Original Article

Maranao Parents' Willingness and Barriers to Chest X-ray Screening for Childhood Pneumonia

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Abstract

Pneumonia is a leading infectious killer of children under five and remains a major cause of hospitalisation in the Philippines. Chest X-ray is central to diagnosis, yet little evidence describes how Muslim parents in poor urban communities decide for or against imaging. This qualitative phenomenological study examined how Maranao mothers in Mahayahay, Iligan City, viewed chest X-ray for children with suspected pneumonia, and what factors shaped their decisions. Fifteen Maranao mothers who had sought care for a child with cough and difficulty in breathing in the previous year took part in semistructured interviews. Transcripts underwent Colaizzi style thematic analysis. Mothers described conditional willingness that depended on perceived severity, trust in the physician, and ability to pay. Knowledge about pneumonia and radiation was limited, and anxiety about cancer and long term harm was common. Modesty, gender concordance with staff, and respect for hijab shaped comfort with imaging. Financial hardship, distance to functioning X-ray units, and equipment breakdowns reinforced delay or refusal. Mothers requested community level education, clear explanation of radiation dose and benefit, and free or subsidised imaging for children. The findings support culturally safe, affordable chest X-ray services in Muslim communities as a strategy to reduce avoidable pneumonia deaths.

Keywords: chest X-ray, cultural sensitivity, parental decision-making, pneumonia

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1. Introduction

Pneumonia still kills more children worldwide than any other single infectious disease. In 2019 it accounted for about 14 percent of all deaths in children under five years and caused an estimated 740,000 deaths (World Health Organization [WHO], 2022; Kudagammana et al., 2024). UNICEF reports that more than 700,000 young children die from pneumonia every year, which means one preventable death roughly every 40 seconds (UNICEF, 2024). In the Philippines, pneumonia ranks among the top causes of child mortality and hospital admission, and the national burden remains high despite vaccine scale up and improvements in case management (Santos, 2020; WHO, 2022).

Chest X-ray plays a crucial role in the diagnosis and management of paediatric pneumonia, especially when clinical signs overlap with asthma, bronchiolitis, or tuberculosis (Kader et al., 2019). National and PhilHealth guidelines list chest X-ray as part of the standard work up for community acquired pneumonia in children and link it to case based payment schemes (Santos, 2020; Tumanan-Mendoza et al., 2017). Yet use of diagnostic imaging often reflects social, geographic, and financial inequities. Studies from Asia and Africa describe delayed care seeking, incomplete investigative work ups, and heavy out of pocket spending among families of children with severe respiratory disease (Kudagammana et al., 2024; Tumanan-Mendoza et al., 2017). In the Philippines, the economic burden of paediatric community acquired pneumonia can reach several tens of thousands of pesos per admission and can exceed PhilHealth reimbursement, which exposes poor households to debt (Tumanan-Mendoza et al., 2017).

Parental understanding of radiological tests is often poor. Surveys in Europe and Malaysia show that many parents do not know that common imaging examinations expose children to ionising radiation, and very few recall a discussion of radiation dose or long term risk (Ng et al., 2022; Oikarinen et al., 2019). Radiology staff and referring physicians rarely provide structured information about benefits and risks, which leaves caregivers anxious yet poorly informed (Kasraie et al., 2019; Oikarinen et al., 2019). Recent reviews on paediatric radiation exposure confirm persistent gaps in public and professional awareness despite campaigns that promote justification and optimisation of imaging (Aleid et al., 2024).

Cultural and religious values also influence parental decisions about diagnostic tests. Muslim patients place high value on privacy, modesty, and gender concordance with clinicians, and they expect respect for religious dress and bodily integrity during examinations (Attum et al., 2025; Clemen et al., 2023; Rassool, 2015). Evidence from Muslim communities shows that when health workers ignore these expectations, patients feel unsafe, avoid sensitive examinations, and delay care (Attum et al., 2025; Contaoi, 2025). Educational interventions that address Islamic views on illness, modesty, and stewardship of health can improve trust and communication between Muslim families and health providers (Alucozai et al., 2024).

Maranao Muslims form a large ethnolinguistic and religious community in Mindanao. Many Maranao families in coastal or urban poor communities rely on crowded public facilities and have limited access to specialist paediatric or radiology services. No published study has examined how Maranao parents interpret chest X-ray for childhood pneumonia and what barriers affect timely imaging.

This study explored how Maranao mothers in Mahayahay, Iligan City, made decisions about chest X-ray for their children with suspected pneumonia. The research described their understanding of pneumonia and imaging, their willingness to accept chest X-ray, the cultural and structural factors that constrained that willingness, and their suggestions for more acceptable services. The study aimed to generate evidence that can guide culturally safe and financially inclusive diagnostic strategies for childhood pneumonia in Muslim communities.

2. Methodology

2.1 Design

The study used a qualitative phenomenological design that focused on lived experience. The goal was to capture how Maranao mothers understood and interpreted chest X-ray for their children, rather than to measure predefined attitudes on a scale. Phenomenology suits questions about meaning, agency, and decision processes in health care.

2.2 Setting and Participants

The research took place in Barangay Mahayahay in Iligan City, Lanao del Norte, in the southern Philippines. Mahayahay is a coastal urban poor community with both Christian and Muslim residents. Families typically access a barangay health station for primary care and rely on city hospitals for diagnostic imaging. Travel to hospital requires transport costs that many households struggle to meet.

Fifteen Maranao mothers took part. All self identified as Muslim, lived in Mahayahay, and had at least one child who developed cough and difficulty in breathing that required consultation in a health facility within the previous 12 months. Mothers ranged in age from early twenties to early forties. Most had completed only elementary or some secondary education. Most households depended on informal work, daily wage labour, small vending, or unstable service jobs.

Purposive sampling identified mothers who had faced real decisions about chest X-ray or similar investigations. Community health workers and barangay officials helped the researchers contact eligible mothers. Mothers who were critically ill, who had cognitive impairment, or who had experienced a recent bereavement were not invited to protect their wellbeing. Recruitment continued until the research team judged that no new insights appeared in successive interviews.

2.3 Data Collection

Data came from individual semistructured interviews that took place face to face. Interviews used an open guide that prompted mothers to describe the child's illness episode, the sequence of care seeking, any recommendation for chest X-ray, their reasons for acceptance or refusal, their views on radiation and cancer, and their expectations of staff behaviour. Interviews also explored the influence of religion, modesty, and gender norms in decisions.

Interviews took place in Maranao or Cebuano, depending on the preference of the mother. Each session lasted about thirty to sixty minutes and occurred either in the mother's home or in a private corner of the barangay health station. The interviewer was female, familiar with the local culture, and trained in qualitative methods. With consent, all interviews were audio recorded. The interviewer also wrote field notes about nonverbal cues and contextual features. Recordings were transcribed verbatim, translated into English, and checked for accuracy by a second bilingual researcher.

2.4 Data Analysis

The analysis followed Colaizzi's approach. The researchers read each transcript several times to gain a sense of the whole. They then extracted significant statements that related to knowledge of pneumonia, perceptions of chest X-ray, cultural expectations, and barriers to imaging. Each statement was assigned a formulated meaning. Meanings with conceptual similarity were grouped into clusters, and clusters were integrated into broader themes that described the structure of experience.

Two researchers coded the transcripts separately and compared codes. Disagreements were resolved through discussion, with a focus on staying close to the mothers' words. A summary of preliminary themes was shared with a subset of participants in an informal meeting. Mothers confirmed that the themes reflected their experience and added minor clarifications. The team kept an audit trail of decisions and analytic memos.

2.5 Ethical Considerations

The institutional ethics review committee in Iligan City approved the study. Mothers received verbal and written information in a language they understood. Each participant signed written informed consent before the interview. Pseudonyms replaced real names, and any identifying detail was removed from transcripts. Audio files and transcripts were stored on password protected devices and used only for research.

3. Results

3.1 Participant Profile

Table 1 describes the profile of the fifteen mothers. Most fell in the 30 to 39 year age range and had three or four children. Twelve reported that at least one child had received a physician diagnosis of pneumonia in the past.

Table 1. Profile of Maranao mothers in Mahayahay, Iligan City (n = 15).

Characteristic	Category	n
Age	21-29 years	6
	30-39 years	7
	40 years or older	2
Highest education level	Elementary or less	5
	Some or completed high school	8
	Some college	2
Number of children	1-2	5
	3-4	7
	5 or more	3
Child ever diagnosed with pneumonia	Yes	12
	No	3

The mothers' narratives converged around three interlinked themes: conditional willingness to accept chest X-ray, cultural and informational constraints, and structural and financial barriers.

3.2 Conditional Willingness to Accept Chest X-ray

Mothers did not see chest X-ray as an automatic step when a child developed cough or fever. They described a line that the illness had to cross before they considered imaging. That line involved visible difficulty in breathing, fast breathing, high fever that did not respond to home remedies, refusal to eat, or signs such as chest retractions. Mothers spoke of waiting until "the cough went to the chest" or until the child seemed "weaker than usual."

Physician advice played a decisive role. Mothers said they wanted a clear and firm statement that chest X-ray was necessary to know the real cause of the illness. Some used phrases like "if the doctor pushes for it, we follow," which shows strong deference to medical authority. Others said they would resist if they felt the child was already improving or if the doctor sounded unsure. This pattern reflects a conditional willingness that depends on both clinical severity and the strength of the clinician's recommendation.

Worry about hospital admission and cost shaped decisions. Several mothers delayed return visits or imaging because they feared that a chest X-ray would lead directly to admission and high bills. They often tried cough syrup, herbal remedies, and over the counter antibiotics before returning to the facility. They reported that when the child finally underwent chest X-ray, the disease was already at an advanced stage.

3.3 Cultural and Informational Constraints

Mothers held partial and sometimes inaccurate knowledge about pneumonia and chest X-ray. Many associated pneumonia with exposure to cold or rain and with "strong colds" that settled in the lungs. They did not distinguish between different types of pneumonia or between pneumonia and asthma. Only a few could describe chest X-ray as a picture of the lungs. Others saw it as a general scan of "what is inside the body."

Fear of radiation appeared repeatedly. Mothers spoke of "burning inside," "weak lungs," and "cancer in the future" as possible outcomes of repeated X-ray examinations. None recalled a detailed discussion about radiation dose, shielding, or international safety norms. This aligns with evidence from Malaysia and Finland that parents receive little information about radiation dose and risk and that awareness of radiation exposure from common paediatric examinations is low (Ng et al., 2022; Oikarinen et al., 2019; Aleid et al., 2024). For the mothers in Mahayahay, fear did not always block acceptance, but it added emotional burden and fed a sense that chest X-ray was a serious step reserved for severe illness.

Modesty and gender norms strongly influenced comfort with imaging. Mothers described unease when male radiologic technologists requested removal of upper garments or adjusted the child's position. They expected sensitivity to hijab, loose clothing, and limited exposure of the chest, especially for older girls. Mothers felt more at ease when female staff handled positioning and when curtains or doors ensured privacy. These concerns echo literature on care for Muslim patients, where modesty, privacy, and gender concordance with clinicians are central values (Attum et al., 2025; Rassool, 2015; Contaoi, 2025). When staff did not respect these values, mothers felt embarrassed and less willing to return for follow up imaging.

3.4 Structural and Financial Barriers

The mothers' accounts highlighted heavy financial pressure. Even when consultation in public facilities was free or low cost, parents needed money for transport, food, antibiotics, and diagnostic tests. Many described chest X-ray as an extra cost that competed with rice, rent, and school needs. This is consistent with Philippine data that show large out of pocket expenditures for paediatric pneumonia that extend beyond the PhilHealth case rate and can reach several weeks of household income (Tumanan-Mendoza et al., 2017; Santos, 2020).

Distance and unreliable access to functioning X-ray units created further obstacles. When hospital machines were out of order, mothers travelled from one facility to another and sometimes gave up. For some, the total time and cost of seeking imaging across multiple sites outweighed perceived benefit. The absence of chest X-ray in primary care centres reinforced the idea that imaging was optional and not a core part of pneumonia care.

Mothers suggested straightforward solutions: community level education about pneumonia and its warning signs, clear explanations of the role of chest X-ray in early diagnosis, availability of female radiology staff, and free or subsidised imaging for children from poor families.

4. Discussion

This study shows that Maranao mothers in an urban poor community in Iligan City view chest X-ray for childhood pneumonia as both important and risky. They stand at the intersection of global child health priorities and local realities. Globally, pneumonia continues to cause a large share of under five deaths, even though appropriate diagnosis and treatment could prevent most of these deaths (WHO, 2022; Kudagammana et al., 2024; UNICEF, 2024). In the Philippines, pneumonia remains a leading cause of child hospitalisation and a source of heavy economic burden for families (Santos, 2020; Tumanan-Mendoza et al., 2017).

The mothers' conditional willingness to accept chest X-ray reflects rational strategies under severe constraint. They know that pneumonia is dangerous but must weigh each hospital visit and test against daily survival. Studies of caregiver behaviour in low income settings report similar patterns. Families delay care or decline recommended investigations when they fear catastrophic health expenditure, even for life threatening illnesses (Kudagammana et al., 2024; Tumanan-Mendoza et al., 2017). In the Iligan context, partial PhilHealth coverage does not remove costs for transport, food, lost wages, and out of stock medicines. These findings support arguments that universal health coverage must address both direct and indirect costs if it aims to reduce inequities in access to diagnostics.

The study also exposes a deep information gap around radiation. Mothers feared long term harm but lacked concrete facts about dose and risk. International surveys show that this is not unique to Mahayahay. Parents in Malaysia and Finland report low awareness of radiation exposure from paediatric examinations and minimal counselling on dose and alternatives (Ng et al., 2022; Oikarinen et al., 2019; Kasraie et al., 2019). Reviews on paediatric radiation note that communication often focuses on logistics rather than transparent discussion of benefit and risk (Aleid et al., 2024). Without accurate information, parents in Mahayahay rely on rumours and fragments from radio or social media. Fear then attaches to any radiological procedure and intensifies only when illness appears severe enough to "justify" the perceived danger.

The results show that cultural and religious factors are not marginal details. They sit at the core of decision making. Mothers voiced discomfort when male staff

handled their chest or their daughters' bodies. They expected staff to respect hijab, cover the chest as much as possible, and explain each touch. Literature on Muslim patients highlights modesty, gender concordance, and privacy as central to culturally competent care (Attum et al., 2025; Rassool, 2015; Contaoi, 2025). Evidence from other Islamic contexts links gender concordance between patients and clinicians with greater trust, openness, and adherence to recommended procedures (Attum et al., 2025). When radiology departments ignore these norms, they place an invisible tax on Muslim families that can result in avoidance or delay of essential diagnostics.

From a health systems perspective, the study underscores that technical quality is not enough. Even if X-ray equipment meets safety standards, families will not benefit unless services are financially accessible, geographically reachable, and culturally safe. The mothers' accounts of equipment breakdowns, repeated referrals between facilities, and long waits reveal structural fragility that mirrors national reviews of pneumonia care in the Philippines (Santos, 2020). Each delay erodes trust and contributes to a perception that chest X-ray is optional rather than central to early pneumonia management.

The findings align with international guidance on parent communication and paediatric imaging. Kasraie and colleagues argue that clinicians should provide simple, concrete explanations of radiation dose, contextualise risk with everyday exposures, and state clearly why imaging is helpful for their child (Alipio et al., 2022; Kasraie et al., 2019; Miranda et al., 2023; Pelias et al., 2023). Larson and colleagues show that when parents receive balanced information, they remain willing to proceed with appropriate imaging while gaining more realistic expectations and reduced anxiety (Larson et al., 2007). These principles fit well with the requests voiced by Maranao mothers for straightforward explanation in their own language.

The study has limitations. It focused on a small number of mothers in one urban barangay and did not include fathers, grandparents, or other caregivers who may influence decisions. It relied on retrospective accounts of illness episodes, which may involve recall bias. It also did not examine the views of physicians, radiologic technologists, or health administrators. Future research should explore these perspectives and test interventions that combine financial support, service reorganisation, and cultural competence training.

Despite these limits, the findings provide a strong, context grounded signal. They show that willingness to accept chest X-ray among Muslim parents rests on a fragile set of conditions: visible severity of illness, trust in the doctor, assurance of modesty, and access to money and functioning equipment. For policy makers and hospital leaders, this means that improving pneumonia outcomes in Muslim and other marginalised communities requires more than technical guidelines. It requires deliberate design of services that respect culture, protect families from financial harm, and treat parents as partners who deserve clear and honest information.

5. Conclusion

Maranao mothers see chest X-ray as an important but serious step in the care of children with suspected pneumonia. They accept imaging when they see the child in visible distress and when physicians give clear advice, yet they remain afraid of radiation, embarrassed by breaches of modesty, and burdened by cost and distance. These barriers delay diagnosis and undermine efforts to reduce pneumonia mortality in the southern Philippines.

Health services that want to close this gap must combine universal health coverage, reliable imaging infrastructure, and cultural safety. Barangay level education on pneumonia and chest X-ray, clear and honest communication on radiation dose and benefit, provision of female radiologic staff for women and girls, and free or subsidised chest X-ray for poor children would respond directly to the priorities that mothers in this study articulated. Such reforms would move pneumonia care closer to global child health goals and to the right of every child to timely and appropriate diagnosis.

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Conflict of Interest Statement

The authors declare no conflict of interest.

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