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Monitoring Toddler Development Based on Indonesia Health Survey (SKI) 2023

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Abstract

Background: Monitoring the development of toddlers is an essential aspect of the early detection of child growth and development problems. However, its implementation in Indonesia still faces various challenges, such as low parental awareness and limited access to health services. This study aims to identify factors related to monitoring the development of toddlers based on data from the 2023 Indonesian Health Survey (SKI). **Method:** This study uses a quantitative method with a cross-sectional design involving all children aged 0-6 years in Indonesia. Data were collected through standardized questionnaires and structured interviews, then analyzed using simple linear regression to measure the relationship between socioeconomic factors, ownership, and utilization of KIA books, as well as access to health centers for child development monitoring. **Result:** The results showed that the most dominant factor in supporting development monitoring was the ownership and utilization of KIA books, with a powerful and significant correlation ($R=0.781$ and $R=0.788$). Easy access to health centers also has a considerable influence ($R=0.681$). In contrast, economic status has a lower relationship and is not statistically significant in most categories. **Conclusion:** These findings highlight the importance of increasing parental awareness of using KIA books and optimizing access to health services to support better child development monitoring.

Keywords: access to health, development monitoring, economic status, KIA books, toddlers

INTRODUCTION

Monitoring the development of toddlers is one of the essential aspects in efforts to detect early health problems of children's growth and development¹. Optimal development at the age of toddlers significantly affects the quality of life of children in the future, both from physical, cognitive, and social aspects². This refers to the supervision and evaluation of the mental, emotional, and social development of children at the age of toddlers, namely, the age of 0 to 5 years. Regular and timely monitoring of progress can help identify potential developmental delays, as well as intervene early³. Typically, this is done by evaluating age-appropriate milestone achievement and conducting clinical assessments during health monitoring⁴. Based on data from the World Health Organization (WHO),

¹ Laura V. Sánchez-Vincitore et al., "The Impact of Ever Breastfeeding on Children Ages 12 to 36 Months: A Secondary Data Analysis of the Standardization Study of the Dominican System for Evaluating Early Childhood Development," *Infant Behavior and Development* 75, no. November 2023 (2024), <https://doi.org/10.1016/j.infbeh.2024.101950>.

² Maud Edvoll et al., "The Relations between Parent and Toddler Emotion Regulation," *Mental Health and Prevention* 30, no. March (2023), <https://doi.org/10.1016/j.mhp.2023.200266>.

³ Sulim Chun et al., "Comprehensive Assessment and Early Prediction of Gross Motor Performance in Toddlers With Graph Convolutional Networks-Based Deep Learning: Development and Validation Study," *JMIR Formative Research* 8 (2024): 1–13, <https://doi.org/10.2196/51996>.

⁴ Yonatan Bilu et al., "A Developmental Surveillance Score for Quantitative Monitoring of Early Childhood Milestone Attainment: Algorithm Development and Validation," *JMIR Public Health and Surveillance* 9 (2023): 1–16, <https://doi.org/10.2196/47315>.

it is recorded that the number of babies worldwide reaches around 52.9 million. Of these, about 54% of babies have developmental delays. The majority of cases of this developmental delay, around 95%, occur in low- to middle-income countries⁵.

Monitoring the development of toddlers, there are still many challenges faced in its implementation, both at the individual level, the family environment, and the health system. Based on the 2023 SKI report, the percentage of those who monitor progress is less (43.2%) compared to those who do not monitor progress (56.8%). Development monitoring according to the child's age group can be done by checking the KIA book, and by the standards, it is done at least 2 times for children aged 1-23 months, and at least 1 time for children aged 24-59 months in 12.

Last month⁶. Child development monitoring does not only depends on physical health aspects, but also involves social, economic, and environmental factors. Education⁷.

Research conducted by⁸, It shows that parental involvement, the quality of interaction in the family, and socioeconomic conditions have a significant role in the effectiveness of child development monitoring. Active parental involvement and supportive environmental stimulation can improve the ability to detect developmental disorders early. In addition, the economic status of the family affects access to quality health services and education, so that children from families with better financial status tend to receive more optimal monitoring.⁹

Some other factors that can hinder monitoring the development of toddlers include family socioeconomic status, ownership and utilization of KIA books, access to health facilities, availability of trained medical personnel, and social support¹⁰. In the digital era, the application of information technology in monitoring child development is also growing. The use of digital systems in documenting and analyzing child development data has been proven to increase the speed and accuracy of problem identification, allowing for faster and more appropriate interventions¹¹. Based on this, it is essential to identify and understand the factors related to child development monitoring to support comprehensive and integrated intervention planning.

METHOD

This study uses a quantitative method with a cross-sectional design. This design was chosen to measure and analyze the relationship between various factors (economic status, KIA book ownership, utilization of KIA books, access to health centers) and child development monitoring at a single point in time. The population in this study is all children from 0-6 years old in all provinces in Indonesia. The sampling technique uses a total sample of as many as 38 provinces. The instruments in this study used standardized questionnaires and structured interviews because the data source used secondary data from the 2023 SKI report. Data analysis uses univariate analysis, which is used to distribute dependent variables and independent variables. The multivariate analysis used in this study is Simple Linear Regression, which is used to perform a more comprehensive interpretation and determine how much of a relationship exists between the variables of factors and child development.

⁵ (Silaban et al, 2024)

⁶ Masfi Sya'fiatul Ummah, "No 主観的健康感を中心とした在宅高齢者における健康関連指標に関する共分散構造分析Title," *Sustainability (Switzerland)* 11, no. 1 (2019): 1-14,

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⁷ Shengfu Fan et al., "Family Environmental Risk Factors for Developmental Speech Delay in Children in Northern China," *Scientific Reports* 11, no. 1 (2021): 1-7, <https://doi.org/10.1038/s41598-021-83554-w>.

⁸ Brown, C., & Lee (2021)

⁹ (Uzun Cicek et al, 2020)

¹⁰ Erika Hoff et al., "Context and Education Affect the Quality of Parents' Speech to Children," *Journal of Applied Developmental Psychology* 91, no. January (2024), <https://doi.org/10.1016/j.appdev.2024.101632>.

¹¹ Nina Iordanova et al., "Digital Methodology for Parental Self-Assessment of Child Development," *Procedia Computer Science* 225 (2023): 289-97, <https://doi.org/10.1016/j.procs.2023.10.013>; Fairus Niratama et al., "Development of Application for Early Intervention Speech Therapy in Children with Intellectual Disability," *Journal of ICSAR* 7, no. 1 (2023): 30, <https://doi.org/10.17977/um005v7i12023p30>.

RESULT & DISCUSSION

Analysis of Univariate for Monitoring the Development, Ownership, and Utilization of KIA Books, Economic Status, and Access to Health Centers in Indonesia

Table 1: Frequency Distribution of Development, Ownership, and Utilization of KIA Books in Indonesia

	N	Minimum	Maximum	Mean	Std.Deviasi
KIA Book Ownership					
Have	38	102.00	427.00	320.65	76.04
Not have	38	2.00	347.00	38.00	88.04
Utilization of KIA Books					
Utilize	38	489.00	891.00	719.71	85.09
Not Utilizing	38	109.00	511.00	281.86	86.60
Progress Monitoring					
Conducted	38	110.00	614.00	385.60	121.07
Not Conducted	38	386.00	890.00	609.86	118.68

Source: SKI Data, 2023

Table 1 shows that the use of KIA books has a significant role in monitoring developments, with an average score of 719.71%, while the average score of respondents who have KIA books is 320.65%.

Table 2: Distribution of Social Status Frequency and Access to Health Centers in Indonesia

	N	Minimum	Maximum	Mean	Std.Deviasi
Status Economy					
Bottom	38	.00	644.00	192.86	118.56
Middle	38	62.00	500.00	196.44	71.24
Intermediate	38	.00	266.00	188.52	49.05
Upper Middle	38	21.30	500.00	201.90	79.74
Top	38	.00	419.00	214.10	92.02
Access to the Health Center					
Easy	38	183.00	690.00	467.92	109.39
Difficult	38	66.00	295.00	186.39	43.16
Very Difficult	38	108.00	751.00	347.86	135.09

Source: SKI Data, 2023

Table 2 shows that factors related to monitoring development include socioeconomic status, with the most significant average value at the top economic status of 214.10%. Access to the Easy Health Center has the highest average score of 467.92%.

Bivariate Analysis of Factors Related to Child Development Monitoring in Indonesia

Table 3: Distribution of Monitoring-Related Factors in Child Development in Indonesia

Variable	R	R2	p-value	Line Equation
Lower Economic Status	0.214	0.046	0.198	$427.668 - 0.218$
Lower Middle Economy Status	0.243	0.059	0.141	$466.804 - 0.413$
Intermediate Economic Status	0.120	0.014	0.474	$329.939 + 0.295$
Upper-Middle-Income Economic Status	0.092	0.008	0.582	$357.376 + 0.140$
Top Economic Status	0.335	0.113	0.039	$291.107 + 0.441$
Easy Access	0.681	0.463	0.000	$33.133 + 0.753$
Difficult Access	0.654	0.428	0.000	$43.471 + 1.836$
Access is Very Difficult	0.741	0.549	0.000	$616.688 - 0.664$
Have a KIA Book	0.781	0.610	0.000	$13.301 + 1.244$
No KIA Book	0.865	0.749	0.000	$480.621 - 1.190$
Utilizing KIA Books	0.788	0.622	0.000	$421.825 + 1.122$
Not Utilizing	0.801	0.642	0.000	$701.419 - 1.120$

Source: SKI Data, 2023

Based on Table 3, it can be seen that the economic status of the bottom, lower middle, and upper middle has a low correlation with $R=0.214$; $R=0.243$; $R=0.092$, and showed a statistically insignificant relationship with the P-value value of (0.198, 0.141, 0.582). Intermediate economic status has a very

weak and insignificant correlation with $R=0.120$ and $P\text{-value}=0.474$. The top economic status had a higher correlation than the previous group, with $R=0.335$ and $P\text{-value}=0.039$ showing a significant relationship. The three access groups to health centers showed a statistically significant relationship ($P\text{-value} = 0.000$) with a reasonably strong correlation, especially in the group with complicated access ($R=0.741$). Ownership and utilization of KIA books have a powerful and significant relationship with child development monitoring ($P\text{-value} = 0.000$).

The study results show that the top economic status tends to be associated with more people who monitor child development. A family's economic status is essential in monitoring child development, especially regarding nutritional status and growth. Research ¹², indicates that the top economic status has a greater chance of monitoring development. In addition, the economic status of parents also has a significant effect on children's social skills. Research shows that low economic status can hinder the development of children's abilities, including social skills ¹³. However, not all studies have found a significant link between economic status and child growth. These differences in outcomes may be due to other factors such as parenting, parental education, and access to health care ¹⁴. Overall, despite the study's results, there is much evidence that family economic status plays a role in monitoring children's development, especially related to nutritional status and social skills ¹⁵.

The variable of access to health centers indicates that easier access contributes significantly to monitoring child development. Access to Puskesmas (Public Health Centers) is crucial in monitoring child development, especially in early detection and intervention against growth and development disorders. Puskesmas, as the spearhead of health services in Indonesia, provides child growth and development monitoring services through programs such as Posyandu (Integrated Service Post). The Posyandu activity, which is carried out once a month in collaboration with the local health center, aims to monitor the growth and development of toddlers and provide nutritious food for them ¹⁶. Routine monitoring at the Health Center allows for early detection of growth and development obstacles in toddlers through collecting health history, periodic physical examinations, and developmental screening. This early detection is essential to identify factors hindering children's development, such as bone development disorders, metabolic disorders, and genetic factors ¹⁷. In addition, the use of information technology, such as the Smart KMS application, can help monitor the growth and development of toddlers during the pandemic. Digitalization in health services allows parents to monitor their child's growth and development comprehensively, despite limited access to health centers ¹⁸.

Overall, easy and routine access to the Puskesmas is essential to ensure optimal child development monitoring. However, in situations where such access is limited, the active role of parents and the use of technology are alternative solutions to ensure that children's growth and development are well monitored. Mothers who own and use KIA books are better at monitoring child development. The ownership and use of Maternal and Child Health Books (KIA) are essential in monitoring child development. The KIA book serves as a communication tool between mothers and health workers, as well as a guide for parents in monitoring their children's growth and development ¹⁹. Research ²⁰, shows that the ownership of the KIA Book is significantly related to parental behavior in stimulating children. Parents who have KIA books tend to be more active in providing adequate stimulation, which is essential for the development of movement, speech, language, socialization, and independence in

¹² Arnett et al., (2024)

¹³ Jeličić, L et al, 2021)

¹⁴ (Sunderajan, T., & Kanhere, 2019; Wallace, I., 2015)

¹⁵ Manju Shrestha et al., "Prevalence and Associated Factors of Malnutrition in Under Five Children in Eastern Nepal: A Hospital Based Study," *Journal of Nepal Paediatric Society* 43, no. 1 (2023): 73–81, <https://doi.org/10.58665/NJISS>.

¹⁶ Choiril Hana Mustofa Sri Rahayu, Marhaeni DS, "Pemantauan Tumbuh Kembang Anak Dan Penyediaan Makanan Sehat Bagi Balita," *Wasaton Jurnal Pengabdian Masyarakat* 2, no. 2 (2024): 32–38, <file:///C:/Users/russi/Downloads/961-Article Text-3197-1-10-20240720.pdf>.

¹⁷ (Alzahrani, L et al, 2023)

¹⁸ (Widyaningrum Indrasari, et al., 2025)

¹⁹ Mariyani Rita Oktavia, "Pengaruh Pemanfaatan Buku Kia Terhadap Perkembangan Anak Diposyandu Jati Bening Tahun 2023," *Journal Of Social Science Research* 3, no. 3 (2023): 9250–62, <file:///C:/Users/russi/Downloads/9250-9262.pdf>.

²⁰ Emmy Putri, dkk (2023)

children. In addition, the use of the KIA Book is also related to the developmental status of toddlers. Studies show that most children whose parents use the KIA Book show age-appropriate development. This emphasizes the importance of using the KIA Book in monitoring and supporting children's development²¹. However, the ownership of the KIA Book alone does not always guarantee the use of other health services. Several studies have found that there is no significant relationship between KIA Book ownership and utilization of basic immunization services. This shows that, in addition to ownership, parents' understanding and awareness of the importance of health services also play a role in their utilization²². Overall, the ownership and use of KIA Books play an essential role in monitoring child development. This book not only provides health information but also encourages parents to be active in monitoring and stimulating children's development, which in turn can support optimal child growth and development.

CONCLUSION

Economic status has a relatively low relationship with child development monitoring. Meanwhile, access to health services, ownership, and utilization of KIA books have a greater relationship in monitoring development. The most dominant factor is the ownership and utilization of KIA books, which correlate closely with the quality of child development monitoring.

DECLARATION OF CONFLICTING INTERESTS

The author declares that there is no conflict of interest in the publication of this article.

FUNDING

This research was independently funded by the authors, not by any other parties.

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²² Taufanie Rossita Lensiana, Yesi Putri, "Hubungan Pemanfaatan Buku Kia Dengan Kepatuhan Imunisasi Dasar Lengkap Pada Bayi Usia 0-11 Bulan Di Puskesmas Kampung Delima Kabupaten Rejang Lebong Tahun 2024," *Journal Student Scientific* 3, no. 1 (2024): 77–84.

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