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Promoting noise awareness among parents of students at *Aisyiyah Bustanul Athfal* (ABA) Kentungan Kindergarten in Yogyakarta

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ABSTRACT

Introduction: Noise exposure is a problem in children due to the vulnerability of the growing auditory system and its impact on hearing and quality of life during early developmental phases, which might influence a child's future path. Children have different external ear anatomy than adults, with narrower ear canals that absorb higher-frequency sounds. Hearing loss can be minimized by implementing educational programs, regulations, and laws to increase awareness and proactively limit damage from noise. This article will describe the noise awareness empowerment programs for parents of *Aisyiyah Bustanul Athfal* (ABA) Kentungan Kindergarten in Yogyakarta.
Methods: The community empowerment program collaborator is *Pimpinan Ranting Aisyiyah* (PRA) Condongcatur Barat, and it includes approximately 24 parents of ABA Kentungan Kindergarten students.
Results: The program's results indicated that the average score of participants' knowledge before the program started was 51.6 out of 100. The average score increased to 82.9 after the program.
Conclusion: The community empowerment team recommends that all parents understand the importance of protecting children's environment from excessive noise exposure. Furthermore, teachers can help by providing a suitable environment and encouraging safer listening habits with Personal Listening Devices (PLDs). The government should initiate campaigns to increase public awareness of excessive noise exposure and regulate the standard volume of toys and sleep machines for newborns and children.

Keywords: Health education; kindergarten children; noise awareness; noise-induced hearing loss.
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INTRODUCTION

Noise exposure is a problem in children due to the vulnerability of the growing auditory system and its impact on hearing and quality of life during early developmental phases, which might influence a child's future path. Children have different external ear anatomy than adults, with narrower ear canals that absorb higher-frequency sounds. Children frequently have high levels of exposure to Personal Listening Devices (PLDs).[1] Children with developmental problems, such as autism spectrum disorder, frequently have a heightened sensitivity to noise. They may exhibit unusual play behaviors with noisy objects, such as extended and repetitive use, which could increase the risk of hearing loss.[2,3]

Hearing loss has been identified as a common disability worldwide. 0.5 percent of 1,000 children are born with or develop hearing loss during childhood.[4] This condition is a significant health issue that can occur at any age. When it occurs throughout childhood, it can negatively affect various aspects of development, including social, emotional, academic, and long-term communication skills.[5,6]

The condition requires specific attention due to the crucial role of hearing in language acquisition, speech development, and communication. In Nigeria, research found that 6.7 percent of participants with hearing loss reported difficulties achieving their performance in school.[7] Another study discovered that the auditory process might retain information with an efficiency of twenty percent. This number is notable over the reading process's ability to take in just ten percent of the material offered. Listening is crucial for early childhood education.[8]

According to the World Health Organization (WHO), around 360 million people, representing 5 percent of the worldwide population, experience hearing loss. This condition is also common among children, with around 34 million experiencing deafness or hearing loss. Out of these cases, 60% are caused by preventable conditions.[9–11] Indonesia is the fourth country in Southeast Asia with the most remarkable rate of deafness, following Sri Lanka, Myanmar, and India.[12–14] Early identification of hearing loss in children can avoid over 60 percent of cases, positively affecting language and speech development, emotional and cognitive growth, and overall quality of life.[15,16]

Noise-induced hearing Loss (NIHL) can be minimized by implementing educational programs, regulations, and laws to increase awareness and proactively

limit damage from noise.[17] Parents are called "health agents" because they influence their children's lives. They should create a positive environment and include safety measures from the beginning. Parents have the authority to determine whether their child should undergo a medical evaluation, regardless of the presence of any visible illness or if there are any health-related worries. Children's health is substantially influenced by their parents' income, social standing, education level, and health.[18]

Promoting and examining parents' knowledge of noise awareness is essential for early detection. Parents' awareness impacts the prevention of hearing loss in children. Parents with high awareness levels tend to have a positive attitude. In contrast, those with low awareness levels may increase children's hearing loss risk.[4] It is crucial to have a program that enhances or empowers parents to address this issue. Empowerment activities must be carried out according to the situation and adapted to the characteristics and problems. The article will describe the noise awareness empowerment programs for parents of *Aisyiyah Bustanul Athfal* (ABA) Kentungan Kindergarten in Yogyakarta.

METHOD

Our design is a quasi-experimental one-group pre-test and post-test design. The community empowerment program collaborator is *Pimpinan Ranting Aisyiyah* (PRA) Condongcatur Barat, and it includes approximately 24 parents of *Aisyiyah Bustanul Athfal* (ABA) Kentungan Kindergarten students. ABA Kentungan Kindergarten is located near Colombo Market at Joho, Kolombo Baru, Kaliurang Street KM 7, Condongcatur, Depok, Sleman, Special Region of Yogyakarta. ABA Kentungan Kindergarten provides education for preschool-aged children divided into groups A and B. The students in Group A are between 5 and 7 years old, while those in Group B are between 4 and 5. The community program team focuses on ABA Kentungan Kindergarten due to its central location in the center of a crowded community.[19]

This community empowerment program aims to educate parents of ABA Kentungan Kindergarten students about noise awareness. This program is implemented in three steps, as illustrated in Figure 1.

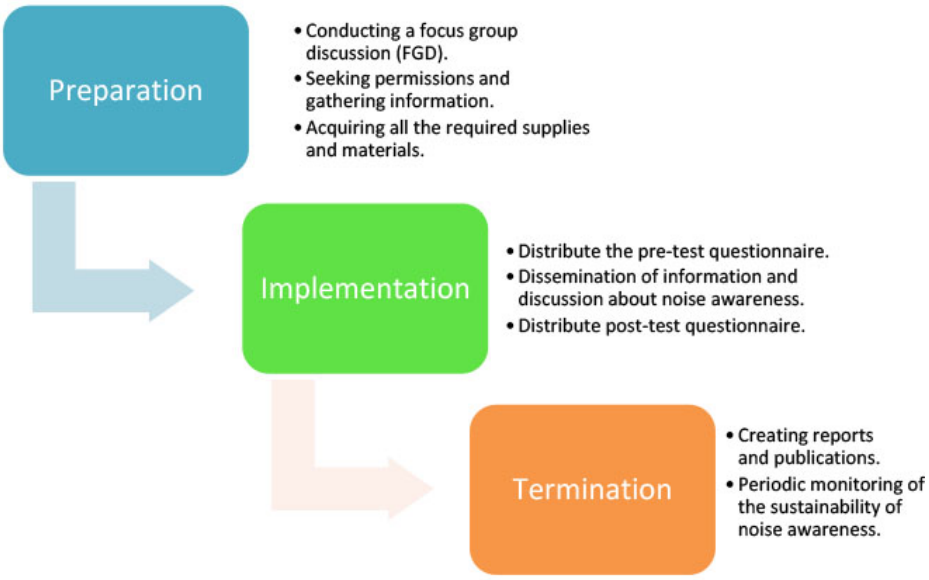

Figure 1. Community empowerment program steps.

The initial step involved conducting a focus group discussion (FGD) with the community empowerment team, the head, and the ABA Kentungan Kindergarten representatives. The following step included applying for permissions and gathering information on common health issues. The FGD results revealed that most parents of ABA Kentungan Kindergarten students lack understanding and information about preserving ear health to avoid deafness caused by noise exposure. Hence, it is essential to enhance the knowledge of noise awareness to prevent hearing loss issues in children. After receiving permission, the community empowerment team prepared all the required equipment and supplies for the activities.

Quantitative data was collected using pre-tests and post-tests. Participants had to answer several questions before and after the program to evaluate their knowledge level. The instrument utilized was a set of multiple-choice questions (MCQs) comprising ten questions. Each question is 1 point for the correct answer and 0 for an incorrect answer. Only the responses from participants who completed both the pre-test and post-test were included in the data analysis. This program was conducted after obtaining service permission from the University of Muhammadiyah Yogyakarta with the number 483.2/A.3-III/FKIK-UMY/XI/2023. Informed consent was also obtained from all participants before completing the questionnaire.

RESULT

This study included 24 parents from ABA Kentungan Kindergarten in Condongcatur, Depok, Sleman. The community service program was held on Wednesday, 7 February 2024, involving parents of ABA Kentungan Kindergarten students in Condongcatur, Depok, Sleman. The program started with participants filling out the attendance sheet and receiving a questionnaire to complete (pre-test). The second stage involved an expert delivering a 20-minute educative session using the lecture technique, followed by a discussion. Afterward, participants were requested to complete the questionnaire again in a post-test session. The material also consists of the impact of noise and its effects and instructions on proper and correct ear-cleaning techniques. The program ended with a documentation process.

The study revealed that the youngest participant was 28, and the oldest was 57. Based on the analysis of the results in Table 1, the characteristics of the participants found that the total participants are female. Eleven participants, representing 45.8%, were between 31 and 40. Most participants have a high school education level

Table 1. Characteristics of the Participants

Characteristics	N	%
Gender		
Male	2	8%
Female	22	92%
Age		
21-30 years old	5	21%
31-40 years old	11	46%
41-50 years old	6	25%
> 51 years old	2	8%
Education		
Elementary school	2	8%
Junior high school	6	25%
Senior high school	13	54%
Diploma/bachelor degree	3	13%

Table 2. The comparison between pre-test and post-test scores

	Mean	Mean±SD	t-table KS	t-count KS	
Pre-test	51.6	0,583 ± 0,122	0,237	0,237	Normal
Post-test	82.9	0,725 ± 0,108	0,237	0,209	Normal

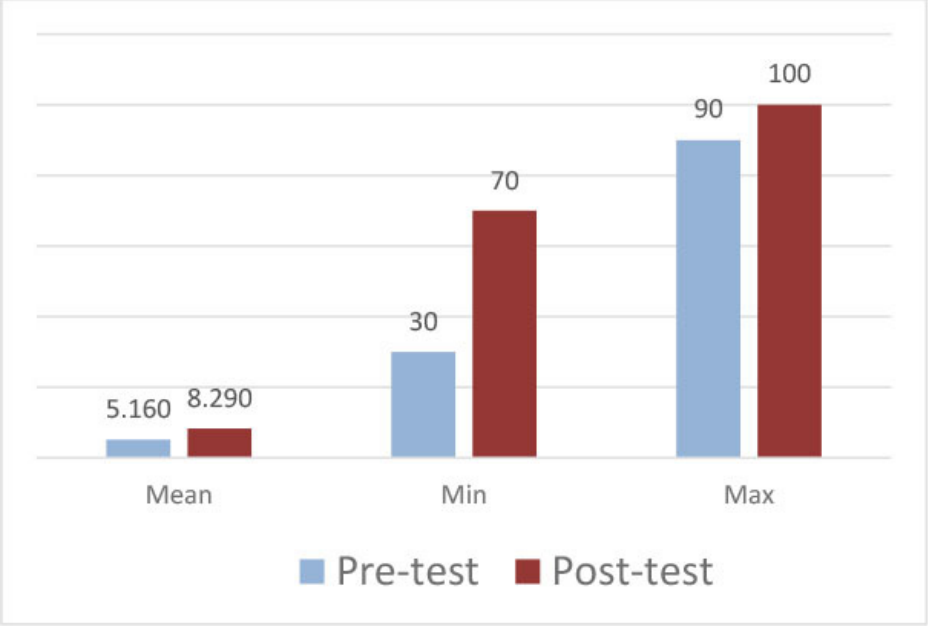

Figure 2. The graphic comparison between pre-test and post-test scores.

(54%). The table shows the demographic characteristics of participants in this community empowerment program:

Participants were required to complete a knowledge evaluation before receiving any information from this program. According to Table 2, the average score of participants during the pre-test was 51.6 (with a standard deviation of 0.583 ± 0.122), while the average score after the post-test was 82.9 (with a standard deviation of 0.725 ± 0.108). In addition, the Kolmogorov-Smirnov test was used to assess changes in knowledge scores due to the normal distribution of the data. Figure 2 displays the graphic comparison between pre-test and post-test scores.

The following findings were acquired through paired t-tests constructed to assess the degree of knowledge before and after the presentation of the information. A significance value of 0.000 was obtained from the paired t-tests with a confidence level of 95%, indicating a notable effect on the changes in knowledge that occurred both before and after the education on noise awareness. The implementation of this community empowerment program can be seen in the figure below:

DISCUSSION

The risk of hearing loss is no longer confined to industrial workers; it can also affect children, teenagers, and young adults due to lifestyle choices that may harm their hearing. Many children and young people risk hearing loss from using their devices at high volumes and for extended periods, placing them close to the eardrum. While parents are generally aware that high noise levels can result in hearing loss, several parents in this program still need to be educated about preventing noise from affecting their child's environment. Most parents are unaware that the maximum suggested duration for listening to music is sixty minutes, with the volume level adjusted to sixty percent. The results of this program indicate that parental involvement is essential for the success of the community empowerment program on noise awareness in Depok, Yogyakarta. This initiative focuses on increasing awareness of noise pollution, enhancing health literacy, and improving parents' ability to prevent hearing loss in their children.

Empowering the community to prevent and control ear diseases is challenging. Changes in behavior concerning childcare practices must be enforced due to the community's declining habits and culture. Typically, factors contributing to noise include the type and level of noise exposure, the risk of age-related hearing loss, and probable degenerative changes in susceptible individuals.[20] The program's results indicated that the average score of participants' knowledge before the program started was 51.6, which increased to 82.9 after the program. This program involved a behavioral intervention focused on strategies for changing behavior. A study by Rama et al. demonstrated that educational programs efficiently enhance knowledge, attitudes, and practices. As the health belief model outlines, improving knowledge about loud noise's dangers and health impacts raises self-perceived severity, susceptibility, and benefits.[21]

Hearing loss often occurs due to prolonged exposure to loud recreational

Figure 3. (a) Delivering information on noise awareness (b) Participants seemed interested in the material provided (c) Discussions about noise awareness (d) Participants filling out post-test questionnaires.

noise, impacting learning. Background noise can interfere with cognitive activities, significantly affecting short-term and long-term memory.[22] Prolonged exposure to loud noise can also affect cognitive function, including memory, attention, and reaction time, even after the noise exposure stops. Noise has a detrimental effect on the ability to understand and perceive speech.[23] Children should be protected from sudden loud noises whenever feasible. It is advisable to use double hearing protection to decrease the risk of hearing loss when anticipating impulse noise.[1]

Following the 60/60 guideline when using earphones is essential to preserve healthy ears and hearing. This means listening at a maximum volume of 60% for no more than 60 minutes, with a break or relaxation of a few minutes. Another critical measure is wearing ear protection in noisy environments, keeping the ears dry to prevent infections, and arranging frequent check-ups with an ear, nose, and throat specialist.

This community empowerment program is limited to utilizing educational methods related to health through PowerPoint presentations. A broader and varied follow-up study can be conducted in the upcoming program to assess the impact of health education on noise awareness among parents of ABA kindergarten students. Future programs can evaluate health education using focus group discussions, demonstrations, movies, or other approaches.

The community empowerment team recommends that all parents understand the importance of protecting children's environment from excessive noise. Furthermore, teachers can help provide a suitable environment and encourage safer listening habits with Personal Listening Devices (PLDs). The government should initiate campaigns to increase public awareness of excessive noise exposure. This involves spreading information to parents, children, and teenagers about the potential risks of Personal Listening Devices (PLDs). Additionally, the government should regulate the standard volume of toys and sleep machines for newborns and children.

CONCLUSION

The community empowerment program implemented at ABA Kentungan Kindergarten has effectively enhanced noise awareness, as demonstrated by the improved scores on the pre-test and post-test questionnaires. The participants of this program understood the methods to protect their children's hearing from excessive noise. We hope that communities will develop an increased awareness of using volume in surrounding areas of infants and children, focusing on age-appropriate risks rather than adult standards.

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CONFLICT OF INTERESTS

All authors declare no conflict of interest.

AUTHOR CONTRIBUTION

The authors confirm contribution to the paper: study conception and design: RF and AM; data collection: RF and AM; analysis and interpretation of results: RF and AM; draft manuscript preparation: RF. All authors reviewed the results and approved the final version of the manuscript.

ETHICAL STATEMENT

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

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