who smoke cigarettes, n=100.

Variables	Frequency (n)	Percentage (%)
None	20	20%
Passive smoker	48	48%
Active smoker	32	32%
Total	**100**	**100%**

Source: Primary data (2024)

Table 4 shows that the majority of the respondents, 48 (48%), live with people who smoke cigarettes, while the minority of the respondents, 20 (20%), were free from smokers.

Figure 1: Showing distribution of respondents by response on ventilation of the houses, n=100.



Source: Primary data (2024)

Figure 1 shows that the majority of the respondents, 70 (70%), did not have ventilation, while a minority of respondents, 30 (30%), had ventilation.

Socio-economic factors contributing to pneumonia among children under 5 years

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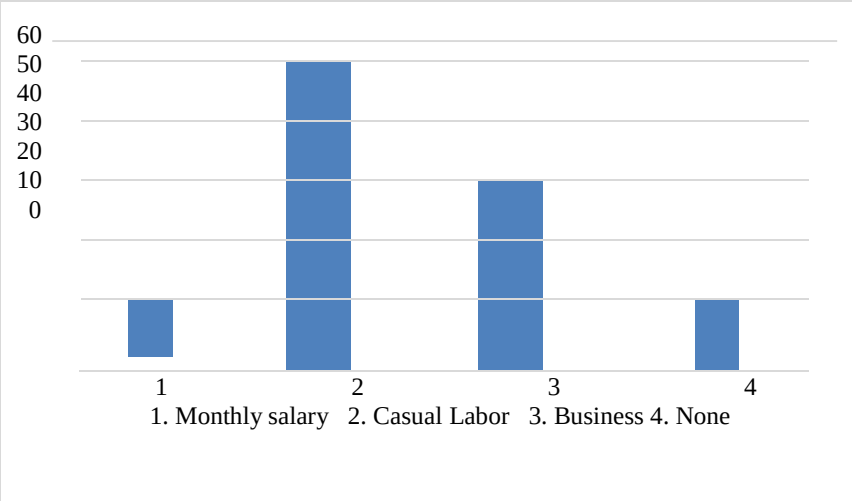
Table 5: Showing distribution of respondents by response on number of people in the household, n=100.

Response	Frequency (n)	Percentage (%)
Extended family (population)	68	68%
Nuclear family	32	32%
Total	**100**	**100%**

Source: Primary data (2024)

Table 5 shows that most of the respondents, 68 (68%), live in an extended population, and a few respondents, 32 (32%), live in a nuclear family in their household.

Figure 2: Showing distribution of respondents by response on source of income, n=100.



Source: Primary data (2024)

Figure 2 shows that the majority of the respondents, 50 (50%), obtain income from casual labor while a few respondents, 9 (9%), obtain income from monthly salary income.

Health Facility Related factors contributing to pneumonia among children under 5 years.

Table 6: Showing the number of mothers under 5 years who seek health care services n=100

Variables	Frequency (n)	Percentage (%)
None	48	48%
VHT	32	32%
Health Center	11	11%
Hospital	9	9%
Total	**100**	**100**

Source: Primary data (2024)

Table 6 shows that the majority of the respondents, 48 (48%), did not seek healthcare services, and the minority of respondents, 9 (9%), sought healthcare at the hospital level.

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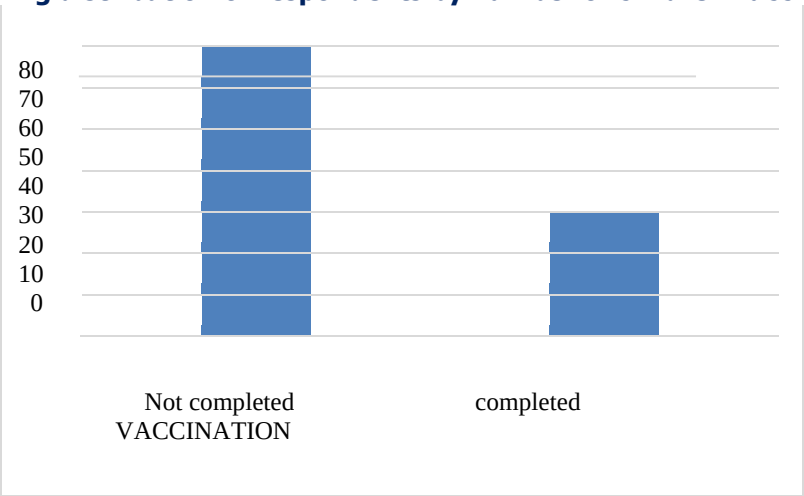
Figure 3: Showing distribution of respondents by number of children vaccinated, n=100.



Source: Primary data (2024)

Figure 3 shows that most of the respondents, 70 (70%), did not complete vaccination, and a few respondents, 30 (30%), completed vaccination.

Table 7: Showing distribution of respondents by number of mothers who know the HIV status of their under 5 year children, n=100.

Response	Frequency (n)	Percentage (%)
Not aware	70	70%
Aware	30	30%
Total	**100**	**100%**

Source: Primary data (2024)

Table 7 shows that the majority of the respondents, 70 (70%), were not aware of their child's HIV status, while the minority respondents, 30 (30%) knew their child's HIV status.

Table 8: Showing distribution of respondents by source of health education, n=100.

Source	Frequency(n)	Percentage (%)
Friends	15	15%
VHT	20	20%
Media	31	31%
Health workers	30	30%
None	4	4%
Total	**100**	**100**

Source: Primary data (2024)

Table 8 shows that the majority of respondents, 31 (31%), access health education from media, while the minority, 4 (4%), do not have access to health education.

DISCUSSION

Environmental factors contributing to pneumonia among children under 5 years

According to the study, findings revealed that the majority of respondents, 64 (64%), did not have a proper method of fecal disposal, such as latrines, which contributed to the risk of pneumonia among children under 5 years. This is supported by the findings of a study by (Leung et al., 2016), who reported that areas where morbidity and mortality from pneumonia remain high have less access to latrines and poor sanitation.

Furthermore, the findings revealed that most of the respondents, 48 (48%), were surrounded by smokers and other pollutants. This might contribute to pneumonia among children under 5 years old because they become passive smokers, hence affecting their lungs. This agrees with a study by (Pratley, 2016), who reported that children whose mothers, among the Papua women, carry them to

traditional areas of work within the Honai tend to have high exposure to biomass smoke.

The study findings revealed that the majority of the respondents, 70 (70%), did not have ventilation, which might expose children under 5 years to pneumonia. Findings are supported by a study by (Rylance et al., 2013) that suggests that exposure to household air pollution is the cause of the 4 million deaths caused by respiratory infections, chronic lung disease, cancer, and cardiovascular disease. Environmental factors such as indoor air pollution and sanitation are important risk factors for pneumonia; this will be examined closely related to traditional house Papua, which is usually called Honai. Honai is a traditional house made from wood with a conical roof of straw or reeds. Honai was built narrow or small, not windowed, and had a wood stove in the middle, which aimed to withstand the cold mountain temperatures.

Social-economic factors contributing to pneumonia among children under 5 years.

Study findings revealed that the majority of the respondents, 68 (68%), live in extended populations that would contribute to community-acquired pneumonia. This agrees with the study by (Semakura, 2023), who reported that higher incidences of pneumonia were observed among families with more than three children, indicative of an extended family.

Additionally, the findings revealed that most of the respondents, 50 (50%), obtain income from casual labor. This could lead to irregular earnings, hence a shortage of funds needed for intervention, the findings are in agreement with those of a study by(Skarda, n.d.), who argued that household income in early childhood is a strong and consistent predictor for several health-related problems. These observations could be due to the differences in the type of medical care provided for poor families who usually have limited access to adequate preventative and curative interventions. However, understanding an individual's lifetime history of family income may be more important than understanding the current income conditions in terms of predicting children's health.

Health facility-related factors contributing to pneumonia among children under 5 years

The findings of the study showed that most of the respondents, 48 (48%), did not seek health care services, which could lead to acute respiratory infection, hence pneumonia coverage among children under 5 years. The findings are in agreement with those of a study by Agweyu et al. (2018), who reported that early care seeking for children with pneumonia symptoms from hospitals reduces child mortality. However, in recent years, care-seeking behavior for children with acute respiratory infection symptoms from a healthcare provider has stagnated in Western and Central Africa as well as in Eastern and Southern Africa. Furthermore, in Sub-Saharan Africa, where most pneumonia deaths occur, less than 50% of children with pneumonia symptoms are taken for care, with the lowest proportions in rural areas.

In addition, findings revealed that 31 (31%) did not have access to health education from the health care providers. This may be attributed to distant health facilities or high facility costs, yet it poses a great risk to the health of their under-five children. Findings assimilate with those of a study by (Opuba & Onyango, 2022), who reported that the slow progress might be attributed to poor health-seeking behavior of caregivers whose children were under five years old as evidenced by the caregiver's history of the presenting illness of taking 1-14 days before visiting a health facility for treatment.

CONCLUSION

Environmental factors such as poor disposal of fecal waste and pollutants surrounding their household contributed to pneumonia among children under 5 years. While socio-economic factors such as casual labor and living as an extended population contributed to pneumonia, health facility-related factors such as poor health-seeking behavior and limited access to health education from healthcare providers likewise contributed to pneumonia.

RECOMMENDATION

The Ministry of Health should ensure mass sensitization and health education in the community concerning adequate hygiene and sanitary measures like proper toilet facilities to minimize the incidences of Pneumonia.

Health workers, especially nurses and midwives, should practice a positive attitude to provide competent child health services.

ACKNOWLEDGEMENT

Thanks go to God the Father for enabling me to do this research amidst many challenges.

I also thank my supervisor, Ms. Mercy Bantya, for her timely response and consistent direction during the writing of this research.

My family members are highly appreciative of the prayers and financial assistance they extended to me.

The in-charge of Naguru Hospital is appreciated for accepting me to conduct my study at the facility, as well as the participants for their unconditional involvement in the study.

LIST OF ABBREVIATIONS

ARI: Acute Respiratory Infection
CO: Carbon Monoxide
CAP: Community-Acquired Pneumonia
DHO: District Health Officer
DHT: District Health Team
Hib: Haemophilus influenza type b
IMCI: Integrated Management of Childhood Illness
MDG: Millennium Development Goal
REC: Research Ethical Committee
RSV: Respiratory Syncytial Virus
PM: Particulate Matter
U5s: Under Fives

WHO: World Health Organization

SOURCE OF FUNDING
The study was not funded.

CONFLICT OF INTEREST
The author declares no conflict of interest

AUTHOR CONTRIBUTIONS
DM- Study developer, Data collector and analyzer
MB- Supervised the Study

DATA AVAILABILITY
Data is available upon request.

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Original Article

PUBLISHER DETAILS:

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa