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INFANT NUTRITIONAL STATUS ASSESSED USING WEIGHT-FOR-AGE AT HJ. ANDI NANI NURCAHYANI INDEPENDENT MIDWIFERY PRACTICE, MAKASSAR

STATUS GIZI BAYI DINILAI MENGGUNAKAN BERAT BADAN MENURUT USIA DI PRAKTIK KEBIDANAN INDEPENDEN HJ. ANDI NANI NURCAHYANI, MAKASSAR

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Abstract

Infant growth monitoring is essential for identifying early nutritional problems and guiding timely counselling. Weight-for-age (WFA) is a simple anthropometric index used in routine child growth surveillance, but its interpretation should follow sex-specific WHO standards and should not be used alone to diagnose overweight. This study aimed to describe infant nutritional status using WFA at Hj. Andi Nani Nurcahyani Independent Midwifery Practice in Makassar. A quantitative descriptive cross-sectional design was used. The source thesis recorded 35 infants recruited by accidental sampling during the study period. Infant age and body weight were obtained through direct measurement and documentation review, then summarized using frequency distributions. Most infants were aged 0-6 months (30/35; 85.7%), and the most frequent body-weight range was 6-7 kg (14/35; 40.0%). The source WFA table classified 23 infants (65.7%) as normal and 12 (34.3%) as above the cut-off applied in the thesis, while a separate final nutritional-status table reported 28 infants (80.0%) as normal and 7 (20.0%) as having higher nutritional status. Because the thesis used a >+2 SD threshold for the higher WFA category and the master table did not include sex-specific z-scores, these two summaries could not be independently reconciled. Current Indonesian standards classify WFA >+1 SD as risk of higher body weight and recommend confirmation with weight-for-length/height or BMI-for-age. The findings indicate that most infants in this facility-based sample were reported to have normal weight status, but a meaningful proportion required continued growth surveillance. Routine plotting of serial measurements, verification with sex-specific growth standards, support for exclusive breastfeeding during the first six months, and appropriate complementary feeding thereafter remain important.

Keywords : Anthropometry, Infant Growth, Nutritional Status, Weight-For-Age, Growth Monitoring, Makassar.

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Abstrak

Pemantauan pertumbuhan bayi sangat penting untuk mengidentifikasi masalah gizi dini dan memberikan konseling tepat waktu. Berat badan menurut usia (WFA) adalah indeks antropometri sederhana yang digunakan dalam pengawasan pertumbuhan anak secara rutin, tetapi interpretasinya harus mengikuti standar WHO yang spesifik jenis kelamin dan tidak boleh digunakan sendiri untuk mendiagnosis kelebihan berat badan. Penelitian ini bertujuan untuk mendeskripsikan status gizi bayi menggunakan WFA di Praktik Kebidanan Mandiri Hj. Andi Nani Nurcahyani di Makassar. Desain deskriptif kuantitatif potong lintang digunakan. Tesis sumber mencatat 35 bayi yang direkrut dengan pengambilan sampel acak selama periode penelitian. Usia dan berat badan bayi diperoleh melalui pengukuran langsung dan peninjauan dokumentasi, kemudian diringkas menggunakan distribusi frekuensi. Sebagian besar bayi berusia 0-6 bulan (30/35; 85,7%), dan kisaran berat badan yang paling sering adalah 6-7 kg (14/35; 40,0%). Tabel WFA sumber mengklasifikasikan 23 bayi (65,7%) sebagai normal dan 12 (34,3%) sebagai di atas ambang batas yang diterapkan dalam tesis, sementara tabel status gizi akhir terpisah melaporkan 28 bayi (80,0%) sebagai normal dan 7 (20,0%) sebagai memiliki status gizi yang lebih tinggi. Karena tesis menggunakan ambang batas >+2 SD untuk kategori WFA yang lebih tinggi dan tabel utama tidak menyertakan skor z spesifik jenis kelamin, kedua ringkasan ini tidak dapat diselaraskan secara independen. Standar Indonesia saat ini mengklasifikasikan WFA >+1 SD sebagai risiko berat badan lebih tinggi dan merekomendasikan konfirmasi dengan berat badan berdasarkan panjang/tinggi atau BMI berdasarkan usia. Temuan menunjukkan bahwa sebagian besar bayi dalam sampel berbasis fasilitas ini dilaporkan memiliki status berat badan normal, tetapi sebagian besar memerlukan pemantauan pertumbuhan berkelanjutan. Pemetaan rutin pengukuran serial, verifikasi dengan standar pertumbuhan spesifik jenis kelamin, dukungan untuk pemberian ASI eksklusif selama enam bulan pertama, dan pemberian makanan pendamping yang tepat setelahnya tetap penting.

Kata Kunci : Antropometri, Pertumbuhan Bayi, Status Gizi, Berat Badan Menurut Usia, Pemantauan Pertumbuhan, Makassar.

1. INTRODUCTION

Optimal nutrition during infancy is fundamental to survival, neurodevelopment, immune function, and later health. The first year of life is characterized by rapid changes in body weight and length, and growth trajectories during this period are sensitive to feeding practices, birth outcomes, illness, caregiving, and the broader household environment. Globally, child malnutrition remains a double burden: undernutrition persists while the number of children living with overweight remains substantial. The 2025 UNICEF/WHO/World Bank Joint Child Malnutrition Estimates reported that in 2024 approximately 150.2 million children under five were stunted, 42.8 million were wasted, and 35.5 million were living with overweight (UNICEF, WHO, & World Bank Group, 2025). Although those indicators are not interchangeable with infant WFA, they illustrate why accurate growth assessment and early identification of abnormal trajectories remain central to child-health services.

Indonesia continues to face this double burden. The 2024 Indonesian Nutritional Status Survey (SSGI) documented continuing national nutritional challenges and confirmed that child nutritional assessment uses multiple anthropometric indices rather than a single measure. Nationally, stunting declined to 19.8% in 2024 and wasting to 7.4%, but underweight increased to 16.8%, demonstrating that progress across indicators is not uniform (Badan Kebijakan Pembangunan Kesehatan, 2025; Kementerian Kesehatan Republik Indonesia, 2025). In the Indonesian context, infant growth monitoring is therefore not only a clinical activity but also part of the national nutrition surveillance system, linking measurements made in community and primary-care settings to early counselling and referral.

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Anthropometry is widely used because it is non-invasive, feasible, and suitable for repeated measurement. Indonesian Regulation of the Minister of Health No. 2 of 2020 establishes four principal indices for children aged 0-60 months: weight-for-age (WFA), length/height-for-age, weight-for-length/height, and body mass index-for-age. WFA expresses body weight relative to age and is particularly useful for detecting low or very low weight; however, it cannot distinguish whether a low value reflects acute or chronic growth problems. The same regulation emphasizes that possible growth problems identified by WFA should be interpreted alongside other anthropometric indices. Under the current national standard, WFA below -3 SD is classified as severely underweight, -3 to less than -2 SD as underweight, -2 to +1 SD as normal, and above +1 SD as risk of higher body weight (Kementerian Kesehatan Republik Indonesia, 2020). WHO provides sex-specific WFA charts and z-score tables from birth to five years to support standardized interpretation (World Health Organization, 2026a).

The distinction between growth screening and diagnosis is particularly important when an infant has a relatively high WFA. WFA can signal that a child weighs more than expected for age, but it does not incorporate body length and therefore cannot by itself diagnose overweight or obesity. Confirmation requires weight-for-length/height or BMI-for-age. This is clinically relevant because both insufficient and excessive early weight gain deserve attention, yet management should differ. Evidence indicates that rapid infant growth and elevated weight status during infancy can be associated with higher BMI and later overweight, although the strength of the association varies by definition and follow-up period (Doñate Carramiñana et al., 2024; Taylor et al., 2023). Conversely, low or faltering weight gain may precede more serious growth problems and may benefit from early nutritional assessment and counselling (Tanjung et al., 2024).

Feeding practice is one of the most important modifiable influences on infant growth. WHO and UNICEF recommend initiation of breastfeeding within one hour after birth, exclusive breastfeeding for the first six months, and continued breastfeeding up to two years or beyond while safe and nutritionally adequate complementary foods are introduced from six months of age (World Health Organization, 2026b). The 2023 WHO complementary-feeding guideline further highlights six to twenty-three months as a period in which growth faltering and nutrient deficiencies can emerge when food quality, dietary diversity, meal frequency, or feeding responsiveness are inadequate (World Health Organization, 2023). In Indonesia, maternal knowledge, breastfeeding practice, food security, infection, sanitation, and access to growth monitoring all interact with child nutritional outcomes.

Local evidence from South Sulawesi illustrates the importance of close monitoring. In Makassar, Tanjung et al. (2024) screened more than nine hundred infants aged 6-12 months and identified a subgroup with weight faltering using WHO weight-increment standards. Nutritional counselling, with supplementation for infants with greater deficits, improved short-term weight gain and helped many infants move out of the weight-faltering category. A Makassar study of low-birth-weight infants also found that feeding pattern was associated with WFA and length-for-age status (Syahrir, 2024). More recent work in South Sulawesi has linked exclusive breastfeeding, gestational age, and maternal nutritional status with infant WFA outcomes, reinforcing that WFA reflects the combined effect of early-life exposures rather than nutrition intake alone (Sulfianti et al., 2026).

Descriptive facility-based studies remain useful because they show the nutritional profile of infants actually encountered in routine services. Gumilar et al. (2023) reported that 69.2% of infants in a clinic-based sample had normal WFA status, while Urufia et al. (2024) found 75% normal WFA among children attending an integrated health post in Baubau. Such studies cannot estimate population prevalence when sampling is non-probability based, but they help services identify the pattern of children presenting for care and can reveal whether additional counselling, monitoring, or referral is needed.

The thesis underlying this manuscript was conducted at Hj. Andi Nani Nurcahyani Independent Midwifery Practice (TPMB) in Makassar, a facility providing maternal, newborn, infant, immunization, and growth-monitoring services. Preliminary records indicated regular infant weighing

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at the facility, creating an opportunity to describe the distribution of infant age, measured body weight, and WFA-based nutritional categories. However, the source thesis also contained two related but non-identical nutritional summaries: a WFA table and a separate final nutritional-status table. This inconsistency is important because scientific reporting should distinguish a WFA screening category from a broader nutritional-status label and should use standard sex-specific z-score thresholds. Accordingly, this manuscript has two objectives. First, it describes the infant profile reported in the source study, including age, body-weight distribution, and WFA categories. Second, it critically interprets the findings against current WHO and Indonesian anthropometric standards, with explicit acknowledgement of the source-data classification discrepancy. This approach preserves the thesis as the primary data source while improving the scientific clarity needed for journal submission.

2. RESEARCH METHOD

This study used a quantitative descriptive design with a cross-sectional approach. The source thesis was conducted at Hj. Andi Nani Nurcahyani Independent Midwifery Practice in Makassar, South Sulawesi. The thesis title retains the year 2025; however, the methods section and research documentation state that data collection occurred in January 2026. To avoid creating an unsupported date, this manuscript reports the data-collection period according to the methods documentation and omits the year from the article title. The study population consisted of infants who visited the midwifery practice during the study period. The abstract and sampling subsection of the thesis specify accidental sampling, whereby eligible infants presenting during data collection were recruited. A later procedural paragraph refers to total sampling, but this conflicts with the dedicated sampling section. The manuscript therefore follows the sampling method stated consistently in the abstract and population-sample subsection: accidental sampling. Thirty-five infants were included in the final dataset.

The main variables were infant age, measured body weight, WFA category, and the final nutritional-status category recorded in the source thesis. Age was recorded in months and summarized into 0-6 months and 7-12 months. Body weight was measured using an infant scale and grouped into 3-4 kg, 4-5 kg, 5-6 kg, 6-7 kg, and 7-8 kg. The observation sheet and child growth records (Kartu Menuju Sehat/KMS) were used as supporting documentation. The study did not report repeated measurements, so the analysis represents a single cross-sectional assessment rather than longitudinal growth velocity.

The source thesis states that WFA was interpreted using WHO-based anthropometric standards. However, its operational definition used -2 to +2 SD for normal WFA and >+2 SD for the higher category. This differs from the currently applicable Indonesian standard, which defines normal WFA as -2 to +1 SD and >+1 SD as risk of higher body weight. Moreover, the master table supplied in the thesis does not include infant sex or the raw sex-specific WFA z-score for every record, preventing a valid retrospective reclassification according to WHO/Permenkes thresholds. Consequently, this manuscript reports the source categories as recorded and does not relabel them as a definitive diagnosis of overweight.

Data were analyzed descriptively using frequencies and percentages. Four summaries from the source thesis were retained: age group, body-weight range, the source WFA classification, and the separate final nutritional-status classification. No inferential test was performed because the study objective was descriptive and no exposure-outcome hypothesis was specified. Percentages were checked against the reported denominator of 35 infants. Data-integrity review identified a discrepancy between the source WFA table and the final nutritional-status table. The WFA table reported 23 infants (65.7%) as normal and 12 (34.3%) in the higher WFA category, whereas the separate final nutritional-status table reported 28 infants (80.0%) as normal and 7 (20.0%) in the higher category. Because the available source does not provide sufficient sex-specific z-score data to determine which derivation is correct, both summaries are presented transparently. For submission to a journal, the authors should

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reconcile these classifications against the original infant sex, exact age, measured weight, and WHO/Permenkes z-score calculation.

The source thesis describes informed consent from parents or guardians, anonymity, confidentiality, protection from discomfort, and beneficence. Written parental consent forms are included in the thesis appendices. A formal ethics approval number was not identified in the provided document; therefore, no ethics number has been invented in this manuscript. If ethical approval was obtained, the corresponding committee name and approval number should be added before submission.

3. RESULT AND DISCCUSSION

Participant Profile

A total of 35 infants were included. Most were in the first six months of life, with 30 infants (85.7%) aged 0-6 months and only five (14.3%) aged 7-12 months. This age distribution is important for interpretation because feeding recommendations and expected weight gain differ markedly before and after six months. During the first six months, exclusive breastfeeding is the recommended feeding pattern for most infants, whereas complementary foods should begin around six months while breastfeeding continues (World Health Organization, 2023, 2026b).

Table 1. Distribution of Infants by Age Group

Age Group	n	%
0-6 months	30	85.7
7-12 months	5	14.3
Total	35	100.0

Source: Primary Data, 2026.

The dominance of infants younger than six months means that the results largely reflect an early-infancy service population rather than the full 0-12-month age range. This matters because the first six months are characterized by high expected growth velocity and relatively rapid changes in body weight. Comparisons with studies containing a larger proportion of older infants or toddlers must therefore be made cautiously. Saba et al. (2020), for example, specifically described infants aged 0-6 months and also reported that most had good nutritional status, whereas Urufia et al. (2024) included children up to 60 months and consequently observed a wider range of undernutrition and growth problems.

The age pattern also has service implications. A midwifery practice that sees a large number of infants in the first six months is well positioned to reinforce breastfeeding, monitor weight gain, identify faltering early, and refer infants with concerning trajectories. WHO recommends breastfeeding support as a routine component of maternity and child-health services, and the first six months provide repeated opportunities to integrate weighing with counselling rather than treating anthropometry as an isolated measurement (World Health Organization, 2026b).

Body-Weight Distribution

The most frequent body-weight range was 6-7 kg, representing 14 infants (40.0%). Eight infants (22.9%) weighed 7-8 kg, seven (20.0%) weighed 5-6 kg, five (14.3%) weighed 4-5 kg, and one (2.9%) weighed 3-4 kg. Body weight alone should not be interpreted as nutritional status because the same weight may be appropriate at one age and abnormal at another, and interpretation also depends on sex and body length. Nevertheless, the distribution provides a useful descriptive picture of the infants presenting to the facility.

Table 2. Distribution of Measured Infant Body Weight

Body Weight	n	%
3-4 kg	1	2.9
4-5 kg	5	14.3
5-6 kg	7	20.0
6-7 kg	14	40.0

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7-8 kg	8	22.9
Total	35	100.0

Source: Primary Data, 2026.

The observed concentration in the 6-7 kg range is plausible for a sample dominated by infants in early life, but it cannot be judged independently from exact age and sex. WHO growth standards provide separate WFA tables for boys and girls and expect age to be calculated precisely in completed units when constructing z-scores. The Indonesian anthropometric regulation similarly requires standardized measurement and interpretation. Accordingly, routine practice should record the exact date of birth, sex, and weight, and then plot the measurement on the correct sex-specific chart rather than relying on broad kilogram categories (Kementerian Kesehatan Republik Indonesia, 2020; World Health Organization, 2026a).

A single weight measurement also provides less clinical information than a trajectory. Tanjung et al. (2024) demonstrated the value of WHO weight-increment standards in identifying infants with weight faltering in Makassar. Growth velocity can reveal concern even when a child remains within a nominally normal point-in-time range. Conversely, one relatively high measurement may not represent persistent excess weight if the infant's length and previous trajectory are appropriate. This reinforces the need for serial plotting in the KIA book/KMS and follow-up of unexpected changes.

Weight-for-Age Classification

The primary WFA table in the source thesis reported that 23 infants (65.7%) were within the normal category and 12 infants (34.3%) were above the cut-off used by the study. No infant was reported in the underweight or severely underweight category. This pattern suggests that low WFA was not the dominant problem among infants attending the facility during the observation period. However, the higher-category percentage should not be interpreted as a prevalence of overweight because the source operational cut-off and label differ from current national WFA terminology.

Table 3. Weight-for-Age Classification as Reported in the Source Thesis

Source WFA Category	n	%
Normal according to source cut-off	23	65.7
Above the source cut-off	12	34.3
Total	35	100.0

Source: Source thesis Table 4.3 / Primary Data, 2026. Category labels paraphrased to avoid treating WFA as a diagnosis of overweight.

Current Indonesian guidance requires more conservative interpretation. For WFA among children aged 0-60 months, the normal range is -2 to +1 SD and values above +1 SD are categorized as risk of higher body weight. Importantly, the regulation explicitly notes that WFA is not used to classify a child as overweight or obese; children with concerning WFA should be confirmed using weight-for-length/height or BMI-for-age (Kementerian Kesehatan Republik Indonesia, 2020). The thesis, by contrast, used a normal range of -2 to +2 SD and labelled values above +2 SD as higher nutrition/overweight. Because the master table does not contain sex-specific z-scores, it is not scientifically valid to convert the 12 cases into the official >+1 SD category retrospectively.

This distinction has practical consequences. A large percentage of infants appearing above a study-defined WFA threshold may reflect true high relative weight, differences in sex composition, broad age grouping, or classification procedures. Without length data, one cannot determine whether the infant has high weight relative to body size. Taylor et al. (2023) reported that obesity status during infancy predicted later adiposity more consistently than some definitions of rapid weight gain, while Doñate Carramiñana et al. (2024) found that rapid early growth was associated with higher later BMI and overweight risk. These findings support continued surveillance of infants with high relative weight, but they do not justify labelling high WFA alone as obesity.

Local studies provide useful comparison but also show why index-specific terminology matters. Gumilar et al. (2023) found 69.2% of infants in their clinic sample had good/normal WFA, a proportion close to the 65.7% normal category in the present source WFA table. In Baubau, Urufia et

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al. (2024) reported 75% normal WFA, with 25% underweight or severely underweight. The current facility sample did not report underweight in the source summary, which may reflect differences in the population served, age distribution, feeding patterns, sample size, or non-probability sampling rather than a genuinely lower community prevalence.

The absence of underweight should therefore be interpreted as a finding within this small service sample, not evidence that undernutrition is absent in Makassar. National SSGI 2024 findings show that underweight remains an important problem in Indonesia, with national prevalence increasing to 16.8% (Kementerian Kesehatan Republik Indonesia, 2025). Facility-based samples can differ substantially from national household surveys because they include only children who present for care and may be influenced by caregiver health-seeking behavior, service accessibility, and the timing of visits.

Source-Reported Final Nutritional Status

A separate table in the thesis summarized overall nutritional status as 28 infants (80.0%) normal and seven infants (20.0%) in a higher nutritional-status category. This summary is also the distribution cited in the thesis abstract. The difference from the WFA table (23 normal and 12 above the source cut-off) was not fully explained in the document. The master table contains both a WFA-result column and a separate nutritional-status coding column, suggesting that the two summaries may have been generated through different coding steps. Because the derivation cannot be reconstructed with confidence from the available information, the manuscript preserves both results instead of silently selecting one.

Table 4. Final Nutritional-Status Summary Reported in the Source Thesis

Reported Nutritional Status	n	%
Normal	28	80.0
Higher nutritional status (source label)	7	20.0
Total	35	100.0

Source: Source thesis Table 4.4 / Primary Data, 2026.

Despite the discrepancy, both source summaries share the same broad message: most infants were categorized as normal and a smaller, but clinically relevant, subgroup had relatively high weight status. The appropriate response in practice is not dietary restriction in infancy but careful confirmation of growth measurements, review of feeding practice, and serial monitoring. Early-life growth is dynamic, and inappropriate restriction can compromise nutrient intake during a critical period of development. Instead, counselling should focus on responsive feeding, age-appropriate milk feeding, avoiding unnecessary energy-dense complementary foods, and monitoring the trajectory of both weight and length.

For infants younger than six months, breastfeeding support is particularly relevant because 85.7% of the sample fell in this age group. WHO recommends exclusive breastfeeding for the first six months for most infants, followed by continued breastfeeding and complementary foods from approximately six months (World Health Organization, 2026b). Maternal dietary behavior and feeding knowledge can influence infant growth. Zahara and Siregar (2022) reported an association between maternal eating behavior during breastfeeding and infant nutritional status, while studies in Makassar have found relationships between breastfeeding patterns and child nutritional outcomes. However, the present thesis did not measure breastfeeding exclusivity, maternal nutrition, birth weight, or formula use, so those factors cannot be assumed to explain the observed distribution.

For the five infants aged 7-12 months, complementary feeding becomes an additional determinant. WHO's 2023 guideline emphasizes dietary adequacy, food diversity, feeding frequency, hygiene, and responsive feeding from six months onward. Inadequate complementary feeding can contribute to faltering growth and micronutrient deficiency, whereas excessive energy density or inappropriate feeding patterns can promote excessive weight gain. Because the study did not collect dietary data, the manuscript cannot determine whether the higher weight categories were related to milk feeding, complementary foods, birth size, family characteristics, or other influences.

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The Makassar clinical trial by Tanjung et al. (2024) is particularly relevant because it shows how routine anthropometric surveillance can move beyond description to action. Infants with low weight increment were identified before established stunting and then provided nutritional advice, with additional oral supplementation for those with greater deficits. Most infants improved their weight-faltering classification during follow-up. The lesson for midwifery practice is that a growth chart is most valuable when it triggers a structured pathway: verify measurement, assess feeding and illness, counsel the caregiver, schedule follow-up, and refer if growth remains abnormal.

At the other end of the growth spectrum, a high weight value should prompt confirmation rather than immediate diagnostic labelling. WHO and Indonesian standards require length-based or BMI-for-age indices for classification of overweight/obesity in young children. This is especially important in infancy because body proportions change rapidly. A child with relatively high WFA may also be long for age and therefore have a normal weight-for-length. The current study did not record length in the analyzed dataset, which limits interpretation of the 12 infants above the study's WFA cut-off and the seven infants recorded with higher nutritional status.

The study's facility setting also affects generalizability. Accidental sampling captures infants whose caregivers attended the practice and agreed to participate. Families who regularly seek preventive care may differ from those who do not attend in breastfeeding support, socioeconomic conditions, maternal education, and health literacy. Consequently, the 80.0% normal nutritional-status summary should not be interpreted as the prevalence of normal infant nutrition in Makassar. Population estimates require probability-based community sampling such as SSGI.

Nevertheless, the findings have practical value for service planning. The predominance of younger infants indicates that the practice has repeated contact with families during a critical window for breastfeeding and early growth monitoring. Integrating standardized weight measurement with the Maternal and Child Health (KIA) book can strengthen continuity between midwifery practice, Posyandu, and Puskesmas services. Measurements should be plotted at every visit, and unexpected downward or upward crossing of growth trajectories should prompt assessment rather than waiting until a categorical threshold is reached.

The study also underscores the need for measurement quality. Small errors in weighing, age calculation, or data entry can shift an infant across z-score boundaries. Scales should be calibrated, infants should be weighed with minimal clothing, age should be calculated accurately, and sex-specific WHO standards should be used. Ratumanan et al. (2023) reviewed anthropometric approaches and emphasized the practicality of conventional anthropometry, but reliable interpretation depends on standardized technique. SSGI likewise uses standardized digital measurements and structured quality control to minimize classification error (Badan Kebijakan Pembangunan Kesehatan, 2025).

From a public-health perspective, growth monitoring should be linked to both prevention of undernutrition and prevention of excessive weight gain. The 2025 Joint Child Malnutrition Estimates show that the world remains off track for multiple nutrition targets, including stunting and overweight. This double burden means that counselling cannot focus only on increasing intake. Families need support for breastfeeding, timely and diverse complementary foods, responsive feeding, avoidance of sugar-sweetened beverages and inappropriate energy-dense foods, infection prevention, immunization, and timely care-seeking. The most appropriate counselling depends on the child's full anthropometric profile and growth trajectory rather than a single weight measurement.

Recent Indonesian research further supports a multidimensional view. Kekalih et al. (2025), using data from Indonesian children aged six months and older, documented nutritional and micronutrient concerns across age groups, demonstrating that apparently adequate growth does not exclude dietary inadequacy. Syahrir (2024) showed that nutritional status among infants with a history of low birth weight in Makassar was related to feeding exposure. Sulfianti et al. (2026) similarly reported associations of exclusive breastfeeding, gestational age, and maternal nutrition with infant WFA status in South Sulawesi. These studies indicate that anthropometric classification should be treated as an entry point for broader assessment rather than the endpoint of nutritional evaluation.

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The present source study has several limitations. First, the sample was small and selected through accidental sampling at a single private midwifery practice, limiting external validity. Second, the cross-sectional design cannot evaluate growth velocity or temporal relationships. Third, key determinants such as sex, birth weight, gestational age, exclusive breastfeeding, complementary feeding, illness, maternal education, and socioeconomic status were not included in the analytic results. Fourth, infant length was not analyzed, preventing confirmation with weight-for-length. Fifth, the source thesis contains an internal inconsistency between the WFA table and the final nutritional-status table and uses a WFA cut-off that differs from the current Permenkes standard. These limitations should be addressed before using the findings for prevalence claims or clinical classification.

A stronger follow-up study should collect exact age in days or completed months, sex, weight, recumbent length, birth weight, feeding history, and recent morbidity, and should calculate sex-specific WHO z-scores directly using validated software. Repeated measurements would allow assessment of weight-gain velocity and crossing of centile/z-score channels. A larger multi-site sample from TPMB, Posyandu, and Puskesmas settings in Makassar would also improve representativeness and allow analysis of factors associated with both underweight and high relative weight.

Comparison with Previous Evidence

The facility profile in this study can be better understood when compared with descriptive and analytic studies from Indonesia. The proportion classified as normal varied across settings, reflecting differences in age, case mix, anthropometric index, and sampling. Importantly, studies that measured several indices consistently showed that one index cannot substitute for another. A child can have normal WFA but still be stunted, wasted, or at risk of overweight when length-based measures are considered. This supports the Indonesian requirement to interpret WFA together with length/height-based indices when a potential growth problem is identified.

Table 5. Comparison with Selected Indonesian Evidence on Infant and Child Growth

Study	Setting / Sample	Indicator	Main Finding	Relevance
Saba et al. (2020)	Kupang; 44 infants 0-6 mo	WFA	50% reported good status	Shows early-infancy facility profiles can be predominantly normal
Gumilar et al. (2023)	Serang; 46 infants	WFA, HFA, head circumference	69.2% normal WFA	Normal WFA can coexist with abnormalities on other indices
Urufia et al. (2024)	Baubau; 20 children 0-60 mo	WFA, HFA, WFH, BMI/A	75% normal WFA; underweight also present	Illustrates value of multi-index assessment
Syahrir (2024)	Makassar; 160 LBW infants	WFA, HFA, WFH	Feeding exposure related to WFA/HFA	Shows feeding and birth history influence anthropometric status
Tanjung et al. (2024)	Makassar; 913 screened infants 6-12 mo	Weight increment / growth faltering	170 had weight faltering; many improved with nutrition care	Shows importance of serial growth velocity, not only one-time weight

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Kekalih et al. (2025)	Indonesia; children 6 mo-12 y	Anthropometry + dietary/biochemical measures	Multiple nutritional problems identified	Anthropometry should be integrated with dietary assessment
Sulfianti et al. (2026)	South Sulawesi; 35 mother-infant pairs	WFA / BGM	Breastfeeding, gestational age, maternal nutrition associated with WFA	Supports assessment of early-life determinants
Alam et al. (2026)	Central Sulawesi; 88 infants at 6 mo	WFA z-score	Microbiota pattern associated with lower WAZ	Highlights biological determinants beyond feeding alone

Source: Synthesized from published studies cited in the manuscript.

The comparison highlights why the apparent absence of underweight in the current source sample should not be overgeneralized. Clinic populations differ from community surveys, and the present sample was especially concentrated in infants younger than six months. In contrast, Urufia et al. (2024) included children across the first five years of life and identified both severely underweight and underweight children. SSGI 2024, which used national probability sampling and standardized anthropometry, estimated substantial underweight at population level. The different sampling frames explain why facility findings and national estimates answer different questions.

Another important contrast concerns growth velocity. The thesis used a single cross-sectional weight measurement, whereas Tanjung et al. (2024) used WHO weight-increment standards to detect faltering among 6-12-month-old infants in Makassar. Growth velocity is often clinically more informative than a single point because it identifies deviation from an infant's own trajectory. In practical terms, a child whose WFA remains within the normal range but crosses downward through several z-score channels may deserve more attention than a child who remains stable at a lower percentile.

Evidence from South Sulawesi also supports integrating maternal and perinatal information into interpretation. Syahrir (2024) examined low-birth-weight infants and found associations between feeding exposure and anthropometric outcomes. Sulfianti et al. (2026) reported relationships of exclusive breastfeeding, gestational age, and maternal nutritional status with infant WFA. These findings are especially relevant for midwifery services, which often have access to pregnancy, birth, and postnatal records and can therefore interpret infant growth within a life-course context rather than as an isolated measurement.

The current sample contained a sizeable group with relatively high weight according to the source classification. This deserves surveillance but not alarm. Early high weight can be transient, and WFA does not account for length. Nevertheless, systematic reviews suggest that rapid infant growth and high weight status can predict later overweight in some children (Doñate Carramiñana et al., 2024; Taylor et al., 2023). The most appropriate response is to verify measurement quality, review feeding practices, assess length, and monitor subsequent growth rather than to recommend energy restriction without a complete assessment.

The high proportion of infants younger than six months also makes breastfeeding counselling a central service implication. At each weighing visit, providers can assess breastfeeding effectiveness, feeding frequency, maternal concerns, and signs of inadequate intake. When growth is adequate, the visit reinforces confidence and supports continuation of exclusive breastfeeding. When weight gain is inadequate, early assessment can identify latch problems, maternal illness, infant illness, or other

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barriers. For infants approaching six months, counselling can transition toward timely, safe, diverse, and responsive complementary feeding while breastfeeding continues.

Growth monitoring is most effective when caregivers understand the meaning of the chart. Simply telling parents that an infant's weight is 'normal' or 'high' may not improve feeding behavior. Health workers should explain the child's trajectory, the purpose of repeated measurements, and the difference between weight-for-age and weight-for-length. Visual explanation using the KIA book or KMS can improve shared decision-making and may reduce unnecessary feeding changes based on a single measurement.

The role of the independent midwifery practice is therefore not limited to weighing. TPMB services can function as a continuity point that links newborn care, breastfeeding support, immunization, growth surveillance, maternal counselling, and referral to Posyandu or Puskesmas when a problem is detected. Because families may return frequently during infancy, consistent documentation allows different providers to recognize trends that might be missed in fragmented care. Data quality is equally important for research and service delivery. The discrepancy between the WFA table and the final nutritional-status table demonstrates how coding decisions can change the apparent distribution of nutritional problems. For future studies, the master dataset should include sex, exact date of birth, exact measurement date, raw weight, recumbent length, calculated z-scores, and the software or growth standard used. Storing both raw values and derived classifications allows independent verification and prevents category drift during analysis.

A reproducible analysis protocol would strengthen future manuscripts. Researchers should predefine the anthropometric standard, specify exact z-score thresholds, describe equipment and calibration, and report how implausible values are handled. WHO Anthro or another validated implementation of the WHO growth standards can be used to compute sex-specific z-scores. The resulting manuscript should then report the index accurately—for example, 'risk of higher weight-for-age' for WFA rather than 'overweight'—and reserve overweight/obesity classification for length- or BMI-based indices as recommended by national guidance. Finally, future research should move from simple description toward explanation while preserving routine feasibility. A multi-site prospective cohort in Makassar could recruit infants at birth or the first postnatal visit and repeat weight and length measurements monthly through twelve months. Feeding pattern, birth weight, gestational age, maternal nutritional status, recent infection, household food security, and caregiver education could be collected concurrently. Such a design would allow identification of determinants of both growth faltering and excessive relative weight and would provide stronger evidence for targeted counselling in midwifery and primary-care settings.

4. CONCLUSION

Most infants attending Hj. Andi Nani Nurcahyani Independent Midwifery Practice in the source study were younger than six months, and the most common measured weight range was 6-7 kg. The source WFA table reported 65.7% of infants as normal and 34.3% above the study-defined cut-off, while a separate final nutritional-status table reported 80.0% normal and 20.0% in a higher category. These results indicate that most infants were considered to have an acceptable weight profile in the source study, but a subgroup required continued surveillance. Because WFA alone cannot diagnose overweight and the source classification differs from the currently applicable Indonesian cut-off, the higher categories should be verified using exact sex-specific WFA z-scores and confirmed with weight-for-length/height or BMI-for-age.

Midwifery and primary-care services should continue routine growth monitoring, plot serial measurements in the KIA book/KMS, support exclusive breastfeeding during the first six months, provide appropriate complementary-feeding counselling from six months onward, and refer infants with persistent abnormal growth trajectories. Before journal submission, the authors should reconcile the two nutritional classifications against the original individual data and add the corresponding author's email and ethics approval details if available.

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5. REFERENCES

Alam, S., Hadju, V., Ansariadi, Jafar, N., Abdullah, M. T., & Manyullei, S. (2026). Clostridium abundance and lower weight-for-age z scores among 6-month-old infants: Nested cross-sectional study. JMIR Pediatrics and Parenting, 9, e87452. https://doi.org/10.2196/87452

Badan Kebijakan Pembangunan Kesehatan. (2025). Survei Status Gizi Indonesia (SSGI) 2024 dalam angka. Kementerian Kesehatan Republik Indonesia.

Doñate Carramiñana, L., Guillén Sebastián, C., Iglesia Altaba, I., Nagore Gonzalez, C., Alvarez Sauras, M. L., García Enguita, S., & Rodriguez Martinez, G. (2024). Rapid growth between 0 and 2 years old in healthy infants born at term and its relationship with later obesity: A systematic review and meta-analysis of evidence. Nutrients, 16(17), 2939. https://doi.org/10.3390/nu16172939

Gumilar, R., Soviah, S., & Yuliyani, L. (2023). Gambaran status gizi berdasarkan berat badan/umur, tinggi badan/umur dan lingkar kepala tahun 2022. Jurnal Obstretika Scientia, 11(2), 158-166.

Kekalih, A., Chandra, D. N., Mirtha, L. T., Khouw, I., Wong, G., Sekartini, R., & SEANUTS II Indonesia Study Group. (2025). Dietary intakes, nutritional and biochemical status of 6 months to 12-year-old children before the COVID-19 pandemic era: The South East Asian Nutrition Survey II Indonesia (SEANUTS II) study in Java and Sumatera Islands, Indonesia. Public Health Nutrition, 28(1), e1. https://doi.org/10.1017/S1368980024001654

Kementerian Kesehatan Republik Indonesia. (2020). Peraturan Menteri Kesehatan Republik Indonesia Nomor 2 Tahun 2020 tentang Standar Antropometri Anak. Kementerian Kesehatan Republik Indonesia.

Kementerian Kesehatan Republik Indonesia. (2024). Buku Kesehatan Ibu dan Anak (KIA), edisi revisi 2024. Kementerian Kesehatan Republik Indonesia.

Kementerian Kesehatan Republik Indonesia. (2025). Survei Status Gizi Indonesia 2024: Prevalensi stunting nasional turun menjadi 19,8%. Direktorat Jenderal Kesehatan Primer dan Komunitas.

Ratumanan, S. P., Achadiyani, A., & Khairani, A. F. (2023). Metode antropometri untuk menilai status gizi: Sebuah studi literatur. Health Information: Jurnal Penelitian, 15(1).

Saba, A. W., Mindarsih, T., & Nahak, M. P. M. (2020). Gambaran status gizi bayi usia 0-6 bulan di Posyandu Bogenvil Puskesmas Oesapa Kota Kupang. CHMK Applied Scientific Journal, 3(2), 63-69.

Sulfianti, S., Fitriani, L., Hasnidar, H., Sapartina, N. E., & Rochmawati, R. (2026). Exclusive breastfeeding, gestational age, and maternal nutrition associated with infant weight-for-age status: A cross-sectional study. MEDICA, 8(9). https://doi.org/10.53770/medica.v8i9.1298

Syahrir, S. (2024). The relationship between formula milk supplementation and the nutritional status of low birth weight infants at the age of 0-6 months at the Makassar City Health Center in 2020-2022. E-Jurnal Medika Udayana, 13(10), 86-91. https://doi.org/10.24843/MU.2024.V13.i10.P14

Tanjung, C., Fikri, B., Prawitasari, T., Massi, N., Zainuddin, A. A., Juliaty, A., Yullyana, D. S., Dwitya, S., Shimojo, N., Ohno, H., & Koletzko, B. (2024). Comparative analysis of nutritional advice and a combined approach for addressing impending stunting in infants: A clinical trial. Nutrients, 16(17), 2832. https://doi.org/10.3390/nu16172832

Taylor, R. W., Haszard, J. J., Meredith-Jones, K. A., Heath, A.-L. M., Galland, B. C., Gray, A. R., Fortune, S., Sullivan, T., Adebowale, T., & Taylor, B. J. (2023). Rapid infant weight gain or point-in-time weight status: Which is the best predictor of later obesity and body composition? Obesity, 31(10), 2583-2592. https://doi.org/10.1002/oby.23861

UNICEF, World Health Organization, & World Bank Group. (2025). Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates - Key findings of the 2025 edition. UNICEF and World Health Organization.

Multidisciplinary Indonesian Center Journal (MICJO)
Journal page is available to
https://e-jurnal.jurnalcenter.com/index.php/micjo
Email: admin@jurnalcenter.com

Urufia, W. O. N., Thaifur, A. Y. B. R., Nurhidayati, W. O., Sumarni, M., Dafid, D. Z., & Subhan, M. (2024). Gambaran status gizi anak umur 0-60 bulan di Posyandu Ferbena wilayah kerja Puskesmas Wolio, Kota Baubau, Sulawesi Tenggara. Jurnal Kolaboratif Sains, 7(8), 3242-3253.

World Health Organization. (2023). WHO guideline for complementary feeding of infants and young children 6-23 months of age. World Health Organization.

World Health Organization. (2026a). Child growth standards: Weight-for-age. World Health Organization.

World Health Organization. (2026b). Infant and young child feeding. World Health Organization.

Zahara, R., & Siregar, T. J. (2022). Perilaku makan ibu menyusui dengan status gizi bayi 0-6 bulan. Journal of Telenursing (JOTING), 4(2), 820-828. https://doi.org/10.31539/joting.v4i2.4769