Monitoring Information System of Supplementary Feeding Program for Stunted Toddlers at Posyandu Matahari

Amelia Nur Fadhila*, Rina Firliana, Aidina Ristyawan
Universitas Nusantara PGRI Kediri, Kediri, 64112, Indonesia
e-mail: nf.amelia03@gmail.com, rina@unpkediri.ac.id, aidinaristi@unpkediri.ac.id
Corresponden Author: nf.amelia03@gmail.com

Abstract: *Stunting is a serious health issue in Indonesia, with a prevalence reaching 21.6% in 2022. The Supplementary Feeding Program at Posyandu Matahari, Bangkok Village, faces challenges in monitoring daily consumption, specifically in ensuring that the food is consumed by toddlers as recommended. The objective of this research is to develop a Supplementary Feeding Program monitoring information system capable of automatically classifying nutritional status, storing monitoring data, and generating systematic reports. This study is a system development research focused on stunted toddlers aged 6-59 months. The method employed is the prototyping method, which includes user requirements identification, prototype creation, system coding, testing, and implementation. The results demonstrate that the information system integrates daily Supplementary Feeding Program consumption data with digital anthropometric records. This system enables staff to analyze nutritional status developments in real-time and prepare monitoring reports more accurately. The study concludes that the implementation of a monitoring information system can address Supplementary Feeding Program consumption non-compliance and simplify reporting bureaucracy, thereby supporting the optimization of the Supplementary Feeding Program in improving the nutritional status of toddlers at Posyandu Matahari.*

Key Words*:* Stunting, Monitoring Information System, Supplementary Feeding Program, Posyandu, Nutritional Status.

Introduction

Stunting remains a critical public health challenge in Indonesia, with a prevalence of 21.6% in 2022 according to the Indonesian Nutritional Status Survey (SSGI). This growth disorder, caused by chronic malnutrition during the first 1,000 days of life, significantly hinders physical growth and motor development (Rahmadhita, 2020; Asra Laily et al., 2023). As a national priority, the Indonesian government has implemented the Supplementary Feeding Program, targeting on stunted toddlers aged 6-59 months. This initiative provides local food-based supplements and biscuits for 90 days to improve nutritional status (Sugiana et al., 2023). However, ensuring the effectiveness of this intervention at the community level, particularly in rural facilities like Posyandu Matahari, requires more than just food distribution; it necessitates intensive monitoring.

Previous literature has extensively explored digital solutions for stunting management. Studies by Dewanti & Oktaviani (2023) and Azhariyah et al. (2023) successfully developed web-based systems for anthropometric data recording to replace manual logs, while Letuna & Pakereng (2023) introduced Android-based applications to evaluate stunting prevalence. Regarding program impacts, research by Susilo (2022) and Apriliani et al. (2024) highlighted that while the Supplementary Feeding Program is effective in increasing weight,

low consumption compliance remains a significant barrier. Despite these advancements, most existing systems only focus on recording monthly measurement results (output) without providing a mechanism for daily monitoring of the actual consumption process.

The scientific novelty of this research lies in the integration of a daily consumption monitoring mechanism within a nutritional status information system. Unlike previous systems that focus on static monthly data, this study introduces a real-time tracking feature for the daily compliance of Supplementary Feeding Program intake. This approach provides a more granular analysis of why certain toddlers fail to show progress, bridging the data gap between food distribution and actual nutritional outcomes. By incorporating daily behavioral data into the system, this research offers a more comprehensive tool for evaluating the direct impact of nutritional interventions.

The primary research problem at Posyandu Matahari is the difficulty for health workers to verify if the distributed supplements are consumed by toddlers according to recommendations. The current lack of a daily monitoring mechanism results in inconsistent data, making it nearly impossible for staff to determine whether poor weight gain is caused by non-compliance or other underlying health factors. Additionally, manual data management hinders the speed and accuracy of program reporting. Therefore, the purpose of this study is to build a Supplementary Feeding Program monitoring information system that is capable of storing monitoring data, automatically analyzing the nutritional status of stunted toddlers, and generating systematic program reports at Posyandu Matahari.

Method

The research design utilizes a modified Prototyping approach based on the Design Thinking framework, consisting of five iterative phases: Empathize, Define, Ideate, Prototype, and Test. The research subjects are the health workers (cadres) at Posyandu Matahari and stunted toddlers aged 6-59 months who are recipients of the nutritional intervention. The instruments used include observation sheets and structured interview guides. Data collection is performed through direct engagement in the community health facility, and data analysis is conducted by evaluating the system's ability to facilitate the Supplementary Feeding Program monitoring compared to previous manual methods. The process can be seen in Figure 1 below.

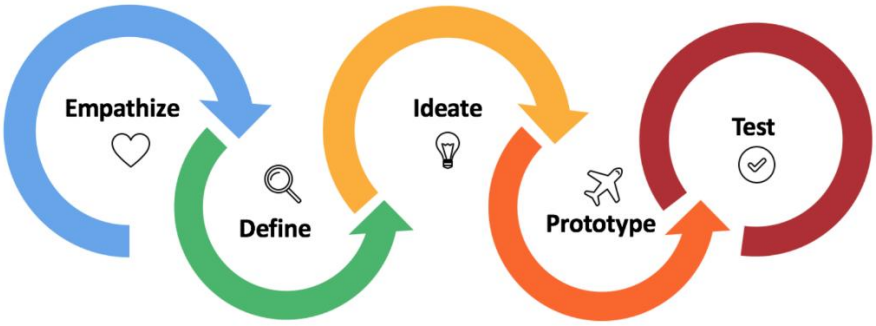

Figure 1. Prototype Method

The first phase is Empathize, which involves observing the daily activities and gathering qualitative data from the users. In this phase, the researcher focused on understanding the challenges faced by cadres at Posyandu Matahari in recording the Supplementary Feeding Program data for stunted toddlers. Through direct observation, it was found that the lack of a daily consumption monitoring mechanism in manual logs hindered the effectiveness of tracking the nutritional progress of the toddlers.

The second phase is Define, where the insights gathered from the empathize phase are analyzed to identify the core problem. This phase resulted in the identification of a significant data gap between food distribution and actual nutritional outcomes for stunted toddlers. The technical requirements were established to create a system that can store granular monitoring data and automatically calculate the nutritional status of toddlers, addressing the inaccuracies found in existing manual records at Posyandu Matahari.

The third phase is Ideate, which involves brainstorming and designing the conceptual framework of the system. During this phase, the researcher created system flowcharts and database architectures that prioritize real-time tracking of daily intake compliance for the toddlers. This activity aimed to design a unique solution that integrates daily behavioral data into a nutritional information system, specifically tailored to the reporting needs of the Supplementary Feeding Program.

The fourth phase is Prototype, where the conceptual designs are built into an interactive working model. This phase focuses on developing the user interface and the core monitoring dashboard without full backend complexity initially. The prototype allowed cadres at Posyandu Matahari to visualize how the digital input forms for toddler data and automatic reports would function, providing a basis for immediate feedback before the final system coding.

The final phase is Test, which is a critical procedure to ensure the reliability and usability of the software in the field. During this phase, the system was trialed during the actual Supplementary Feeding Program cycle at Posyandu Matahari, involving real data from stunted toddlers to identify any bugs or logical errors. The activity included User Acceptance Testing (UAT) to verify that the automated reporting and daily tracking features met the standards required for effective community-level health monitoring.

Results and Discussion

The implementation of the Monitoring Information System at Posyandu Matahari is designed to replace conventional manual documentation with a digital framework that enhances data accuracy and intervention speed. Each stage represents a critical touchpoint in the digital transformation of the Supplementary Feeding Program, ensuring that the transition from data collection to real-time monitoring is executed seamlessly to improve nutritional outcomes for toddlers.

Login

Figure 2. Login

The initial phase of system interaction begins with the Login Interface, where the health cadres are required to enter their unique username and password before clicking the login button. This step ensures that the health cadres have secured access to the system environment, allowing them to manage sensitive nutritional data under an authorized session while maintaining the confidentiality of the community health records. The system login interface is presented in Figure 2.

Anthropometric Data Input

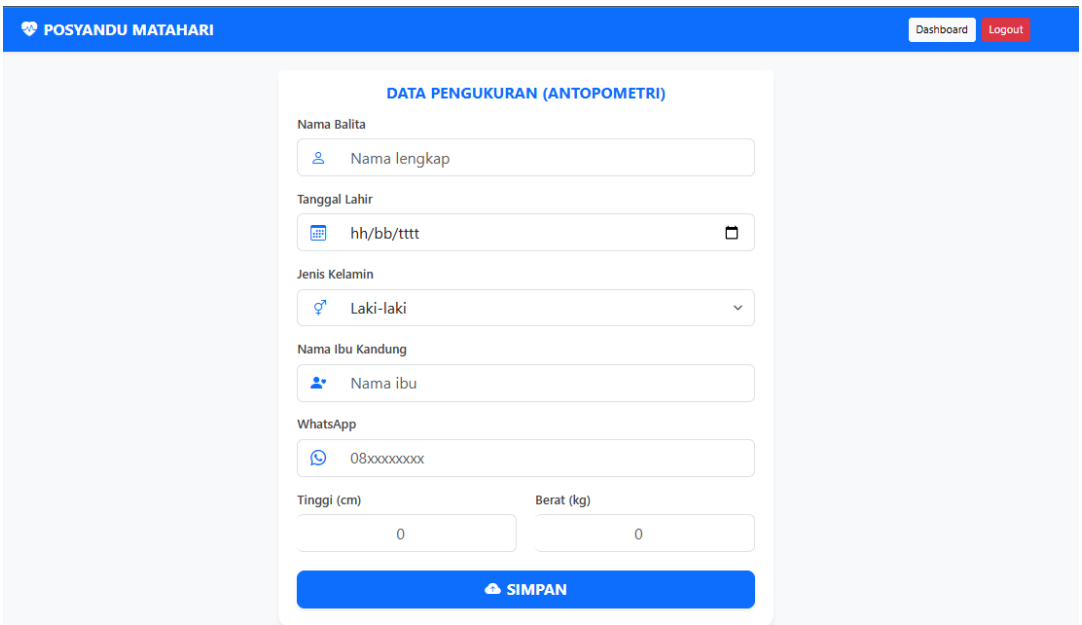

Figure 3. Anthropometric Data Input

Upon successful authentication, the health cadres proceed to the Anthropometric Data Input stage to digitize the toddler's health information. The health cadres input the form, including the toddler's name, date of birth, gender, mother's name, and WhatsApp contact, followed by the specific measurements of height and weight. After verifying the entries, the health cadres click the save button to trigger the system's automated nutritional status calculation. The anthropometric data entry form is illustrated in Figure 3.

Toddler Health Data

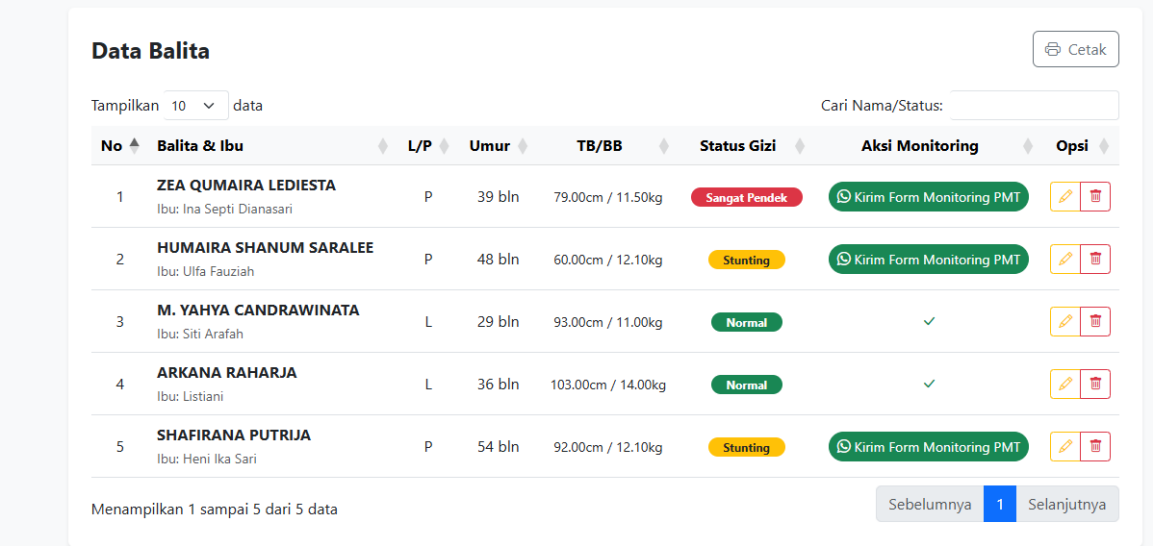

Figure 4. Toddler Health Data

Following the data submission, the health cadres review the Toddler Health Data to identify the nutritional classification of each child. If the system detects a stunted status based on the inputted measurements, the health cadres take an immediate clinical step by clicking the "Send Monitoring Form" button. This action activates the intervention protocol by automatically dispatching a digital link to the parent's WhatsApp number. The profile data and nutritional status results are shown in Figure 4.

Form Monitoring Supplementary Feeding Program

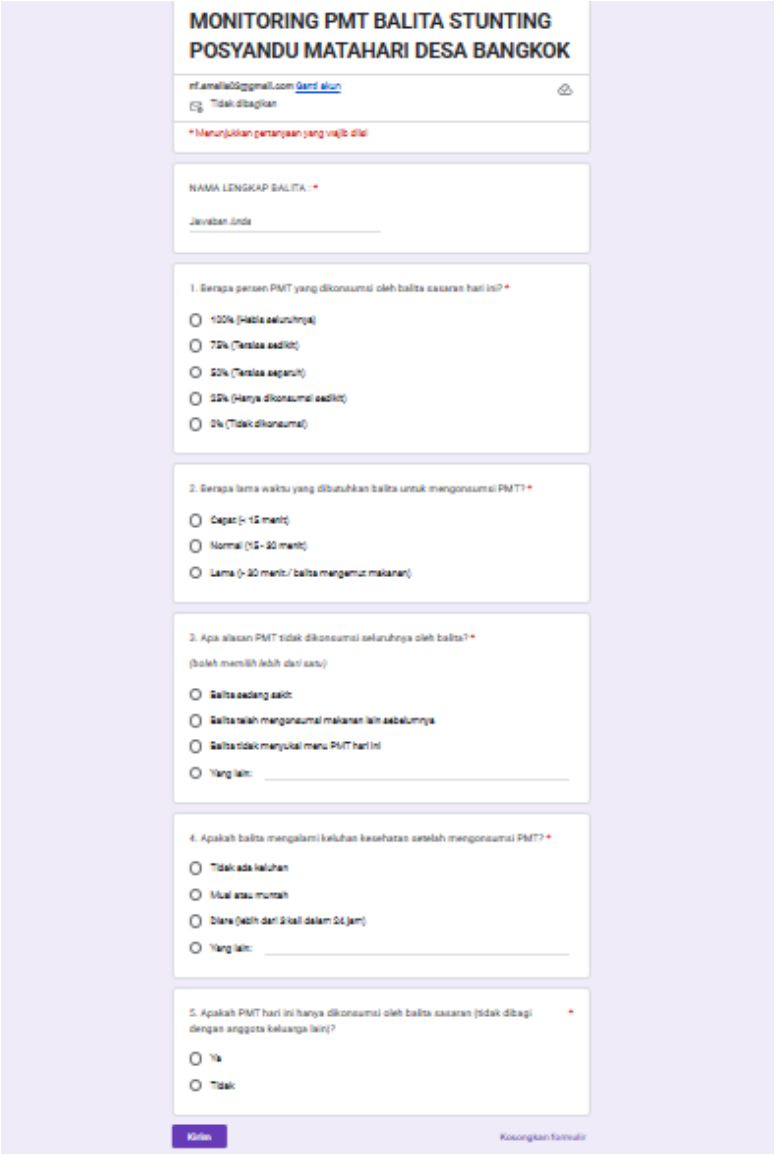

Figure 5. Form Monitoring Supplementary Feeding Program

Once the link is sent, the task transitions to a collaborative monitoring process where parents fill out the daily form via their mobile devices. The health cadres maintain control by monitoring the Supplementary Feeding Program dashboard, where the system aggregates daily entries into a real-time status update. This allows the health cadres to ensure that the toddler is receiving and consuming the distributed supplements according to the program's guidelines. The form monitoring supplementary feeding program can be seen in Figure 5.

Monitoring Supplementary Feeding Program Report

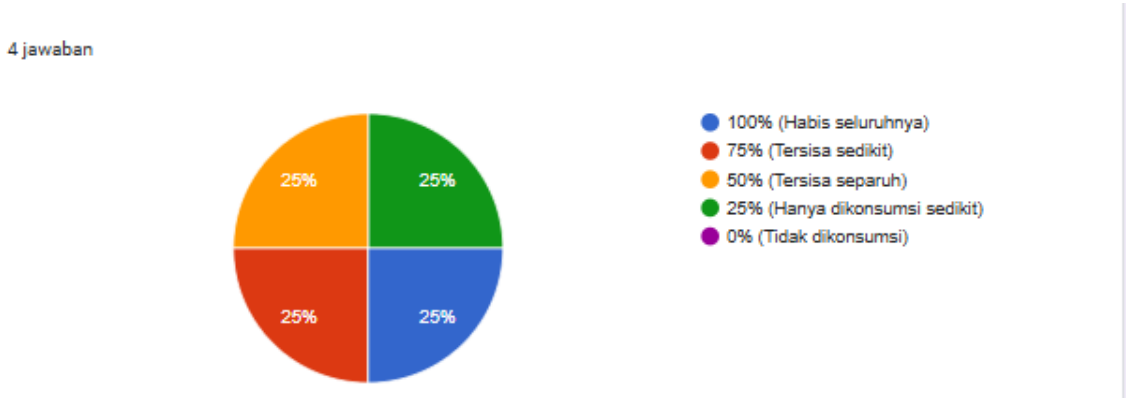

Figure 6. Monitoring Supplementary Feeding Program Report

The final stage of the process involves the analysis of the Monitoring Supplementary Feeding Program Report, where the health cadres evaluate the progress through dynamic visual graphs. This visual data enables the health cadres to provide evidence-based recommendations and evaluate the overall effectiveness of the intervention at Posyandu Matahari. The Monitoring Supplementary Feeding Program Report can be seen in Figure 6.

Conclusion

This research successfully implements a monitoring information system at Posyandu Matahari, optimizing nutritional surveillance through data automation and real-time reporting. The findings indicate that the system streamlines the workflow of health cadres in accurately detecting stunting and ensuring compliance with the supplementary feeding program through structured digital monitoring. For further development, it is suggested to incorporate simple automated reminders for monthly check-ups and a nutritional education module within the application to improve parental knowledge during the intervention period.

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