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# Food Security, Psychological Health Status and Coping Strategies Among Low-Income Mothers In Taiping, Perak

(Keterjaminan Makanan, Status Kesihatan Psikologi dan Strategi Menanganinya dalam Kalangan Ibu Berpendapatan Rendah di Taiping, Perak)

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## Abstract

*Food insecurity, exacerbated by socioeconomic disadvantage, is a critical determinant of nutritional inadequacy and psychological distress. However, localised data on this relationship and coping mechanisms among low-income populations remain limited. This study investigated the prevalence of food insecurity, coping strategies and psychological health among low-income (B40) households in Taiping, Perak, Malaysia. A cross-sectional study was conducted online using convenience and snowball sampling among 115 women of reproductive age (18-49 years) from B40 families. Food security status was assessed using 18-item U.S. Household Food Security Survey Module (HFSSM). Depression and anxiety status were measured with Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) scale, respectively. Coping strategies were recorded using a structured checklist. Overall, 81.7% of households were food-secure, while 18.3% were food-insecure. The prevalence of clinically significant depression (PHQ-9 ≥10) and anxiety (GAD-7 ≥10) was 4.3% and 2.6%, respectively. Significant association were found between food insecurity and psychological distress, with food-insecure women reporting higher levels of depressive and anxiety symptoms ($p<0.001$). Common coping strategies included food-related actions (such as prioritising children's food intake) and financial rationing (such as stringent budgeting), while income-generating strategies were less frequently adopted. In conclusion, most households were food-secure, and a minority experienced food insecurity, which was strongly associated with depression and anxiety. This highlights the need for integrated public health interventions that address both economic vulnerability and mental health, moving beyond short-term food assistance toward sustainable social support strategies.*

*Keywords: Food insecurity, psychological, low-income households, depression, anxiety*

## Abstrak

*Ketidakjaminan makanan, yang diburukkan oleh kekurangan sosioekonomi, merupakan penentu kritikal kepada ketidakcukupan pemakanan dan tekanan psikologi. Namun, data setempat mengenai hubungan ini dan strategi daya tindak dalam populasi berpendapatan rendah masih terhad. Kajian ini mengkaji prevalens ketidakjaminan makanan, strategi daya tindak serta status kesihatan psikologi dalam kalangan isi rumah berpendapatan rendah (B40) di Taiping, Perak, Malaysia. Kajian keratan rentas telah dijalankan secara dalam talian menggunakan persampelan kemudahan dan bola salji melibatkan 115 wanita usia reproduktif (18–49 tahun) daripada keluarga B40. Status keterjaminan makanan dinilai menggunakan 18-item U.S. Household Food Security Survey Module (HFSSM). Status kemurungan dan kebimbangan diukur menggunakan skala Patient Health Questionnaire-9 (PHQ-9) dan Generalised Anxiety Disorder-7 (GAD-7). Strategi daya tindak direkodkan menggunakan senarai semak berstruktur. Secara keseluruhan, 81.7% isi rumah mempunyai keterjaminan makanan, manakala 18.3% mengalami ketidakjaminan makanan. Prevalens kemurungan (PHQ-9 ≥10) dan kebimbangan (GAD-7 ≥10) yang signifikan secara klinikal masing-masing adalah 4.3% dan 2.6%. Terdapat hubungan yang signifikan antara ketidakjaminan makanan dan tekanan psikologi, dengan wanita yang mengalami ketidakjaminan makanan melaporkan tahap simptom kemurungan dan kebimbangan yang lebih tinggi ($p<0.001$). Strategi daya tindak yang lazim termasuk kaedah berkaitan makanan (seperti mengutamakan pengambilan makanan anak-anak) dan pengurangan perbelanjaan secara ketat (seperti penyediaan bajet yang ketat), manakala strategi penjanaan pendapatan kurang diamalkan. Kesimpulannya, majoriti isi rumah mempunyai keterjaminan makanan, namun sebahagian kecil mengalami ketidakjaminan makanan yang berkait rapat dengan kemurungan dan kebimbangan.*

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*Dapatan ini menekankan keperluan intervensi kesihatan awam bersepadu yang menangani kerentanan ekonomi dan kesihatan mental dengan melangkaui bantuan makanan jangka pendek ke arah strategi sokongan sosial yang mampan.*

*Kata kunci: Ketidakjaminan makanan, psikologi, isi rumah berpendapatan rendah, kemurungan, kebimbangan*

## INTRODUCTION

The Food and Agriculture Organization of the United Nations (FAO) defines food security as a condition that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2001). However, food insecurity remains a pervasive global challenge. Beyond its immediate physiological consequences, food insecurity drives a shift toward monotonous, nutrient-poor diets due to financial constraints (Darmon & Drewnowski 2008), elevating long-term risks of malnutrition and chronic disease (Gundersen & Ziliak 2015). This challenge is particularly acute in low- and middle-income countries and disproportionately affects economically vulnerable populations (FAO et al. 2024).

The B40 income category in Malaysia, which officially comprises households with a monthly income below RM 4,850 (Department of Statistics Malaysia, 2019), represents the bottom 40% of the national income distribution and is consequently at increased risk of food insecurity. Persistent economic pressures, including unemployment, underemployment and insufficient wages, directly limit their ability to afford adequate food (Reeves et al. 2021). Disruptions to income can quickly lead to hunger and severe food shortages, as savings are depleted and access to nutritious food becomes unattainable (Leete & Bania 2010). This economic precarity highlights the B40 group's vulnerability to sustained food insecurity.

Compounding this issue is the robust, bidirectional association between food insecurity and adverse psychological health. The chronic stress of financial hardship and resource scarcity is a significant risk factor for anxiety and depression (Ridley et al. 2020). In the Malaysian context, B40 individuals report negative associations between work-life balance and psychological well-being in relation to job instability (Abdul Jalil et al. 2023), with studies documenting moderate to severe mental health symptoms among those facing socioeconomic strain (Lugova et al. 2021; Wong et al. 2022). This relationship is cyclical: psychological distress can exacerbate difficulties in managing resources, while food insecurity itself acts as a profound psychological stressor (Abeldt 2024).

Despite growing recognition of this relationship, there remains a notable lack of detailed, local data. While national trends provide a broad overview, findings from other geographic settings cannot be directly generalised. The experience of food insecurity, the feasibility of coping strategies, and their psychological impacts are strongly shaped by local socio-environmental factors. As a result, context-specific patterns, particularly among B40 women who often serve as primary household food managers, remain underexplored. Taiping, Perak, which has one of the highest concentrations of B40 households in the state (Department of Statistics Malaysia 2020), lacks targeted research addressing these issues. Therefore, this study aimed to assess the prevalence of food insecurity, the coping strategies employed and the levels of depression and anxiety among women of reproductive age from B40 households in Taiping. By examining these interconnected factors within a specific, high-risk population, the study seeks to generate evidence essential for the design of targeted and effective public health and social policy interventions.

## MATERIALS AND METHODS

### Study design and participants

This cross-sectional study was conducted online between 15 September 2021 and 14 November 2021 among women of reproductive age (18-49 years) from low-income (B40) households in Taiping, Perak, Malaysia. Participants were recruited through convenience and snowball sampling initiated by the researcher within Taiping. To ensure localised dissemination, the digital recruitment poster was shared through community WhatsApp groups and direct messages to local contacts. Initial participants were then encouraged to forward the recruitment poster to other eligible participants in their Taiping social networks. The online data collection approach was adopted to maximise recruitment efficiency and facilitate participant access during the study period.

Eligible participants were required to be primary residents of Taiping, Perak; have a total household income within the B40 bracket (<RM 4,850); be a mother or primary female caregiver to at least one child aged 2-12 years; be fluent in Malay, English, or Chinese; and have access to the internet to complete the survey. Primary residents are defined as individuals whose main, habitual residence is located within the district, excluding transient visitors and those residing outside the area. Pregnant or lactating women were excluded

due to differing nutritional requirements during these periods, as were individuals with physician-diagnosed chronic physical illnesses (e.g., advanced cancer, end-stage renal disease) or severe mental health disorders (e.g., schizophrenia, bipolar disorder, severe cognitive impairment) to reduce potential confounding effects on key measures of food security and psychological health.

Ethical approval was obtained from the Research Ethics Committee of Universiti Kebangsaan Malaysia (Reference number: JEP-2021-568). Participants received a digital Information Sheet outlining the study's objectives, procedures, risks, benefits and data confidentiality, and provided informed consent before commencing the survey.

### Measures

Data were collected using a structured, self-administered questionnaire distributed via Google Forms, comprising five sections that captured sociodemographic and economic status, food security status, coping strategies for food insecurity, depressive symptoms and anxiety symptoms.

The sociodemographic and economic section included age, ethnicity, education level, employment status, marital status, household size, number of children, monthly household income and monthly food expenditure. Food security was assessed using the validated 18-item U.S. Household Food Security Survey Module (HFSSM) (USDA 2012), which assesses household food-related behaviours and experiences during the preceding 12 months. Affirmative responses were summed to generate a raw score (0-18) and categorised into high food security (0), marginal food security (1-2), low food security (3-7) and very low food security (8-18). Families with high or marginal food security were classified as food secure, whereas those with low or very low food security were classified as food insecure.

To quantify the coping strategies employed in response to food insecurity, all participants were presented with a pre-defined list of strategies developed based on a review of the food security literature and the local context (Ibrahim & Othman 2020). Participants were asked to select all strategies they had used in the past 12 months to manage periods of food insecurity.

Depressive symptoms were measured using the Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al. 2001), a 9-item screening tool assessing symptom presence and severity over the past two weeks, scored on a 4-point Likert scale from 0 (not at all) to 3 (nearly every day), yielding a total score of 0-27. Anxiety symptoms were measured using the 7-item Generalised Anxiety Disorder scale (GAD-7) (Spitzer et al. 2006), which assesses anxiety symptom frequency over the past two weeks on the same 4-point scale and produces a total score of 0-21. Psychological health status was operationalised as the presence or absence of clinically significant symptoms, defined by established cut-offs: a PHQ-9 total score $\geq 10$ for probable depression and a GAD-7 total score $\geq 10$ for probable anxiety.

The standard questionnaire utilised established English and Malay versions of the validated tools. To accommodate the target population's demographic profile, the instruments were subsequently translated into Chinese using a standard forward-backwards translation method. The final online survey was made available in all three languages (Malay, English and Chinese), allowing participants to select their preferred language. A pilot study was conducted among 12 women from the target population (B40 mothers in Taiping) to evaluate the comprehension, clarity and completion time of the translated instruments.

### Statistical analysis

All analyses were conducted using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics are presented as frequencies and percentages (n, %) for categorical variables. The association between household food security status (food secure vs. food insecure) and psychological health outcomes was assessed using Fisher's Exact Test. A two-tailed p-value $< 0.05$ was considered statistically significant.

## RESULTS

### Sociodemographic and economic characteristics

The study included 115 mothers of reproductive age from B40 households in Taiping, Perak. The sociodemographic and economic profile of the participants is detailed in Table 1. The sample was characterised by a mature age distribution, with the majority (69.6%) being aged 30-39 years, and was ethnically diverse, with nearly equal proportions of Chinese (47.8%) and Malay (41.7%) participants. Education levels were moderate, with 85.2% of participants and 86.1% of their husbands having completed secondary school as their highest attainment. Economically, the sample reflected the targeted B40 bracket. Household income was concentrated (56.5%) in the RM 3,971-4,850 monthly range, while reported monthly household expenditure on all items was predominantly (73.0%) in the RM 1,001-2,000 range. Most participants

(68.7%) and their husbands (80.9%) were employed in the non-governmental or private sector. Households were typically nuclear families, with 91.3% consisting of 3–5 members. The vast majority of participants (83.5%) had 1-2 children, of whom 1-2 were typically attending school (87.8%).

TABLE 1. Sociodemographic and economic characteristics of the study participants, n = 115

| Characteristic | Category | n | % |
|---|---|---|---|
| **Age (years)** | 18–29 | 14 | 12.2 |
| | 30–39 | 80 | 69.6 |
| | 40–49 | 21 | 18.3 |
| **Ethnicity** | Malay | 48 | 41.7 |
| | Chinese | 55 | 47.8 |
| | Indian | 12 | 10.4 |
| **Highest education level** | Primary school | 4 | 3.5 |
| | Secondary school | 98 | 85.2 |
| | Higher education (college/university) | 13 | 11.3 |
| **Husband's highest education level** | Primary school | 8 | 7.0 |
| | Secondary school | 99 | 86.1 |
| | Higher education (college/university) | 8 | 7.0 |
| **Work status (participant)** | Government | 4 | 3.5 |
| | Non-government (private) | 79 | 68.7 |
| | Self-employed | 4 | 3.5 |
| | Housewife | 28 | 24.3 |
| **Work status (husband)** | Government | 4 | 3.5 |
| | Non-government (private) | 93 | 80.9 |
| | Self-employed | 5 | 4.3 |
| | Others | 13 | 11.3 |
| **Marital status** | Married | 107 | 93.0 |
| | Divorced/Others | 8 | 7.0 |
| **Monthly household income (RM)** | <2500 | 15 | 13.0 |
| | 2501–3170 | 8 | 7.0 |
| | 3171–3970 | 27 | 23.5 |
| | 3971–4850 | 65 | 56.5 |
| **Husband's monthly income (RM)** | <1000 | 6 | 5.2 |
| | 1000–2000 | 21 | 18.3 |
| | 2001–3000 | 73 | 63.5 |
| | 3001–4000 | 6 | 5.2 |
| | >4000 | 9 | 7.8 |
| **Household expenditure per month (RM)** | 500–1000 | 21 | 18.3 |
| | 1001–2000 | 84 | 73.0 |
| | 2001–3000 | 10 | 8.7 |
| **Number of family members** | 3–5 | 105 | 91.3 |
| | 6–8 | 9 | 7.8 |
| | ≥9 | 1 | 0.9 |
| **Number of children in family** | 1–2 | 96 | 83.5 |
| | 3–4 | 17 | 14.8 |
| | ≥5 | 2 | 1.7 |
| **Number of children in school** | 1–2 | 101 | 87.8 |
| | 3–4 | 12 | 10.4 |
| | ≥5 | 2 | 1.7 |

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Food security status and psychological health

The distributions of household food security and maternal psychological health symptoms are presented in Table 2. Based on the 18-item HFSSM, 81.7% of households were classified as food secure, including 19.1% with high and 62.6% with marginal food security, while the remaining 18.3% were food insecure, comprising 13.0% with low and 5.2% with very low food security.

Regarding maternal psychological health, the majority of participants reported none or minimal depressive symptoms (78.3%, PHQ-9 score 0-4), with 4.3% experiencing clinically significant moderate depressive symptoms (PHQ-9 ≥ 10). Anxiety symptoms were similarly low, with 84.3% (n = 97) reporting none or minimal symptoms (GAD-7 score 0-4) and 2.6% exhibiting clinically significant moderate anxiety (GAD-7 ≥ 10).

TABLE 2. Food security status and psychological health of study participants, n = 115

| Variable | Category | n | % |
|---|---|---|---|
| **Food security status** | High | 22 | 19.1 |
| | Marginal | 72 | 62.6 |
| | Low | 15 | 13.0 |
| | Very low | 6 | 5.2 |
| **Levels of depression (PHQ-9)** | None-minimal | 90 | 78.3 |
| | Mild | 20 | 17.4 |
| | Moderate | 5 | 4.3 |
| | Moderately severe | 0 | 0.0 |
| | Severe | 0 | 0.0 |
| **Levels of anxiety (GAD-7)** | None-minimal | 97 | 84.3 |
| | Mild | 15 | 13.0 |
| | Moderate | 3 | 2.6 |
| | Severe | 0 | 0.0 |

Coping strategies for food insecurity

The coping strategies participants used to manage food insecurity are presented in Figure 1. Food-related strategies were the most prevalent, with nearly all participants reporting at least one such action. The most common approach in this category was prioritising food for children (n = 96), followed by using savings to purchase food (n = 44) and reducing the amount of food bought from outside (n = 22). Non-food-related strategies were also widely utilised, with the majority of participants (n=87) engaging in actions such as careful financial management, prioritising daily necessities, and planning household expenditures. Income-generating strategies were least adopted, with many participants taking on a second job (n = 74), while starting an online business was less frequently reported (n = 24).

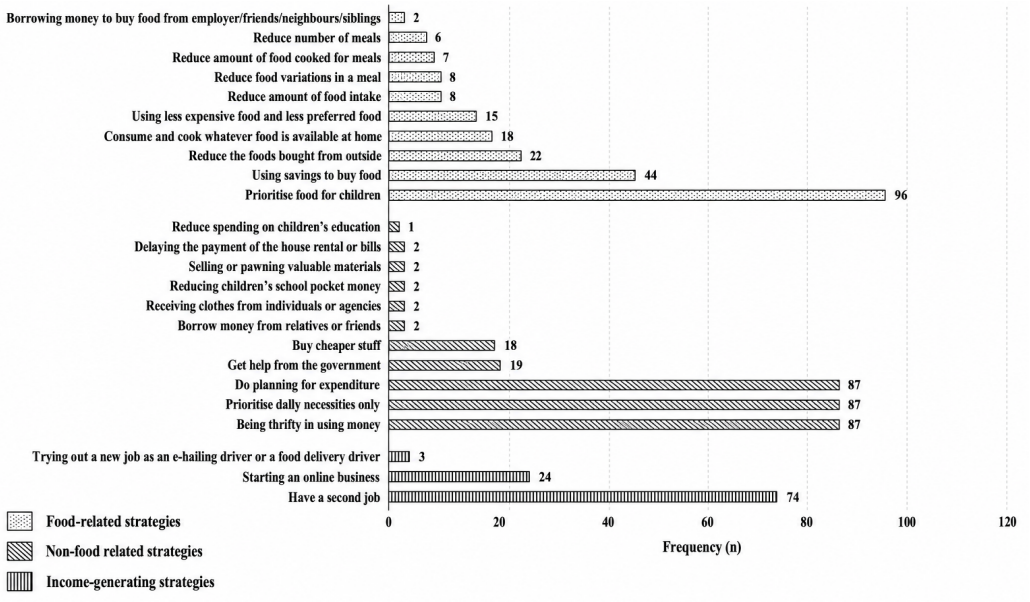


FIGURE 1. Frequency of coping strategies employed by study participants (n = 115)

Association between food security and psychological health

A statistically significant association was found between household food security status and psychological health (Table 3). Participants from food-insecure households demonstrated a markedly higher prevalence of clinically significant depressive symptoms (PHQ-9 ≥10) compared to those from food-secure households (19.0% vs. 1.1%), and this difference was confirmed using Fisher's Exact Test ($p < 0.001$). A similar trend was observed for anxiety, where clinically significant symptoms (GAD-7 ≥10) were reported by 9.5% of individuals in food-insecure households compared with 1.1% in food-secure households, also yielding a statistically significant association ($p < 0.001$).

TABLE 3. Association between household food security status and psychological health symptoms

| Psychological Health | Symptom level (Score range) | Food secure (n = 94) | Food insecure (n = 21) | p-value |
|---|---|---|---|---|
| Depressive symptoms (PHQ-9) | None/Minimal (0-4) | 83 (88.3%) | 7 (33.3%) | <0.001 |
| | Mild (5-9) | 10 (10.6%) | 10 (47.6%) | |
| | Moderate or severe (≥10) | 1 (1.1%) | 4 (19.0%) | |
| Anxiety symptoms (GAD-7) | None/Minimal (0-4) | 87 (92.6%) | 10 (47.6%) | <0.001 |
| | Mild (5-9) | 6 (6.4%) | 9 (42.9%) | |
| | Moderate or severe (≥10) | 1 (1.1%) | 2 (9.5%) | |

## DISCUSSION

This study investigated the prevalence of food insecurity, psychological distress, and the coping strategies employed by mothers of reproductive age from low-income households in Taiping, Malaysia. The findings highlight that the majority of households were food secure, although a sizeable minority faced food insecurity. There was a clear relationship between food insecurity and symptoms of depression and anxiety. Coping efforts were dominated by food-related and financial management strategies, with fewer women engaging in income-generating activities.

In our sample, the majority of households were classified as food secure, a prevalence consistent with another Malaysian study involving 107 low-income mothers in Terengganu, where the majority of households were food secure (85.0%) (Cheah et al. 2020). Notably, in this study, most food-secure households (62.6%) fell into the marginal food security category, indicating that they had managed to avoid overt hunger but had experienced anxiety or compromised food quality, indicating a state of persistent vulnerability. This high overall security rate, despite low income, likely reflects the active use of coping mechanisms. The most prevalent strategies were food-related, particularly prioritising children's food intake, and non-food-related financial management, such as stringent budgeting. These findings align with global literature where maternal buffering of children and expenditure prioritisation are common responses to scarcity (Eicher-Miller et al. 2023; Mcintyre et al. 2003). In contrast, formal income-generating activities (e.g., securing a second job) were least frequently reported, suggesting structural barriers in the local context. For mothers of young children in semi-urban areas like Taiping, these barriers often include limited access to affordable childcare, inadequate public transportation, and a lack of flexible employment opportunities that accommodate caregiving responsibilities. As a result, consumption-based adjustments tend to be a more immediate and accessible response to food shortages.

The prevalence of clinically significant depression and anxiety in our study was lower than reported in many Malaysian studies of low-income populations (Ismail et al. 2021; Lugova et al. 2021; Wong et al. 2022). While this may reflect true population differences influenced by cultural factors or community support, it is also important to consider the role of measurement; screening tools, though validated, may not fully capture culturally specific expressions of distress. Despite this lower baseline prevalence, the association between food insecurity and psychological distress was strong. This aligns with extensive literature positing that the chronic stress of food insecurity acts as a key pathway to depression and anxiety, particularly in women who bear primary responsibility for household food provision (Huddleston-Casas et al. 2009; Nagata et al. 2019).

Despite approximately two-thirds of the participants experiencing marginal food security, the prevalence of clinically significant depression and anxiety remained relatively low. This may be due to several reasons. First, the use of coping strategies such as careful financial planning and seeking additional income may have provided these mothers with a greater sense of control, thereby reducing psychological distress. Second, although marginal food security involves ongoing concern about food availability, it does not necessarily result in severe hunger, which may explain the lower prevalence of mental health problems observed. Nevertheless, further studies are needed to confirm these findings and better understand the underlying protective factors.

Several limitations should be considered when interpreting these findings. The cross-sectional design restricts the ability to draw causal conclusions. The use of convenience and snowball sampling within a single locality limits broader generalisability to all B40 women in Malaysia. In addition, self-reported information on psychological symptoms and coping behaviours may be influenced by recall errors or social desirability bias. Furthermore, the reliance on online data collection may have introduced selection bias, favouring participants with higher digital access and literacy. Consequently, the prevalence of food insecurity and psychological distress reported here may not fully capture the experiences of the most economically marginalised individuals within the B40 group who lack digital connectivity.

Future research should adopt longitudinal designs to clarify the causal pathways linking economic strain, food insecurity, coping responses and mental health outcomes. Qualitative studies would complement these efforts by providing deeper insight into the reasoning behind coping choices and the barriers to income generation. Extending similar investigations across different Malaysian regions and ethnic groups will be essential to inform equitable and contextually relevant national policies.

## CONCLUSION

This study demonstrates that while most low household-income mothers in Taiping, Malaysia maintain a basic level of food security, a proportion of them exist in a state of marginal food security. Despite a relatively low overall prevalence of clinical depression and anxiety in the sample, food insecurity was significantly associated with poorer psychological health outcomes among these women. The coping strategies observed, which emphasised immediate consumption adjustments and financial rationing over sustainable income generation, highlight the precariousness of this marginal security. These findings underscore food insecurity as a critical psychosocial stressor. They call for integrated public health and social policies that move beyond emergency food aid to address the chronic anxiety of marginal food security and the economic constraints that underpin it. Concrete measures could include incorporating mental health screenings and psychosocial support services directly at food bank distribution points or within local community health clinics, ensuring that both nutritional and psychological vulnerabilities are addressed simultaneously. Future research should employ longitudinal designs and broader national sampling to clarify causal pathways and inform the development of targeted, effective interventions to safeguard both the nutritional and mental well-being of vulnerable families.

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