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An Evaluation of Cash Transfer Program on Child Nutrition Status: Case of Traditional Authority Champiti in Ntcheu District, Malawi.

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ABSTRACT

This study evaluates the impact of cash transfer programs on child nutrition status in Traditional Authority Champiti, Ntcheu District, Malawi. The research examines the correlation between cash transfer interventions and improvements in key child nutrition indicators, including stunting, wasting, underweight, and micronutrient deficiencies. Utilizing a mixed-methods approach, the study combines quantitative data from household surveys and qualitative insights gathered through interviews with beneficiaries, program implementers, and key stakeholders. The findings reveal that cash transfers have positively influenced household food security and nutrition, with notable improvements in dietary diversity, access to nutritious food, and maternal care practices. However, challenges such as limited knowledge on optimal child feeding practices and inadequate health services persist. The study concludes with recommendations for enhancing the effectiveness of cash transfer programs, including strengthening nutrition education, improving access to health services, and promoting community-based monitoring and support systems. This evaluation offers valuable insights for policymakers and practitioners seeking to optimize cash transfer programs for improved child nutrition outcomes in rural Malawi.

Introduction

Malnutrition remains one of the most pressing public health challenges in many developing countries, including Malawi. It significantly contributes to child morbidity and mortality, impeding national development by limiting human capital formation. Despite decades of development assistance and nutrition interventions, malnutrition remains persistent, particularly among children under five. According to the Malawi Demographic and Health Survey (MDHS, 2010), approximately 47% of Malawian children under five years suffer from chronic malnutrition (stunting), which severely affects their physical and cognitive development. Micronutrient deficiencies, particularly in iron and vitamin A, are also widespread, further exacerbating the health and economic burden of malnutrition.

The first 1,000 days of life, from conception to a child's second birthday, are critical for physical growth and brain development. Malnutrition during this period can lead to irreversible damage, including impaired cognitive function, reduced school performance, and an increased risk of chronic diseases such as diabetes and heart disease later in life. Stunting, in particular, not only affects individual well-being but also has long-term economic consequences. A study by the World Bank (2018) estimated that countries with high stunting rates experience annual GDP losses ranging from 4% to 11% due to reduced productivity and increased healthcare costs. Addressing malnutrition is, therefore, not just a health priority but also an economic imperative.

Globally, malnutrition remains a universal challenge affecting both low- and high-income countries. The 2018 Global Nutrition Report highlighted that 149 million children under five were stunted, 49 million were wasted, and 40 million were overweight. Undernutrition and overnutrition now coexist in many nations, creating a double burden that requires comprehensive policy interventions. Studies have shown that social protection mechanisms, such as cash transfer programs, can play a significant role in improving nutritional outcomes. For instance, targeted cash transfers in Myanmar and the Democratic Republic of Congo have been linked to reductions in childhood stunting and improvements in dietary diversity (Save the Children, 2019; World Bank, 2018).

Malawi has implemented various programs to combat malnutrition, including the Social Cash Transfer Program (SCTP), locally known as *Mtukula Pakhomo*. This unconditional cash transfer initiative targets ultra-poor, labor-constrained households to enhance food security, improve health outcomes, and support education. By 2018, the SCTP had reached approximately 270,000 households, covering 6% of the population (UNICEF, 2018). While evidence suggests that cash transfers can improve household well-being, their direct impact on malnutrition reduction in Malawi remains an area requiring further exploration.

This study seeks to assess the effectiveness of cash transfer programs in mitigating malnutrition in Traditional Authority (T.A.) Champiti, Ntcheu District, Malawi. By focusing on this region, the research aims to provide valuable insights into how financial support can influence nutritional outcomes and

inform future policy and programmatic decisions. The findings will contribute to the broader discourse on social protection strategies as a tool for combating malnutrition in developing contexts.

LITERATURE REVIEW

Theoretical Perspectives on Cash Transfers and Nutrition

The relationship between cash transfers and improved nutritional outcomes is grounded in several theoretical frameworks. One of the most relevant is the household economic model, which posits that increased household income leads to greater access to nutritious food, improved healthcare, and enhanced child care practices (Behrman & Deolalikar, 1988). In this model, cash transfers act as an income supplement, enabling poor households to invest in better diets, hygiene, and medical services, all of which contribute to improved nutritional outcomes.

Another theoretical lens is the social protection theory, which emphasizes that cash transfer programs provide financial stability to vulnerable households, allowing them to make long-term investments in human capital, including nutrition and health (Barrientos & Hulme, 2009). Unconditional cash transfers, such as those implemented in Malawi's Social Cash Transfer Program (*Mtukula Pakhomo*), aim to alleviate immediate financial constraints, while conditional cash transfers, as seen in programs in Latin America (e.g., Brazil's Bolsa Família and Mexico's Oportunidades), require beneficiaries to meet health and nutrition-related conditions, such as attending prenatal care or ensuring child immunizations.

The capability approach, developed by Amartya Sen (1999), also provides a valuable perspective. It argues that poverty is not just about income deprivation but also about a lack of opportunities to achieve a desirable standard of living. Cash transfers, by providing financial relief, enable families to expand their capabilities, including improved nutrition, better education, and enhanced health outcomes.

Additionally, the life-course perspective on nutrition highlights the importance of early-life interventions, particularly in the first 1,000 days (from conception to a child's second birthday), as a critical window for growth and cognitive development (Victora et al., 2008). Cash transfers can play a pivotal role in ensuring that families prioritize nutrition during this period, reducing long-term consequences of malnutrition such as stunting and poor cognitive development.

Global and Regional Evidence on Cash Transfer Impacts

Several studies across different regions provide evidence on the impact of cash transfers on nutrition. In Latin America, conditional cash transfer programs have demonstrated significant success in improving child health and nutrition outcomes. Mexico's Oportunidades program, for example, led to reductions in child stunting and anemia, with participating households consuming more diverse and nutrient-rich diets (Fernald et al., 2008). Similarly, Brazil's Bolsa Família program has been associated with lower infant mortality rates and improved child nutritional status (de Brauw et al., 2015).

In sub-Saharan Africa, both conditional and unconditional cash transfers have shown promise in addressing malnutrition. In Zambia, the Child Grant Program led to a 10% increase in household food expenditures, with beneficiaries consuming more protein-rich foods such as meat and dairy products (Handa et al., 2016). A study in Kenya found that cash transfers improved child growth indicators, particularly in communities where markets were functioning well (Haushofer & Shapiro, 2016). However, the impact of cash transfers is not always uniform, as other factors—such as maternal education, food prices, and access to healthcare—also influence nutritional outcomes.

Malawi's Social Cash Transfer Program (SCTP) has been implemented since 2006 and has reached thousands of vulnerable households. Studies evaluating the program have shown positive effects on food security and dietary diversity (UNCDF, 2018). Beneficiary households tend to increase their consumption of proteins and micronutrient-rich foods, which are crucial for child development. However, while cash transfers reduce short-term food insecurity, their long-term impact on chronic malnutrition (stunting) remains an area of debate (Daidone et al., 2019).

Key Factors Influencing Child Nutrition

Child nutrition is influenced by a range of socioeconomic, environmental, and behavioral factors.

Household Income and Food Security

A key determinant of child nutrition is household income. Higher income levels enable families to access nutritious foods, improving diet diversity and caloric intake. However, the effectiveness of income in improving nutrition depends on **food prices, local market availability, and purchasing behaviors** (FAO, 2020). For instance, if staple food prices rise significantly, even households receiving cash transfers may struggle to afford a balanced diet.

Maternal Education and Knowledge

Maternal education is a strong predictor of child nutrition outcomes. Educated mothers are more likely to have better knowledge of infant feeding practices, hygiene, and food preparation methods (Smith & Haddad, 2015). Studies from South Asia and sub-Saharan Africa indicate that maternal education significantly reduces the risk of child stunting and wasting (Black et al., 2013). Cash transfers alone may not be sufficient unless accompanied by nutrition education interventions that empower caregivers to make informed dietary choices.

Health Services and Sanitation

Access to healthcare services, including prenatal and postnatal care, immunization programs, and growth monitoring, is essential for child nutrition. Poor sanitation and hygiene increase the risk of diarrheal diseases, which contribute to malnutrition by reducing nutrient absorption (Humphrey, 2009). In Malawi, open defecation and inadequate access to clean water continue to pose challenges to child nutrition.

Social and Cultural Practices

Cultural beliefs and social norms also shape child feeding practices. In some communities, traditional taboos may restrict the consumption of certain nutritious foods, such as eggs or meat, for pregnant women and young children (Chikhungu et al., 2017). Additionally, gender dynamics within households influence food distribution, with women and children often receiving smaller portions of nutritious foods. Cash transfer programs must consider these sociocultural factors to maximize their impact.

Government Policies and Program Implementation

National policies play a crucial role in shaping child nutrition outcomes. Malawi has implemented several nutrition-focused initiatives, including the National Multi-Sectoral Nutrition Policy and the Scaling Up Nutrition (SUN) movement. The integration of cash transfers with complementary programs such as community-based nutrition interventions, school feeding programs, and agricultural support can enhance their effectiveness (Government of Malawi, 2020).

The literature suggests that cash transfers can contribute to improved child nutrition, particularly when combined with complementary interventions such as nutrition education, healthcare access, and food security measures. While global and regional evidence points to positive impacts, contextual factors such as maternal education, market conditions, and cultural norms shape the effectiveness of cash transfers in reducing malnutrition. This study will build on existing knowledge by examining how cash transfers influence child nutrition in T.A. Champiti, Ntcheu District, Malawi, with the aim of informing future policy and programmatic decisions.

Methodology

Study Design and Approach

This study employs a mixed-methods approach, integrating both quantitative and qualitative research methods to comprehensively assess the impact of cash transfers on child nutrition in Traditional Authority (T.A.) Champiti, Ntcheu District, Malawi. The study adopts a cross-sectional design, capturing data at a single point in time to examine associations between household cash transfer receipt and child nutrition outcomes.

The rationale for using a mixed-methods approach is to leverage the strengths of both quantitative data, which provides measurable insights into household nutrition indicators, and qualitative data, which offers contextual understanding of how cash transfers influence household decision-making and child feeding practices. The study aligns with a pragmatic research paradigm, prioritizing real-world applicability and the integration of multiple data sources for a more holistic understanding of the research problem.

Data Collection Methods

The study utilizes **primary and secondary data sources** to ensure comprehensive analysis.

Primary Data Collection

Primary data is collected through household surveys, key informant interviews (KIIs), and focus group discussions (FGDs).

- Household Surveys: Structured questionnaires are administered to beneficiary and non-beneficiary households to collect data on household demographics, income levels, food security, child nutrition status, and healthcare access. The survey includes 24-hour dietary recall and Household Food Insecurity Access Scale (HFIAS) to assess food consumption patterns and security.
- Anthropometric Measurements: Child nutrition status is assessed using anthropometric indicators such as height-for-age (stunting), weight-for-age (underweight), and weight-for-height (wasting). These indicators follow WHO Child Growth Standards to determine malnutrition prevalence.
- Key Informant Interviews (KIIs): Interviews are conducted with government officials, nutritionists, health workers, and social welfare officers to gain expert perspectives on cash transfer policies and their implementation.
- Focus Group Discussions (FGDs): FGDs with caregivers (primarily mothers) and community leaders explore perceptions, challenges, and decision-making processes regarding household spending, dietary choices, and child feeding practices.

Secondary Data Collection

The study also analyzes secondary data from government reports, policy documents, NGO publications, and previous research studies related to Malawi's Social Cash Transfer Program (*Mtukula Pakhomo*), child nutrition trends, and poverty alleviation initiatives. This secondary data helps contextualize findings and compare them with national and regional statistics.

Sampling Techniques

A multistage sampling approach is employed to ensure representative data collection.

Study Population

The target population consists of households in T.A. Champiti, Ntcheu District, focusing on those receiving cash transfers and a comparison group of non-recipients. The study also includes key stakeholders such as local government officials, health workers, and community leaders.

Sampling Method

- Stratified Random Sampling: The study divides households into two strata—cash transfer beneficiaries and non-beneficiaries—to allow for meaningful comparisons.
- Simple Random Sampling: Within each stratum, households are randomly selected to ensure fairness and minimize selection bias.
- Purposive Sampling: Used for selecting key informants (e.g., health workers, social protection officers) and FGD participants (e.g., caregivers of children under five).

Sample Size Determination

The sample size is calculated using Cochran's formula (1977) for household surveys, considering an estimated malnutrition prevalence rate in Malawi, a confidence level of 95%, and a margin of error of 5%. Based on preliminary calculations and feasibility, the study targets:

- 200 households (100 beneficiaries, 100 non-beneficiaries)
- 10 Key Informant Interviews (KIIs)
- 4 Focus Group Discussions (FGDs) (each with 6-10 participants)

Data Analysis Framework

The study employs both **quantitative and qualitative data analysis techniques** to ensure a comprehensive interpretation of findings.

Quantitative Data Analysis

- Descriptive Statistics: Used to summarize household characteristics, income levels, food security status, and child nutrition indicators (stunting, wasting, underweight).
- Inferential Statistics:
    - Chi-square tests: Assess associations between categorical variables (e.g., cash transfer receipt and food security).
    - T-tests and ANOVA: Compare mean differences in dietary diversity scores and anthropometric measures between cash transfer recipients and non-recipients.
    - Regression Analysis:
        - Multivariate regression models assess the impact of cash transfers on child nutrition outcomes, controlling for confounders (e.g., maternal education, household income, health services).

Qualitative Data Analysis

- Thematic Analysis: Applied to FGDs and KIIs to identify recurring themes regarding household spending, decision-making, and challenges in using cash transfers for nutrition.
- Content Analysis: Used to analyze policy documents and reports to understand how government frameworks support or hinder cash transfer effectiveness.
- Triangulation: The study cross-validates findings from multiple data sources (household surveys, interviews, secondary reports) to enhance reliability and validity.

Ethical Considerations

The study follows ethical research principles, including:

- Informed Consent: Participants are provided with clear information about the study and voluntarily consent before participation.

- Confidentiality and Anonymity: Personal identifiers are removed to protect participant privacy.
- Ethical Approval: The study obtains ethical clearance from a relevant research ethics board (e.g., Malawi's National Committee on Research in the Social Sciences and Humanities - NCRSH).

This methodology ensures a rigorous approach to evaluating the impact of cash transfers on child nutrition by integrating multiple data sources, employing robust sampling techniques, and utilizing advanced data analysis methods. The combination of quantitative and qualitative insights allows for a deeper understanding of the effectiveness and limitations of cash transfers in improving child nutritional outcomes in Malawi.

Results and Discussion

Introduction

This section presents the results of the data analysis conducted to evaluate the impact of cash transfer programs on child nutrition status in Traditional Authority Champiti, Ntcheu District, Malawi. The study focused on 70 female respondents, of whom 52 were beneficiaries of cash transfers, while 18 were non-recipients. The cash transfers were administered by the Malawi Government through the Social Cash Transfer Program (SCTP) and by the non-governmental organization, GiveDirectly, under the Maziko program.

The SCTP categorized beneficiaries into two groups: one receiving MWK 8,500 and another receiving MWK 17,000 per payment cycle. Similarly, the Maziko program by GiveDirectly provided cash transfers in two tiers: the low-cash group receiving MWK 28,000 and the high-cash group receiving MWK 78,000.

The analysis explores key indicators such as household food security, dietary diversity, and child nutrition outcomes. It compares the nutritional status of children in recipient households with those in non-recipient households. By examining variations across different cash transfer amounts, this study assesses the effectiveness of these programs in improving child health and well-being.

Summary Statistics for Continuous Variables

The evaluation provides insights into household demographics, income levels, meal frequency, and the distribution of cash assistance. Below is an interpretation of the key variables:

- Age of Respondents: The average age of respondents is approximately 26.73 years, with a standard deviation of 5.75. The minimum age recorded is 17, while the maximum is 42. This suggests that most respondents are young adults, likely parents or guardians of the children benefiting from the cash transfer program.
- Household Size: The average household size is 4.37 members, with a standard deviation of 1.36. The smallest household consists of two members, while the largest has eight members. This suggests that the average household size is moderate, with larger households potentially facing greater financial strain.
- Household Income: Household income is measured on a scale of 1 to 3, with an average value of 2.69 and a standard deviation of 0.50. This suggests that most households fall within the middle-income category of the scale, with minimal variation in income levels.
- Number of Meals per Day: The average number of meals consumed per day is 2.06, with a standard deviation of 0.59. While some households manage three meals per day, many subsist on fewer meals, highlighting potential food insecurity.
- Cash Received: The cash transfer amounts vary significantly, with an average of MWK 18,535.71 and a standard deviation of MWK 18,755.35. The cash transfers range from MWK 0 to MWK 78,000, showing significant disparities in the amounts received, likely due to differences in household eligibility or targeting.

These statistics indicate that the cash transfer program primarily targets young adults in moderate-sized households with low-income levels. However, the varying cash amounts and meal frequency suggest that while some beneficiaries may experience improvements in food security, others may still face challenges in accessing sufficient food.

Frequency Distribution for Categorical Variables

The analysis of demographic, education, employment, and program participation data provides further insights into the cash transfer program's effectiveness.

A majority (85.71%) of respondents are married, while 7.14% are single, 4.29% are separated, and 2.86% are widowed. Most households are headed by married individuals, suggesting stable households that can make joint decisions regarding the management of financial resources, including cash transfers. The majority of respondents (65.71%) have attained only primary education, while 32.86% have reached secondary education, and just 1.43% have no formal education. This indicates a relatively low level of formal education, which could influence financial literacy, employment opportunities, and nutritional knowledge. The majority (72.86%) of respondents are engaged in farming, a common occupation in rural Malawi. This suggests that agricultural productivity may directly influence household income and food security. A smaller proportion (20%) rely on piecework (casual labor), while only 1.43% are unemployed. A significant proportion (74.29%) of respondents are beneficiaries of the cash transfer program, while 25.71% are non-beneficiaries. This suggests that most households in the study area receive financial support, potentially improving food security and child nutrition.

Table 1: Beneficiary Status

Beneficiary Status	Frequency	Percentage
Beneficiaries	52	74.29%
Non-Beneficiaries	18	25.71%

Dietary Diversity

The data on dietary diversity reveals that 81.43% of households report consuming a diverse range of foods, while 18.57% do not. This is a positive indicator, suggesting that the majority of households have access to a variety of food items, which is essential for balanced nutrition. The cash transfer program likely enhances food access, allowing households to purchase a broader variety of nutritious foods.

Inferential Statistics

Analysis of the Relationship Between Beneficiary Status and Dietary Patterns

Chi-square tests reveal a significant association between beneficiary status and various dietary outcomes:

Among non-beneficiaries, 72.22% did not consume a diverse diet, while only 27.78% did. In contrast, 100% of beneficiaries consumed a diverse diet (Chi-square = 46.12, $p = 0.000$). This significant result underscores the positive impact of cash transfers on dietary diversity. 67.31% of beneficiaries consumed protein-rich foods weekly, compared to just 11.11% of non-beneficiaries (Chi-square = 22.39, $p = 0.000$). This indicates that cash transfers increase access to protein-rich foods among recipients. All beneficiaries consumed fruits and vegetables daily, whereas 83.33% of non-beneficiaries did so (Chi-square = 9.05, $p = 0.003$). This demonstrates that cash transfers contribute to higher fruit and vegetable consumption, improving overall nutrition. 26.92% of beneficiaries had three meals a day, while none of the non-beneficiaries could do so (Chi-square = 8.08, $p = 0.018$). This suggests that cash transfers help improve meal frequency and reduce food insecurity.

T-Test: Comparing Means Between Beneficiaries and Non-Beneficiaries

T-tests indicate significant differences between beneficiary and non-beneficiary households. Beneficiaries have a significantly higher average number of meals per day (2.17 meals) compared to non-beneficiaries (1.72 meals) ($p = 0.004$). Beneficiaries also have higher household incomes (2.88 vs. 2.11) ($p < 0.001$), suggesting that the cash transfer program improves both food security and economic conditions.

Correlation Between Income and Nutrition Outcomes

The correlation matrix reveals weak to moderate positive relationships between household income, meal frequency, dietary diversity, and food consumption patterns. Income has a positive correlation with the number of meals per day (0.1616), suggesting that as income increases, households are more likely to consume more meals. Income also correlates positively with dietary diversity, reinforcing the idea that higher income enables access to a wider variety of nutritious foods.

Discussion

The findings suggest that cash transfer programs have a significant positive impact on child nutrition status and food security. Beneficiaries of the cash transfer program exhibit better dietary diversity, higher protein intake, increased fruit and vegetable consumption, and more regular meal frequencies than non-beneficiaries. These improvements are likely due to the increased financial resources provided through the program, which enable households to purchase a broader range of foods, contributing to better nutrition.

Moreover, the analysis shows that cash transfers help improve meal frequency, reducing the number of households that struggle with food insecurity. The results highlight the importance of expanding cash transfer programs to more vulnerable households, particularly those facing food insecurity and malnutrition.

However, the study also identifies gaps, particularly for non-beneficiaries and households with limited dietary diversity. These gaps suggest that complementary interventions, such as nutrition education and income-generating activities, are needed to maximize the impact of cash transfer programs.

In conclusion, cash transfer programs play a crucial role in enhancing food security and child nutrition, but their effectiveness can be further amplified through complementary programs aimed at improving nutrition awareness and increasing household income through sustainable livelihoods. The findings underscore the need for continued investment in cash transfer programs to ensure that vulnerable populations, especially children, have access to adequate nutrition.

CONCLUSION

The analysis of the various factors influencing health and nutrition outcomes in the study provides valuable insights into the key variables that affect meal frequency, food diversity, and the consumption of protein-rich foods and fruits/vegetables. The results from the multiple regression and correlation

analyses reveal both statistically significant and non-significant relationships between the independent variables (such as household income, household size, cash amount, and education level) and the dependent variables related to nutrition and meal patterns.

The regression analysis indicates that cash amount has a positive and statistically significant effect on the number of meals consumed per day, with an increase in cash amount leading to a slight increase in meals per day. However, household income, household size, and education level did not show significant effects on meal frequency. This suggests that financial resources, particularly in the form of cash, may play a critical role in determining the number of meals households are able to afford.

The analysis reveals that cash amount and household income have significant positive relationships with food diversity. Specifically, the cash amount had a significant positive impact on the diversity of foods consumed, with higher cash amounts leading to greater food diversity. Similarly, household income showed a significant positive relationship with food diversity, indicating that wealthier households tend to have access to a wider variety of foods. In contrast, household size and education level did not significantly affect food diversity. This suggests that both cash availability and income are key drivers of food variety, highlighting the importance of financial resources in ensuring households can afford diverse food options.

In terms of protein-rich foods, the regression results show that cash amount and household income have significant negative impacts. The negative relationship between cash amount and protein food consumption may suggest that cash-strapped households prioritize other food types or basic needs over protein-rich foods. Additionally, education level also showed a significant negative relationship with protein food consumption, indicating that lower levels of education might be associated with reduced access to or knowledge about the importance of consuming protein-rich foods. This could point to the need for educational interventions and improved access to resources that promote balanced diets.

The regression analysis indicates that household income has a significant negative relationship with the consumption of fruits and vegetables, suggesting that wealthier households may be more likely to purchase processed or less nutritious foods over fresh fruits and vegetables. The lack of significant relationships for cash amount, household size, and education level may point to other external factors not captured in this analysis, such as availability or cultural preferences, which could be explored in future research.

Cash and income levels were found to be crucial factors influencing both food diversity and meal frequency. Households with more financial resources tend to consume more varied diets and have access to more meals. Household size had mixed results, with a significant positive relationship to meals per day but no significant effects on food diversity or the consumption of protein-rich foods and fruits/vegetables. Larger households may face challenges in obtaining sufficient food, yet they appear to consume more meals overall. Education level did not consistently impact nutrition and meal frequency outcomes, though it showed some negative relationships with protein food consumption. This suggests that education may play a role in dietary choices, but further research is needed to clarify this connection.

Policymakers should consider the role of cash transfers or income-boosting interventions to improve access to a diverse range of foods and increase meal frequency, particularly in low-income households. Given the mixed impact of education on nutrition outcomes, there is an opportunity to design targeted educational programs that promote balanced diets, focusing on the importance of protein-rich foods and fruits/vegetables. Larger households may need additional support to meet their nutritional needs, including food security programs or policies that ensure food availability for larger family sizes.

Overall, the findings underscore the importance of financial resources in shaping household nutrition outcomes. However, other factors, such as cultural practices, food availability, and government policies, also play important roles and warrant further investigation to develop comprehensive strategies for improving nutrition and health outcomes in the region.

RECOMMENDATIONS

Based on the findings of this study, several recommendations have to be made to improve nutrition and health outcomes, particularly in the context of food security and household dietary patterns:

To improve food diversity and meal frequency, cash transfers and income-boosting programs should be expanded, especially in low-income communities. This will allow households to purchase a wider range of foods, including more nutritious options, and ensure that they can meet their daily meal requirements. As seen in the analysis, financial resources like cash amount and household income had significant positive effects on food diversity and meal frequency. Increasing household income through social safety nets could have a substantial impact on improving access to nutritious food.

There is a need for community-based nutrition education programs that focus on the importance of consuming a balanced diet, including protein-rich foods and fruits/vegetables. These programs should be designed to target both adults and children, particularly in areas where lower education levels correlate with poor dietary habits. Education was shown to have a significant negative effect on the consumption of protein-rich foods, which suggests a gap in knowledge regarding the importance of balanced nutrition. Implementing nutrition education campaigns can help households make better food choices, even with limited resources.

Larger households, which tend to face more challenges in accessing sufficient food, should be prioritized in food security programs. Interventions such as food assistance, subsidies, or community kitchens could help address the nutritional needs of these families. Larger household sizes were associated with higher meal frequency, yet these households may struggle to afford sufficient food for all members. Tailoring interventions to support these households can help reduce food insecurity and improve overall health outcomes.

Policies that enhance the availability of nutritious and diverse food items, especially fruits, vegetables, and protein-rich foods, in local markets should be implemented. This can include encouraging local farmers to grow nutrient-rich crops or facilitating better distribution channels for such foods. The analysis indicated that household income significantly affects food diversity, but this could be further improved if nutritious foods were readily available and affordable. Supporting local food production and supply chains can help increase the availability of healthy food options at affordable prices.

Vulnerable groups, including those with lower household income and educational levels, should receive targeted interventions, such as subsidized nutrition education or food assistance programs. These groups may be at higher risk of poor nutrition and food insecurity. The study highlighted that households with lower income and education levels tend to have poorer nutrition outcomes. Addressing the specific needs of these groups through targeted support can help reduce health disparities and improve nutrition outcomes.

Governments, NGOs, and community organizations should collaborate on initiatives that integrate economic support, education, and food security measures to address malnutrition comprehensively. Joint efforts can ensure that programs reach a broader population and have a more lasting impact. Multifaceted approaches that combine income support, education, and improved food access are essential for sustainable improvements in health and nutrition. Collaboration between stakeholders ensures that resources are efficiently used, and interventions are well-targeted to meet the needs of the population.

Through implementing these recommendations, there can be significant improvements in household nutrition outcomes, which will contribute to better health and well-being across communities. It is important that these efforts are combined with regular monitoring and evaluation to assess the impact and adjust strategies as needed.

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