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Validity and Reliability of Ear Care Questionnaire Indonesian Version

¹Arsyada Hakama Syakuro, ² Deoni Daniswara*, ³Adnan Abdullah, ²Rizka Fakhriani, ²Asti Widuri

Email (Corresponding Author): *leonidaniswara.fkik@umy.ac.id

¹Medical Student, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia

²Department of Otorhinolaryngology, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia

³Department of Otorhinolaryngology, Faculty of Medicine, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

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ABSTRACT

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The auditory system is a vital and prominent component of humans. It is imperative for individuals to prioritize the maintenance of this organ throughout their lives. These methods encompass the maintenance of ear cleanliness, safeguarding against excessive noise exposure, preventing accidents, and warding off ear infections and disorders. This study aimed to determine the validity and reliability of the Indonesian version of the ear care questionnaire. This study uses a descriptive-analytic method with a cross-sectional design. The ear care questionnaire consisting of knowledge, attitude and practice translated and applied for 45 participants, the validity test using Pearson's correlation and reliability test evaluation determined by Cronbach's alpha. The ear care questionnaire Indonesian version found Pearson's correlation of all items r above 0.35 or strongly valid, and the Cronbach's alpha coefficient was 0.749 (adequate). The Indonesian version of the ear care questionnaire is valid and reliable, the result recommends the use of the Bahasa Indonesia version of this questionnaire among Indonesians in further relevant research.

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INTRODUCTION

Cerumen, or ear wax, is secretions from the ceruminous and sebaceous glands, together with shed epithelial cells, found in the external auditory canal (EAC). Cerumen is usually pushed from the ear canal naturally by a self-cleaning mechanism that is aided by jaw movement¹. However, in certain individuals, this system malfunctions and cerumen becomes compromised. Patients suffering with cerumen impaction may have symptoms such as a feeling of fullness in the ear,

reduced hearing ability, ear discomfort, itching, ringing in the ears, and inflammation of the external ear. Cerumen impaction describes the buildup of cerumen that either produces symptoms or limits the examination of the ear canal, tympanic membrane, or audio vestibular system. It is not necessary for the obstruction to be total^{2,3}. That said, the precise underlying mechanism remains unidentified and could potentially be associated with the subsequent factors such as anatomically constricted and distorted ear canals, progressed age, physical obstructions hindering the natural expulsion of earwax, such as the use of hearing aids, cotton swabs, and earplugs, as well as infectious or dermatological ailments¹.

The ear is a vital and prominent component of human anatomy. Due to its vital role in the auditory system, it is imperative for individuals to prioritize the maintenance of this organ throughout their lives. Ear hygiene is a form of personal cleanliness that relates to the care and maintenance of one's ears. While it may not require much attention, providing correct care is crucial for ensuring its best functionality. There are certain methods via which one might achieve ear care. These methods encompass the maintenance of ear cleanliness, safeguarding against excessive noise exposure, preventing accidents, and warding off ear infections and disorders. Although self-ear cleaning is common, there is still a lack of essential knowledge on this topic. Therefore, public health education must be provided to inform individuals about the correct cleaning of cerumen, its purpose, and the possible outcomes⁴.

This study aimed to determine the validity and reliability of the Indonesian version of the ear care questionnaire. Previous validated questionnaires were available in Arabic. At present, there is no objective questionnaire available in Indonesian on ear care. In order to ensure the accuracy and consistency of the cerumen questionnaire, it is necessary to carry out research on its validity and reliability.

METHODS

This research utilizes a descriptive-analytic approach using a design with a cross-sectional approach. This research was carried out at a private medical facility in Yogyakarta, Indonesia. The study received clearance from the Ethics Committee PKU Muhammadiyah Gamping Hospital under the reference number 006/KEP-PKU/1/2024. The questionnaire used in this study is an adaptation and modification of a questionnaire that has been used in previous studies⁵. The last care ear questionnaire was validated in the Arabic version, which from a pre-designed electronic questionnaire containing yes and no questions then modified and translated by the research team into Bahasa Indonesia. The questionnaire contained sociodemographic information of participants and assessed their awareness of ear care, including knowledge, attitude, and practice.

The research was conducted from November 2023 to January 2024 by distributing questionnaires using Google Forms. In the first stage, the research team translated the questionnaire into Indonesian. Next, the research team conducted an expert validity test and

modified the content of the questionnaire. In the final stage, the research team tested the construct validity and reliability of the questionnaire. Validity and reliability tests were conducted with respondents who met the study inclusion criteria. The study's inclusion criteria were (1) health workers over 18 years old who utilized a mobile phone, (2) who could read and speak Indonesian, and (3) who were ready to participate as respondents. The exclusion criteria were respondents who did not complete the questionnaire. There is no universal method for determining the quantity of samples used in validity research, however lots of research use a sample size that is triple the number of questions⁶. The survey consisted of 5 questions each on knowledge, attitude, and practice, necessitating a minimum sample size of 45 health workers.

The validity test was conducted utilizing Pearson's correlation coefficient (r). The interpretation parameters are as follows: highly valid ($r > 0.35$), perhaps useful ($r = 0.21-0.35$), situation-dependent ($r = 0.11-0.20$), and unlikely to be beneficial ($r < 0.11$). Internal consistency evaluates the extent to which questions in a questionnaire are interconnected or consistent in evaluating the same idea. The value is often calculated using the alpha coefficient, also known as Cronbach's Alpha. The guidelines to use in assessing an internal consistency reliability coefficient are the following: exceptional (≥ 0.90), acceptable ($0.80 - 0.90$), adequate ($0.70 - 0.79$), and less applicable (< 70)⁷.

RESULTS

There were 45 participants who fulfilled the inclusion criteria and failed to fulfill the exclusion criteria. Twenty participants, accounting for 44.4%, were males, while 25 participants, making up 55.6%, were females. Most participants, 35 (77.8%), had a university or postgraduate education level. The characteristics of the individuals we gathered include gender, degree of education, and occupation, as displayed in table 1.

Table 1. Characteristic's of participants.

Characteristic	n	%
Gender		
Male	3	6,7
Female	42	93,3
Total	45	100
Level of Education		
Senior high school	1	2,2
Diploma	5	11,1
Bachelor	37	82,2
Master	1	2,2
Doctor	1	2,2
Total	45	100
Profession		
Physician	2	4,4
Nurse	26	57,8
Employees	5	11,1
Medical student	5	11,1
Others	7	15,6
Total	45	100

Content of the questionnaire about ear care was the knowledge, attitude and practice aspect that was translated and modified in the Indonesia version by team with the FGD process, the item of questions as shown in table 2.

Table 2. The Indonesian version of ear care questionnaire

	<i>Original Version</i>	<i>Indonesian Version</i>
Knowledge		
1.	Should ear wax be removed continuously?	Apakah pembersihan serumen di telinga harus dilakukan setiap hari?
2.	Does perforation in ear required surgery?	Apakah perforasi gendang telinga memerlukan tindakan pembedahan?
3.	Does sudden exposure to loud noise can damage your hearing ability?	Apakah paparan suara keras secara tiba-tiba dapat merusak kemampuan pendengaran?
4.	Do you require medical consultation and help because of poor hearing ability?	Apakah anda perlu untuk melakukan konsultasi dan mencari bantuan medis jika mengalami kemampuan mendengar kurang baik?
5.	Does high and low altitude may cause ear pain?	Apakah waktu kita mengalami perubahan ketinggian dan perubahan tekanan udara yang terlalu cepat misalnya saat menyelam atau pesawat mendarat dapat menyebabkan nyeri telinga?
Attitude		
1.	Do you believe exposure to loud noise cause deafness?	Apakah anda yakin jika telinga terpapar suara keras (misalnya: bom, petasan, konser music) dapat menyebabkan terjadinya gangguan pendengaran bahkan ketulian?
2.	Do you recommended putting water while bathing?	Apakah anda menyarankan memasukkan air ke dalam lubang telinga sebagai cara untuk membersihkan telinga
3.	Do you think that ear piercing must be done early as possible from birth?	Apakah tindik telinga harus dilakukan segera setelah lahir?
4.	Should visit your ENT specialist in certain interval?	Apakah untuk menjaga kesehatan telinga, perlu berkunjung ke dokter spesialis THT?
5.	Do you realize the importance of neonatal screening for hearing status?	Apakah deteksi bayi baru lahir terkait status pendengarannya merupakan hal yang penting?
Practice		
1.	Do you have habit of ear cleaning with sharp objects like pencils, pins, and ear buds?	Apakah anda membersihkan telinga dengan menggunakan benda tajam seperti pensil, peniti, dan cotton buds?
2.	Do you normally blow your nose vigorously when you have cold or influenza?	Apakah anda membuang ingus dengan kuat saat pilek atau flu?
3.	Do you normally used eardrops without doctor consultation when you have ear pain?	Apakah anda menggunakan obat tetes telinga tanpa konsultasi dokter ketika mengalami sakit telinga?
4.	Do you use headsets when listening to load music for long period of time?	Apakah anda menggunakan headset saat mendengarkan musik dengan volume keras dalam jangka waktu yang lama?
5.	Do you use oils in ear?	Apakah telinga perlu diberikan minyak/ tetes telinga secara rutin?

The validity test was conducted on a sample of 45 participants, resulting in a correlation coefficient (r value) of 0.301. The r table provides the r value for each item specified. Based on the correlation coefficient (r value), we determined that all the items in the Indonesian adaptation of the cerumen questionnaire had higher r values than the threshold specified in the table. This ensures that the data obtained from the questionnaire is accurate. The validity research findings indicated that the Indonesian version demonstrated strong validity ($r > 0.35$) with a significance level of $p < 0.001$, as presented in table 3.

Table 3. Results of ear care questionnaire validity and reliability test

Items	r	r table	p	Interpretations
Knowledge				
1	0,566	0,301	0,755	Strongly valid and adequate
2	0,701	0,301		Strongly valid and adequate
3	0,651	0,301		Strongly valid and adequate
4	0,719	0,301		Strongly valid and adequate
5	0,660	0,301		Strongly valid and adequate
Attitude				
1	0,463	0,301	0,727	Strongly valid and adequate
2	0,651	0,301		Strongly valid and adequate
3	0,694	0,301		Strongly valid and adequate
4	0,552	0,301		Strongly valid and adequate
5	0,674	0,301		Strongly valid and adequate
Practice				
1	0,634	0,301	0,758	Strongly valid and adequate
2	0,599	0,301		Strongly valid and adequate
3	0,738	0,301		Strongly valid and adequate
4	0,680	0,301		Strongly valid and adequate
5	0,621	0,301		Strongly valid and adequate

A reliability assessment was performed with Cronbach's Alpha. The research revealed that Cronbach's alpha value for the 15 items was 0.749. This suggests that the questionnaire demonstrated reliability and sufficient internal consistency.

DISCUSSION

Cerumen impaction is a frequent cause for seeking medical advice from primary care physicians and is observed in around 10% of children, 5% of healthy adults, as well as in up to 57% of elderly individuals residing in nursing homes, and one-third of patients with mental retardation^{8,9}. The World Health Organization has reported that over 5% of the global population, which amounts to 430 million individuals, require rehabilitation to address hearing impairments. This includes 432 million adults and 34 million children. Approximately 50% of the global population with hearing impairments resides in Southeast Asia, with Indonesia ranking fourth with a prevalence rate of 4.6%⁷. In 2012, Medicare expenses on operations connected to cerumen amounted to around \$50 million^{8,9}.

Medical professionals' inadequate understanding is a major factor affecting early diagnosis and intervention for hearing loss⁵. Knowledge, attitude, and practices (KAP) surveys are useful for determining people's understanding of a certain idea or issue as well as their perspectives and approaches to solving it¹⁰. By looking into medical team members' experiences, attitudes, and knowledge about early hearing detection and intervention, it may be possible to find misconceptions that are causing unfavourable result¹⁰.

This study is conducted due to the scarcity of literature on the validation and reliability of questionnaires on knowledge and attitudes towards earwax in Indonesia and another country. The ear care questionnaire was previously available in an Arabic version that has been used in other studies⁴. Assessing the precise extent of knowledge, attitude, and practice related to ear care might uncover gaps in information and negative mindsets and practices, potentially resulting in cerumen impaction and ear disorders. General perception of the people is agreed that ear is necessary for hearing, but they did not know that respiratory infection can affect the ear and some systemic diseases like diabetes mellitus and hypertension can cause hearing loss¹¹.

Therefore, it is necessary to address this issue through diverse approaches to decrease the occurrence and prevalence of cerumen impaction. One effective approach to decrease the occurrence and spread of a condition is to utilize a validated and rehabilitated questionnaire that assesses knowledge, attitude, and practice for ear care. The Indonesian modification of the ear care questionnaire is valid for use and have the ability to measure what it intends to measure. According to report that patients at ENT clinics seem to have relatively insufficient knowledge and lax attitude toward cotton-bud usage, the ear care questionnaire recommended for evaluation the educational and awareness ear and hearing protection programs¹². In addition, ear care questionnaires can help assess participants' knowledge, attitudes and practices regarding ear care. This information can be used to identify gaps in knowledge and areas for improvement in ear care practices. In conclusion, ear care questionnaires are a valuable instrument for evaluating and enhancing ear care procedures, determining risk factors for ear issues, and guiding the development of ear health and hearing loss policy and practice¹³.

The validity research findings indicated that the Indonesian version demonstrated strong validity ($r > 0.35$) with a significance level of $p < 0.001$. A questionnaire's validity test determines how effectively it measures the things it is supposed to measure. It is ascertained by examining the validity of the deductions and conclusions drawn from the questionnaire's answers¹⁴.

The reliability test employed in this study is internal consistency. Based on our analysis, we determined that the Cronbach's Alpha score for the Indonesian modification of the Cerumen questionnaire is 0.749. This indicates that the instrument is reliable, as a Cronbach's Alpha score above 0.7 is considered acceptable. The reliability of this instrument refers to the ability of the ear care questionnaire to produce consistent results under similar conditions, as well as to

discriminate between the performance of different providers¹⁵.

The limitation of this study was that the translation was not by official Indonesian Language and Cultural Learning Services and there was an imbalance in participant gender (few male participants), because the majority of health workers were females.

CONCLUSION

Overall, we have successfully carried out the process of adapting, culturally translating, and validating the Indonesian version of the ear care questionnaire. The Indonesian adaptation of the ear care questionnaire has been determined to be both valid and reliable, making it a good tool for measuring knowledge, attitude and practice regarding ear care. It is crucial to identify the attributes and objective measures, such as validity and reliability, that should be emphasized throughout the development of a questionnaire.

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