



Retrospective Study Of Stunting Among Children Under Five In Polewali Mandar Regency West Sulawesi Province

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ABSTRACT

Stunting is a linear growth problem that requires assessment of early feeding, infection history, and nutritional interventions. This study aimed to examine histories of exclusive breastfeeding, helminth infection, and zinc supplementation in relation to stunting among children under five in Polewali Mandar Regency. The methods described a retrospective case-control design with purposive sampling of mothers of children aged 24–59 months. The specified sample comprised 120 mothers, with 60 cases and 60 controls, across Polewali Mandar and Majene; the final analyzed numbers by district were not documented. Data collection involved questionnaire interviews, anthropometric measurements, and observations of sanitation and hygiene. The reported analytical approach comprised univariate analysis and bivariate estimation of odds ratios. The narrative findings identified breastfeeding history, helminth infection history, and zinc supplementation history as factors requiring attention, alongside illness, sanitation, and household circumstances. However, exposure frequencies, odds ratios, confidence intervals, and p-values were not presented. The results section also differed from the methods in its description of the study design and geographical coverage. Consequently, association magnitude, statistical significance, and independent predictor status could not be established. The findings support integrated assessment of feeding, infection, and nutrition history, while completion of the original statistical results and confirmation of the implemented design and study population remain necessary before empirical conclusions can be strengthened.

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1. INTRODUCTION

Stunting is a state of height or height according to age that is below the two standard deviations of the median standard of child growth of the World Health Organization (WHO). This assessment relates body size to the child's age and gender, so it is different from the assessment of girdle based on weight according to height or height [1]. The discussion of stunting needs to pay attention to growth from the beginning of life and the circumstances that take place before the measurement is made. Feeding history, disease, and nutritional support are important parts of the assessment.

In the context when the research report was compiled, the 2022 Indonesian Nutrition Status Survey (SSGI) recorded a national stunting prevalence of 21.6%, West Sulawesi at 35.0%, and Polewali Mandar Regency at 39.3% [2]. This figure is the context of a population survey in 2022, not the results of measurements by this study participant. The magnitude of the problem in Polewali Mandar encourages the study of factors related to child growth so that family monitoring and support can be adjusted to local needs.

A review of the determinants of stunting in Indonesia shows the importance of factors at the child, maternal, household, and environmental levels [3]. Inter-district analyses also show geographical and socioeconomic gaps in the problem of child malnutrition [4]. More recent national research places social



and environmental conditions as relevant contexts in stunting studies [5]. Because these factors can be interrelated, an assessment of a single exposure history needs to consider family conditions and accompanying access to services.

Exclusive breastfeeding history is one of the focuses of the study because it describes early life feeding practices. WHO and UNICEF guidelines provide definitions and indicators of infant and child feeding to support consistent measurement [6]. In studies with children aged 24–59 months, information about the breastfeeding period was obtained after the period had passed. Therefore, the definition of exclusive breastfeeding, the intended age limit, and the ability of respondents to recall other foods or beverages need to be considered in the interpretation.

Zinc supplementation is another focus that needs to be distinguished from dietary intake and the body's zinc status. The Cochrane review of preventive zinc supplementation shows that the benefits to height growth tend to be small and need to be read according to the population and the intervention studied [7]. The history of receiving supplements in a family survey does not in itself describe the adequacy of intake or the diagnosis of zinc deficiency. Clarity of timing, reason for administration, and regularity of use are necessary to understand the meaning of these variables.

History of worms is also considered because the child's health takes place in an environment with different patterns of infection exposure. WHO guidelines on the control of soil-borne worms place deworming as part of reducing the burden of infection in at-risk groups [8]. History of worming, diagnosis of active infection, and history of deworming are different information. The separation of the three helps to prevent the inference of inappropriate conclusions from the method of measurement.

The approach that pays attention to various life stages is supported by the MAL-ED longitudinal study, which examines the relationship between pre- and post-birth conditions and child growth [9]. This evidence provides a basis for examining the history of feeding, infection, and nutritional interventions simultaneously, without assuming that a single factor explains all stunting events. This study aims to examine the association between the relationship between exclusive breastfeeding, deworming, and zinc supplementation with stunting in toddlers in the context of Polewali Mandar Regency, West Sulawesi.

2. IMPLEMENTATION METHOD

Research design and scope

The design described in the summary and method section is an analytical quantitative research with a case-control retrospective approach. The grouping of subjects is determined according to stunting status, then the exposure history is traced through the mother. This design is a reference for the preparation of the method description because it contains group criteria and variables in more detail. However, the report results section mentions cross-sectional design; the actual implementation of the design cannot be ascertained from the participant table or individual data. The location coverage in the method includes Polewali Mandar and Majene Regencies, while the title and description of the results focus on Polewali Mandar.

Subjects and groupings

The subjects determined were mothers who had children aged 24–59 months and lived in the target area from pregnancy to the implementation of the research. The selection was carried out purposively. The method included a total of 120 mothers, consisting of 60 mothers with stunted children as a case group and 60 mothers with non-stunted children as a control group. This number is said to be calculated using the Lemeshow formula. The grouping in the design is summarized in Table 1.

Table 1. Subject groupings set out in the research design

Groups	Criteria in the report method	Stipulated amount
Case	Mothers with children aged 24–59 months who are stunted; z-score height according to age <-2 elementary school, included in the very short category (<-3 elementary school).	60

Controls	Mothers with children aged 24–59 months; Z-score range –2 to +1 SD as written in the method.	60
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The definition of stunting refers to height or height according to age below –2 SD, with the very short category being below –3 SD. The range of control groups in the method section is –2 to +1 SD and is maintained as a reported selection criterion. The child is the unit for assessing growth status, while the mother is the source of information on the child's history and family circumstances.

Variables and data collection

The bound variable was stunting status. The three main exposures mentioned in the method were exclusive breastfeeding history, worm history, and zinc supplementation history. Additional information included individual and socioeconomic characteristics, nutritional intake history, child health, deworming, sanitation, and clean and healthy living behaviors. Supplementation history was treated as information regarding supplementation; no biochemical test results were used to establish zinc deficiency in the report.

Data were collected through interviews using questionnaires, anthropometric measurements for nutritional status, as well as direct observation and interviews regarding sanitation and clean and healthy living behaviors. The stages described included instrument preparation and licensing, enumerator training, data collection, processing, and report preparation. The identity of anthropometric tools, calibration process, repeated measurements, and questionnaire validation details have not been described as implementation procedures. Laboratory diagnosis of worms is also not mentioned, so these variables are still declared as worm history.

Data processing and analysis

Data processing uses Microsoft Excel 2010 and SPSS version 22 for Windows. The stages include questionnaire checking, coding, data entry, cleaning, and categorization of variables. The analysis described is univariate to describe variables and bivariate to obtain odds ratio (OR). The report uses a confidence interval that does not include a value of one as the basis for assessing the relationship. The type of test, the level of confidence interval, and numerical results are not detailed.

3. RESULTS AND DISCUSSION

Reported findings

The description of the results placed exclusive breastfeeding history, history of worms, and history of zinc supplementation as factors that need to be considered in the incidence of stunting. Disease history in children and mothers, sanitation, availability of clean water, education, and family economic conditions are also discussed as context. A summary of findings according to the three main exposures is presented in Table 2.

Table 2. Summary of findings

Exposure	Breakdown of results in reports	Association size
Exclusive breastfeeding history	It is said to be related to stunting; the distribution of exposure by group and the direction of the relationship has not been detailed.	OR, confidence interval, and p are not presented.
History of worms	Discussed as a factor to consider; the source of diagnosis and the burden of infection are not detailed.	OR, confidence interval, and p are not presented.
History of zinc supplementation	It is said to be related to stunting; the time, dose, duration, and reason for administration have not been explained.	OR, confidence interval, and p are not presented.

Exclusive breastfeeding history and feeding practices

The exclusive breastfeeding history discussed in the report is relevant to the assessment of feeding practices from the beginning of life. However, interpretation at 24–59 months of age requires clarity regarding the period of history in question. WHO and UNICEF guidelines emphasize the consistency of indicator definitions as well as age groups of measurement [6]. Feeding indicators during the infant survey cannot be directly treated the same as the mother's memory of the practice several years earlier. The



instrument used needs to ensure that the respondent understands the food or beverage included in the question.

The research of Astuti and colleagues in Karanganyar shows that feeding practices need to be read together with social circumstances and family habits [10]. This comparison supports the discussion of exclusive breastfeeding as one aspect of parenting history, while still considering intake after the period of exclusive breastfeeding, health conditions, and household resources. The study at Polewali Mandar has not presented a distribution of exposure or an adjusted analysis to separate the relationship between these factors. Therefore, the role of exclusive breastfeeding in the report cannot be stated as a measurable protective effect in the study sample.

History of worms and deworming

The history of worms in the report is health information that needs to be reviewed according to the source of the record. Infections identified based on complaints or family memories may differ from infections confirmed through examination. Without information on the examination, the type of worms, the time of occurrence, and the intensity of the infection, the study has not been able to estimate the actual burden of worms. The history of receiving deworming also does not confirm that the child has previously had an infection, as administration can be part of preventive services.

WHO guidelines direct the control of soil-borne worms at reducing the burden of infection of at-risk groups [8]. Meanwhile, a Cochrane review shows that routine deworming in the child population does not necessarily result in a significant increase in average height [11]. The two types of evidence answer different questions, namely infection control and changes in growth output. Thus, the description of worms in this study was not used to ensure that deworming alone would reduce stunting. Assessment of infection history and intervention still needs to be linked to the nutritional status and environment of the child.

History of zinc supplementation and nutritional status

The report discusses the importance of zinc for growth, but the operational variable that is determined is the history of supplementation. This information has a different meaning than the results of the assessment of zinc intake or body zinc concentration. Because deficiency measurements are not reported, this article does not conclude that all stunted children are zinc deficient or that the group without supplements must have insufficient intake. This distinction is necessary to keep the interpretation consistent with the information collected.

The Cochrane review of preventive zinc supplementation provides support for the possibility of small growth improvement, with outcomes that need to be considered alongside population characteristics and intervention administration [7]. Such intervention trial evidence cannot be used as a substitute for OR from this retrospective study. The current study does not detail the timing of administration, reason for administration, dosage, duration of use, or adherence. Nutritional status and medical history prior to receiving supplementation may also differ anarchy. With these limitations, the relationship between supplementation history and stunting cannot be separated from the underlying conditions for supplementation.

Family conditions, environment, and interdependencies

Socio-economic, sanitation, and access to services characteristics are discussed in the report as the circumstances accompanying the main factors of the study. National studies show that resource and environmental gaps remain associated with stunting in children [4,5]. In the case-control design, these differences in circumstances between cases and controls may affect the estimated relationship between feeding history, infection, and supplementation. The selection of controls from a group that is comparable to the case is therefore an important part of assessing the findings.

The MAL-ED study placed maternal conditions, environment, enteric infections, and intake in growth relationships that took place from the beginning of life [9]. This helps explain why multiple exposures in the study may be present at the same time. However, biological or social associations do not prove the existence of statistical interactions in the samples. The report does not present multivariate analyses or interaction testing, so there are no claims of combined effects, mutually reinforcing influences, or independent contributions of each factor.



Implications for growth monitoring

Implications that can be considered are the collection of feeding and health histories that are more connected to anthropometric results. Information on exclusive breastfeeding periods, disease events, worm examinations when available, and timing and reasons for supplementation can help clarify the child's condition. The history needs to be read together with family food conditions, sanitation, and access to services. A review of the determinants of stunting in Indonesia also shows the need to pay attention to several levels of factors simultaneously [3].

The report's findings have not established a single intervention with the greatest impact or proven the effectiveness of a program. Support planning at Polewali Mandar requires examinable field outcomes, including frequency of exposure, magnitude of association, and characteristics of comparison groups. The use of outcomes for program priorities needs to consider data completeness, regional coverage, and possible confounders. This article does not provide recommendations for supplementation doses or deworming because the study did not test the prescription of such interventions.

Limitations of the study

The main limitation is the lack of tables of quantitative results, OR, confidence intervals, and p-values. The number of participants who were actually analyzed and their distribution by district could also not be examined. Inconsistencies in the mention of case-control and cross-cutting affect the understanding of how subjects were selected and the interpretation of the results. The fulfillment of the elements of observational reporting, including participant selection, exposure definition, measurement methods, and presentation of estimates, is necessary for the strength and limitations of the study to be assessed [12].

Tracing of history through mothers has the potential to experience memory errors, especially for events that occur before the child's measurement age. Health records and history of supplementation are not always complete in the report. Purposive selection and limitation of the range of control groups can limit the representation and comparability of the subjects. Confounding control, missing data handling, and documentation of instrument validity have not been reported. These limitations limit the determination of causal direction, risk amount, and independent predictors, and need to be resolved before empirical conclusions are used more widely.

4. CONCLUSION

The narrative findings in the report place exclusive history of breastfeeding, deworming, and zinc supplementation as aspects that need to be studied along with health, nurturing, family conditions, and the environment in the incidence of stunting in toddlers. However, the absence of detailed exposure tables and statistical results limits the assessment of the magnitude of the relationship, significance, and independent contribution of each factor. The case-control design and coverage of Polewali Mandar and Majene participants also require confirmation of implementation. The research has not been able to determine the most dominant factors or prove the causal relationship. The completeness of participant data, affirmation of measurement definitions, and presentation of original analysis results are needed to strengthen the usefulness of the findings for growth monitoring in Polewali Mandar Regency.

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