

WHO-Anthro Growth Standard's Effect On Quality and Data On Toddler Nutrition

Agus Hendra Al Rahmad^{*1,2}

¹Department of Nutrition, Health Polytechnic of Aceh, Ministry of Health, Aceh, Indonesia.

²Doctoral Program in Medical Science, Faculty of Medicine, Universitas Syiah Kuala, Aceh, Indonesia

Author's Email Correspondence (*): 4605.ah@gmail.com
(085260047644)

Abstract

Indonesia began implementing the WHO-2006 child growth standard in 2010, including Aceh Province. However, it has not used WHO-Anthro to measure the quality of data and information on the nutritional status of children under five. Nutritionists only assess the growth of toddlers using simplified tables and growth charts. The study aims to measure the effect of using WHO-Anthro growth standards on toddlers' quality and nutritional status data. The study used a Quasi Experiment design conducted at the Banda Aceh City Health Office in 2021. The subjects were all nutritionists, namely 22 nutritionists. Data collection was carried out for three months, starting from the pretest and post-test after one month of practice and after two months—the training on using WHO-Anthro application-based growth standards. The data collected was the quality of nutrition data, including timeliness, completeness of information, accuracy, and usefulness. Data were analyzed using the Repeated Measured Anova test at 95% CI. The results found that using WHO-Anthro standards for two months after the intervention had improved the quality of nutrition data to 85.16%. Therefore, there is a statistically significant difference in average data quality between before and after one to two months of using WHO-Anthro (p-value < 0.05). In conclusion, using WHO-Anthro growth standards can improve the quality of data and information on the nutritional status of young children.

Keywords: Accuracy, Completeness, Growth Standards, Usefulness.

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Phone: +628525357076

Email: ghidzajurnal@gmail.com

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I. INTRODUCTION

Growth charts are widely used in pediatric practice and research to assess child health through anthropometric measurements (Cole, 2012; De Onis et al., 2012). In addition to providing an overview of variations in child growth, these standards also provide a measure of normal or reasonable limits of child growth (Johnson et al., 2012; Kim et al., 2018). In some industrialized countries, this standard is used to provide a state of the prevalence of obesity (de Bont et al., 2020; Garrido-Miguel et al., 2019), but in low- and middle-income countries (including Indonesia), it is used only to measure indicators of malnutrition, such as underweight, stunting and wasting (Ssentongo et al., 2021).

Indonesia is a developing country that is very serious in handling nutrition problems, especially stunting (Aryastami, 2017). Indonesia, in the 2020-2024 National Medium-Term Development Plan (RPJMN) for the health sector, has set one of the development targets to be achieved by reducing the prevalence of stunting to a maximum of 22% and reducing the prevalence of wasting to 7% (Ali, 2019). In addition, the SDG's target adopted in the RPJMN is that infants aged 0-6 months receive exclusive breastfeeding as stated in Target 2 (No Hunger) and Target 3 (Healthy and Prosperous Life), as well as reducing the prevalence of low birth weight infants (LBW) to 2.5% (Ali, 2019). Various efforts continue to be made to achieve these targets, such as monitoring the prevalence of malnutrition through Basic Health Research (RISKESDAS) and the Nutrition Status Survey (SSGI).

Indonesia is currently experiencing a decline in the prevalence of nutritional status in toddlers. According to the Riskesdas statistics report, 17.7% of Indonesians are underweight, with a stunting prevalence (30.8%) and an incidence of wasting of 10.2% (Balitbangkes, 2018). Although the prevalence of nutritional disorders has decreased since 2013, the statistic is not yet substantial (Miko & Al-Rahmad, 2017). The Indonesian Nutrition Status Study (SSGI) in 2019-2021 has reported a decrease in the prevalence of stunting (27.7% to 24.4%) and wasting (7.4% to 7.1%). However, on the contrary, the prevalence of underweight increased from 16.3% to 17.0% (Kemenkes RI, 2021). The nutritional status of toddlers in Aceh Province has not improved since there are still numerous instances of acute and chronic malnutrition among toddlers (Al Rahmad et al., 2020). 11.9% of the population was wasting, and 23.5% were underweight. Additionally, the frequency of stunting is still very high, reaching 37.3% and ranking third after West Sulawesi and East Nusa Tenggara (Balitbangkes, 2018).

Several studies have reported that technology can significantly enhance nutritional status data for toddlers (Al Rahmad et al., 2022; Hijrawati et al., 2021). The ability to provide information that is timely has high validity, and of course, the benefits of making the right and fast policies are felt by policymakers. (Gebreslassie et al., 2020). It will positively impact reducing the high prevalence of malnutrition in Aceh Province (Al Rahmad, 2020).

Monitoring of nutritional status needs a standard evaluation of nutrition status. While to assess the complexity of nutrition problems in a population, indicators of nutrition status are used (Kemenkes RI, 2020). A regency's data and health information system are unavoidably essential to support the decision (Nurhayati et al., 2019). Documentation and notification are the indicators of the success of a program. Without them, any nutrition programs will be less significant (Grandia, 2017; Van Der Lei, 2002).

Appropriate information, high accuracy, and completeness can improve the healthcare process, although they are rarely found in the data or the available information (Hoxha et al., 2022). Human resources heavily influence the work agenda. Therefore, low human resource quality became an obstacle to a monitoring program and the growth of under five-year-old children. Improvement in computerization is needed to get qualified data and enhance the validity of the data on toddlers' nutrition status (Maina-Gathigi et al., 2017; Sadeghi et al., 2021). Aceh Province is very serious and firmly committed to reducing nutrition problems. The essential thing is continuously monitoring nutritional status (Rahmah & Dahlawi, 2022; Ulfah, 2019).

This monitoring no longer uses conventional methods but has shifted towards electronic and digital, for example, through E-PPGBM and the WHO Anthro 2005 application. Therefore, WHO Anthro is highly recommended for processing the MNS data. Based on this background study, the research objectives are to measure the effect of using WHO-Anthro growth standards on the quality and data on the nutritional status of toddlers in Banda Aceh City.

II. METHOD

The study used a quasi-experiment design with a quantitative approach and was conducted in Banda Aceh City in 2021. The design used is the Pretest and Posttest non-equivalent group approach, which is an experimental approach that controls the design research situation before and after the intervention without using a control group. The sample in this study was all nutrition workers at the selected health center who received an intervention using WHO-Anthro 2005. The intervention is to provide training and practice using the WHO-Anthro application. The report submission system and its usefulness in policy-making were also shared.

The only primary data collected consisted of nutritionist characteristics and quality information. Characteristic data was collected by filling out a form by nutritionist and was done during the registration of trainees. Information quality data was obtained from observational checklist results with the assessment based on the suitability of the information generated from the assessment before training, after one month, and after two months. Enumerators involved in the nutrition collegium were tasked with assisting in filling out the questionnaire data. The research questionnaire contained 31 questions, and each question had the options "0= very poor," "1= poor," "2= moderate," "3= good," and "4= excellent". The result of filling in the continuous data is called the data quality achievement in the form of a percentage value ranging between 0.0% and 100.0%. The variable quality of information on nutritional status data for toddlers consisted of four components: timeliness, completeness of information, accuracy, and usefulness. Measurement of timeliness is the accuracy of sending reports at the beginning of the month. Information completeness is measured based on the achievement of all nutritional status indices, such as WHZ, WAZ, and HAZ, both by gender and age group. The accuracy of the information is measured by the equivalence of the data produced with the gold standard. Meanwhile, the benefits of the data measured based on nutritional status indicators can be used as feedback in program planning. The training

used the WHO Anthro v3.2.2 application in 2011 and can be downloaded at the URL <https://www.who.int/tools/child-growth-standards/software> (WHO, 2011).

Data processing is done computerized by going through several stages, namely, editing (checking data), coding (giving code), entry (computer data entry), and cleaning data entry. They then analyzed the data using the SPSS v18 application. The results of prerequisite testing, namely using Shapiro Wilks, obtained that data timeliness, completeness, accuracy, and benefits were normally distributed (p -value > 0.05). The results of Levene's Test also show that the data comes from a homogeneous group ($P > 0.05$). Thus, to prove the hypothesis in this study, we used Repeated Measured Anova at the 95% significance level.

III. RESULT

Based on the characteristics, it can be seen that the subjects were mostly female (90.9%), their education was College of Nutrition (50.0%), and they had experience working as a nutritionist generally for 5 to 10 years. This study involved 22 nutritionists, and only 18.2% had not been exposed to training similar to this study. The complete characteristics are presented in Table 1.

Table 1.
Characteristics of subjects (n= 22)

Characteristics	Nutritionists	
	n	%
Age		
20 – 29 years old	3	13.6
30 – 39 years old	5	22.7
40 – 49 years old	12	54.5
50 – 59 years old	2	9.1
Gender		
Male	2	9.1
Female	20	90.9
Education		
College of Nutrition	11	50.0
College of non Nutrition	2	9.1
Bachelor of Nutrition	7	31.8
Postgraduate of Public Health	2	9.1
Work experience		
Under five years	3	13.6
5 to 10 years	9	40.9
10 to 15 years	6	27.3
Above 15 years	4	18.2
Participate in similar training		
Yes	18	81.8
No	4	18.2

The study results related to quality outcomes using WHO-Anthro growth standards are descriptively presented in Figure 1.

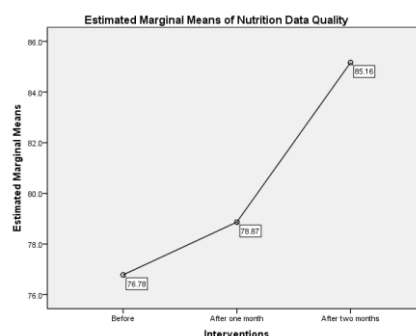


Figure 1. Estimation of marginal means of nutrition data quality

Descriptively, based on the results of the study (Figure 1) shows that intervention through WHO-Anthro can improve the quality of nutrition data better, namely before the intervention, the quality of nutrition data was 76.78%, and it increased by 78.87% after one month until two months of intervention has improved the quality of nutrition data to 85.16%.

Table 2.
Effect of WHO-Anthro growth standards on the quality and nutrition data of children under five (n=22)

The intervention of WHO Anthro Growth Standard	Nutrition Data Quality			p-value	
	Mean Difference	Standard Error	CI: 95% (Lower – Upper)		
Before (i)	After one month (j)	2.08	0.879	0.26 – 3.91	0.027
	After two months (j)	8.38	0.761	6.80 – 9.96	0.000
After one month (i)	After two months (j)	6.30	0.767	4.70 – 7.89	0.000

Interventions through WHO Anthro are very good at improving the quality of nutrition data. The study's results (Table 2) have proven an effect before and after one month of practicing WHO-Anthro (p= 0.027). Likewise, after two months of practice, there was a better improvement, which had a mean difference of 8.36, and also showed a very significant effect (p= 0.000) in improving the quality and nutritional status data of toddlers. The four components that shape the quality of nutrition data are timeliness, completeness of information, accuracy, and usefulness.

The results show significant consistency in improving the quality of data and nutritional status of toddlers in various indicators such as WHZ, WAZ, and HAZ. The improvement evidences this after one month of practice until after two months. It shows that software-based WHO Anthro growth standards are more effective than manual-based ones in improving the quality of information on children's nutritional status.

IV. DISCUSSION

Training evaluation is defined as designing an evaluation pre-training and post-training or by *pre-post*. The evaluation assessed the level of reaction, the learning process, the behavior, and the results of the activities (Salamate, 2014). This study showed that the training and implementation of the WHO growth standard influenced data information quality of toddlers. Specific health information technology might enhance efficiency and the quality of the working process, starting from understanding and positive responses. Therefore, the degree of effectiveness is unavoidably essential (Nurhayati et al., 2019). Improving knowledge for workers was not only done by reading but also by training in order to develop their understanding (Roberfroid et al., 2007). Ongoing training is needed due to the changing position, job descriptions, and the workers' limited knowledge and skill (Pradhan et al., 2013).

The nutritionist has a good quality of nutrition information. They have understood and responded well, considering the importance of using the standard to assess the status of toddler nutrition and improve the notification system, starting from the local clinic to the health service level. Moreover, supports from each organization were helpful for nutritionists in developing nutrition data quality. Esmail et al. (2007) stated that an organization is a factor and the human resource is the foundation of a program. Well-improved capacity and skill were beneficial to enlarge the scoop of health care supported by good

facility usage. Their seriousness, persistence, and consciousness to give the best demanded them to be more skillful in applying software-based WHO Anthro growth standards. Cichy & Rass (2019) stated that the quality of the data relies on the frequency of the users using the data. The desired data should be accurate, timeliness, relevant, comprehensive, understandable, and believable.

Preparing and considering concepts like learning models, learning motivation, self-effectiveness and other approaches are essential to produce practical training. Some aspects are needed to know the quality of information and data. According to Aqil et al. (2009), the quality of information and data can be seen through relevance, completeness, timeliness, and accuracy. The finding revealed that training and implementation of software-based WHO Anthro were significant.

The rapidly developed information technology has revolutionized everyone in terms of working systems. The findings proved that the training and the implementation of the software-based WHO-Anthro growth standard improved understanding and improved data information quality of toddler nutrition. This research was supported by De Onis et al. (2012); the use of WHO-Anthro software accelerates the process, increases the validity of input-output data, and is an essential part of the assessment or observation of nutrition status utilization of growth standard was a good reference as an indicator in measuring nutrition prevalence. Users' satisfaction with the web-based information system influenced their willingness to continue using it to meet information needs (Salam & Farooq, 2020). Moreover, a set of tools was needed to process the data, which could improve comprehension and accessibility, storage level, data process, and output (Johnson et al., 2012).

In observing the growth and development of toddler health, the effectiveness of measurement and follow-up was the most influencing factors in the program's success (Aritonang, 2012). The training and implementation of the standard growth were aimed at presenting better information about nutrition status and supporting data in decisions and policy-making related to a nutrition program and competitive value in the workplace, which could significantly increase efficiency and quality. Information technology's general ability and effectiveness became very important because the system was a tool for supporting the healthcare process (Goldzweig et al., 2013). The upgrading of capacity and skill, as well as the excellent process of management reinforcement to the workers, have helped enlarge the scoop of health care, and it was also supported by good facility usage. On the contrary, the impairment of organizational structure, poorly run processes, lack of knowledge, and unskilled workers impeded health care to society (Esmail et al., 2007). Moreover, it was challenging to arrive at wise decisions in medical treatment, which is why the usage of information system technology did not only impact organizations but also individuals' development.

Timeliness and accurate information were required to facilitate decision-making, planning, and effective control. The available information should help make decisions and solve problems until the level of problem-solving. The presence of a supervisor or a director, feedback, and improvement of human resources through training and development were parts of positive mechanisms in supporting the improvement of notification quality in order to improve their skills related to their field that the result would be helpful to make decisions in an organization (Russell, 2015; Ziema & Asem, 2020). Related to

monitoring and supervising, every local clinic should directly and regularly monitor the activities in the field which a supervisor conducts, and this part became important in deciding policy related to the program of monitoring and development (Faber et al., 2009).

V. CONCLUSION

Using growth standards based on the WHO Anthro application significantly improves toddlers' quality and nutritional status data. Suggestions for the health department to be able to carry out monitoring and evaluation so that the quality of nutritional status data remains consistent, implementation is needed to health departments in other regions, as well as making this result a pilot project for developing the quality of toddler nutritional status data in nutrition programs in other health departments.

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