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Community Nursing Care in Meeting Nutritional Needs of Food-Insecure Families with Stunted Toddlers in Rural Areas of Indonesia

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Abstract

Background: Families in rural areas face a high risk of having stunted toddlers, often exacerbated by household food insecurity (HFI), which prevents adequate nutritional intake. This study aims to identify the fundamental principles of community nursing care to address food insecurity for family nutritional fulfillment and tackle specific and sensitive stunting issues in toddlers.

Methods: This two-year mixed-methods study will involve families with stunted toddlers in rural Indonesia. In the first year, qualitative exploration (in-depth interviews and focused group discussions (FGD)) to identify precipitating, supporting, and reinforcing factors of stunting, HFI, and household food resilience. Quantitative analysis will identify HFI (using the Food Insecurity Experience Scale (FIES-9)), dietary diversity (FAO 2013 24/48-hour and 7-day recall), and stunting parameters (length/height, weight via WHO Anthro plus Z-score). The findings the first year will guide the development of community nursing care principles. The second year will involve testing these principles through a quasi-experimental trial, integrating health promotion and family assessment theories through family-based, Posyandu, and Puskesmas interventions for growth monitoring. Data will be analyzed using paired t-test and independent t-tests.

Results: The research aim to establish basic principles of community nursing care for addressing HFI, dietary diversity, and improving family nutrition in stunted toddlers in rural areas, supported by health promotion and family assessment theories.

Conclusions: This study seeks to define specific and sensitive community nursing care principles for addressing HFI and ensuring nutritional fulfillment in stunted toddlers in rural settings, guided by health promotion and family assessment theory.

Key Words: Community nursing; Family; Food insecurity; Rural, Stunting.

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1- INTRODUCTION

The prevalence of household food insecurity (HFI) in Indonesia is 4.5%, manifested as poorly diversified dietary patterns and micronutrient deficiencies. HFI is caused by poor dietary diversity, poverty, and malnutrition (1). This can disrupt the growth and development of toddlers in rural areas, especially those with moderate/severe food insecurity (2), which is often latent (3). Food insecurity indicates a family's inability to access food due to socioeconomic and cultural conditions, leading to difficulties in obtaining, consuming, and meeting family nutritional needs (4,5). The condition of household food insecurity reflects a family's inability to access daily necessary food (6), which impacts nutritional problems within the family, specifically stunted toddlers.

Stunting remains a critical public health issue in Indonesia, particularly in rural and resource-limited settings. Despite national commitments to accelerate stunting reduction, prevalence remains high due to persistent structural and household-level determinants. Among these, inadequate nutritional intake and limited access to diverse and nutrient-rich foods are the most consistent contributors to impaired growth in early childhood. The issue of stunted toddlers in Indonesia is linked to household food insecurity (7) and socioeconomic status (8). HFI, social disparities, poverty, neglect, and family stress are risk factors for stunting in toddlers (9). HFI results in developmental risks and adverse effects on the function, academic achievement, and social skills of stunted toddlers (10). Therefore, household food insecurity needs to be addressed through strengthening food security within the framework of stunting prevention using a nursing process approach.

Achieving food security remains a significant challenge in Indonesia for realizing a golden generation towards Golden Indonesia 2025 through strengthening Asta Cita in creating quality human resources. However, current nutritional and food security problems in Indonesia are concerning due to the large gap between nutritional consumption and food availability in families BPS data for 2023 shows that the number of poor people in Indonesia reached 9.36% and the number of poor families was 4.71% (11) with 21.6% of toddlers experiencing stunting (12). Therefore, a solution is needed to address stunted toddlers through optimizing dietary diversity by utilizing the potential of the surrounding family environment. HFI plays a central role in shaping dietary quality and feeding practices. Families in rural areas often experience unstable food availability, limited purchasing power, and reliance on low-cost staple foods. These conditions narrow dietary diversity and reduce the intake of essential macro- and micronutrients needed for optimal child growth. Evidence shows that food-insecure households are more likely to have children with inadequate meal frequency, restricted consumption of animal-source foods, and a higher risk of growth faltering.

Dietary diversity refers to the different foods consumed by a family as a parameter of nutritional status (13). Low dietary diversity leads to growth retardation in toddlers (14). Delayed cognitive and physical development in toddlers is difficult to correct during critical developmental periods (13,14). Therefore, the long-term impact of toddler stunting can decrease the country's economic productivity (13-16). Jember Regency, East Java, has the highest prevalence of toddler stunting at 34.9% (17-19), which is related to unmet food and food variation needs, community sociocultural factors, family parenting, and accessibility to health services in the community. Although Indonesia has

implemented large-scale programs to address stunting, many interventions focus on supplementary feeding or health education without addressing the broader household context or the capacity of families to meet nutritional needs independently. At the community level, nurses serve as frontline health providers who can integrate health education, family empowerment, nutritional counseling, and home-based support. However, structured community nursing interventions targeting food-insecure families with stunted toddlers remain limited.

The research approach involves community nursing care for families with stunted toddlers in rural areas. Therefore, specific and sensitive basic principles of community nursing care are needed to address this problem as a solution, through testing the concepts of health promotion and family assessment theory to realize a golden generation towards Golden Indonesia 2045 by strengthening human resources through family food security. The pillar of addressing toddler stunting is a national agenda in Indonesia to reduce its prevalence to 14% (19). Several programs currently underway have not yet achieved the desired targets. Previous studies have identified stunting problems (3-10) and analyzed various stunting intervention programs (13-18). However, no research has analyzed community nursing care in overcoming food insecurity and fulfilling dietary diversity in families as a specific and sensitive basic principle for addressing the issue of stunted toddlers. Therefore, the novelty of this research is to analyze specific and sensitive basic principles of community nursing care through the integration of HFI, dietary diversity, and toddler stunting in Indonesia based on the analysis of health promotion and family assessment theory concepts using a nursing process approach. The problem of toddler stunting has complex short-term and long-term impacts, requiring holistic and comprehensive handling efforts to achieve a golden generation towards Golden Indonesia 2025 through strengthening Asta Cita in creating quality human resources. Therefore, the research problem is: "What are the basic principles of community nursing care in overcoming food insecurity and fulfilling dietary diversity in families with stunted toddlers in rural areas?

Community nursing, as a health and care service in the community, contributes to solving the problem of stunted toddlers in families. Community nursing care can be provided to address food insecurity and dietary diversity through fundamental, holistic, and comprehensive service principles with a specificity and sensitivity approach based on rural areas, utilizing health promotion and family assessment theory. To date, no research has analyzed the basic principles of community nursing care through the integration of HFI, dietary diversity, and toddler stunting in rural areas. These basic nursing care principles can form the conceptual basis for specific and sensitive community nursing care to address the issue of stunted toddlers in rural families. Therefore, this study aims to analyze the basic principles of community nursing care to overcome food insecurity and fulfill dietary diversity in rural families as a specific and sensitive basic concept for the management of stunted toddlers with a nursing process approach. To fill this gap, the present study proposes a community nursing care model designed to improve nutritional practices, dietary diversity, and family capacity in managing food insecurity. This protocol outlines the quasi-experimental approach to evaluating the effectiveness of the intervention in rural Indonesian households, where high stunting prevalence intersects with chronic food insecurity.

2- MATERIALS AND METHODS

2-1. Trial Design

This research utilizes a mixed-methods design and will be conducted over two years in rural areas of Jember Regency, Indonesia, through three stages. In the first year (stages 1 and 2), the research will involve qualitative exploration of family problems with stunted toddlers and their community nursing care needs factors contributing to stunting, food insecurity, and household food resilience in rural families. Additionally, it will involve the identification of food insecurity, dietary diversity, and stunting parameters in toddlers in rural areas using SEM-PLS. The findings from the qualitative and quantitative analyses in the first year will form the basis for testing community nursing care principles in the second year.

In the second year (stage 3), the research will analyze specific and sensitive community nursing care principles for managing stunted toddlers in rural families. This will be done using a quasi-experimental trial design. This approach will incorporate health promotion and family assessment theory. The results will form the basic principles of nursing care for addressing stunted toddlers and will be analyzed using paired t-tests and independent t-tests. The flow of the research is illustrated in Figure 1.

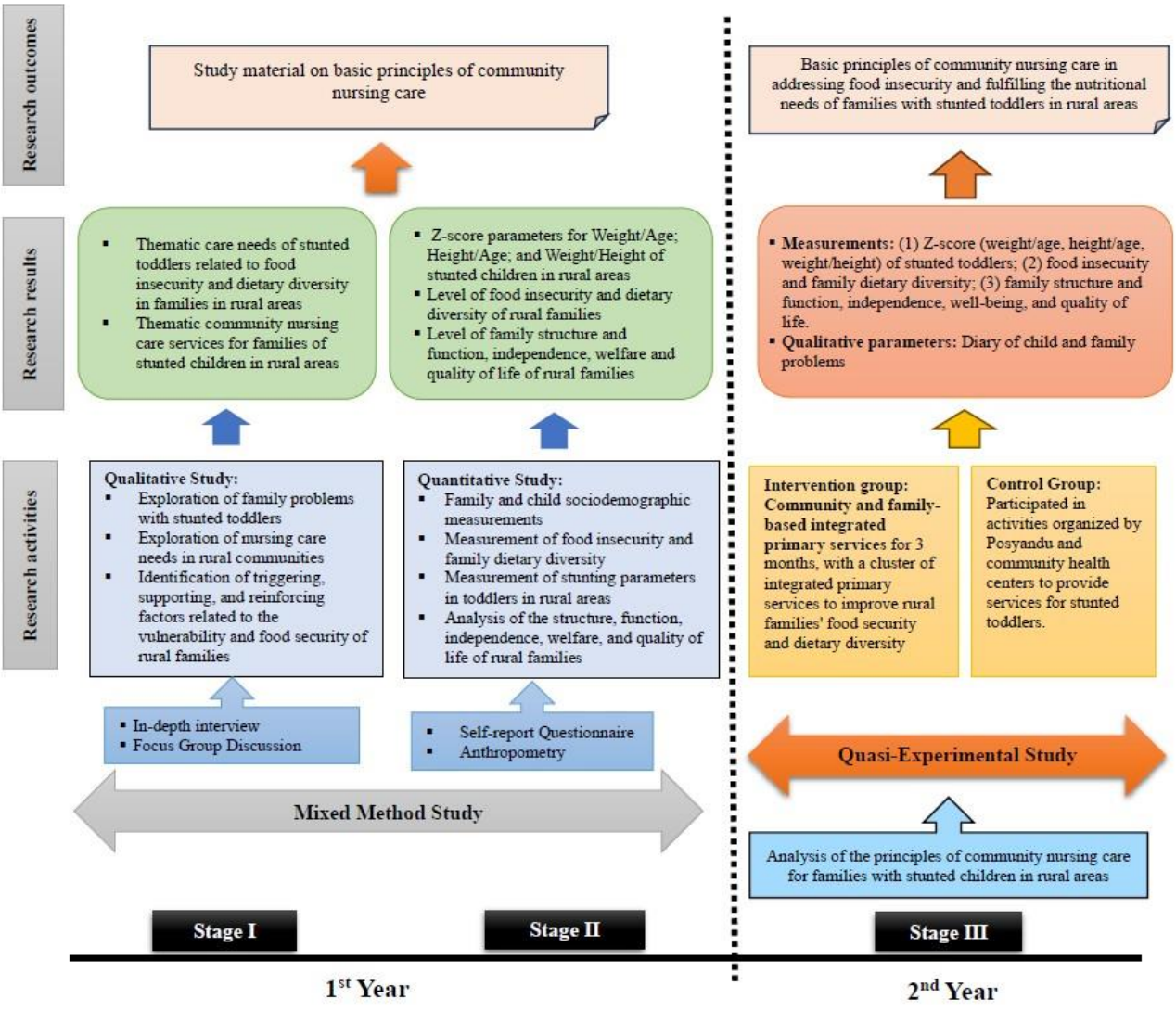

Figure-1: The flow chart of the fundamental research.

2-1-1. Intervention Components

The quasi-experimental phase implements a multi-level Community Nursing Care Intervention targeting nutritional needs among food-insecure families with stunted toddlers. The intervention consists of coordinated activities at the family, Posyandu, and Puskesmas levels over 12 weeks.

Family-Level Intervention

Objective: Improve feeding practices, household food management, and caregiver self-efficacy. Components:

1) Home-based nutrition counseling delivered by community nurses, frequency: Biweekly (6 sessions), duration: 45–60 minutes, and contents: complementary feeding (menu planning, portioning, use of local foods), responsive feeding and child stimulation during meals, addressing food insecurity using low-cost strategies, identifying early signs of growth faltering. Tools used in the intervention are illustrated in the counseling booklet and household food assessment guide; 2) Demonstration of low-cost nutritious meal preparation with a frequency of monthly (3 sessions) using hands-on demonstrations conducted in caregivers' kitchens with a focus on locally available protein and micronutrient-rich foods;

3) Family goal-setting and monitoring using families identify 2–3 achievable nutrition goals. Nurses conduct monitoring at each visit using a standardized family nutrition monitoring sheet.

Posyandu-Level Intervention

The objective of this intervention is to strengthen community-based growth monitoring and caregiver group education. Components:

1) Enhanced growth monitoring and promotion (GMP) with monthly Posyandu sessions using activities: accurate anthropometric measurement, immediate interpretation with caregivers, and individualized feedback on child progress. Intervention of peer support groups for caregivers with monthly frequency (3 sessions across the intervention period) that facilitators trained cadres with nurse supervision. The focus of the intervention is sharing feeding challenges, food budgeting, and food insecurity coping strategies. Intervention for distribution of context-based nutrition education materials that content adapted from the Ministry of Health modules and includes visual guides on local affordable food combinations.

Puskesmas-Level Intervention

The objective of the intervention is to strengthen health system support for integrated nutritional care in rural contexts. Components:

1) Training of nurses and nutrition officers using one-day training prior to intervention with a focus on community nutrition, family-centered nursing, food insecurity screening, and counseling skills;

2) Monthly case review meetings for duration 60 minutes regarding staff review growth data, food insecurity status, and family challenges to feedback loops established for referral and follow-up; and

3) Integration with existing programs that align with Puskesmas Integrated Management of Childhood Illness (IMCI) and Family Nursing guidelines and ensure the intervention is scalable and feasible for routine practice.

Intervention Duration

The total duration of the intervention is 12 weeks, including family-level home visits: 6 weeks, Posyandu sessions: 3 weeks, meal demonstrations: 3 weeks, and system-level Puskesmas activities: continuous support plus monthly review.

Intervention Fidelity Monitoring

To ensure consistency across sites, the following fidelity mechanisms will be applied:

1) Standardized intervention manuals: manuals for nurses, cadres, and nutrition officers outlining activity steps, messages, and demonstration procedures.

2) Checklists and observation forms: each session includes an implementation checklist completed by nurses or cadres and 10% of sessions will be observed by a senior researcher for quality assurance.

3) Training and certification: all implementers (nurses, cadres, nutrition officers) undergo structured training and competency assessment, with retraining conducted if fidelity falls below 80%.

4) Session logging and time tracking: all delivered sessions are logged, including duration and deviations.

5) Monthly review meetings: used to discuss challenges and reinforce protocol adherence.

Reproducibility Statement

The detailed description of components, delivery formats, materials, frequency, and fidelity checks ensures the intervention can be reproduced in similar rural contexts and evaluated rigorously for effectiveness.

2-2. Participants

Study setting: Rural areas of Jember Regency, specifically in the working areas of Pakusari and Ajung Community Health Centers (Puskesmas). Participants included in this study met the following eligibility criteria: mothers with children aged 12-60 months (toddlers), Registered participants of Posyandu (community health post), and Mothers willing to participate in the research. Meanwhile, toddlers with chronic diseases, infectious diseases, or currently hospitalized were excluded from the study.

2-3. Sampling and Recruitment Procedures

This study will use a multistage sampling strategy to recruit food-insecure families with stunted toddlers in rural areas of Indonesia.

Sampling Frame and Random Selection

A complete list of households with stunted toddlers (aged 6–59 months) will be obtained from the Posyandu and Puskesmas e-PPGBM database. This registry will serve as the sampling frame for each selected rural village. Sampling will proceed through the following steps:

1) Village selection: villages will be selected based on food-insecurity prevalence and accessibility using purposive criteria aligned with study objectives;

2) Household listing: all eligible households within each selected village will be enumerated with support from community health workers (kaders) and Puskesmas nutrition officers;

3) Simple random sampling: a randomly ordered computer-generated list (Excel RAND function) will be used to select households proportionally to village size. Replacement sampling will be avoided, except when households permanently migrate or decline participation. Field teams will not influence the randomization process to minimize selection bias.

Strategies to Minimize Selection Bias

Several procedures will be used to ensure representativeness. These include comprehensive registry use to ensure all eligible households are included in the sampling frame, neutral recruitment practices where data collectors conducting recruitment are not involved in providing care to reduce social desirability or coercion bias, the use of standardized scripts in the local language during household approaches to ensure consistency, and documentation of non-participation (e.g., refusal reasons,

migration) to allow assessment of potential bias.

Recruitment Approach

Recruitment will be conducted through a combination of methods:

1) Home visits with the assistance of village health cadres.

2) Information sessions at Posyandu to increase awareness.

3) Distribution of printed study briefs explaining study objectives, risks, benefits, and duration.

4) Flexibility in scheduling to accommodate caregivers' working hours and farming activities. Informed consent will be obtained privately to maintain voluntary participation.

Attrition Minimization Plan (Two-Year Follow-Up)

To ensure continued participation during the two-year study period, the following retention strategies will be implemented:

- Regular engagement (quarterly check-ins) through home visits or phone calls.

- Use of community health workers with long-standing relationships with families.

- Scheduling data collection during Posyandu days to reduce travel burden.

- Provision of non-coercive incentives such as nutrition education materials and growth monitoring charts.

- Tracking and follow-up mechanisms, including updated phone numbers and alternative contacts.

- Monitoring migration patterns, especially seasonal work mobility.

- Culturally sensitive communication emphasizing community benefit and respect for local norms. Attrition will be tracked and reported, including reasons for loss to follow-up, to assess potential impact on study conclusions.

Expected Representativeness

The use of a complete community-based registry as the sampling frame, computer-assisted randomization, and a structured retention strategy ensures that the sample is likely to be representative of families experiencing food insecurity and caring for stunted toddlers in rural Indonesia.

2-4. Research Procedure

Recruitment and Intervention

First stage (Qualitative Study): This stage will qualitatively explore family issue relate to stunted toddlers and their community nursing care needs. The goal is to identify factors that contribute to stunting, food insecurity, and household food resilience in rural families. The study will involve in-depth interviews and focused group discussions (FGDs) with families with stunted toddlers in three Community Health Center areas until data saturation is achieved through snowball sampling. FGDs will also be conducted with health cadres and Puskesmas health officers. The results of the interviews and FGDs will be transcribed and analyzed qualitatively.

Comparison Group in the Quasi-Experimental Design

This study will use a non-equivalent control group quasi-experimental design with pre-post measurements. Two groups will be included:

1) Intervention group: families receiving the Community Nursing Care Intervention; and

2) Comparison group: families receiving standard care from the Posyandu and Puskesmas without additional intervention components.

Selection of Comparison Group

Comparison villages will be selected based on matched community characteristics, including: prevalence of stunting, rural geographic context, socioeconomic profile,

availability of health services, and patterns of food insecurity. Villages will be matched with intervention villages to ensure approximate equivalency. To reduce contamination, intervention and control villages will be geographically non-adjacent, with a minimum buffer zone of 3-5 km, and nurses delivering the intervention will not work in the comparison villages. From each comparison village, households with stunted toddlers will be selected using the same simple random sampling procedure as described for the intervention group.

Standard Care for the Comparison Group

The comparison group will continue to receive routine services, including, monthly Posyandu growth monitoring, nutrition counseling provided by cadres and Puskesmas staff, and referrals for moderate/severe malnutrition per standard guidelines. No additional intervention components (home visits, cooking demonstrations, peer support groups, enhanced GMP) will be provided. This ensures an ethical design while allowing estimation of the effect attributable to the new multi-level intervention.

Measurement Schedule

Both groups will undergo identical measurement protocols at baseline (T0), post-intervention,Week 12 (T1), 6-month follow-up (T2), and 12-month follow-up (T3). This allows for a longitudinal evaluation of intervention effects and sustainability.

Managing Potential Confounding Factors

To strengthen internal validity, several steps will be taken:

1) Measurement of key confounders: Variables such as household socioeconomic status, maternal education and literacy, household food insecurity level (HFIAS), child age, sex, morbidity history, breastfeeding and feeding practices, access to health services, seasonal food availability indicators, household size, and food expenditure will be collected at baseline in both groups.

2) Statistical techniques to adjust for confounding: Data analysis will include propensity score adjustment to reduce baseline imbalance between intervention and comparison households, multivariable regression models to isolate intervention effects by including relevant confounders difference-in-differences (DiD) analysis to compare changes over time between groups, and sensitivity analyses to examine the robustness of findings in the presence of unmeasured confounding;

3) Avoiding contamination: Intervention materials will not be distributed outside intervention villages, and cadres from comparison villages will not participate in intervention training.

Justification of Quasi-Experimental Design

Randomization at the village level is not feasible due to community administrative boundaries and programmatic constraints within rural Puskesmas systems. A matched non-equivalent comparison design provides a practical and ethical alternative while enabling estimation of causal effects when combined with rigorous confounder adjustment. The inclusion of a matched comparison group, standardized measurement schedules, and comprehensive confounder control procedures enhances the internal validity of the study and supports credible interpretation of intervention effects.

2nd Stage (Quantitative Study)

This stage is based on the prevalence of toddler stunting in Jember Regency, which is 34.9%, so the total population is approximately 35,000 toddlers. The study will be conducted in two Community Health Center areas, Pakusari and Ajung, which are rural areas in Jember Regency,

with 262 and 339 stunted toddlers, respectively (secondary data from Puskesmas stunting reports, as of February 2025). The estimated sample size, calculated using the proportion formula with a 95% confidence interval, is 339 toddlers. The sampling technique used is proportional random sampling. The sample size in Pakusari sub-district is 157 toddlers, and in Ajung sub-district is 182 toddlers. Inclusion criteria for this study are mothers with children aged 12-60 months, registered as Posyandu participants, and mothers willing to participate in the study. Toddlers with chronic diseases, infectious diseases, and those currently hospitalized will be excluded.

Sample Size Calculation

The sample size was calculated to ensure adequate statistical power to detect meaningful changes in nutritional outcomes among food-insecure families with stunted toddlers. The primary quantitative outcome for sample size determination is the change in child height-for-age z-score (HAZ) and HFIAS score over the study period.

Statistical Assumptions

The following assumptions were used effect size (Cohen's d)= 0.35. Based on previous community nutrition interventions in rural Indonesia showing small-to-moderate improvements in growth and food-security indicators (0.30–0.40) with a significance level (α) of 0.05 (two-tailed), statistical power (1 – β) of 0.80 to ensure the study is adequately powered to detect differences in nutritional outcomes, and standard deviation (SD): HAZ SD ≈ 1.0; HFIAS SD ≈ 4.5 (based on national and district surveillance data). Using these assumptions and a repeated-measures design, the minimum required sample size is 118 households.

Adjustment for Potential Dropouts

Given the two-year follow-up period and the rural context, attrition is expected due to migration, seasonal work, and loss of contact. Based on similar longitudinal community studies in East Java and NTT, an expected attrition rate of 20–25% is anticipated. To accommodate this, we inflated the sample size:

$$n_{\text{adjusted}} = \frac{118}{1 - 0.25} = 158$$

Thus, the study aims to recruit 160 households to ensure adequate statistical power at follow-up.

Justification of Assumptions

The effect size chosen reflects realistic improvements from community-based nursing interventions targeting feeding practices, food allocation, and caregiver empowerment. A minimum power of 80% is standard for clinical and community intervention research. The attrition estimate reflects actual local trends in rural mobility and prior research involvement. Outcome variability values are drawn from Indonesian Basic Health Research (Riskesdas), Puskesmas monitoring data, and published literature.

Adequacy of Power

The final adjusted sample of 160 households will provide sufficient power to detect a ≥0.3 SD improvement in HAZ, adequate sensitivity to identify changes in household food insecurity levels, and enough data to support subgroup analyses (e.g., maternal education, severity of food insecurity). This ensures the study is methodologically robust and capable of detecting meaningful differences that inform the development of a culturally appropriate community nursing care model.

Data collection tools include questionnaires to assess family sociodemographic characteristics. Family health history and stunted toddler health

history data will be obtained from medical records at the Community Health Centre or registration data at local Posyandu. Food insecurity will be measured using The Food Insecurity Experience Scale (FIES) consisting of 9 questions. Dietary diversity will be measured using Dietary Diversity from FAO, 2013, with three indicators: 24-hour recall, 7-day recall, and 48-hour standard recall techniques. All instruments used have been validated and are reliable for research in Indonesia (13,14,18, 20-23). Toddler stunting will be measured using length/height and weight appropriate for the child's age in months, then analyzed with Z-scores using WHO Anthro plus software (17). The results of analyses from the 1st and 2nd years will undergo mixed-method analysis. The combined qualitative and quantitative analyses from Year I will form the basis for the community nursing care principles to be tested in the 2nd year.

In the 2nd year, analysis of specific and sensitive community nursing care principles for the management of stunted toddlers in rural families will be conducted using a quasi-experimental trial design with a health promotion and family assessment theory approach. These principles will become the basic principles of nursing care in addressing stunted toddlers in rural families and will be analyzed with paired t-tests and t-independent tests. Data collection will be conducted through family-based interventions, Posyandu, and Community Health Centres in monitoring child growth. Data collection will be carried out with the consent of the mothers of stunted toddlers as subjects after receiving explanations from the researcher based on ethical clearance procedures from the Committee of Ethical Clearance Review Board of Indonesia No.3151/UN25.8/KEPK/DL/2025. The data obtained will be analyzed in accordance with the research objectives. The systematic data collection procedure is outlined in Figure 2.

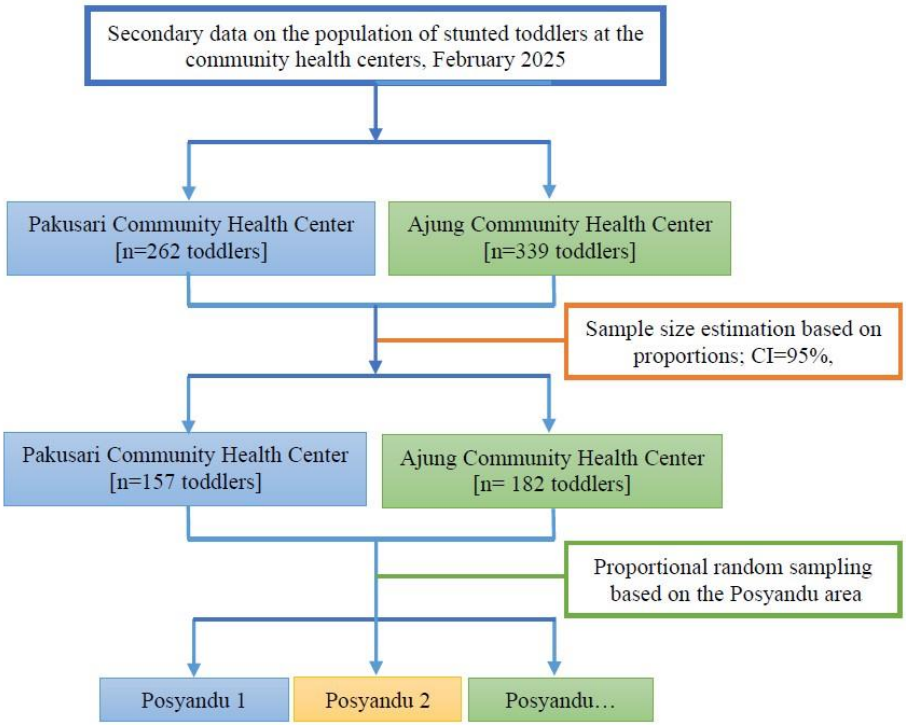

Figure-2: Flow chart for recruitment of participants.

2-5. Data Collection Procedures

This study utilizes a convergent mixed-methods design, where quantitative and qualitative data collected during Year 1 are analyzed separately and then integrated to inform the development of the Community Nursing Care Model for food-insecure families with stunted toddlers. Integration will occur at three levels: design level–convergence of parallel strands, methods level-merging and triangulation, and interpretation level-resolution of discrepant findings.

Design Level – Convergence of Parallel Strands

Quantitative data (household food insecurity scores, dietary diversity, child anthropometric indicators, caregiving and household characteristics) and qualitative data (themes from in-depth interviews and focus group discussions) will be collected concurrently and given equal priority.

Methods Level – Merging and Triangulation

After separate analyses, a merging strategy supported by joint displays will be used to facilitate comparison of datasets. Quantitative indicators will be aligned with qualitative themes to identify points of convergence, complementarity, or divergence. Triangulation will be conducted by examining how qualitative explanations support, expand upon, or contradict quantitative findings. Joint displays such as matrices linking thematic categories with corresponding numeric results, will be used to visually integrate and interpret the merged data.

Interpretation Level – Resolution of Discrepant Findings

When inconsistencies arise between qualitative and quantitative results, an explanatory reconciliation process, will be employed. This process includes revisiting raw data for potential misinterpretation, conducting targeted team discussions involving qualitative and quantitative experts, exploring contextual explanations (e.g., cultural feeding norms, seasonal food availability), and if necessary, performing follow-up qualitative probing with a subset of participants.

The final integrated interpretation will generate a set of evidence-based nursing care principles that reflect both the measurable determinants of child nutrition and the lived experiences of food-insecure families in rural Indonesia. This systematic integration enhances the rigor, credibility, and transparency of the mixed-methods design.

2-6. Ethical Considerations

This study was approved by the Ethical Clearance Committee with No. 3150/UN25.8/KEPK/DL/2025.

Expected Outcomes

The expected outcomes of this research are aligned with the three stages of research conducted over two years, as presented in Table 1.

Targeted Achievement Indicators

This research aims to establish the basic principles of community nursing care to address food insecurity for family nutritional fulfillment and tackle specific and sensitive stunting issues in toddlers, tailored to the needs of families in rural areas. The research findings will be derived from three stages of research over two years, with annual indicators to be achieved as shown in Table 2.

Roles and Responsibilities of the Research Team

Principal Investigator (PI): Responsible for the overall research process, including planning, implementation, data analysis, and final report preparation. Develops research design, methodology, and conceptual framework. Coordinates the research team, allocates tasks, supervises data collection and analysis and makes

strategic decisions, including problem-solving in the field. Responsible for publishing research results and reporting to stakeholders.

Researcher 1 (Member 1): Interacts directly with the community to collect data related to meeting dietary diversity needs in food-insecure families and among stunted toddlers. Conducts surveys and interviews with families and community health workers, observes food consumption patterns and availability, and collects anthropometric data of toddlers to measure stunting levels. Analyzes social and economic factors influencing food needs And conducts health education for the community about the importance of healthy and diverse eating patterns.

Researcher 2 (Member 2): Responsible for processing, analyzing, and interpreting research data. Processes quantitative and qualitative data from surveys and interviews, conducts statistical analysis to examine relationships between research variables, prepares analysis reports, formulates data-based recommendations, contributes to writing research results, and prepares of scientific presentations. Ensures the accuracy and validity of data before publication.

Table-1. Expected outcomes of the study.

Year	Research Stage	Method	Measurable Parameter
1st	Stage 1	In-depth interview and Focus Group Discussion (FGD)	Themes related to stunting problems in toddlers and their needs from the perspective of parents and families in rural areas, including: precipitating factors, supporting factors, and exacerbating factors for stunting in toddlers, as well as family food insecurity and food security in rural areas
1st	Stage 2	Cross-sectional design: survey and measurement	Measurement of family food insecurity, family dietary diversity, and stunted toddlers with parameters of Height-for-age (HAZ), Weight-for-age (WAZ), and Weight-for-height (BAZ) in toddlers in rural areas
2nd	Stage 3	Quasi-Experimental Design	Testing of specific and sensitive basic community nursing principles for the management of stunted toddlers in rural areas with parameters of increase in family food consumption and child nutritional value, and decrease in stunting prevalence

Table-2. Targeted achievement indicators of the study.

Year	Research Stage	Method	Measurable Parameter
1st	Stage 1	Qualitative	Exploration of stunting problems and community nursing care needs for stunted toddlers in rural areas
1st	Stage 2	Quantitative	Identification of food insecurity, dietary diversity, and stunted toddlers in rural areas
2nd	Stage 3	Quantitative	Basic principles of specific and sensitive community nursing for stunted toddlers in rural areas

3- RESULTS

The research protocol outlines expected outcomes in three stages over two years, focusing on developing basic principles of community nursing care to address food insecurity and stunting in rural families.

3-1. Expected Outcomes

First year (Stage 1 and 2): Qualitative exploration will identify precipitating, supporting, and reinforcing factors of stunting, food insecurity, and household food resilience in rural families. This will involve in-depth interviews and FGDs with families, health cadres, and

Puskesmas health officers until data saturation is achieved through snowball sampling. Quantitative identification will involve assessing food insecurity using the FIES, dietary diversity using FAO 2013 indicators (24-hour, 7-day, and 48-hour standard recall techniques), and toddler stunting using length/height and weight analyzed with Z-scores via WHO Anthro plus software. This analysis will utilize SEM-PLS. The combined qualitative and quantitative analyses from the first year will form the basis for the community nursing care principles to be tested in the second year.

Second year (Stage 3): Analysis of specific and sensitive community nursing care principles for the management of stunted toddlers in rural families will be conducted using a quasi-experimental trial design. This stage will involve interventions at the family, Posyandu, and Puskesmas levels for growth monitoring. The health promotion and family assessment theory approach will be applied, and data will be analyzed using paired t-test and t-independent test. The expected outcome is the establishment of basic principles of community nursing care to overcome food insecurity and fulfill family nutrition for stunted toddlers in rural areas, reinforced by health promotion and family assessment theory concepts.

3-2. Novelty of the Research

This research is unique in its analysis of specific and sensitive basic principles of community nursing care through the integration of HFI, dietary diversity, and toddler stunting in Indonesia. This approach is based on an analysis of health promotion and family assessment theory concepts using a nursing process approach. To date, no prior research has analyzed these basic principles of community nursing care through such an integrated lens in rural areas.

4- DISCUSSION

This research protocol outlines a comprehensive mixed-methods study addressing the critical issue of stunting in toddlers within food-insecure families in rural Indonesia, specifically in Jember Regency. The study aims to identify the basic principles of community nursing care to overcome food insecurity and fulfil family nutritional needs, tailored to the specific context of rural areas.

The prevalence of HFI in Indonesia, at 4.5%, is a significant concern, often resulting in poor dietary patterns and micronutrient deficiencies. This, coupled with poverty and malnutrition, contributes to HFI. The research acknowledges that HFI can disrupt the growth and development of toddlers, especially those with moderate to severe food insecurity. Stunting in Indonesian toddlers is directly linked to household food insecurity and socioeconomic status. Furthermore, HFI is identified as a risk factor for stunting, along with social disparities, poverty, neglect, and family stress. The long-term impacts of stunting, including decreased economic productivity, underscore the urgency of this research.

The study's two-year, three-stage mixed-methods design is a strength, allowing for a deep understanding of the problem and the development of practical solutions. The first year focuses on qualitative exploration through in-depth interviews and FGDs with families, health cadres, and officers to identify factors contributing to stunting and food insecurity. This qualitative phase is crucial for understanding the nuanced community nursing care needs. Simultaneously, the first year includes a quantitative assessment of food insecurity using the FIES and dietary diversity using FAO's indicators, along with stunting measurements analysed with the WHO Anthro plus software. The integration of

these qualitative and quantitative findings will form the foundation for developing community nursing care principles.

The second year of the study will involve a quasi-experimental trial to analyze and test these specific and sensitive community nursing care principles, incorporating health promotion and family assessment theories. Interventions will be family-based and also involve Posyandu (community health posts) and Puskesmas (community health centers) for growth monitoring. This multi-level intervention approach is crucial for real-world applicability. The use of paired t-tests and independent t-tests for data analysis in the second year will provide robust statistical evidence for the effectiveness of the proposed nursing care principles.

A notable aspect of this research is its focus on Jember Regency, East Java, Indonesia, which has a high prevalence of toddler stunting (34.9%). This regional focus ensures the relevance and impact of the findings in a high-need area. The research also highlights a gap in existing literature, stating that no prior research has analyzed community nursing care in addressing food insecurity and dietary diversity as a specific and sensitive basic principle for tackling toddler stunting. This emphasizes the novelty and potential contribution of the study, aiming to integrate HFI, dietary diversity, and toddler stunting within a nursing process approach, guided by health promotion and family assessment theories.

The expected outcomes, specifically the establishment of basic principles of community nursing care, reinforced by health promotion and family assessment theory, are well-defined and directly address the research objectives. The clear roles and responsibilities of the research team, from the Principal Investigator overseeing the entire process to Researcher 1 focusing on community interaction and data collection, and Researcher 2 on data analysis and interpretation, ensure a structured and efficient execution of the study.

In conclusion, this research protocol presents a well-designed and timely study that seeks to provide a much-needed solution to the complex problem of toddler stunting in rural, food-insecure families in Indonesia through the lens of community nursing care. Its mixed-methods approach, focus on a high-prevalence area, and integration of relevant theories make it a promising endeavor for contributing to the "Golden Indonesia 2045" generation.

5- CONCLUSION

This research protocol outlines a two-year mixed-methods study aimed at developing basic principles of community nursing care to address food insecurity and stunting in toddlers in rural Indonesia, specifically Jember Regency. The high prevalence of stunting in this region (34.9%) and the link between HFI and stunting highlight the urgent need for effective interventions.

The study will be conducted in three stages over two years. The first year (stages 1 and 2) involves a qualitative exploration of family problems, community nursing care needs, and factors contributing to stunting and food insecurity through in-depth interviews and focused group discussions. This will be combined with a quantitative study identifying parameters of food insecurity (using FIES), dietary diversity (using FAO 2013 methods), and toddler stunting (using WHO Anthro plus software). The combined qualitative and quantitative analyses from the first year will form the basis for the community nursing care principles. In the second year (stage 3), these principles will be tested using a quasi-experimental trial design, incorporating health promotion and family assessment theory approaches. Interventions will be delivered at the family, Posyandu, and Puskesmas levels

for growth monitoring. Data will be analyzed using a paired t-test and independent t-test.

The expected outcome of this research is the establishment of specific and sensitive basic principles of community nursing care for overcoming food insecurity and fulfilling family nutrition in stunted toddlers in rural areas, reinforced by health promotion and family assessment theory. This research is novel in its integrated approach to HFI, dietary diversity, and toddler stunting within community nursing care, aiming to contribute to the national agenda of reducing stunting prevalence in Indonesia.

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8- CONFLICT OF INTEREST

The authors declared no conflict of interest.

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