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Results of Hearing and Vision Tests on Preschool Children at Kindergarten in 2022-2024

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ABSTRACT

Hearing and Vision Tests are used to detect early hearing and vision disorders to find abnormalities. The purpose of the study was to determine the description of results of vision and hearing tests in preschool children at Dharma Wiweka Kindergarten in 2022-2024. The type of descriptive research is a cross-sectional design using total sampling technique. The study was conducted in March-May 2025 at Dharma Wiweka Kindergarten. The total of samples was 355. Secondary data collection used a data collection checklist. Data analysis is form frequency distribution and percentage. The results of the study showed that the characteristics the respondents were mostly 5 years old (82.3%), proportion of gender was dominated by boys (54.6%). Preschool children showed the results of the vision examination showed (92.1%) had normal vision, the results of the hearing examination (97.2%) were normal. There is an increasing trend in hearing and visual impairments detected in preschool children. Regular visual and hearing examinations, facilitated by the Denpasar City Health Office, have proven to be useful in detecting sensory disorders in children at an early stage.

Keywords: hearing test, preschool children, vision test

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INTRODUCTION

Growth and development are two distinct but continuous processes. Growth is a measurable change in the body, including height, weight, and head circumference, recorded in a child's growth chart. Development refers to the maturation of bodily organ function (Murtini et al., 2023). The manifestation of a child's growth and development occurs through a complex collaboration between internal and external factors (Khayati et al., 2023). Preschool children experience rapid growth and development, encompassing cognitive, biological, spiritual, and psychosocial development, making education essential for building a foundation and shaping a child's personality, mentality, and character (Widiari et al., 2023).

Growth impacts the physical aspects, while development is related to the maturation of each individual's organ functions (Anggoro, 2022). Child health protection must be carried out comprehensively, comprehensively, and continuously because every child has the right to live, grow, and develop and to be protected from discrimination and violence (Dewi et al., 2022).

Early detection of hearing and vision impairment is crucial for timely intervention, as untreated hearing and vision impairment can have a significant impact on social, emotional and cognitive life (Suh et al., 2023). Normal hearing and vision are crucial because they enable children to receive, process, and respond appropriately to environmental stimuli. Children with good hearing and vision function will find it easier to learn, speak, interact socially, and adapt to their surroundings. Conversely, untreated vision and hearing impairments may lead to developmental delays.

According to the World Health Organization (WHO) on World Hearing Day 2024, more than 80% of global ear and hearing care needs remain unmet. Untreated hearing loss causes annual losses of nearly US$1 trillion globally. Ministry of Health data shows that 3 out of 100 children aged 5 years have hearing loss, meaning approximately 2.6% of children have hearing loss. According to data from the International Agency for the Prevention of Blindness in 2021, 165 million children worldwide are nearsighted. The 2023 Indonesian Health Survey (SKI) data recorded the prevalence of visual impairment in the population aged 1 year and over at 0.6%, while the prevalence of hearing impairment was 0.4%. As many as 0.4% of the population aged 1 year and over in Bali Province experienced hearing and visual

impairment. The 2023 SKI data recorded that 11.7% of the population aged 1 year and over in Indonesia used visual aids, and 4.1% used hearing aids.

The prevalence of blindness in Bali is 1%, with cataract prevalence above the national average. This 1% rate results in approximately 38,914 Balinese people suffering from blindness (JIPPNAS, 2024). Addressing eye health issues in Bali has not been optimally and equitably implemented. Hearing screening data from Sanglah General Hospital in Denpasar in 2018 showed that of 331 patients who underwent hearing screening, 35.6% were diagnosed with hearing loss. Most sufferers were children aged 0-5 years (Dwi Cahya et al., 2021). While definitive data on the prevalence of visual impairment in Bali is not yet available, early detection programs in schools have been implemented to identify vision problems in children. These programs aim to raise parental awareness of the importance of hearing and vision health screenings for children.

Parents must pay attention to children's growth and development from an early age because children are the nation's youth who have the right to proper development. The golden age is a period when children are most in need of stimulation. Children who receive good, sufficient, and age-appropriate stimulation ensure optimal growth and development (Hanifa et al., 2024).

This study was conducted at Dharma Wiweka Kindergarten to evaluate the possibility of developmental delays in preschool children, particularly in the areas of hearing and vision. Preventing developmental delays and growth disorders requires early detection. Therefore, visual acuity tests (TDL) and hearing acuity tests (TDD) are important instruments in identifying problems from an early age. Visual acuity tests and hearing acuity tests are performed on each child to determine these conditions (Mnir et al., 2023). Based on a preliminary study conducted at Dharma Wiweka Kindergarten in 2024, 108 students underwent TDL and TDD examinations conducted by the South Denpasar IV Community Health Center twice a year, in February and August. The test results indicated that two children aged 4-5 years had speech delays, two children aged 5-6 years had speech delays, and one child aged 6-7 years had speech delays.

Developmental disorders in children that are left untreated can have detrimental effects. Children with hearing and vision impairments experience impaired development, such as speech, language, and cognitive development. Children with

hearing and vision impairments can become more emotional, have difficulty expressing themselves verbally, and experience decreased self-confidence. These impairments can impact learning and academic achievement. Obstacles to children's growth and development must be addressed promptly to prevent worsening their condition as adults (Purwati, 2022).

Based on the explanation above, it is necessary to conduct research on the visual and auditory test results for preschool children at Dharma Wiweka Kindergarten in 2022-2024. The purpose of this study is to determine the visual and auditory test results for preschool children at Dharma Wiweka Kindergarten in 2022-2024.

METHOD

This research is a quantitative study using descriptive methods and a cross-sectional research design. This research was conducted at Dharma Wiweka Kindergarten from March 20 to April 21, 2025. The population in this study was all preschool children at Dharma Wiweka Kindergarten in 2022-2024, totaling 450 children. The sample of this study was every preschool child aged 5-6 years at Dharma Wiweka Kindergarten in 2022-2024. The total sample size was 355 samples. This study used non-probability sampling with a total sampling technique. In this study, only one single variable was used, so descriptive statistical analysis was used, namely frequency distribution and percentage. Data collection was carried out using secondary data, namely document observations of preschool children in 2022-2024. Observations were made on the results of hearing and vision screening tests in preschool children in 2022-2024. The research instrument used was secondary data obtained from the results of hearing and vision screening tests on preschool children aged 5-6 years in 2022-2024, which were then recorded on a data collection checklist.

RESULTS AND *DISCUSSIONS*

Result

The subjects of this study were all preschool children who underwent hearing and vision tests at Dharma Wiweka Kindergarten between 2022 and 2024. The researchers obtained 355 samples from the Denpasar City Health Office. The sample size, based on characteristics, is shown in the following table.

Table 1. Respondent Characteristics Based on Age and Gender of Preschool Children at Dharma Wiweka Kindergarten in 2022-2024

Characteristics	Frequency (f)	Percentage (%)
Preschool Age Children		
5 years	292	82,3
6 years	63	17,7
Gender		
Boy	194	54,6
Girl	161	45,4
Total	355	100

Source: secondary data 2025

Based on the research results, the characteristics of the respondents were that most of the children were aged 5 years (292 people) (82.3%) and a small number were aged 6 years (63 people) (17.7%), with the proportion of gender dominated by boys (194 people) (54.6%) compared to girls (161 people) (45.4%).

Univariate Analysis

Based on the research results, a sample was considered normal if the child was able to follow the instructions from the three questions posed by the examiner. If the child was unable or unwilling to follow one or more of the three questions, it indicated a possible hearing impairment.

Table 2. Frequency Distribution of Hearing Test Results in Preschool Children at Dharma Wiweka Kindergarten in 2022-2024

Year	Normal		There is hearing loss		Total	
	n	%	n	%	n	%
2022	112	98,2	2	1,8	114	100
2023	115	97,5	3	2,5	118	100
2024	118	95,9	5	4,1	123	100
Total	345	97,2	10	2,8	355	100

Source: secondary data 2025

Based on the results of the 2022 study, the results of the hearing examination showed that 112 children (98.2%) had normal hearing, and only 2 children (1.8%) had hearing loss. The results of the 2023 study showed that 115 children (97.5%) had normal hearing, and only 3 children (2.5%) had hearing loss. In 2024, the results of the hearing examination showed that 118 children (95.9%) had normal hearing, and only 5 children (4.1%) had hearing loss. The results of the hearing examination in 2022-2024 showed that 345 children (97.2%) had normal hearing, and only 10 children (2.8%) had hearing loss.

Based on the research results, the sample is said to be normal if the child is able to see the letters from the first line to the third line on the “E” poster and the child can adjust the direction of the “E” card held according to the direction of “E” to the third line pointed by the examiner. If the child is unable to observe up to the

third line on the "E" poster or is unable to adjust the direction of the "E" card held according to the direction of "E" to the third line pointed by the examiner, it means that the child has the possibility of having a disturbance in his or her visual ability.

Table 3. Frequency Distribution of Visual Power in Preschool Children at Dharma Wiweka Kindergarten in 2022-2024

Year	Normal		There is visual impairment		Total	
	n	%	n	%	n	%
2022	105	92,1	9	7,9	114	100
2023	111	94,1	7	5,9	118	100
2024	111	90,2	12	9,8	123	100
Total	327	97,2	28	7,9	355	100

Source: secondary data 2025

Based on the results of the 2022 study, the results of the visual examination showed that 105 children (92.1%) had normal vision, and 9 children (7.9%) showed visual impairment. The results of the 2023 study showed that the results of the visual examination showed that 111 children (94.1%) had normal vision, and 7 children (5.9%) showed visual impairment. The results of the visual examination in 2024 showed that 111 children (90.2%) had normal vision, and 12 children (9.8%) showed visual impairment. The results of the visual examination in 2022-2024 showed that 327 children (92.1%) had normal vision, and 28 children (7.9%) showed visual impairment.

Discussion

1. **Hearing Test Results for Preschool Children at Dharma Wiweka Kindergarten in 2022-2024**

The results of the 2022-2024 hearing test showed that almost all respondents, 345 children (97.2%), had normal hearing. Only 10 children (2.8%) had hearing loss. In 2022, the annual review showed that 112 children (98.2%) had normal hearing, while 2 children (1.8%) had hearing loss. In 2023, there was a slight increase in the number of children with hearing loss, with 3 children (2.5%) out of 118 children, while 115 children (97.5%) were in the normal category. In 2024, there was another increase, with 5 children (4.1%) of the 123 children screened showing hearing loss. These data indicate that, although the percentage of children with normal hearing continues to increase each year, there is a year-over-year upward trend in the number of cases of hearing loss. This demonstrates the importance of regular hearing screening for early detection of hearing loss in preschool-aged children.

Hearing screening results indicate whether a child's hearing is normal or shows signs of impairment. This screening is

performed as an early detection tool to determine whether a child has hearing problems that could impact language development, speech, and learning abilities (Suh et al., 2023). Various factors, such as a child's stable health, no history of ear infections, good genetics, and parental support for verbal stimulation at home, can influence a child's normal hearing percentage.

Although the proportion of children with normal hearing remains very high, the increasing number of children with hearing loss is a growing concern. Various factors, including the child's environment, parenting styles, the child's own health, and parental support for verbal stimulation at home, can influence this increase. Increased exposure to environmental noise, both at home and at school, can impact a child's hearing health. According to the World Health Organization (WHO), the causes of hearing loss or deafness are congenital (hereditary factors) or acquired, appearing after birth or during pregnancy, perinatally, or postnatally, including in infants cared for in the NICU (Nugraha et al., 2022 in Yuliyani et al., 2024). Early detection and intervention are crucial in minimizing the effects of hearing loss on a child's development and educational attainment. Hearing loss in children can occur due to infections (Toxoplasma, Rubella, Cytomegalovirus, Syphilis, Herpes simplex, HIV, Mumps, Measles, Lyme disease, bacterial meningitis), secondary trauma (noise-related, ototoxic substances, head trauma), and anomalies in the structure of the middle and inner ear (Nugraha et al., 2022). Schools' awareness of conducting annual hearing screenings is commendable. This is because consistent early detection allows for rapid and appropriate follow-up. This data can also serve as a basis for schools and parents to pay more attention to children's ear health and the importance of a noise-free learning environment.

According to Yuliyani et al., 2024, the earlier a child's hearing loss is detected, the sooner hearing habilitation efforts can be carried out so that the child is able to respond to sounds and communicate and is able to achieve the same level of language ability as his/her peers.

Hearing screenings are useful for assessing a child's physical abilities and determining their readiness for formal education. Children who lack optimal hearing ability will struggle to follow teacher instructions, interact with peers, and may even experience communication misunderstandings. Therefore, the year-over-year increase in cases is an important reminder to strengthen systems to

promptly detect sensory impairments in early childhood.

The study conducted by (Norlita and Rizky, 2022) found that all parents should be aware of and pay attention to their child's development, starting with cognitive development, speech, language, thinking, learning, and creativity. According to Rahardjo (2012) in (Mnir et al., 2023), parental knowledge of child development significantly influences their ability to support their child's development.

According to Sukadi (2008) in (Novitasari & Fauziddin, 2021), auditory development is a type of cognitive development, where hearing ability is closely related to the sense of hearing and sound. Children primarily use auditory cognitive abilities for learning activities. In other words, children can easily receive stimuli through their auditory senses, commonly referred to as ears. Their ability to hear is influenced by auditory abilities.

The importance of early detection of hearing loss is also emphasized by the World Health Organization (WHO, 2025) which recommends that hearing screenings be conducted regularly during childhood, especially in school settings, to prevent long-term impacts. Regular hearing screening programs, such as those implemented at Dharma Wiweka Kindergarten in collaboration with the Denpasar City Health Office, are a strategic step in supporting children's holistic growth and development. Although the prevalence of hearing loss in this study was relatively low, attention is still needed to address children who exhibit signs of hearing loss. They should receive follow-up examinations by a healthcare professional (ENT doctor or audiologist) to confirm the diagnosis and receive appropriate interventions, such as speech therapy or hearing aids, if necessary.

The active involvement of parents and teachers in recognizing early signs of hearing loss is also crucial. Changes in a child's behavior in class, such as not responding to calls, having difficulty following instructions, or frequently asking for repetition, can be strategically identified by teachers. Conversely, parents should pay attention to signs of slower speech development compared to their peers, such as not responding to loud sounds or not reacting when called.

Thus, the results of this study indicate that early hearing detection programs significantly contribute to optimizing child growth and development and need to be continued and expanded, especially for preschool-aged children in other areas. With routine hearing screenings, such as

those conducted at Dharma Wiweka Kindergarten in collaboration with the Denpasar City Health Office, children with potential hearing loss can be identified early. This step is an effective preventive measure to ensure the quality of children's overall growth and development.

2. Visual Acuity Test Results for Preschool Children at Dharma Wiweka Kindergarten 2022-2024

The analysis results showed that the majority of preschool children had normal vision, a total of 327 (92.1%). Meanwhile, 28 children (7.9%) showed visual impairment. Looking at the results annually, in 2022, 9 children (7.9%) out of 114 respondents experienced visual impairment. In 2023, there was a slight improvement, with only 7 children (5.9%) out of 118 experiencing impairments. However, in 2024, a significant increase was found, with 12 children (9.8%) out of 123 respondents experiencing visual impairment. This increase in the last year can be attributed to various factors, such as increased gadget use among early childhood students, suboptimal lighting during home learning, and a lack of regular eye examinations.

Although data generally shows a rise in the proportion of children with normal vision over the years and a predominance of children with visual impairments, this should not be taken lightly. This increase in cases indicates that children's visual behavior at home and at school requires greater attention. It is crucial for parents to actively monitor their children's screen use habits and recognize early signs of visual impairment, such as squinting when viewing distant objects, frequent rubbing, or bringing their face closer to a book or screen. More serious complications such as amblyopia or lazy eye can be prevented with early detection and intervention (Saiyang et al., 2021). Visual impairments can potentially impact children's growth and development, particularly in cognitive aspects, fine motor skills, and learning readiness.

Visual impairment in preschool children can impact delayed cognitive development and academic abilities later in life. Therefore, early detection of visual impairment is crucial and should be conducted regularly. Visual acuity can be affected by the use of digital devices, genetic conditions, and lack of outdoor activity (Cahyaningrum Gyta et al., 2024). Furthermore, poor lighting design can cause visual impairment or fatigue (Puspitasari et al., 2021).

Children with visual impairments should not be ignored, even though the majority of children have age-appropriate vision. Learning, fine motor development, social

skills, and self-confidence can be affected by visual impairments in preschool children. If visual impairments are not addressed promptly, they can develop into more serious conditions, where the brain ignores signals from the affected eye due to lack of early intervention. Children with visual impairments may have difficulty following visual instructions, recognizing objects, or observing the blackboard, which can impact their ability to learn and participate in group activities (Novitasari & Fauziddin, 2021). Consequently, children identified should be referred to an eye health facility for additional examinations and possible treatment, such as corrective eyewear.

One-way schools can help reduce the risk of visual impairment in students is by educating them about eye health. Increasing parents' and teachers' knowledge about how to maintain eye health and prevent eye problems early on by adopting a healthy lifestyle, using digital devices cautiously, and implementing routines that support eye health is crucial for enhancing eye health education programs. Another factor that contributes to vision development is the increased outdoor exercise among young children (Cahyaningrum Gyta et al., 2024). Proper lighting, ergonomics, and classroom lighting contribute to eye health (Kartini et al., 2021).

Visual ability in preschool is a crucial aspect in supporting children's exploration and learning processes. Early childhood relies heavily on their sense of sight to recognize shapes, colors, and letters, and coordinate movement. If visual impairments are not detected and treated early, children are at risk of experiencing delays in language development, reading difficulties, and difficulties interacting socially in the school environment. Delays in letter recognition, reading, writing, and understanding lessons can occur if visual impairments are not promptly addressed. These children's inability to respond appropriately to visual stimuli can lead to a loss of self-confidence, which can ultimately hinder social interaction and academic achievement (Kristanto & Diyono, 2023).

According to (Hamid et al., 2025), the quality of preschool children's vision is crucial to supporting their learning and quality of life. Quality vision is crucial for children, especially very young children. A child's learning ability is significantly affected by impaired vision caused by refractive errors.

Parents and teachers are crucial to paying attention to their children's visual behavior both at home and at school. If there are

early signs of vision problems, such as frequent squinting, tilting the head when looking, or bringing the face closer to books and screens, an eye examination should be performed immediately. Parents and teachers should be more educated about eye health so they can create a positive home environment. Routine visual screenings in schools, such as those conducted at Dharma Wiweka Kindergarten in collaboration with the Denpasar City Health Office, are a very appropriate preventative measure. These regular examinations are expected not only to detect vision problems early but also to serve as the basis for follow-up, such as referrals to eye health services or adjustments in the child's learning.

CONCLUSION

According to the results of a study conducted on preschool children at Dharma Wiweka Kindergarten in 2022-2024, it can be concluded that most preschool children at Dharma Wiweka Kindergarten have normal hearing. There was a trend of increasing hearing impairment detected in preschool children at Dharma Wiweka Kindergarten from 2022-2024. These results indicate that the hearing screening program is effective in detecting sensorineural hearing impairments at an early stage. Most preschool children have normal vision. There was a trend of increasing visual impairment detected in preschool children at Dharma Wiweka Kindergarten from 2022-2024. This indicates that the majority of children have good visual function, but some may experience developmental delays due to visual impairments that have not been clinically detected.

Children who receive abnormal test results must inform their parents to encourage referral to a health facility. Parents should immediately seek further examination at a health facility if they suspect their child is exhibiting any signs of visual or hearing impairment. Parents should also reduce the use of electronic devices and increase outdoor activities that support the child's visual and auditory development. Teachers should always supervise children with visual or hearing impairments during the learning process.

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