

EAR DISORDER SCREENING IN IMPROVING HEARING QUALITY IN CHILDREN AT CIANTRA STATE ELEMENTARY SCHOOL 01 CIKARANG SELATAN BEKASI

Wiro A. Sumilat^{1*}, Muhammad Subhan Alfaqih², Reza Yuridian Purwoko³

Medical Faculty, President University, Indonesia^{1,2,3}

**Corresponding Author : wirosuamilat@yahoo.co.id*

ABSTRAK

Gangguan pendengaran pada anak usia sekolah merupakan masalah kesehatan yang dapat memengaruhi perkembangan kognitif, sosial, dan emosional mereka. Organisasi Kesehatan Dunia (WHO) memperkirakan bahwa 34 juta anak mengalami gangguan pendengaran, dengan 60% kasus dapat dicegah. Penelitian ini bertujuan untuk menyaring gangguan pendengaran serta meningkatkan kesadaran tentang kesehatan telinga pada siswa Sekolah Dasar Negeri Ciantra 01, Cikarang Selatan. Metode yang digunakan meliputi pemeriksaan otoskopi terhadap 68 siswa kelas 1 dan 5, disertai dengan edukasi kesehatan telinga. Persiapan dilakukan melalui koordinasi dengan pihak sekolah dan penyediaan peralatan medis seperti otoskop, lampu kepala, dan alat pembersih telinga. Hasil penelitian menunjukkan bahwa 26 siswa (38%) mengalami cerumen yang dapat memengaruhi fungsi pendengaran mereka, dan 6 siswa (23%) membutuhkan rujukan ke fasilitas kesehatan lanjutan. Selain itu, tidak ditemukan kelainan telinga lain yang signifikan. Kegiatan edukasi menunjukkan hasil positif, dengan siswa dan guru memperlihatkan pemahaman yang lebih baik tentang pentingnya kebersihan telinga, sebagaimana tercermin dari keberhasilan siswa dalam kuis edukasi. Sekolah memberikan apresiasi terhadap kegiatan ini dan merekomendasikan agar program serupa dilaksanakan secara rutin. Penelitian ini menyoroti pentingnya program pemeriksaan dan edukasi kesehatan telinga untuk mencegah gangguan pendengaran pada anak-anak. Implementasi program ini secara luas diharapkan dapat meningkatkan kualitas hidup dan proses belajar siswa, serta berkontribusi pada kebijakan kesehatan masyarakat terkait pencegahan gangguan pendengaran.

Kata kunci : cerumen, gangguan pendengaran, kesehatan anak, pemeriksaan telinga

ABSTRACT

Hearing loss in school-age children is a health problem that can affect their cognitive, social, and emotional development. The World Health Organization (WHO) estimates that 34 million children have hearing loss, with 60% of cases preventable. This research aims to screen hearing loss and increase awareness about ear health in students of Ciantra 01 State Elementary School, South Cikarang. The method used included otoscopy examination of 68 students in grades 1 and 5, accompanied by ear health education. Preparations were made through coordination with the school and the provision of medical equipment such as otoscopes, headlamps, and ear cleaners. The results showed that 26 students (38%) had cerumen that could affect their hearing function, and 6 students (23%) needed a referral to an advanced health facility. In addition, no other significant ear abnormalities were found. Educational activities showed positive results, with students and teachers showing a better understanding of the importance of ear hygiene, as reflected in the success of students in educational quizzes. The school appreciates this activity and recommends that similar programs be carried out regularly. This study highlights the importance of ear health examination and education programs to prevent hearing loss in children. The implementation of this program is widely expected to improve the quality of life and learning process of students, as well as contribute to public health policies related to the prevention of hearing loss.

Keywords : ear screening, cerumen, hearing disorders, child health

INTRODUCTION

Hearing loss in children is one of the health challenges that often goes undetected, but has a long-term impact on children's cognitive, social, and emotional development. Early

identification of hearing loss is an important step in ensuring appropriate and effective interventions, so that they can improve the quality of life of these children (Yoshinaga-Itano et al., 2018). In Indonesia, the prevalence of hearing loss in children is still high, especially in areas that have limited access to health facilities, such as in South Cikarang, Bekasi (Kementerian Kesehatan Republik Indonesia, 2022b). Schools are a strategic environment to conduct hearing loss screening programs, given the amount of time children spend there as well as the opportunity to conduct systematic and targeted examinations (Wrobel et al., 2021). At Ciantra State Elementary School 01, there are indications that hearing loss in students is an obstacle in the teaching and learning process, but there has been no structured effort to identify the problem (Zubaidah et al., 2017).

Therefore, it is important to integrate ear screening programs in school settings to detect disorders early. One of the causes of ear disorders is earwax (cerumen). Full, dense earwax can impair hearing and even impermanent deafness. Another cause is ear infections that occur on the outside and inside of the ear. This can interfere with the process of receiving lessons from students or students, which will further interfere with the teaching and learning process. The importance of ear screening in children cannot be ignored given the significant impact hearing loss has on their academic, social, and psychological development. Undetected and untreated hearing loss can lead to delays in speaking, difficulty communicating, decreased academic achievement, as well as potential psychological problems such as low self-esteem and social isolation. The World Health Organization (WHO) in 2020 estimated that there are 466 million people in the world with hearing loss and 34 million of them occur in children and 60% are preventable. Indonesia is among 4 countries in Asia with a fairly high prevalence of hearing loss of 4.6% (Kementerian Kesehatan Republik Indonesia, 2022a). Various risk factors can affect a child's ear health, including a history of recurrent ear infections, excessive noise exposure, genetic factors, and certain health conditions. Therefore, a proactive approach through periodic screening is an important strategy in maintaining children's hearing health.

A wide variety of diseases of the ear can cause hearing loss. As many as 65 - 330 million people in the world are reported to experience Chronic Suppurative Media Otitis (OMSK), with the most incidences occurring in developing countries. Based on WHO data, Indonesia is included in the countries with a high prevalence (2-4%). A National Survey by the Ministry of Health of the Republic of Indonesia in 7 provinces in Indonesia in 1996 showed that the incidence of OMSK in Indonesia was 3.8% of the population. Helmi reported that OMSK patients constituted 25% of all patients at the RSCM ENT polyclinic in 1993 - 1996. The number of OMSK patients per year reaches 1300 – 2000 cases and 90% of these patients undergo surgical procedures (Kementerian Kesehatan Republik Indonesia, 2018).

Screening programs such as those conducted at State Elementary School 01 Ciantra aim not only to identify hearing loss, but also to educate children, parents, and educators about the importance of ear hygiene and health. Through this activity, it is hoped that better awareness will be created about the prevention and early treatment of ear disorders. Hearing loss in children is also related to the high rate of upper respiratory tract infections that cause otitis media. Lestari et al in their research at the hospital. Dr. H. Abdul Moeloek of Lampung Province in 2016 obtained the incidence of Acute Otitis Media (OMA) in the age group of 0-5 years as many as 24 people (16.8%), the age group of 6-11 years as many as 22 people (15.4%), and the age group of 12-16 years as many as 22 people (15.4%) (Lestari et al., 2018). In addition, hearing loss in school-age children is mostly caused by earwax blockages (cerumen prop). Serumen can close the ear canal, causing mechanical resistance to sound waves, causing hearing loss. This can cause a decrease in the hearing threshold by 5 – 10 dB (World Health Organization, 2021).

A survey conducted by the ENT Doctors Association (PERHATI) in several schools in 6 cities in Indonesia obtained a prevalence of cerumen prop of 30 - 50% (Pengurus Pusat

PERHATI-KL, 2016). Serumen impaction is a term that has the same meaning as cerumen prop, which is earwax that collects in the ear canal, causing symptoms complained of and obstructing the examination of the ear canal. The accumulation of this cerumen will block part or all of the ear canal. The symptoms complained of are no or less hearing, ringing in the ears, itchy ears and even ear pain (Kementerian Kesehatan Republik Indonesia, 2010).

The purpose of this activity is to check the ears as a screening, if there is earwax, infection, or other abnormalities that are not known before.

METHOD

This community service is a screening activity for ear disorders carried out at State Elementary School 01 Ciantra, South Cikarang District, Bekasi. The activity is intended for grade 1 and 5 students with a total population of 68 people, consisting of 53 grade 5 students and 15 grade 1 students. Preparation for the activity began with an initial survey to the school and coordination with the school. The service team from the Faculty of Medicine, Universitas President prepared an official assignment letter and examination equipment, which included an otoscope, head lamp, cerumen mask, cotton, and tissue. The method of implementing the activity is carried out through several systematic stages. First, ear health education is carried out which includes an explanation of the importance of ear hygiene and health. The next stage is an interactive quiz with seven questions about educational materials, which is accompanied by prizes to increase participant engagement. The core of the activity is screening and ear examination, where each student is thoroughly checked for the condition of his ears. The medical team identifies the presence of cerumen, cleans up mild cases, and records in detail each finding. For complex cerumen cases or further indications of infection, the team prepares a referral letter for further examination at the nearest health facility.

Data collection is carried out through direct observation, clinical examinations, interviews, and documentation. The entire process is recorded and documented for analysis and reporting purposes. Data analysis was carried out descriptively by calculating the percentage of findings and categorizing the condition of students' ears. The activity pays attention to ethical aspects by obtaining permission from the school, maintaining student privacy, and ensuring approval from parents/guardians. The implementation time of the activity lasted for approximately 1 hour and 45 minutes, starting at 09.00 to 10.45 WIB.

RESULT

Ear health screening activities at State Elementary School 01 Ciantra involved 68 students from grades 1 and 5. The examination showed that 26 students (38%) had cerumen that could potentially affect hearing function. Of these, six students (23%) needed a referral to a health facility due to the turmeric prop that was difficult to clean at the activity site. No other significant ear abnormalities or diseases were found in the students examined. In addition, all students were cooperative during the activity, allowing the screening and ear cleaning process to run smoothly. The education session on ear hygiene was well attended by students and several teachers. Participants showed a fairly good understanding, as reflected in their success in answering the educational quiz. The school expressed its appreciation for this activity, with the hope that similar activities can be carried out again in the future.

DISCUSSION

The results of the examination showed a fairly high prevalence of cerumen among students, indicating a lack of attention to ear hygiene. The accumulation of cerumen can decrease hearing

ability by up to 5–10 dB, which has the potential to interfere with students' learning process in the classroom. This is in line with the literature that states that mechanical blockages in the ear canal can significantly affect sound transmission (PERHATI, 2016). In addition, a study in Ghana found a prevalence of cerumen impaction of 22.4% in primary school students. This cerumen impaction can significantly cause conductive hearing loss that negatively impacts students' academic performance (Akotey et al., 2017). The cerumen prop cases found in six students require further treatment to prevent complications, such as pain, infection, or more serious hearing loss. These findings emphasize the importance of screening programs and ear health care in schools as a preventive measure. Another study in Nigeria also showed that routine ear cleaning by trained health workers can significantly reduce the impact of cerumen on students' academic performance (Ologe & Kolade Ernest, 2004).

Educational activities involving students and teachers also show their effectiveness in increasing understanding of the importance of maintaining ear hygiene. A study in India confirmed that health education interventions significantly improve students' knowledge of personal hygiene, including relevant habits such as cleaning the ears safely (Damayanthi & Ranganatha, 2016). In addition, technological innovations such as smartphone-based applications for the diagnosis of ear conditions are also proposed as a cost-effective and portable solution for early detection of cerumen impaction in schools (Shehieb et al., 2018). The full support from the school emphasizes that this program is not only directly beneficial for students, but also has a long-term impact on health awareness in the school environment. A study in Western Australia noted the benefits of ear health programs in reducing ear infections and improving student attention in the classroom, although challenges such as parental consent and resource limitations still exist (Doyle & Ristevski, 2010).

With the success of this activity, a similar program is recommended to be carried out regularly with a wider scope. The publication of the results of this activity can also contribute to the development of public health policies, especially in the prevention of hearing loss in school-age children. The studies mentioned support the need for a systematic approach that includes education, routine screening, and the application of technology to improve students' hearing health. Previous research has shown various findings that reinforce the results of research on the prevalence of cerumen and its impact on students' hearing health. A study by Isaradisaikul et al. (2024) in Thailand found the prevalence of cerumen in 40.88% of elementary school students. This underscores the importance of ear health education and regular check-up programs in schools to prevent adverse impacts on hearing and learning. This conclusion is in line with the finding that the impact cerumen can significantly decrease listening ability, affecting students' academic performance (Isaradisaikul et al., 2024).

Another study by Lubis et al. (2024) in Indonesia highlights the relationship between the use of cotton buds and the increase in cases of cervical impact in medical students. This study underscores the importance of providing education on how to maintain safe and effective ear hygiene. These findings support the importance of health counseling that not only focuses on handling cerumen but also preventing incorrect practices in cleaning the ears, such as the inappropriate use of cotton buds (Siregar et al., 2024). Kaspar et al. (2024) conducted a study in Samoa that showed patterns of ear diseases, including cerumen, in primary school students. They found that ear health checks in schools had a positive impact in identifying cases that needed medical intervention. This study supports the idea that an ear examination program can be an important step in the early detection of hearing loss and the prevention of further complications (Kaspar et al., 2024).

Gautam et al. (2024) study in Nepal observed that loud cerumen and impaction were found in students with a history of hearing loss. The study highlights the importance of comprehensive ear health screening to detect potentially annoying cerumen. In addition, the study also suggests that the use of portable technology, such as digital otoscopes, can help in making early detection

easier in schools (Kaspar et al., 2024).

CONCLUSION

Ear health screening activities at State Elementary School 01 Ciantra show that ear hygiene issues are still a concern, with 38% of students experiencing cerumen accumulation and 23% of them requiring further medical treatment due to cerumen prop. No other significant abnormalities or illnesses were found, and all students participated well during the examination. The education session also succeeded in increasing the understanding of students and teachers about the importance of maintaining ear hygiene. The school gives high appreciation for this activity, which is expected to be continued in the future.

Similar activities are recommended to be carried out regularly so that the benefits can be felt by more students. Collaboration between schools and health services is essential to ensure follow-up for students in need. In addition, continuous education for students and parents needs to be carried out so that the habit of maintaining ear hygiene becomes part of daily routines. The publication of the results of this activity in scientific journals can also contribute to the development of a wider public health program.

ACKNOWLEDGMENTS

We would like to thank State Elementary School 01 for its support and cooperation, as well as to the Head of LPPM Universitas President who has sponsored this community service activity, so that this program can be carried out well

REFERENCES

- Akotey, S. C., Adza, E. K., Awini, A., Cobbinah, J. B., Darko, K., Ador, E. W., Arckertson, L. P., Dadzie-Bonney, P., Adzoe, C., & Asamoah, B. (2017). *Significance of ear wax impaction in school children: a case of winneba west circuit, ghana. Significance*, 35.
- Damayanthi, M. N., & Ranganatha, S. C. (2016). *Effectiveness of health education on knowledge regarding personal hygiene among school children in rural field practice area of medical college. Annals of Community Health*, 4(4), 8.
- Doyle, J., & Ristevski, E. (2010). *Less germs, less mucus, less snort: teachers' and health workers' perceptions of the benefits and barriers of ear health programs in lower primary school classes. Australian Journal of Primary Health*, 16(4), 352–359.
- Isaradisaiikul, S. K., Chantachote, T., Chinnarat, C., & Thathawong, W. (2024). พฤติกรรม การ ฟัง ความ ชุก ของ โรค หู และ การ สูญ เสีย การ ได้ยิน ใน เด็ก ชั้น ประถม ศึกษา ตอน ต้น ใน โรงเรียน ที่ มี การ จัดการ เรียน ออนไลน์ (การ ศึกษา นาร่อง แบบ ไป ข้าง หน้า). *Journal of The Department of Medical Services*, 49(1), 39–47.
- Kaspar, A., Pifeleti, S., Driscoll, C., & Ah Kuoi, M. (2024). *Prevalence and Pattern of Ear Disease Among Primary School Students in Samoa: Preliminary Results from ENT Clinic Outreach to Urban, Rural and Remote Settings. Ear, Nose & Throat Journal*, 01455613241279719.
- Kementerian Kesehatan Republik Indonesia. (2010). *Telinga sehat pendengaran baik*. Kemkes.Go.Id. <https://www.kemkes.go.id/article/view/840/telinga-sehatpendengaran-baik.html>
- Kementerian Kesehatan Republik Indonesia. (2018). *Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/Menkes/350/2018 tentang Pedoman Nasional Pelayanan Kedokteran Tata Laksana Otitis Media Supuratif Kronik*. Jakarta: Kementerian Kesehatan Republik Indonesia.

- Kementerian Kesehatan Republik Indonesia. (2022a). *Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/Menkes/1989/2022 tentang Pedoman Nasional Pelayanan Kedokteran Tata Laksana Tuli Sensorineural Kongenital*. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Kementerian Kesehatan Republik Indonesia. (2022b). *Laporan tahunan kesehatan masyarakat*. Jakarta: Kemenkes RI.
- Ologe, F. E., & Kolade Ernest, S. (2004). *Screening audiometry in a private primary school in Ilorin, Nigeria*. *Annals of Tropical Paediatrics*, 24(2), 195–196.
- Pengurus Pusat PERHATI-KL. (2016). *Panduan praktek klinis prosedur tindakan (Vol. 2, pp. 19–20)*. Jakarta: Pengurus Pusat PERHATI-KL.
- Shehie, W., Ridha, A. M., & Sharif, T. (2018). *Diagnostic Approach for Hearing Impairment and Earwax Blockage using Smartphone*. *2018 2nd European Conference on Electrical Engineering and Computer Science (EECS)*, 123–127.
- Siregar, G., Tambunan, A. Z., Lubis, Y. M., & Aishwara, R. N. (2024). *The Relationship Between The Use of Cotton Bud and Obturation Cerumen in Prima Indonesia University Faculty of Medicine Students, Class of 2021*. *AVERROUS: Jurnal Kedokteran Dan Kesehatan Malikussaleh*, 10(2), 23–36.
- World Health Organization. (2021). *World report on hearing*. Geneva: World Health Organization. <https://www.who.int/publications/i/item/world-report-on-hearing>
- Wrobel, C., Zafeiriou, M.-P., & Moser, T. (2021). *Understanding and treating paediatric hearing impairment*. *EBioMedicine*, 63.
- Zubaidah, S., Ismanto, B., & Sulasmono, B. S. (2017). *Evaluasi program sekolah sehat di Sekolah Dasar Negeri*. *Kelola: Jurnal Manajemen Pendidikan*, 4(1), 72–82.