

# Education on maintaining ear and hearing health for medical students at Universitas Muhammadiyah Yogyakarta

Deoni Daniswara<sup>1</sup>, Asti Widuri<sup>1\*</sup>, Rizka Fakhriani<sup>1</sup>, Adnan Abdullah<sup>2</sup>

## ABSTRACT

**Introduction:** Maintaining ear health and hygiene is crucial as it directly influences one's auditory capabilities and overall quality of life. Previous research on university students states that almost all respondents (98%) do their ear cleaning routinely, which causes ear pain, ringing, and itching. According to WHO data, over 1 billion young individuals are susceptible to hearing loss due to exposure to noise or loud sounds. Therefore, the dedicated team provided education to students in the Medical Study Programme, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, on maintaining ear and hearing health to avoid hearing impairment.

**Methods:** The participants of this community service consisted of 27 students. This community service program was carried out in January 2024. The methods used in implementing this program in detail included preparing a pretest, providing educational material on how to maintain ear and hearing health, and ending with posttest activities.

**Results:** On average, Participants who participated in this community service activity were 18-20 years old. Of the participants, only 21 participated in the pretest session, and only 24 participated in the posttest session. The results of the analysis showed that there was a significant increase in knowledge ( $p=0.001$ ) between before education and after education.

**Conclusions:** In this study, medical students' knowledge level at Universitas Muhammadiyah Yogyakarta regarding how to maintain ear and hearing health still needs to be improved. Education on maintaining ear and hearing health proved significant in improving knowledge.

**Keywords:** Community service; ear and hearing health; medical; students.

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<sup>1</sup>Departement of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine and Health Science, Universitas Muhammadiyah Yogyakarta, Indonesia;  
<sup>2</sup>Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Ahmad Dahlan, Yogyakarta, Indonesia.

\*Corresponding author:

Asti Widuri;  
Departement of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine and Health Science, Universitas Muhammadiyah Yogyakarta, Indonesia;  
[asti.widuri@umy.ac.id](mailto:asti.widuri@umy.ac.id)

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## INTRODUCTION

Maintaining and prioritizing ear health and hygiene are crucial for optimal hearing abilities and overall quality of life. However, the knowledge and awareness of the general public regarding ear care still needs to be improved. Actions such as cleaning things into the ear canal are still prevalent.<sup>1</sup> People often place everyday objects into their ear canal, including cotton buds, matchsticks, brooms, tree branches, towel ends, ballpoint pen tips or holsters, and fingers.<sup>2</sup> Previous research on university students stated that almost all respondents (98%) do their ear cleaning regularly, which causes ear pain, ringing, and itching.<sup>3</sup> The practice of self-cleaning ears is long-standing and familiar. The majority find the practice of self-cleaning very beneficial as it clears earwax and relieves ear itching.<sup>4</sup>

In 2023, data from the World Health Organization (WHO) revealed that over 5% of the global population, approximately 430 million individuals, suffer from hearing impairment. According to the World Health Organization (WHO), over 1 billion young individuals are in danger of experiencing hearing loss as a result of being exposed to loud noises. Furthermore, a study by Nurul Syakila 2018 examined the correlation between prolonged use of music earphones and the prevalence of noise-induced hearing loss in students at the Faculty of Medicine, Syiah Kuala University. The findings revealed that 17.65% of the participants experienced hearing loss due to exposure to noise from earphones. Sound can significantly affect an individual's auditory perception. Excessive noise can lead to tinnitus (ringing in the ears) and may impair hearing.<sup>5</sup>

Disseminating information to the public regarding the hazards associated with self-cleaning and hearing care is crucial. Health education is an essential part of health promotion, which seeks to enhance the population's overall health. Health education is usually conducted in schools, clinics, and communities. Health education focuses on building individual capacity through education, motivation, skills, and awareness raising. Health education requires innovation (new ideas, products, or services) to facilitate program outreach, implementation, and maintenance.<sup>6</sup> Considering the provided background information, the service team provided ear and hearing health maintenance education to prevent hearing loss among students in the medical study program at the Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta.

## METHOD

A one-group pre-posttest design study was conducted to determine the effect of ear and hearing education on medical students' knowledge at Universitas Muhammadiyah Yogyakarta (UMY). This research was designed to implement a community service program by lecturers from Universitas Muhammadiyah Yogyakarta. Lecturer community service is a program by UMY lecturers to fulfill the Tri Dharma of Higher Education. The participants of this community service consisted of 27 students of the Medical Study Program, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta. The sample size in this study was adjusted according to the conditions and willingness of the participants to participate in the program. This community service program was held in January 2024 at the Communication Laboratory, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta. The methods used in implementing this program in detail included preparing a pretest, providing educational material on how to maintain ear and hearing health, and ending with posttest activities. Before participating in this community service event, all participants were explained the benefits of participating in the program and signed an informed consent.

The pretest and posttest were administered using a Google application form to make it easier for participants to access and complete. The test consisted of ten multiple-choice questions about educational material, namely how to maintain ear hygiene and hearing. Correct answers received 1 point, and incorrect answers received 0 points. Data were analyzed using SPSS version 22.0. Data analysis was conducted in two phases. The first phase was to analyze the demographics of the respondents. The second phase of the data was analyzed using paired t-test bivariate analysis to determine differences in knowledge levels before and after education. The educational material was provided through a PowerPoint presentation during the community service activity. In addition, participants also received a pocketbook containing a summary of material on how to maintain ear and hearing health.

The series of education about ear and hearing health ended with a question-and-answer session by the participants. Many participants were enthusiastic about participating in this session because the material presented was new to them. The community service activity ended with awarding service partners grants, posttest sessions, and closing.

## RESULT

This community service activity was attended by 27 participants who were students of the Medical Study Program, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta. On average, Participants who participated in this community service activity were 18-20 years old. Of the participants, only 21 participated in the pretest session, and only 24 participated in the posttest session. Details of the number of participants can be seen in [Table 1](#).

The analysis using a paired t-test in [Table 2](#) shows a significant increase in knowledge ( $p=0.001$ ) between before and after education.

## DISCUSSION

The ear is a crucial organ because it has two main functions. The first function is as an organ of hearing, and the second function regulates the balance mechanism using the lubricating and immune system, represented by the earwax.<sup>7</sup> However, many people tend to do "self-ear cleaning" or clean their ears and do not maintain hearing health, and medical students are no exception. Therefore, in our study, we assessed the level of knowledge of medical students regarding how to sustain ear and hearing health. We provided an intervention in the form of education or health education. Finally, we assessed the

students' knowledge level after the health education.

The participants in this study were medical students, with the majority falling between 18-20 years old. This stage of life is particularly susceptible to experiencing hearing loss. A study in the United States revealed that approximately 15% of college students have hearing impairment. Furthermore, 12.5% of teenagers aged 6 to 19 also have noise-induced hearing loss. The hearing loss is a result of incorrect utilization of audio gadgets.<sup>8</sup> Similarly, another study found that among a sample of 2151 students, 39.6% reported experiencing at least one sign of hearing loss, with ear pain being the most prevalent.<sup>9</sup> The research has indicated that portable music players, bars, karaoke bars, and concerts are among the primary noise sources for university students.<sup>9,10</sup>

According to the data analysis findings, the knowledge level among medical students was low (mean = 6.80) before receiving instruction. A study conducted at Al Majmaah University revealed that around 55.4% of medical students lacked a sufficient understanding of ear hygiene practices.<sup>11</sup> Additionally, a separate survey revealed that approximately 55.1% of medical students believed self-cleaning of the ears yielded advantages, with 75% engaging in this practice. The primary motivation for engaging in self-cleaning of the ears was hygiene.<sup>7</sup> Furthermore, approximately 45.6% of medical students have utilized personal audio devices (PADs) for a duration exceeding five years, misusing them.<sup>12</sup>

The data analysis results indicated a significant augmentation in knowledge ( $p=0.001$ ) following the provision of education or health education. Consistent with prior research, there is a statistically significant rise in knowledge following

**Table 1.** Number of pretest and posttest participants

	n	%
Pretest	21	77,78
Posttest	24	88,89
Pretest and posttest	15	55,56

**Table 2.** Effect of education on participants' knowledge

	Number of participants	Mean $\pm$ SD	p
Pre-education knowledge	15	6,80 $\pm$ 1,4	0,001*
Post-education knowledge	15	8,60 $\pm$ 0,9	

\* Significant ( $p < 0.05$ )

the adoption of educational interventions to enhance knowledge and awareness of ear maintenance.<sup>13</sup> Based on the findings in this study regarding knowledge about ear and hearing health, more attention is needed, especially for medical students. Moreover, medical students will become health workers who educate the public. Education on maintaining ear and hearing health can help prevent adverse effects on ear and hearing health in the future. The limitation of this study is that the sample used is too small because this study is a preliminary study whose sample size is to the conditions in the field.

## CONCLUSION

In this research, the knowledge among medical students at Universitas Muhammadiyah Yogyakarta regarding maintaining ear and hearing health still needs to be improved. This requires attention so that more education can be provided to enhance knowledge to maintain ear and hearing health. Education on how to preserve ear and hearing health has been proven to be significant in improving learning.

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Nil.

## CONFLICT OF INTERESTS

The authors declare there is no conflict of interest.

## AUTHOR CONTRIBUTION

DD, AW, and RF conducted literary research and conceived and designed the study. DD collected relevant definitions of intellectual content, statistical analysis,

and manuscript preparation. DD, AA, and RF conducted experimental studies and data acquisition. AW helped in data analysis, manuscript review, and as a guarantor. All authors edited and reviewed the manuscripts.

## ETHICAL STATEMENT

Before participating in this community service, all participants were explained the benefits of participating in the program and signed an informed consent.

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