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Utilization of the Sisfor-Bidanku Application for Early Detection of Child Development

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Abstract

Background: The World Health Organization reports that 5–25% of preschool children experience minor brain dysfunction, including impaired fine motor development. Achieving the 2030 Sustainable Development Goals (SDGs) emphasizes "nurturing care" to support early childhood development, as developmental deviations remain a leading cause of morbidity. **Objective:** This study aimed to evaluate the effectiveness of the Sisfor-Bidanku application in the early detection of child development. **Method:** A pretest–posttest design was conducted at Integrated Health Service Posts (Posyandu) in the Campalagian Polewali Mandar Community Health Center area during August–September 2019. Using purposive sampling, 20 midwives were recruited and trained to apply the Sisfor-Bidanku application in child development screening. Data were collected using questionnaires comparing the ease of use between the application and conventional media. Statistical analysis was performed with the Mann–Whitney test. **Results:** Twelve midwives (60%) reported that the Sisfor-Bidanku application was easier to use compared to only five midwives (25%) using conventional methods. However, the Mann–Whitney test showed no significant difference between the two media (p = 0.080). **Conclusion:** Although no statistically significant difference was found, more midwives perceived the Sisfor-Bidanku application as easier to use, suggesting its potential as a supportive tool for early detection of child development.

Keywords: Child Development, Early Detection, Midwives, Sisfor-Bidanku Application.

1. Introduction

Worldwide, approximately 200 million children under 5 years of age fail to achieve cognitive and social-emotional developmental milestones. The World Health Organization (WHO) reports that 5–25% of preschool-aged children suffer from minor brain dysfunction, including impaired fine motor development. Motor developmental delays are reported to reach 15% in the United States, 50% in Asia, and 30% in Africa. Global efforts have shifted their focus to the 2030 Sustainable Development Goals (SDGs), which highlight the importance of "Nurturing Care" in promoting early childhood development, since developmental delays remain one of the leading causes of morbidity and long-term disability in children.

Children under 2 years of age experience rapid brain development, and this period is critical because it occurs only once in a child's life. Approximately 100 billion brain cells are ready to be stimulated, enabling intelligence to develop. Infancy is a crucial period in child development, as it determines subsequent growth and lays the foundation for overall development. Motor development is particularly important to monitor because many aspects of cognitive development are rooted in successful motor progress. At this stage, nerve fibers grow and brain cells develop, forming complex brain and nerve networks. According to Hurlock, children who experience delays in motor skills are at risk of behavioral and emotional problems, which may disrupt the development of their self-concept. Empirical evidence shows that delays in gross motor development occur in approximately 30% of children aged 12–17 months, making it a common problem that requires attention (Handayani et al., 2017; Kharisma Kusumaningtyas, 2016; Sugeng et al., 2019).

The risk of developmental delays increases significantly due to a number of factors, including stimulation, education, employment, biological factors, psychosocial conditions, nutrition, and income. Developmental disorders can alter brain function and structure, affect behavior, and result in children becoming less creative, with potentially severe and permanent consequences. Therefore, screening tools are needed to identify children at risk and subsequently provide appropriate stimulation at each stage of development. Early intervention through timely screening is essential to minimize the adverse impact of developmental delays. According to the 2016 guidelines of the Indonesian Ministry of Health, early detection of child development can be carried out at the primary health care level, particularly in integrated health posts (Posyandu), using the Pre-Screening Development Questionnaire (KPSP), Hearing Test (TDD), and Vision Test (TDL) (Cardoso et al., 2014; Karusdianti & Tatang, 2018; Zhang et al., 2018).

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In today's modern world, particularly in healthcare, increasing efficiency and effectiveness requires the integration of technological innovations. One promising approach is the use of digital and web-based applications to support health services, including child development monitoring. Previous studies have demonstrated the potential of technology through the development of a web-based expert system for diagnosing hyperactive disorder in children using the Naive Bayes method, an Android-based expert system for detecting ADHD behaviors in children, and web-based as well as mobile stress management interventions for employees (Ervinaeni et al., 2019; Heber et al., 2016; Muhammad Alkaff, Husnul Khatimi, Yuslena Sari, Puja Darmawan, 2019).

2. Materials and Methods

This research was conducted at the Integrated Health Service Post (Posyandu) under the Campalagian Community Health Center (Puskesmas), Polewali Mandar Regency, West Sulawesi, from August to September 2019. The study population included all midwives working at the Community Health Center and affiliated village midwives, as well as children visiting the Posyandu within the study period. The sample consisted of 20 midwives selected using a purposive sampling technique, based on predetermined inclusion criteria. In addition, 20 children who attended the Posyandu were involved in the early detection process using the application. The intervention was carried out by providing training to midwives on the use of the Sisfor-Bidanku application for early detection of child development. After training, the midwives implemented the application during Posyandu activities.

The research instruments consisted of the Sisfor-Bidanku application, which served as a medium for detecting child development, and a structured questionnaire, designed to assess midwives' perceptions and experiences in using the application compared to conventional methods. Data were analyzed using the Mann–Whitney U test to compare ordinal responses between application-based and conventional approaches.

3. Results

Table 1 Characteristics of Midwives

Characteristics	Frequency	%
Age		
≤ 35 Year	16	80
>35 Year	4	20
length of working		
≤ 5 Year	9	45
> 5 Year	11	55
Education		
D3	17	85
D4	3	15
Jumlah	**20**	**100**

Table 1 shows that the majority of midwives (80%) are aged ≤35 years, while only 20% are older than 35 years. In terms of work experience, more than half of the respondents (55%) have been working for more than 5 years, whereas 45% have less than 5 years of experience. Regarding education, most midwives (85%) hold a Diploma III (D3) degree, and only 15% hold a Diploma IV (D4) degree. These findings indicate that the study participants are generally young, with relatively long working experience, and predominantly educated at the D3 level.

Table 2 Descriptive Use of Application Media in Detecting Child Development

Development Detection	Application Media Usage			
	less easy	quite easy	easier	
	N (%)	N (%)	N (%)	***P***
Konvensional	3 (15)	12(60)	5 (25)	*0.080
Sisfor-Bidanku	3(15)	5(25)	12 (60)	

*Uji Mann Whitney

Table 2 shows the distribution of midwives' perceptions regarding the ease of use of application media in detecting child development. For conventional methods, most respondents (60%) considered them "quite easy," 25% found them "easier," and 15% "less easy." In contrast, when using the Sisfor-Bidanku application, the majority of midwives (60%) rated it as "easier," 25% as "quite easy," and 15% as "less easy." Statistical analysis with the Mann–Whitney test produced a p-value of 0.080,

indicating no significant difference between conventional methods and the Sisfor-Bidanku application. However, descriptively, more midwives reported that the Sisfor-Bidanku application was easier to use compared to conventional media.

4. Discussion

The Sisfor-Bidanku application is an information system designed to assist midwives in the Early Detection and Intervention Stimulation for Child Growth and Development (SDIDTK) program. Its development is based on the 2016 Guidelines for the Implementation of Early Detection and Intervention Stimulation for Toddler Growth and Development and Minister of Health Regulation No. 28 of 2017, which grants midwives the authority to detect child development using the Pre-Screening Development Questionnaire (KPSP). Prior to its use, the application was validated through construct and black-box testing involving pediatricians, coordinating midwives, and technology experts, with results showing no errors in system functionality.

The characteristics of respondents in this study showed that most midwives were relatively young (≤35 years, 80%) but had adequate professional experience, with more than half working for over five years (55%). In terms of education, the majority (85%) held a Diploma III qualification. These findings suggest that the respondents represent a workforce with sufficient practical experience but with predominantly mid-level formal education. This demographic profile may influence perceptions and adaptability toward new health service technologies such as the Sisfor-Bidanku application.

In practice, early detection of child development often faces barriers, particularly the reliance on paper-based KPSP formats. The conventional system requires handling multiple sheets of paper, making documentation and reporting burdensome for health workers. The Sisfor-Bidanku application addresses these challenges by digitizing the process, providing age-specific KPSP tools, and making them accessible via mobile devices connected to the internet. This reduces administrative burdens and enhances the efficiency of SDIDTK implementation (Free et al., 2010; Hardiono & Pusponegoro, 2015).

The results of this study further highlight midwives' perceptions of usability. For conventional methods, most respondents (60%) rated them as "quite easy," whereas with the Sisfor-Bidanku application, the majority (60%) rated it as "easier." Although statistical testing with the Mann–Whitney test produced a p-value of 0.080, indicating no significant difference, the descriptive data reveal a clear trend: midwives generally found the application more user-friendly than paper-based methods. This aligns with Gatot's research, which found that age and satisfaction levels are positively related, as older individuals may demonstrate greater maturity and critical thinking. However, this contrasts with Anjani and Wirawati (2018), who reported that age negatively affects the effectiveness of information system use.

These findings suggest that while the Sisfor-Bidanku application did not show statistically significant differences compared to conventional methods, it is perceived as more practical and easier to use. This highlights its potential to optimize early detection services, reduce reporting burdens, and improve the quality of child development monitoring at the primary health care level.

5. Conclusions

This study found no statistically significant difference between the conventional method and the use of the Sisfor-Bidanku application ($p = 0.080$). However, descriptively, more midwives perceived the Sisfor-Bidanku application as easier to use compared to conventional media. The application helps reduce barriers in the implementation of early detection of child development, particularly in relation to administrative and reporting burdens, while providing convenient access through digital devices. Therefore, Sisfor-Bidanku has the potential to serve as a more effective and practical tool in supporting the optimization of the SDIDTK program and improving the quality of child health services at the primary care level.

Conflict of Interest

There is no conflict of interest

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