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Application of the family-centered nursing theory in the education of children with hearing impairments: an analysis of the relationship between parental support and academic achievement

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Abstract

Background: Children with special needs possess intellectual potential comparable to that of typically developing peers; however, they often face challenges related to communication, social adaptation, and learning that necessitate structured family and educational support. Within this context, family engagement plays a crucial role in fostering academic and psychosocial development, especially for children with hearing impairments who require inclusive learning environments.

Purpose: to explore the application of the Family-Centered Nursing theory in the educational setting of children with hearing impairments, specifically analyzing the relationship between parental support and academic achievement.

Method: A quantitative cross-sectional correlational design was employed involving 44 parents of children with hearing impairments enrolled at the Special School (SLB) in Bojonegoro City, Indonesia. Data was obtained using a validated 22-item parental support questionnaire (Cronbach's $\alpha = 0.929$) and students' report card scores as indicators of academic performance. Statistical analysis was conducted using the Spearman's rho correlation test.

Results: The findings demonstrated a strong and positive correlation between parental support and academic achievement (Spearman's $\rho = 0.870$, $p < 0.05$). Higher levels of emotional, informational, appraisal, and instrumental support were significantly associated with better academic performance, with emotional support emerging as the most influential factor enhancing motivation and learning engagement among children.

Conclusion: The study highlights the theoretical and practical significance of the Family-Centered Nursing approach beyond healthcare contexts, emphasizing its relevance in promoting inclusive education for children with disabilities. The results underscore the need for family-based educational interventions and interdisciplinary collaboration among nurses, educators, and policymakers to strengthen parental involvement and improve academic outcomes for children with hearing impairments.

Keywords: Academic Achievement; Children with Hearing Impairments; Family-Centered Nursing; Inclusive Education; Parental Support.

INTRODUCTION

Inclusive education is a fundamental pillar of modern human development, including in Indonesia, as it aims to provide equal learning opportunities for all children, both those without disabilities and those with

special educational needs (SEN) (Bendijo, Pinili, Mangubat, Calasang, & Calasang, 2025; Guo & Keles, 2025; Liu, Tomek, & Feng, 2025; Mantey, 2020). For children with hearing impairments, education functions

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not only as a medium of knowledge transfer but also as a means of social adaptation and communication that fosters independence and self-confidence (Mahmutović & Povlakić Hadžiefendić, 2020; Parveen, Kashif, & Abbas, 2023). Several previous studies emphasize that the academic success of children with hearing impairments is highly dependent on family support, particularly from parents as primary caregivers (Aftab, Ashfaq, & Ali, 2022; Mahmutović & Povlakić Hadžiefendić, 2020; Parveen et al., 2023). This support encompasses emotional, informational, and instrumental dimensions that enable children to adapt to learning environments that differ from those of children without disabilities (Aftab et al., 2022; Parveen et al., 2023). The *Family-Centered Nursing* theory asserts that the family functions as the primary system of child rearing and development, serving as a vital source of emotional, informational, and physical support for children's growth (Friedman, Bowden, & Jones, 2003). Therefore, family support is a central factor in improving the educational quality of children with hearing impairments, both in special schools (SLB) and within inclusive education systems Smith, Swallow, & Coyne, 2015; Vanderkerken et al., 2019).

Although numerous studies have explored the relationship between family support and the academic achievement of children with special needs, theoretical and contextual gaps remain concerning how parental support specifically influences children with hearing impairments in Indonesia (Koch, Kozhumam, Seeler, Docherty, & Brandon, 2021). Most previous research has discussed family support in general terms, without integrating a strong theoretical framework such as *Family-Centered Nursing*, which positions the family as a multidimensional center of support for child well-being (Zia, Aghamohammadi, Moshfeghi, & Vosoghi, 2025). Moreover, earlier studies have tended to focus on children with special needs in general rather than specifically addressing children with hearing impairments, who possess unique communication and learning characteristics (Bendijo et al., 2025; Guo & Keles, 2025; Liu, Tomek, & Feng, 2025; Mantey, 2020). Contextual factors such as social, economic, and cultural conditions across different regions of Indonesia are also often overlooked, even though these factors

may influence the form and intensity of family support for children (Musengamana, 2023).

RESEARCH METHOD

This study employed a quantitative approach with a cross-sectional correlational design, aimed at identifying the relationship between two main variables: parental support as the independent variable and the academic achievement of children with hearing impairments as the dependent variable. This design was chosen because it allows researchers to observe phenomena at a single point in time and analyze correlations between variables without manipulating participants' conditions. The correlational approach is relevant for explaining associative empirical relationships, providing insight into the extent to which parental support contributes to the academic performance of children with hearing impairments.

The population of this study consisted of all parents who had children with hearing impairments enrolled in Special Schools (Sekolah Luar Biasa, SLB) in Bojonegoro City during the 2023/2024 academic year, totaling 49 individuals. The sample included 44 respondents selected using a simple random sampling technique, ensuring that each member of the population had an equal chance of being selected. Inclusion criteria were established to ensure that respondents were relevant to the study's objectives, including (1) parents living in the same household as the child, (2) parents of children diagnosed with mild to severe hearing impairments, and (3) parents willing to provide written informed consent to participate. Exclusion criteria included parents who were not actively involved in their child's educational activities or were unable to complete the questionnaire independently.

The data collection instruments consisted of two parts. The first part was a parental support questionnaire developed based on the Family-Centered Nursing theory and relevant literature on family involvement in the education of children with special needs. The questionnaire contained 22 items assessing the emotional, informational, appraisal, and instrumental aspects of support. Validity testing was conducted on all 22 items, with 20 declared valid (r -calculated > r -table), while reliability testing yielded a

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Cronbach's alpha of 0.929, indicating very high internal consistency. The second part consisted of documentation of the children's report card grades, used as indicators of academic achievement.

Data collection was conducted between March 5 and June 28, 2024. After obtaining research permission and ethical clearance from the Health Research Ethics Committee (No. 035/KEPK/VI/2024), the researcher provided explanations to the school administration and parents regarding the purpose and benefits of the study. Questionnaires were distributed directly to eligible respondents and completed independently under the researcher's supervision. Academic achievement data were subsequently obtained in collaboration with the school, with all student identities kept confidential.

Collected data were analyzed descriptively and inferentially using statistical software. Descriptive analysis was conducted to describe respondent characteristics and the distribution of parental support and children's academic achievement. Inferential

analysis employed Spearman's rho correlation test, as both variables were ordinal and did not meet the normality assumption. The correlation coefficient (r) was used to determine the direction and strength of the relationship between parental support and academic achievement, while the significance value (p) was used to test the hypothesis at a 95% confidence level ($\alpha = 0.05$). The results of this analysis served as the basis for concluding the empirical relationship between the two variables.

This study adhered to ethical research principles, including respect for people, beneficence, and justice. Each participant received a full explanation of the research objectives and their right to withdraw at any time without consequence. All data collected was kept confidential and used solely for academic purposes. Thus, this study not only fulfilled methodological standards but also upheld ethical responsibility toward research participants.

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RESESEARCH RESULTS

Table 1. Characteristics of respondents (N=44)

Variable	Results
Parent	
Age (year)	
21-30	6/13.0
31-40	29/66.0
41-50	5/11.0
51-60	3/7.0
>60	1/3.0
Gender (n/%)	
Female	36/82.0
Male	8/18.0
Education level(n/%)	
Primary education	15/34.0
Secondary education	23/53.0
Higher education	6/13.0
Occupation (n/%)	
Housewives	21/48.0
Private sector employee	5/11.0
Entrepreneurs	7/16.0
Government employee	3/7.0
Farmers	6/14.0
Trading field	1/2.0
Healthcare providers	1/2.0
Children	
Age (year)	
6-7	10/23.0
8	9/20.0
9	2/5.0
10	8/18.0
11	7/16.0
12	8/18.0
Gender (n/%)	
Male	16/36.0
Female	28/64.0
Use of Hearing Aids (n/%)	

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Yes	19/43.0
No	25/57.0
Parental Support (n/%)	
Low	3/7.0
Moderate	27/61.0
High	14/32.0
Academic Achievements (n/%)	
≤ 75	2/5.0
76-85	27/61.0
86-100	15/34.0

Based on Table 1, the characteristics of the respondents indicate that the majority of parents were female (82%), while male respondents accounted for only 18%. Most respondents were aged 31–40 years (66%), followed by those aged 41–50 years (11%). In terms of education, 53% of parents completed secondary education (equivalent to high school), 34% had primary education, and 13% held higher education degrees. Regarding occupation, housewives represented the largest group (48%), followed by entrepreneurs (16%) and farmers (14%). Most children involved in the study were female (64%) and aged between six and seven years. Approximately 43% of the children used hearing aids, while 57% did not. An overview of the parental support variable reveals that most respondents were categorized as providing a “moderate” level of support (61%), while 32% fell into the “high” category, and only 7% were classified as “low.” These findings suggest that parental support for children with hearing impairments at SLB Bojonegoro was relatively positive, though improvements are still needed, particularly in the dimensions of appreciation and informational support.

Meanwhile, the academic achievement variable shows that 61% of children achieved a “moderate” performance level (report card scores of 76–85), 34% achieved a “high” level (86–100), and 5% were categorized as “low” (≤75). These results indicate that most children with hearing impairments were able to achieve satisfactory academic outcomes, especially when supported by their families and a conducive learning environment.

Table 2. Inferential Analysis with Spearman's Rho

Variable		Parental support	Academic achievement
Parental support	Correlation Coefficient	1.000	0.870**
	Sig. (2-tailed)	.	0.000
	N	44	44
Academic achievement	Correlation Coefficient	0.870**	1.000
	Sig. (2-tailed)	0.000	.
	N	44	44

**Correlation is significant at the 0.01 level (2-tailed).

Inferential analysis was conducted to test the hypothesis regarding the relationship between parental support and the academic achievement of children with

hearing impairments (Table 3). The Spearman's rho correlation test was used because both variables were measured on an ordinal scale and the data were not

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normally distributed. The test results showed a correlation coefficient of $r = 0.870$ with a significant value of $p = 0.000$ ($p < 0.05$). This high and positive coefficient indicates a very strong and statistically significant relationship between parental support and children's academic achievement. Thus, the research hypothesis was accepted, meaning that the higher the level of parental support, the better the academic performance of children with hearing impairments.

Additional descriptive findings suggest that children using hearing aids tended to achieve higher academic performance than those who did not, although this variable was not analyzed inferentially. Furthermore, emotional and appraisal support from parents appeared to be the most dominant factors influencing children's motivation and academic outcomes, while informational support, such as at-home tutoring or communication with teachers, remained relatively limited.

Overall, the results of this study emphasize the critical role of family support in the educational success of children with hearing impairments. The strong correlation between parental support and academic achievement demonstrates that the family's role extends beyond mere assistance, it forms the foundational basis for fostering academic and social success. These findings also provide empirical evidence supporting the development of more comprehensive family-based intervention programs within special education settings.

DISCUSSION

The results of this study demonstrate a very strong positive relationship between parental support and the academic achievement of children with hearing impairments at the Special School (SLB) in Bojonegoro City. The Spearman's rho correlation coefficient of 0.870 with a significance level of $p = 0.000$ indicates that the higher the level of parental support, the greater the child's academic achievement. This finding reinforces the Family-Centered Nursing theory, which emphasizes the family as the primary system supporting a child's development emotionally, socially, and academically (Friedman et al., 2003). In the context of children with hearing impairments, family support becomes even more critical as these children face challenges in

communication and comprehension within the learning environment (Davenport, Smolen, Castellanos, Dirks, & Houston, 2024). Thus, positive interaction, emotional encouragement, and parental involvement in the educational process have a direct impact on children's learning motivation and academic performance (Davenport et al., 2024; Dirks & Szarkowski, 2022).

This finding aligns with prior studies indicating that emotional support and active parental involvement are positively correlated with motivation, curiosity, and achievement among children with hearing impairments (Mahmutović & Povelakić Hadžiefendić, 2020; Parveen et al., 2023). Similarly, other research has confirmed that parental attention and appreciation significantly contribute to the academic achievement of hearing-impaired children (Adeniyi & Lawal, 2019). In this study, parental support encompasses four key dimensions: emotional, informational, appraisal, and instrumental support (Friedman et al., 2003). Among these dimensions, emotional support appears to have the most substantial influence on academic achievement, as evidenced by the high prevalence of parental engagement in this domain. Emotional support functions through several mechanisms. First, emotional encouragement enhances learning motivation and interest among children with hearing impairments (Aftab et al., 2022; Parveen, 2023). Second, it contributes to the development of children's academic self-concept (Ghezelseflo & Nekoumanesh, 2024). Third, emotional support fosters better socio-emotional adjustment in school. Children who receive strong emotional support from their parents tend to exhibit improved social-emotional adaptation, which contributes to problem-solving abilities and overall academic performance (Continisio, D'Errico, Toscano, Maldonato, De Falco, Nunziata, & Malesci, 2023).

The findings also provide empirical evidence that instrumental support—such as the provision of hearing aids and adequate learning resources—significantly influences academic achievement among children with hearing impairments. Previous research has demonstrated that hearing-impaired children who use hearing aids tend to show better language, reading, writing, and numeracy skills compared to those who do not (Chimowa, Nkowan, & Sapala, 2024; Choudhry,

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Noor, Shahid, Mukhtar, Zahra, & Butt, 2021; Hung, Ho, Chen, Tsai, Li, & Lin, 2024; Saqulain et al., 2024; Tomblin, Oleson, Ambrose, Walker, McCreery, & Moeller, 2020). The use of hearing aids enhances auditory perception, which plays a vital role in spoken language development, an essential factor mediating academic success (Edquist, Flynn, & Jennische, 2022; Hung et al., 2024; Tomblin et al., 2020). This result is consistent with the findings of Fadillah et al. (2020), who stated that the availability of material resources and familial financial support contribute to improved participation and academic success among children. Therefore, family support should not be viewed solely from the emotional perspective but must also encompass practical dimensions that directly address children's learning needs (Bell & Foiret, 2020; Lala, Ogunwale, & Ojo, 2022; Su, Guthridge, He, Howard, & Leach, 2020).

Despite the significant correlation between parental support and academic achievement, this study has several limitations. First, the cross-sectional design restricts the ability to infer causality. Second, the study did not control other potential influencing factors such as socio-economic status, teaching quality, or children's psychological conditions, which may also affect learning outcomes. Third, the relatively small sample size and the focus on a single geographic area (Bojonegoro City) limit the generalizability of the findings. Therefore, future research should employ longitudinal or multivariate analytical models to achieve a more comprehensive understanding of the factors influencing academic achievement among children with hearing impairments.

Theoretically, this study extends the application of the Family-Centered Nursing theory to the field of special education by demonstrating that the family's role extends beyond the healthcare context and has a substantial impact on children's educational outcomes. Practically, the findings underscore the importance of interdisciplinary collaboration among healthcare professionals, educators, and schools in supporting the development of children with hearing impairments. Implementing a family-based approach can be realized through parental training programs, family counseling, and the provision of inclusive learning facilities. Strengthening family support through integrated

educational and health policies provides hearing-impaired children with greater opportunities to achieve optimal academic performance while promoting social and emotional development within inclusive environments.

CONCLUSION

This study demonstrates a strong positive relationship between parental support and the academic achievement of children with hearing impairments, as evidenced by a statistically significant correlation coefficient. Emotional, informational, appraisal, and instrumental support provided by families play crucial roles in shaping children's learning motivation and independence, with emotional support emerging as the most influential dimension. These findings affirm the relevance of the *Family-Centered Nursing* theory within the context of special education, extending its application beyond healthcare by positioning the family as a central component in child development and academic success. Practically, the study highlights the need for family-based inclusive education programs and policies that foster collaboration among educators, healthcare professionals, and policymakers. The scientific contribution of this research lies in providing local empirical evidence on the role of family support in the educational attainment of children with special needs a topic that remains underexplored in Indonesia. Future studies are recommended to employ longitudinal or multivariate approaches to explore causal relationships and mediating factors such as school support, socio-economic status, and the use of assistive learning technologies.

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