



DISEASE OCCURRENCE SURVEILLANCE AS A DETERMINANT OF STUNTING IN CHILDREN UNDER FIVE: A STUDY OF MOTHERS IN POLEWALI MANDAR REGENCY

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ABSTRACT

Stunting reflects impaired linear growth and requires attention to illness, household conditions, and maternal care. This study aimed to examine disease history and related environmental and socioeconomic factors in the context of stunting among children under five in Polewali Mandar Regency. An observational cross-sectional design was used, with mothers serving as respondents for information concerning their children and households. Questionnaire domains included maternal characteristics, maternal and child illness history, sanitation, clean-water availability, maternal education, and household socioeconomic status. The research report described data processing using Microsoft Excel 2010 and SPSS version 22, followed by univariate and bivariate analyses. The reported findings identified illness history, inadequate sanitation and clean-water access, lower maternal education, and disadvantaged household socioeconomic conditions as factors associated with stunting. However, the available report did not provide the sample size, the distribution of stunting, odds ratios, confidence intervals, or numerical significance tests. Consequently, neither association magnitude nor statistical significance could be independently established. The findings support considering disease monitoring alongside environmental and family circumstances when assessing child growth problems, but do not establish causal determinants. Completion of the original quantitative results is necessary before the strength of these associations can be evaluated and used to prioritize local interventions.

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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 child growth standards of the World Health Organization (WHO, 2006). The assessment requires information on age, gender, and precise measurements of length or height. Because it reflects linear growth, stunting is not sufficiently understood through weight or disease complaints at the time of examination. The discussion needs to include conditions that occur from pregnancy, the quality of intake, the health of the child, and the parenting environment. Studies on maternal and child malnutrition also place this problem in the relationship between health, family resources, and inequality of access to services (Victora et al., 2021).

In Indonesia, the determinants of stunting include factors at the child, mother, household, and environmental levels. The review of Beal et al. (2018) shows that the explanation of stunting cannot be limited to one family characteristic. This framework is relevant for research in Polewali Mandar Regency, because information about childhood diseases needs to be read together with the mother's condition and the environment in which the child grows. The term "toddler mother" in the title of the study refers to the mother as a source of information, while the stunting output discussed is the growth condition of toddlers.

Disease history is important to note because infections and nutritional problems can be interrelated. Cross-country longitudinal analysis showed a relationship between the burden of diarrhea in early life and stunting at a later age



(Checkley et al., 2008). The findings provide a reason to record the history of the disease, but it does not mean that all types of diseases have the same strong relationship. The type of disease, the time of occurrence, the recurrence of the episode, and the suitability of the information to the child's growth period will influence the interpretation. Therefore, recording the history of the disease needs to go beyond the general question of having or never been sick.

The household environment also plays a role in disease exposure and the ability of families to meet children's needs. Research by Torlesse et al. (2016) in Indonesia places water, sanitation, and hygiene as important aspects in the study of stunting. Cross-district analysis shows that there are geographical and socioeconomic gaps in the problem of child malnutrition (Ayuningtyas et al., 2022). National data analysis by Titaley et al. (2019) also identified the relationship between child and household characteristics with stunting in children under two years old. This evidence emphasizes the need to assess family conditions simultaneously, rather than interpreting disease history as a stand-alone explanation.

Maternal education can be related to understanding health information, parenting, and decision to use services. However, the level of formal education does not directly describe all parenting practices. Studies in Central Java show the importance of paying attention to feeding practices and family socioeconomic conditions when discussing children's linear growth (Kartasurya et al., 2023). In this context, the research at Polewali Mandar aims to examine the history of maternal and toddler diseases as well as sanitation, clean water, maternal education, and family socioeconomic conditions related to stunting. The focus is to provide a basis for recognizing factors that need to be considered in growth monitoring, while limiting conclusions according to the design and completeness of the research results.

2. IMPLEMENTATION METHOD

Research design and location

The study was an observational study with a cross-sectional design in Polewali Mandar Regency. The selection of this design refers to the description of the methods and results in the research report. The target population is mothers who have toddlers in the study area. Mothers are respondents for the collection of information about family characteristics and health history, while stunting in toddlers is the output studied. Cross-sectional observations allow for examination of the relationship between variables, but do not ensure that exposure precedes growth disorders.

Variables and data collection

Data collection was conducted using questionnaires that included characteristics of mothers under five, risk factors for stunting, and history of diseases in toddlers. The biological variables mentioned in the report included disease history in mothers and toddlers. Environmental variables included sanitation and availability of clean water, while socioeconomic variables included mother's education and family socioeconomic status. The information was placed as a group of variables that could potentially be related to the child's growth status; not all of them could be considered as mutually free exposure.

The research stages include planning, implementation, data collection and processing, analysis, and reporting. The questionnaire examination is carried out through editing, providing answer codes, data entry, filling in the fields, and categorizing variables. This stage aims to maintain data consistency before analysis. The report has not described the number of respondents analyzed, details of sample selection, disease history memory period, or category limits for each variable. Anthropometric measurement procedures and stunting status determination have also not been presented operationally, so these procedures are not added as facts for the research implementation.

Data processing and analysis

The data processing in the report uses Microsoft Excel 2010 and SPSS version 22 for Windows. Univariate analysis is used to describe variables, while bivariate analysis is directed at odds ratio (OR) estimation. The report mentions the use of the lower and upper limits of confidence intervals that do not include single digits as statistical relationship criteria. However, the cross tables, OR, confidence intervals, and p-values of the analysis results are not available in the source document. Therefore, this article presents the direction of the findings narratively and does not recalculate or fill in the size of associations that cannot be traced.

Presentation and interpretation follow the principles of transparency in observational research reporting, especially the separation between design, measurement, results, and limitations (von Elm et al., 2007). No multivariate models, adjusted risk estimates, or subgroup analyses were added. Statements regarding the relationship to the outcome section are limited to descriptions that are indeed contained in the report, so they are not interpreted as evidence of cause and effect.



3. RESULTS AND DISCUSSION

Research results

The description of the results identified the history of disease in toddlers and mothers as factors related to stunting. The report places the health condition of children in early life as an important concern, and mentions maternal health as part of the context of toddler growth. However, specific diseases, frequency of events, duration of illness, and distribution of exposure according to stunting status are not detailed. Thus, these findings cannot be used to compare the magnitude of the relationship between types of diseases or determine the most dominant group of diseases.

Table 1. Summary of factors

Factors studied	Narrative findings in the report
History of toddler disease	Related to stunting; the type and frequency of the disease are not detailed.
History of maternal illness	It is said to be related to the growth and nutrition conditions of toddlers.
Environmental sanitation	Inadequate sanitation is referred to as a condition that needs attention.
Availability of clean water	The limitation of clean water is said to be related to the problem of stunting.
Mother's education	Lower education is reported to be related to stunting.
Family socio-economy	Disadvantaged socioeconomic conditions are reported to be related to stunting.

History of the disease in the context of toddler growth

The association between disease history and stunting is conceptually consistent with the two-way relationship between infection and nutritional status. The analysis of Checkley et al. (2008) used longitudinal and repeated anthropometric records of diarrhea, so that the timing sequence of events could be better examined than cross-sectional observations. This design difference limits the equivalence of the conclusions with the study at Polewali Mandar. The longitudinal evidence helps explain the reasons for disease monitoring, but cannot be used to fill in the relationship size that is not yet available from this study.

The history of the disease acquired through the mother also needs to be read with the ability to remember events. Recurrent mild illnesses may not be clearly recorded, while severe episodes are easier to remember. Without a uniform time limit, two respondents can interpret the same question for different periods. In addition, children with nutritional disorders may be more susceptible to illness, so the association found at one time does not determine the direction of the relationship. The mention of disease as a determinant in the title is therefore understood as the focus of the factor being studied, rather than the determination of a single cause.

Sanitation, clean water, and family conditions

Findings on sanitation and clean water are consistent with observational research in Indonesia (Torlesse et al., 2016). However, observational relationships do not automatically estimate the magnitude of the benefits of sanitation interventions on growth. Randomized trials in Bangladesh showed that water, sanitation, and handwashing interventions did not necessarily increase linear growth despite some interventions reducing diarrhoea (Luby et al., 2018). The SHINE trial in Zimbabwe also demonstrated the need to distinguish the impact of environmental interventions from the impact of improving child feeding (Humphrey et al., 2019). This evidence supports integrated assessment and prevents the conclusion that one environmental component alone is sufficient to address stunting.

The availability of clean water and sanitation can be intertwined with the economic ability of families. Households with limited resources may face limitations in food supply, environmental improvement, transportation, and service utilization. Cross-regional analysis in Indonesia shows that socioeconomic inequalities need to be taken into account in understanding nutrition issues (Ayuningtyas et al., 2022). However, region-level findings cannot be directly translated into individual risk for each family. The study also did not report a multivariate analysis to separate disease linkages from environmental influences or economic conditions.

Maternal education in the report leads to the importance of access to and understanding health information. The interpretation needs to avoid simplification that low education always results in poor parenting. Eating practices, family norms, food affordability, and service support can influence parenting decisions at various levels of education. The results of research in Central Java show the relevance of feeding practices and socioeconomic conditions for children's linear growth (Kartasurya et al., 2023), while national data analysis shows the need to consider the characteristics of children and households together (Titaley et al., 2019). Thus, maternal education is more appropriately discussed as one of the contexts related to family opportunities to support child growth.

Implications for maternal and toddler health monitoring

The available findings focus attention on recording growth that is connected to information on diseases and family conditions. In the development of monitoring, information on the type of disease, time of occurrence, recurrence of episodes, use of services, and sanitation conditions can help officers understand the needs of children more completely. The attribution of this information is a suggested implication of the findings, not a surveillance system whose

effectiveness has been tested in this study. The report does not present indicators of surveillance performance, such as the completeness of the report, timeliness, or the success of follow-up.

At the program level, attention to disease needs to go hand in hand with assessments of nutritional needs, parenting support, and environmental conditions. A review of maternal and child malnutrition shows that growth issues require an approach that considers multiple sources of vulnerability (Victora et al., 2021). The research at Polewali Mandar provides a direction for factors that deserve attention in the local context, but does not provide a quantitative basis for determining targets based on the magnitude of the risk. Setting program priorities still requires complete field data and an examination of the results of original analyses.

Limitations of the study

The cross-sectional design limits the determination of the time sequence and direction of the relationship. The use of disease history through questionnaires can lead to memory errors, while the association between social and environmental variables opens up the possibility of confounding factors. Since multivariate outcomes are not reported, there is no basis to refer to specific factors as independent determinants. The completeness of the number of participants, measurement definitions, outcome data, and estimates with confidence intervals are required according to observational reporting principles (von Elm et al., 2007). These limitations make the conclusions of the study exploratory and inadequate to establish a causal relationship or the magnitude of the risk in the Polewali Mandar population.

4. CONCLUSION

The description of the results of the study in Polewali Mandar Regency placed the disease history of mothers and toddlers, sanitation, availability of clean water, maternal education, and family socioeconomic status as factors related to stunting in toddlers. These findings support integrated attention to children's health, environment, and family circumstances in growth monitoring. However, the absence of a large number of samples and detailed statistical results limits the assessment of the strength of the relationship and its significance. This study has not been able to determine the causal determinants, the most dominant factors, or the magnitude of the risk. The presentation of original quantitative data and verification of measurements are requirements to strengthen the conclusions and determine the usefulness of the results for regional intervention planning.

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