

**A PRELIMINARY STUDY ON TRANSLATING,
ADAPTING, AND ASSESSING NURSERY
TEACHERS' KNOWLEDGE AND ATTITUDES
TOWARDS CHILDHOOD HEARING LOSS IN
MALAYSIA**

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UNIVERSITI SAINS MALAYSIA

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TOWARDS CHILDHOOD HEARING LOSS IN
MALAYSIA**

by

NURUL AINA SYAFIQA BINTI MOHD SAID

**Thesis submitted in fulfilment of the requirements
for the Bachelor of Health Science
(Honours) Audiology**

July 2025

CERTIFICATION

This is to certify that the dissertation entitled “A Preliminary on Translating, Adapting, and Assessing Nursery Teachers’ Knowledge and Attitudes Towards Childhood Hearing Loss in Malaysia” is the project done by NURUL AINA SYAFIQA BINTI MOHD SAID from September 2024 to July 2025 under my supervision. We have read this dissertation, and in our opinion, it fulfills the acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfillment for the degree of Bachelor of Health Sciences (Honours)(Audiology). Research work and collection of data belong to the Universiti Sains Malaysia.



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DECLARATION

I hereby declare that the work has been done by myself, all the results are of my own investigation and any ideas or quotation from others' work are fully acknowledged according to the standard referring practices of the discipline. I also declare that it has not been submitted as a whole in previous or concurrently for any other degrees in any institutions. I acknowledge that the research work and collection of data belong to Universiti Sains Malaysia.



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LIST OF SYMBOLS

N Number of Item

% Percentage

LIST OF ABBREVIATIONS

MOH	Ministry of Health
WHO	World Health Organization
SPSS	Statistical Package for Social Science
CVI	Content Validity Index
S-CVI	Scale Validity Index
I-CVI	Item Validity Index
DHH	Deaf Hard Hearing
SEN	Special Education Needs
USM	Universiti Sains Malaysia

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**KAJIAN AWAL MENGENAI PENTERJEMAHAN, PENYESUAIAN, DAN
PENILAIAN PENGETAHUAN SERTA SIKAP GURU TASKA
TERHADAP MASALAH PENDENGARAN KANAK-KANAK DI
MALAYSIA**

ABSTRAK

Kajian rintis ini bertujuan untuk menyesuaikan, menterjemah, dan mengesahkan satu soal selidik berkaitan pendengaran bagi menilai pengetahuan dan sikap guru taska di Malaysia tentang kehilangan pendengaran kanak-kanak. Versi asal soal selidik dalam Bahasa Inggeris telah diterjemah ke dalam Bahasa Melayu dan diberikan kepada 25 orang guru taska wanita di Kelantan melalui pengedaran secara dalam talian dan bersemuka. Proses terjemahan melibatkan terjemahan hadapan dan belakang yang dijalankan oleh dua penterjemah dwibahasa dari Pusat Pengajian Bahasa, Literasi dan Terjemahan, Universiti Sains Malaysia, serta seorang pelajar TESL dari Universiti Sultan Zainal Abidin. Kesahan kandungan dinilai oleh dua pakar (seorang ahli audiologi dan seorang pentadbir pendidikan) dengan keputusan yang cemerlang, iaitu skor Scale Content Validity Index (S-CVI) sebanyak 1.00 bagi kerelevanan dan kesesuaian budaya, serta 0.94 bagi kejelasan. Ujian kebolehpercayaan menghasilkan nilai Cronbach's alpha sebanyak 0.69 bagi kedua-dua skala pengetahuan dan sikap, yang menunjukkan konsistensi dalaman sederhana.

Peserta kajian terdiri terutamanya daripada pemegang SPM dan Diploma dengan pengalaman mengajar yang berbeza-beza. Analisis statistik menggunakan One-Way ANOVA menunjukkan tiada perbezaan yang signifikan dalam pengetahuan atau sikap berdasarkan tahap pendidikan atau pengalaman mengajar ($p > 0.05$). Bagi skala pengetahuan, item dinilai sebagai Ya = 1, Tidak/Tidak Pasti = 0, dengan skor min berada di bawah 1.0, menandakan pengetahuan yang terhad. Bagi skala sikap,

item dinilai menggunakan skala Likert 5 mata (1 = Sangat Tidak Setuju hingga 5 = Sangat Setuju), dengan skor purata sedikit kurang daripada 4, yang menggambarkan sikap sederhana tetapi tidak terlalu positif. Dapatan ini menunjukkan bahawa soal selidik dalam Bahasa Melayu yang diubah suai ini adalah alat yang sesuai secara budaya untuk kajian masa depan serta menekankan keperluan pembangunan profesional yang disasarkan dalam kesedaran kesihatan pendengaran dalam kalangan pendidik awal kanak-kanak.

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ABSTRACT

This preliminary study aimed to adapt, translate, and validate a hearing-related questionnaire to assess nursery teachers' knowledge and attitudes in Malaysia about childhood hearing loss. The English version of the questionnaire was translated into Malay and administered to 25 female nursery teachers in Kelantan through both online and face-to-face distribution. The translation process involved forward, and backward translations carried out by two bilingual translators from the School of Languages, Literacies, and Translation, Universiti Sains Malaysia, and one TESL student from Universiti Sultan Zainal Abidin. Content validity was evaluated by two expert panels (an audiologist and an educational administrator), achieving excellent results with Scale Content Validity Index (S-CVI) scores of 1.00 for relevance and cultural suitability, and 0.94 for clarity. Reliability testing yielded a Cronbach's alpha of 0.69 for both knowledge and attitude scales, indicating moderate internal consistency.

The participants consisted mainly of SPM and Diploma holders with varying teaching experience. Statistical analysis, as determined by One-Way ANOVA, showed no significant differences in knowledge or attitudes based on educational level or teaching experience ($p > 0.05$). For the knowledge scale, items were scored as Yes = 1, No/Not Sure = 0, with mean scores falling below 1.0, indicating limited knowledge. For the attitude scale, items were rated on a 5-point Likert scale (Strongly Disagree = 1 to Strongly Agree = 5), with average scores slightly below 4, reflecting moderate but not strongly positive attitudes. These findings suggest that the adapted Malay questionnaire is a culturally appropriate tool for future research and highlight the need

for targeted professional development in hearing health awareness among early childhood educators.

CHAPTER 1

INTRODUCTION

1.1 Background of study

The role of hearing was vital in the lives of human beings. Hearing is a physiological phenomenon that mainly depends on the intact anatomical structure of the ear. If the ability to hear and process auditory information is affected, several areas of development, including verbal language development, would be affected. Hearing, as a part of our everyday life, was a significant factor in assessing one's quality of life. One without the ability to hear or listen well would have a lower quality of life than those who can, especially children. However, not all knowledge and attitudes of hearing loss in children were known to society, especially among nursery teachers.

Nursery teachers serve as children's first formal educators and play a crucial role in their early development. They are responsible not only for teaching basic literacy and numeracy skills but also for monitoring children's growth, communication, social interaction, and behavior. Their daily close interaction allows them to notice subtle changes or delays in developmental milestones, including speech and language acquisition, attention span, and social responsiveness (Barnett *et al.*, 2012). Because of this unique position, nursery teachers often become the first point of observation for potential developmental concerns, such as hearing impairments. In addition, their responsibilities extend to creating a safe, supportive, and inclusive learning environment, communicating effectively with parents, and working collaboratively with healthcare professionals when concerns arise (*Engaging Young Children*, 2018). These responsibilities make their awareness and attitudes toward hearing health highly significant in promoting early detection and intervention.

Nursery teachers who understand the signs of childhood hearing loss, such as delayed speech, inattentiveness, or difficulty following instructions, can act as vital partners in referral pathways to audiologists or healthcare providers (Yoshinaga-Itano *et al.*, 2017). Their knowledge, empathy, and proactive responses therefore become crucial in ensuring timely support for affected children.

This study intends to evaluate the nursery teachers' attitudes toward childhood hearing loss based on the three-component model of attitude formation, which includes cognitive, affective, and conative components (Bakanauskas, Kondrotienė & Puksas, 2020). The cognitive component refers to the knowledge and experiences of nursery teachers regarding childhood hearing loss, including their understanding of its causes, symptoms, and impact on a child's development. Evaluating this aspect is essential to determine whether teachers possess adequate knowledge to identify and support children with hearing impairments in their classrooms. The affective component deals with the attitudes and emotions of nursery teachers toward childhood hearing loss. Their empathy and attitudes could be pivotal in preparing them to accommodate and support affected children. Understanding this will help to identify any bias or misperception that may affect the inclusiveness of the learning environment. Lastly, the conative component examines teachers' behaviours and actions in response to childhood hearing loss. It includes their readiness to implement inclusive teaching strategies, make necessary classroom accommodations, and seek further training. By integrating these three components, this study offers a detailed assessment of nursery teachers' knowledge and attitudes, ensuring that their understanding and practical responses to childhood hearing loss are evaluated in depth.

In Malaysia, the growing emphasis on early childhood education has highlighted the need to equip nursery teachers with the necessary skills and knowledge

to address health-related challenges, including hearing impairments. Empirical data indicates both the prevalence and delayed diagnosis of hearing loss among infants, highlighting the urgency for heightened awareness and early detection. A 10-year review at a Malaysian tertiary hospital revealed 2.71 cases per 1,000 live births, with a median age of diagnosis of 3.9 months—beyond recommended early detection benchmarks (Mazlan, Raman & Abdullah, 2022). Concurrently, a study of Primary Care Physicians across Kuala Lumpur, Selangor, and Terengganu uncovered critical knowledge gaps, where 61.4% did not recognize childhood hearing loss as a major health issue, nearly 46% were unaware that affected children can succeed in mainstream schools, and 78% misunderstood the limitations of hearing aids (Mazlan & Othman, 2023). These findings stress the importance of empowering nursery teachers with sufficient knowledge, empathy, and proactive capacity to support early intervention efforts in the Malaysian early childhood education ecosystem. Despite this, limited research has been conducted to assess their understanding and attitude toward hearing health in children. This study aims to fill this gap by conducting a preliminary survey of nursery teachers' knowledge and attitudes about hearing loss among children in Malaysia.

1.2 Problem Statement & Study Rationale

Early identification and intervention of hearing problems in children are crucial, especially in the critical developmental period between the ages of two and three. Children at this age need to acquire fundamental language skills to prepare them for entry into kindergarten or preschool. Nursery teachers are important front-liners who play a significant role in recognizing early health concerns, including hearing difficulties. With early identification, early intervention can take place. This process

helps maintain and improve students' development, health, and learning outcomes.

Furthermore, familiarity with hearing loss is therefore a key requirement. For children, hearing is essential for acquiring spoken language, achieving academic success, and participating socially. Conversely, hearing difficulties create barriers to learning and social integration. According to the World Health Organization (WHO, 2024), approximately 60% of childhood hearing loss is preventable through appropriate measures. Given their daily close interactions with children, nursery teachers—second only to family members—are in a unique position to notice the behavioral indicators of hearing loss.

In line with Malaysia's advocacy for early identification and intervention, beyond newborn hearing screening, it is essential to explore how well-prepared nursery teachers are to support this effort. Therefore, this study seeks to assess nursery teachers' knowledge and attitudes regarding childhood hearing loss in Malaysia.

1.3 Research Questions

1. What is a suitable Malay version of the questionnaire suitable to assess the knowledge and attitude of nursery teachers in Malaysia about hearing loss among children?
2. How reliable is the adapted and translated questionnaire for assessing the knowledge and attitudes of nursery teachers?
3. What is the current level of knowledge and attitude towards hearing loss in children among nursery teachers in Malaysia?

1.4 Objective

1.4.1 General Objective

To assess the level of knowledge and attitude of the hearing loss in children among nursery teachers in Malaysia

1.4.2 Specific Objectives

1. To adapt and translate an existing English questionnaire into Malay to ensure its relevance and usability in the Malaysian context
2. To evaluate the reliability and validity of the adapted questionnaire
3. To assess the knowledge and attitude of nursery teachers in Malaysia regarding hearing loss and hearing-related issues in children

1.5 Study Hypothesis

1.5.1 Null Hypothesis

1. The Malay version of the questionnaire is not relevant or usable in the Malaysian context, and there is no equivalence with the original English version.
2. The adapted Malay questionnaire has poor reliability and validity, with reliability coefficients below acceptable thresholds and no significant correlation with related measures.
3. Nursery teachers in Malaysia have no significant knowledge about hearing loss and no positive attitudes towards hearing-related issues in children.

1.5.2 Alternative Hypothesis

1. The adapted Malay questionnaire has poor reliability and validity, with reliability coefficients below acceptable thresholds and no significant correlation with related measures.
2. The adapted Malay questionnaire has good reliability and validity, with reliability coefficients meeting acceptable thresholds and significant correlation with related measures.
3. Nursery teachers in Malaysia have significant knowledge about hearing loss and positive attitudes towards hearing-related issues in children.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction to Hearing Health in Early Childhood

Hearing health plays a critical role in children's cognitive, social, and emotional development, particularly in the early years of life. When hearing loss remains undetected or is identified late, the effects can extend far beyond delayed language and communication skills, influencing emotional well-being, family interactions, educational attainment, and even long-term socioeconomic participation. Globally, nearly 90% of children affected by hearing loss live in regions with limited resources, where establishing newborn hearing screening poses considerable obstacles. Despite these challenges, innovative initiatives in several low- and middle-income countries have shown that such programmes can be successfully introduced when adapted to local cultural, societal, and healthcare contexts.

Globally, an estimated 32 million children are affected by disabling hearing loss (≥ 40 dB), with approximately 1 in every 1,000 newborns presenting congenital hearing loss. Children with significant hearing impairment typically acquire language at a slower pace compared to their hearing peers and are at increased risk of mental health difficulties. Nevertheless, when hearing loss is identified early and appropriate intervention is provided, these risks can be substantially mitigated. In many high-income countries, universal newborn hearing screening and intervention services are well established. Conversely, in low- and middle-income countries, where preventable hearing loss is more prevalent, the diagnosis of affected children is frequently delayed until they enter primary school or later (Anderson. J, 2014).

2.2 Global Perspectives on Teachers' Role in Hearing Health

Across the globe, the role of teachers in promoting hearing health is garnering increasing attention, particularly in contexts where early identification of hearing difficulties can significantly influence educational and developmental outcomes. In settings like the United States, structured professional development programs have demonstrated effectiveness in enhancing educators' capacity to support children with hearing impairments—though specific U.S. data remains an area ripe for further study. In low- and middle-income countries (LMICs), research emphasizes that teacher training programs are critical in bridging the gap in access to specialized hearing health services (Bhutta *et al.*, 2019).

For example, in Malawi, a hearing health outreach led by the African Bible College (ABC) in collaboration with U.S.-based audiologists provided primary school teachers with both pre- and post-training assessments using knowledge-based questions and opinion-based Likert scales. The training successfully increased teachers' knowledge and confidence in identifying hearing loss and referring students for care (97% agreement on the need for further hearing care training pre-intervention and 99% agreement post-intervention (Kapalamula *et al.*, 2023). This demonstrates how educational interventions, even brief ones, can substantially improve teacher preparedness in hearing health.

Nonetheless, significant challenges remain. In many LMICs, inadequate access to audiological services and pervasive stigma make hearing loss an "invisible" impairment. Studies from Tanzania reveal that many children with hearing loss go undetected or are misunderstood as being slow learners due to the absence of teacher awareness and screening mechanisms. Further, addressing barriers to referral—such as transportation difficulties and financial constraints—requires innovative

engagement strategies, including the use of SMS reminders and community “expert mothers” (Tronstad *et al.*, 2022)

2.3 Importance of Knowledge and Attitudes Among Educators

Educators’ knowledge and attitudes of hearing health are pivotal for the early identification and management of hearing impairments. Studies have shown that well-informed teachers could recognize symptoms such as inattentiveness, delayed speech, and difficulty following instructions, which are potentially indicators of hearing problems. Despite this, research indicates that many teachers lack adequate training and attitude regarding hearing health, resulting in missed opportunities for early intervention (Lilian G., 2002).

Global evidence highlights the crucial role of teachers’ attitudes in facilitating effective classroom support for children with hearing problems. Positive attitudes contribute to inclusive practices, fostering an environment where children with hearing loss are not left behind academically or socially. Conversely, negative or uninformed attitudes can perpetuate misconceptions, such as assuming a child is inattentive or lazy rather than recognising the possibility of a hearing difficulty.

Furthermore, studies from low- and middle-income countries reveal that limited knowledge and unfavorable attitudes among educators often stem from insufficient exposure to hearing health issues during their (Keerthan K *et al.*, 2025). This lack of preparation hampers early detection and referral, which are essential for mitigating the long-term impact of childhood hearing loss.

2.4 Knowledge and Attitudes of School Teachers toward Hearing Problems with Students

Hearing impairment in children leads to speech, language acquisition, communication, and educational difficulties. Many elementary school students cannot access the services needed because of hearing problems. It is mainly a result of the lack of awareness among teachers and healthcare professionals about how to deal appropriately with such students.

2.4.1 Oversea

In a study that assessed elementary school teachers' knowledge and attitude levels in Makkah, KSA, toward children with hearing problems in general schools identified their associated factors, particularly gender and having special or additional qualifications. According to this study, the knowledge and attitude of elementary school teachers in Makkah City are mostly poor to intermediate (Alotaibi & Alqahtani, 2020). Almost half of the teachers in the present study had inadequate knowledge, and only 4.9% expressed good knowledge about hearing problems. The attitude of elementary school teachers towards children with hearing loss is inconclusive in the present study, as most agreed that deaf or hard-of-hearing (DHH) students would achieve better academically in a special school for DHH. Cronbach's alpha coefficient measured the reliability of the test. The reliability coefficient ranged from 0 to 1 in value; the closer to 1, the more reliable the questionnaire. Based on this study, the reliability analysis showed that the component scales for the two domains were internally consistent with Cronbach's alpha: knowledge = 0.84; attitude = 0.83 (Olusanya, Luxon & Wirz, 2006).

2.5 Local

In Malaysia, early childhood education is a cornerstone of national development

initiatives, with increasing recognition of the need to address health-related challenges in this sector. The Malaysian government has implemented policies to enhance the quality of early childhood education, including integrating health education into the preschool curriculum. However, studies focusing on hearing health attitudes among nursery teachers in Malaysia remain limited. Existing research suggests a general lack of knowledge and attitude, which could hinder early identification and intervention for children with hearing impairments (Masnan, Anthony & Zainudin, 2019).

Alongside educational advancements, health education is increasingly integrated into the preschool curriculum. This includes activities promoting mental and physical well-being, mindfulness, and emotional literacy. However, limited teacher training and resources remain challenges in fully implementing this program (*Programme Standards: Early Childhood Education, 2025*).

Research on hearing health attitudes among nursery teachers in Malaysia is limited but points to significant gaps in awareness. Many teachers lack sufficient knowledge, which may delay early detection and intervention for children with hearing impairments. Collaboration with audiologists in special education is beneficial but minimal training limits its effectiveness, highlighting a need for increased support (Mohd Yasin *et al.*, 2021).

This intersection of early childhood education and healthcare shows the urgent need to improve knowledge and attitudes about hearing health among nursery teachers to enhance outcomes for children with hearing challenges.

2.6 Challenges in addressing Hearing Health in Nursery Settings

Nursery teachers faced several challenges addressing hearing health issues, including limited training opportunities, lack of access to resources, and cultural stigmas associated with hearing loss. A study by Rahmatullah *et al.* (2021) identified

gaps in teacher education programs that failed to prepare educators to manage young children's health-related issues adequately. Additionally, logistical barriers, such as large class sizes and insufficient time for individual attention, further complicate effective monitoring of children's hearing health.

In addition to training deficiencies, nursery teachers often face a shortage of resources to support hearing health. This includes the lack of access to basic screening tools, professional audiologists, and follow-up services within school settings. Without adequate resources, teachers are limited in their ability to monitor, refer, or support children who might be experiencing hearing difficulties (Alanazi *et al.*, 2024). This situation is further complicated by cultural stigmas associated with hearing loss, which may prevent open conversations and delay parents and teachers from seeking help.

Furthermore, logistical challenges exacerbate these problems. Large class sizes mean that teachers rarely have enough time to give individual attention to each child's health needs, including hearing assessments. The demands of managing diverse classrooms restrict the feasibility of regular hearing monitoring. Time constraints and workload pressure thus hinder the consistent implementation of hearing health practices in nursery environments (Wan Ying & Tan Tjin Ai, no date).

Collectively, these factors contribute to significant barriers in addressing hearing health adequately in early childhood education in Malaysia. Closing these gaps through enhanced teacher training, better resource allocation, and tackling cultural stigmas is crucial for improving care and intervention.

2.7 Reliability and Validity of the Questionnaire

Evaluating content validity is a critical step in establishing the construct validity of an instrument. The primary purpose of assessing content validity is to determine

whether the instrument's scale includes a representative sample of items that accurately reflect the construct being measured. Validation types fall under the broader category of construct validity, which is further divided into translational and criterion validity. Translational validity includes face validity and content validity, while criterion validity encompasses concurrent, predictive, convergent, and discriminant validity. Overall, construct validity refers to the extent to which an instrument accurately measures the theoretical construct it is intended to assess.

Content validity indicates whether the items in the tool provide a complete range of the attributes under study. Therefore, a researcher must first obtain an expert opinion to build several scale items. A panel of content experts is asked to review the potential scale items and validate either the tool or instrument used to resemble an appropriate indicator of the construct.

Besides, to assess the reliability of testing, it can be done by determining the internal consistency of the questionnaire using Cronbach's alpha, with a threshold of 0.7 or higher indicating acceptable reliability (Tavakol & Dennick, 2011).

2.8 Questionnaire Translation and Adaptation

The translation and adaptation of the questionnaire involve critical steps to ensure cultural and linguistic appropriateness while maintaining the validity and reliability of the instrument. A study by Hall et al. (2018) proposes a good practice guide for translating and adapting hearing-related questionnaires for comparisons across populations divided by language or culture and encourages investigators to publish detailed steps. It presents a six-step process for translating and adapting questionnaires, including preparation, translation, committee review, field testing, and reviewing and finalising the translation.

A systematic review identified 31 guidelines for cross-cultural research describing a similar multi-step process that aimed to promote high-quality modification of existing questionnaires, to improve the efficiency with which they are produced, and to meet regulatory body requirements (Epstein, Santo & Guillemin, 2015). Conclusions from this review highlight that those guidelines share many common elements, although there is neither universal consensus among investigators on what is essential and what is optional, nor strong empirical evidence of the superiority of one method over another that might otherwise lead to a ‘‘gold standard’’

2.9 Inclusive Education in Malaysia

The Education Act 1996 expands educational opportunities for children with exceptional needs, introducing inclusive education (Jelas & Mohd Ali, 2014). This program allows students with special needs to continue their education alongside their peers, in addition to the provision of special education. The modified Education Act of 1996 (1998) does not explicitly declare the inclusion of children with disabilities.

Inclusive education involves integrating one to five students with special needs into mainstream classes (Webster, 2014). The inclusive education programme involving pupils with special education needs (SEN) in special education integrated programmes (SEIPs) takes two approaches (Malaysia-Education-Blueprint-2013-2025., no date) the first is full inclusion, in which pupils with SEN learn full-time alongside mainstream pupils in all subjects, either based on the national curriculum or a modified version, with or without support services. The second option is partial inclusion, in which students with special educational needs learn specific academic topics or participate in co-curricular or extracurricular activities with mainstream students, commonly known as a pull-out program. Students’ potential, talent, and ability determine their participation in the co-curricular and academic activities.

CHAPTER 3

METHODOLOGY

3.1 Research design

The research study was a quantitative, cross-sectional, and descriptive study that used a survey questionnaire. All surveys were administered through an online Google Form and face-to-face. Only data from teachers who completed all the surveys were included for analysis. In Malaysia, twenty-five nurseries were randomly selected using an online random number generator.

The translated and adapted survey questionnaire was converted into a Google Form to evaluate nursery teachers' knowledge and attitudes of hearing loss among young children. In Malaysia, where multilingualism and cultural diversity were prevalent, the accuracy and cultural resonance of the questionnaire ensured meaningful data collection and enhanced the reliability of the study findings. These adaptations helped bridge linguistic and cultural gaps, allowing the assessment to capture authentic participant insights. The process involved linguistic translation and cultural adaptation to ensure the questions were understandable, appropriate, and relevant to the participants' experiences. These steps were necessary to preserve the accuracy and dependability of the data gathered. (Hall *et al.*, 2018a).

3.2 Study Area

This study aimed to determine the knowledge and the level of attitude toward hearing loss in children among nursery teachers. This study took place via an online survey at nurseries across Malaysia and face-to-face for selected nurseries in Kelantan.

3.3 Study Population

The data was collected from nurseries in Malaysia

3.4 Subject Criteria

3.4.1 Inclusion criteria

1. Nursery teachers who teach children aged 2-4 years.
2. Nursery teachers with at least one year of teaching experience.
3. Teachers with academic qualifications in early childhood education.

3.4.2 Exclusion criteria

1. Temporary or visiting teachers.
2. Those who have problems with language proficiency and understanding in completing the survey.

3.5 Sampling method and subject recruitment

This study employed a combined sampling approach, integrating both probability and non-probability methods, specifically random sampling and convenience sampling. Initially, random sampling was attempted by reaching out to nursery teachers across various states in Malaysia through online platforms such as WhatsApp. However, due to a low response rate and limited cooperation, convenience sampling was subsequently utilized. Data collection was then conducted face-to-face at selected nurseries in Kelantan, chosen based on accessibility and participant availability. A sample size of 10 to 30 participants was targeted to test the feasibility of the study and to identify any significant design issues (Johanson & Brooks, 2010).

3.6 Research Tool

A self-administered questionnaire (Alotaibi & Alqahtani, 2020) was translated and adapted from the original version in English to the Malay language. The questionnaire consisted of 50 items: 14 items for demographic and professional background information, 17 items designed to ascertain a respondent's knowledge of common causes of childhood hearing loss, and 19 items to measure attitudes towards early detection and intervention. The questionnaire also consisted of three sections: Section A—Demographic scale and background and professional information scale; Section B—Hearing problems' knowledge scale; and Section C—Attitudes component scale, which consisted of cognitive, affective, and conative components. Each item in the knowledge component had three possible responses: no, not sure, and yes. For scoring, "yes" responses were assigned 1 point, while "no" and "not sure" responses were scored 0. Meanwhile, for the attitudes component, each item had five possible responses: strongly disagree, disagree, neutral, agree, and strongly agree. These were scored on a scale from 1 to 5, with "strongly disagree" assigned 1 point, "disagree" 2 points, "neutral" 3 points, "agree" 4 points, and "strongly agree" 5 points, capturing the full range of attitude intensity.

Expert rating form for cultural and nursery setting adaptation. This form was distributed to and reviewed by a panel of experts (audiologists and nursery administrators). The expert panel evaluated the questionnaire's clarity, relevance, cultural, and contextual suitability.

3.7 Research Procedures

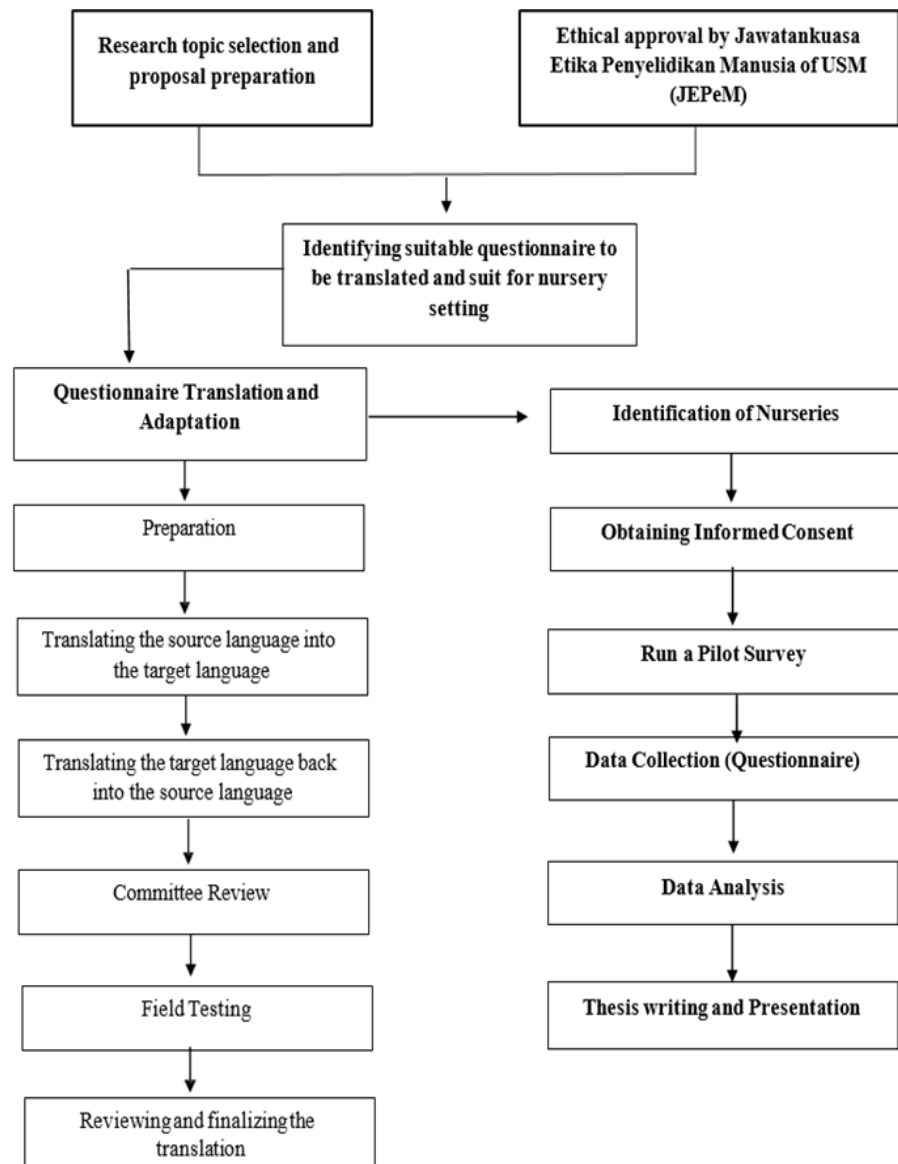


Figure 1 Research Flowchart

As shown in Figure 1, the research procedure began with the selection of the research topic and the preparation of the study proposal. Ethical approval was obtained from the Jawatankuasa Etika Penyelidikan Manusia of Universiti Sains Malaysia (JEPeM) before proceeding to the next stages. Following this, a suitable questionnaire was identified to be translated and adapted for use in nursery settings. The Teachers' Knowledge and Attitude toward Children's Hearing Problems in the General School Setting Questionnaire was selected because it is directly relevant to the educational

context and aligns with the focus of this study on teachers' roles in early identification and support for children with hearing problems. Permission for its translation into the Malay language was obtained from the original author, as shown in Appendix B.

For cultural adaptation, a panel comprising audiologists and nursery administrators reviewed the translated questionnaire to assess cultural relevance and establish face validity. The adapted version was then pilot tested with 25 nursery teachers to evaluate clarity, appropriateness, and reliability. Feedback from the pilot study was incorporated to refine and finalise the questionnaire prior to full administration. Table 1 presents a summary of the translation and adaptation steps, including preparation, forward translation, reconciliation, back-translation, expert review, and pilot testing.

Table 1 Translation and Adaptation Steps

<p>Section 1: Preparation</p> <p>Adequate preparation can minimize the misuse of resources by reducing duplication of pre-existing questionnaires and by avoiding copyright infringement</p> <p>Early communication with the source language Questionnaire Developer can help to define the concepts underlying questionnaire items to reduce the risk of misinterpretation in later stages of translation and to highlight issues from past experiences</p>
<p>Section 2: Translating the source language into the target language</p> <p>At least two bilingual translators should be briefed on the questionnaire, the health condition it measures, and the translation requirements</p> <p>Each translator should produce an independent forward translation, from the original source language to the target language</p> <p>Discrepancies between the multiple independent translations should be reconciled and a single consolidated translation reported by a third independent team member</p>
<p>Section 3: Translating the target language back into the source language</p> <p>At least one additional bilingual translator should independently produce a back translation from the target language back to the original source language</p> <p>Discrepancies between the original source language questionnaire and the back translation should be reported and resolved, including generating alternatives to consider in the next steps</p>

Section 4: Committee Review

A multi-disciplinary team including at least one bilingual translator and a clinician should review the forward and back translation reports and agree on solutions to discrepancies to reach cross-cultural equivalence in the forward translation

If anything is changed this should undertake back translation in order to confirm equivalence

Section 5: Field testing

Cognitive debriefing and/or pilot testing should be conducted with the target audience to ensure that they understand the questions and that the questions are culturally appropriate

Section 6: Reviewing and finalising the translation

Final amendments to the questionnaire should use pilot data to ensure questions are correctly interpreted and culturally appropriate, before proofreading

A translation certification is issued to confirm the processes

A final report of the processes should be shared with the source language Questionnaire Developer. As far as possible, the work should be disseminated to minimise duplication of translations into the same language

(Hall *et al.*, 2018b)

Once the translation process was completed, the next phase of the study involved the identification of nurseries to participate in the research. Formal permission was obtained, and informed consent was secured from the respondents prior to data collection. A pilot survey was then conducted to further validate the questionnaire's usability and to refine the data collection procedure. This was followed by the main data collection, where the finalized questionnaire was distributed to the selected participants. The responses were systematically compiled and subjected to data analysis, which included both descriptive and inferential statistical procedures to address the research objectives. Finally, the findings of the study were synthesized and presented in the form of writing and presentation of a thesis, completing the research process.

In total, 50 nurseries were contacted, of which 40 agreed to participate. From these, 25 completed responses were successfully collected, while 15 declined participation or returned incomplete responses.

3.8 Data Analysis

The Statistical Package for Social Science (SPSS), Version 31 for Windows were used to analyze all the data gathered. Descriptive statistics summarized the knowledge and attitudes levels. Frequency (f) and percentage (%) were used to describe categorical variables which includes gender, age group, educational background, and teaching experiences. For the second objective, Cronbach's alpha was used to assess the reliability of the questionnaire. The content validity index (CVI) was used to determine validity. The third objective was analysed using One way ANOVA test to determine the difference of nursery teachers' knowledge and attitudes towards childhood hearing loss between educational background and teaching experiences. Descriptive statistics are also used to determine the mean response of the total knowledge and attitudes scores for each question.

3.9 Expected Outcomes

The expected outcomes of this research study included the development of a validated and reliable questionnaire in Malay, tailored explicitly for nursery teachers. This questionnaire facilitated the assessment of their knowledge and awareness regarding hearing loss in children. Additionally, the study aimed to establish baseline data on the current levels of knowledge and awareness among nursery teachers, providing valuable insights into their understanding of this critical issue. Based on the findings, the study offered recommendations for training modules or workshops

designed to address the identified knowledge gaps and enhance teachers' capacity to support children with hearing loss.

3.10 Ethical Consideration

Informed consent consisted of providing information and clarifying the substance of the research. This involved informing participants about any potential risks they might face while participating. The second stage involved obtaining consent from participants, in which they voluntarily agreed to take part in the research under the stated terms. In this process, participants were notified about the nature of the study, and ethical approval was obtained from the Jawatankuasa Etika Penyelidikan Manusia, Universiti Sains Malaysia (USM/JEPeM/KK/24121124).

3.11 Significance of Study

This study provided foundational data that could guide the development of educational interventions and policies to enhance the role of nursery teachers in early hearing health. It also contributed to the growing literature on early childhood hearing knowledge and attitudes in Malaysia.

3.12 Declaration of Conflict of Interest

There are no conflicts of interest related to this research, its procedures, or findings

3.13 Handling Privacy & Confidentiality

The consent form was given to the participants using Google Forms. All the participants' information obtained in this study was kept and handled confidentially, following applicable laws and regulations. Participants' identities were not revealed

without their consent when publishing or presenting the study results. Individuals involved in this study, qualified monitors and auditors, and governmental or regulatory authorities were permitted to inspect the study data, where appropriate and necessary. The information was held and processed on a computer. Only research team members were authorised to access the information. Participants authorised the record review, information storage, and data processing by submitting informed consent.

Signatures

Participants were not required to sign in to an account to participate in the online survey. By signing the consent form (clicking ‘agree’), they authorised the record review, information storage, and data processing described above (implied consent).

3.14 Honorarium

An honorarium was given to the participants in the form of an e-wallet coupon.

CHAPTER 4

RESULTS

4.1 Introduction

This chapter presents the findings of the study, which explored translation, adaptation, reliability, validation of the questionnaire and the results of nursery teachers' knowledge and attitudes towards childhood hearing loss in Malaysia. The knowledge and attitudes data were collected using the self-administered questionnaire translated and adapted from Alotaibi et.al (2020). Altogether, 25 nursery teachers participated in this survey.

4.2 Translation and Adaptation of the Questionnaire

The original questionnaire was developed in English. It was translated and adapted in two stages, as detailed below:

4.2.1 English to Malay Translation and Cultural Adaptation:

This stage was carried out by forward translation, back translation, review by two expert panels, and pilot testing. Necessary changes were made to ensure the conceptual equivalence and cultural appropriateness of the translated version.