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Household Food Insecurity among Families with Children Aged 2–5 Years in District Naushahro Feroze, Pakistan.

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Abstract

Background: Early childhood represents a critical window for physical and cognitive development, heavily influenced by nutritional status and household conditions. Household Food Insecurity (HFI) defined as limited or uncertain access to sufficient, safe, and nutritious food remains a key determinant of childhood undernutrition. In Pakistan, particularly in rural areas, HFI continues to pose a widespread challenge. This study aimed to assess the level and patterns of HFI among families with children aged 2 to 5 years in Union Council Dabhro (Darbelo), Taluka Kandiaro, District Naushahro Feroze, Sindh, Pakistan.

Methodology: A community-based cross-sectional survey was conducted among 106 households with children aged 2 to 5 years. A purposive sampling approach targeted households registered with Lady Health Workers (LHWs). Data were collected using a structured, pretested questionnaire incorporating the Household Food Insecurity Access Scale (HFIAS). Descriptive statistics were analyzed using SPSS version 20.0.

Results: The prevalence of HFI was alarmingly high. A total of 82.1% of households reported being unable to eat preferred foods, 81.1% reduced meal sizes, and 77.4% had fewer meals per day. Furthermore, 70.8% experienced entire days without food, and 51.9% went a full day and night without eating. The mean household size was 9.6 members. Based on HFIAS classification, 42.5% of households were severely food insecure and 57.5% were mildly food insecure. None of the households were classified as food secure or moderately food insecure.

Conclusion: This study underscores a substantial burden of food insecurity among rural families with young children in District Naushahro Feroze. These findings highlight the need for locally tailored, community-based interventions such as nutrition-sensitive social protection programs and targeted education to address food insecurity and improve child well-being in similar rural contexts.

Keywords

Household Food Insecurity, Child Undernutrition, Rural Pakistan, Household Food Insecurity Access Scale, Early Childhood Nutrition.

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Introduction

Childhood is a foundational phase for physical and cognitive development, with the first two years being especially critical. During this period, rapid growth demands optimal nutrition and a nurturing environment. Human growth, defined by the increase in both cell number and size, is influenced by intrinsic (genetic) and extrinsic (environmental) factors[1]. Among the environmental factors, access to adequate food, clean water, sanitation, healthcare, and stable housing play a pivotal role in determining a child's developmental trajectory[2].

Stunting defined as impaired linear growth due to chronic undernutrition remains a major global public health concern. It is strongly associated with adverse cognitive, social, and physical outcomes. Children who are stunted face increased risks of mortality, developmental delays, and chronic non-communicable diseases in adulthood. Consequently, linear growth is widely recognized as a proxy for overall child health and well-being[3,4].

A growing body of literature demonstrates a significant association between Household Food Insecurity (HFI) and stunting[5]. HFI is defined as the limited or uncertain ability to access sufficient, safe, and nutritious food required for an active and healthy life[6]. According to The State of Food Security and Nutrition in the World 2022, approximately 2.3 billion people globally experienced moderate to severe food insecurity, and 828 million suffered from hunger[7]. Children in food-insecure households are disproportionately affected by stunting, wasting, and underweight conditions compared to those in food-secure settings[8]. In 2020 alone, an estimated 148.1 million children under the age of five were stunted, with Asia and Africa accounting for 52% and 43% of the global burden, respectively[9].

Understanding the complex relationship between HFI and child growth is essential given its long-term consequences for individuals and societies. A 2024 systematic review of 36 studies confirmed a strong association between HFI and child undernutrition especially stunting and underweight although many studies were constrained by cross-sectional designs, language limitations, and inconsistent grading of evidence[5]. This underscores the need for more context-specific and methodologically robust research in low-resource settings.

In Pakistan, factors such as widespread poverty, low agricultural productivity, political instability, and weak institutional frameworks continue to contribute to chronic food insecurity[10]. Many households are unable to afford a sufficient and balanced diet. Stunting remains highly prevalent, with determinants including maternal education, hygiene practices, poverty, and limited access to healthcare services[11]. The first 1,000 days of life from conception to age two are particularly vulnerable to nutritional deprivation. Children stunted during this period are less likely to achieve their full physical and cognitive potential, resulting in constrained educational attainment and economic opportunities later in life[12,13].

Evidence also points to the role of modifiable community-level factors such as gender equity, maternal literacy, sanitation infrastructure, and clean water access in influencing child nutritional outcomes[14–16]. While some studies in Pakistan suggest that maternal autonomy may offer a protective effect against food insecurity and child undernutrition, findings vary by region, warranting more localized investigation[17].

The objective of this study was to assess the level and patterns of household food insecurity among families with children aged 2 to 5 years in a rural community of District Naushahro Feroze. By identifying the extent, nature, and behavioral indicators of HFI in this context, the study aims to inform evidence-based, community-level interventions that address the root causes of food insecurity and promote child health and development.

Methodology

Study Design

This study employed a cross-sectional design to assess the level and patterns of household food insecurity (HFI) among families with children aged

2 to 5 years residing in rural communities. The primary aim was to understand food access and insecurity-related experiences among these families to inform future public health interventions.

Ethics

The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Prior to data collection, ethical approval was obtained from the Institutional Review Board (IRB) of Health Services Academy, affiliated with Quaid-e-Azam University, Islamabad, under reference number F.No. 35979/HAS/MSPH-2014. All participants were thoroughly informed about the objectives, procedures, benefits, and potential risks of the study. Written informed consent was obtained from the mothers or primary caregivers of participating children. Confidentiality and anonymity were assured, and participants were informed of their right to withdraw from the study at any point without any repercussions.

Setting

The study was conducted in Union Council Dabhro (Darbelo), located in Taluka Kandiaro of District Naushahro Feroze, Sindh, Pakistan. This is a rural area where the population is largely dependent on agriculture and informal labor for livelihood. The region is served by a network of Lady Health Workers (LHWs), who provided the sampling frame for household selection.

Participants

The target population included households that had at least one child aged between 2 and 5 years and were registered with the local LHWs network. Only those families actively engaged with the LHW program were included. Children with chronic illnesses, physical disabilities, or known mental health conditions were excluded to avoid confounding effects on household food access indicators. Mothers or primary caregivers were the respondents for each household.

Variables

The primary outcome variable was household food insecurity, measured using the Household Food Insecurity Access Scale (HFIAS). Independent variables included household demographics such as maternal education, household size, income level, employment status, and child health indicators.

Data Sources/Measurement

Data were collected through a structured and pre-tested questionnaire administered face-to-face to mothers or primary caregivers. The questionnaire consisted of three sections: household demographic data, food access experiences, and the HFIAS instrument. The HFIAS is a validated tool used to assess the frequency and severity of food-related hardships experienced over the past 30 days, including anxiety about food supply, dietary diversity, meal frequency, and instances of food depletion.

Bias

To minimize bias, a standardized questionnaire was used and administered by trained data collectors. However, due to the use of purposive sampling and the exclusion of non-LHW-registered families, there is a risk of selection bias, as the most marginalized households may not be represented. Additionally, self-reported data may be subject to recall or social desirability bias.

Study Size

The sample size was determined based on logistical feasibility and resource availability. While the exact sample size was not statistically calculated using prevalence estimates, a sufficient number of households were included to provide descriptive insight into the patterns of food insecurity within the defined population.

Quantitative Variables

Quantitative variables included the HFIAS score (ranging from 0 to 27), number of household members, monthly income (in PKR), maternal age and education level, and child's age and sex. The HFIAS scores were categorized into levels of food insecurity (food secure, mildly, moderately, and severely food insecure) according to standard scoring guidelines.

Statistical Methods

Data were entered and analyzed using SPSS version 20.0. Descriptive statistics were employed to summarize the variables. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were reported for continuous variables. No inferential statistics were applied, as the primary objective was descriptive in nature.

Results

Participants

A total of 106 households were included in the study. The respondents were predominantly female, with 103 (97.2%) mothers or female caregivers and only 2 (1.8%) male participants, indicating that women primarily assumed caregiving roles in the study setting. The average age of respondents was 31.1 years (±4.8 SD), reflecting a relatively young caregiver population. The mean household size was notably large, with an average of 9.6 members per household, highlighting the potential burden on household resources and an increased vulnerability to food insecurity.

Descriptive Data

The households surveyed were selected based on their active registration with the local Lady Health Workers (LHW) network, ensuring that all included participants were engaged in community-level healthcare programs. The data collection instrument captured multiple indicators of household food insecurity using the Household Food Insecurity Access Scale (HFIAS). Responses were collected on both the occurrence and frequency of food insecurity-related experiences within the previous four weeks.

Outcome Data

Table 1 summarizes the prevalence of household food insecurity experiences based on affirmative responses ("Yes") to the HFIAS items. A majority of households 87 (82.1%) reported that they were not able to eat the kinds of foods they preferred due to lack of resources. Limited dietary diversity was experienced by 80 (75.5%) households, while 87 (82.1%) reported consuming foods they did not want. Moreover, 86 (81.1%) of respondents had to eat smaller meals, and 82 (77.4%) ate fewer meals per day than required. A more severe indicator, the complete absence of food in the household, was reported by 75 (70.8%) households. Additionally, 48 (45.3%) caregivers reported that someone in the household went to bed hungry, and 55 (51.9%) confirmed going a whole day and night without any food due to lack of resources.

The frequency of these experiences is presented in Table 2. Among those who could not eat preferred foods, 13 (14.9%) said this happened rarely, 52 (59.8%) sometimes, and 22 (25.3%) often. Similar patterns were noted across other indicators. For example, 21 (26.3%) often experienced limited food variety, and 29 (33.7%) frequently had to reduce meal size. In severe cases, 13 (23.6%) households experienced an entire day and night without food more than 10 times in the past four weeks.

Main Results

Using the HFIAS classification, the study categorized households into four levels of food insecurity: food secure, mildly food insecure, moderately food insecure, and severely food insecure. Alarmingly, no households (0%) were categorized as food secure. More than half 61 households (57.5%) were classified as mildly food insecure, typically characterized by anxiety about food supply and compromised food quality. No households fell into the moderately food insecure category (0%), which commonly includes reduced food quantity but not extreme deprivation. A significant proportion 45 households (42.5%) were categorized as severely food insecure, indicating frequent reduction in both the quantity and frequency of food intake, often including skipped meals or entire days without eating.

Table 1: Frequency of Household Food Insecurity.

Questions	n(%)
In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	87(82.1)
In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	80(75.5)
In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	87(82.1)
In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	86(81.1)
In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	82(77.4)
In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	75(70.8)
In the past four weeks, did you or any household member got a sleep at night hungry because there was not enough food?	48(45.3)
In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	55(51.9)

Table 2: Frequency of Food Insecurity Experiences

Questions	Rarely n(%)	Sometimes n(%)	Often n(%)
In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	13(14.9)	52(59.8)	22(25.3)
In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources?	17(21.3)	42(52.5)	21(26.3)
In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	13(14.9)	52(59.8)	22(25.3)
In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	15(17.4)	42(48.8)	29(33.7)
In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	16(19.5)	41(50)	25(30.5)
In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	20(26.7)	34(45.3)	21(28)
In the past four weeks, did you or any household member got a sleep at night hungry because there was not enough food?	15(31.3)	21(43.8)	12(25)
In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?	18(32.7)	24(43.6)	13(23.6)

Rarely (Once or twice in last 04 weeks); Sometimes (3-10 times in past 04 weeks); Often (More than 10 times in last 04 weeks)

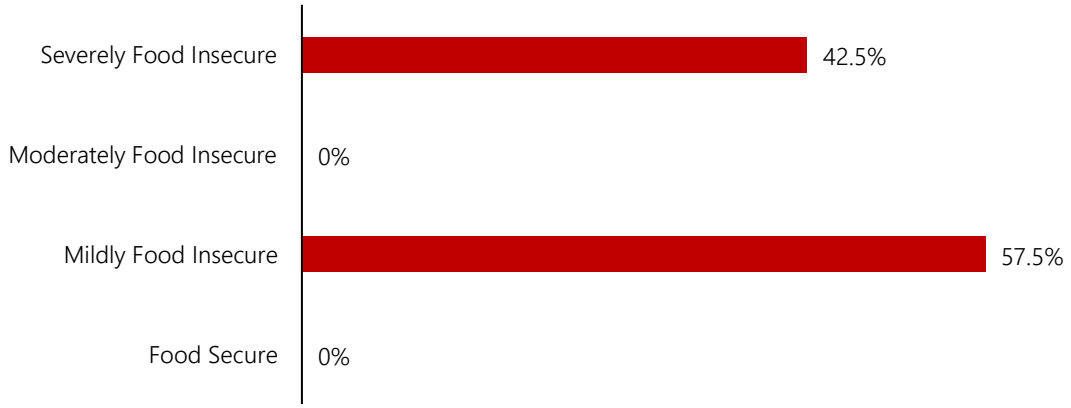

Figure 1: Household Food Insecurity Access Categories.

Discussion

Emerging evidence from recent studies conducted in Pakistan consistently suggests that rural households with low income, larger family sizes, and limited maternal education are at heightened risk for household food insecurity (HFI)[18]. Our study corroborates these findings, as the surveyed population had a mean household size of 9.6 members an indicator of high dependency ratios and potential strain on food resources. Similarly, a cross-sectional study from Punjab reported that economically unstable families were more likely to reduce meal frequency or compromise on food quality, mirroring the behavioral coping strategies reported in our study[19, 20].

The role of maternal empowerment in influencing food access and child nutrition has been increasingly emphasized in the literature[21]. While our study did not specifically assess maternal decision-making autonomy, the fact that 97.2% of respondents were women points to the need for future research to explore gendered dimensions of food-related decision-making, including coping mechanisms and food allocation practices during times of scarcity.

Findings from The State of Food Security and Nutrition in the World 2024 report reinforce the relevance of our results, especially regarding common food insecurity behaviors such as meal skipping and consumption of undesired or nutritionally inadequate food[22]. Our study highlights how these patterns are prevalent even in a localized rural setting, suggesting their utility as markers for broader surveillance efforts.

The application of the Household Food Insecurity Access Scale (HFIAS) in this context is supported by a growing body of literature advocating for its use in low- and middle-income countries (LMICs)[23]. HFIAS allowed for the measurement of not only the presence of food insecurity but also its severity and frequency, capturing the lived experiences of affected households with depth and nuance.

Recent findings by Etuah et al. further emphasize that food insecurity in vulnerable populations is not merely a reflection of poverty, but a complex phenomenon shaped by system-level resilience and the capacity of local institutions to respond to shocks such as climate events or economic disruptions[24]. In our setting, the intersection of rural poverty, large household size, limited dietary diversity, and inadequate social safety nets reflects deeply embedded structural challenges. These findings suggest that long-term solutions must go beyond short-term food aid and should instead

address the broader determinants of food insecurity, such as access to climate-resilient livelihoods and locally tailored nutrition education programs.

Limitations

Several limitations should be acknowledged. First, the cross-sectional design precludes the establishment of causal relationships between household food insecurity and potential nutritional or health outcomes. Second, the use of purposive sampling while pragmatic given logistical constraints limits the generalizability of findings to other rural or urban populations. Third, the study did not include anthropometric assessments such as height, weight, or mid-upper arm circumference (MUAC), which restricts our ability to correlate HFI with child malnutrition. Future research should consider longitudinal or mixed-methods designs with broader sampling frames and the inclusion of nutritional and health outcome data to better understand the short- and long-term effects of food insecurity.

Conclusion

This study provides evidence that household food insecurity is a pressing concern among families with young children in Union Council Dabhro (Darbelo), a rural setting in Sindh, Pakistan. Our findings align with national and global research emphasizing the multifactorial and pervasive nature of food insecurity in low-resource environments. While the results are not intended to be generalized beyond the study population, they highlight a critical need for localized interventions. Targeted strategies such as nutrition-sensitive social protection programs, climate-resilient agricultural initiatives, and culturally relevant, community-based nutrition education may offer promising avenues to mitigate the burden of household food insecurity and promote child health and development in similar contexts.

Conflicts of Interest

The authors declare no conflicts of interest.

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