Domestic Food Uncertainty and Nutritional Rank of Children aged 6-59 Months in Rural Nankana Sahib

Hafiz Abdul Rafah Razzaq[*]
Latif Ullah[**]
Muhammad Faisal Majeed[***]

Abstract

The present study investigated domestic food deficiency and nutritional rank of children aged 6-59 months and the relationship between socioeconomic status, domestic food deficiency, and nutritional rank among children. Quantitative and correlational research designs were used to explain the predictive relationship between domestic food deficiencies and socio-economic status. The study population was Nankana Sahab Punjab (Pakistan), and participants were selected from each area household using simple random sampling. Data was collected through a questionnaire and analysed using SPSS Version-21. Simple and multiple linear regression tests were applied to measure the actual prediction among domestic food deficiencies, socio-economic status, and nutritional ranks. As an outcome of the indirect consequence, it was shown that children's malnutrition was significantly impacted by food insecurity, nutritional needs, water and sanitation, and nutritional status. This suggests that as family food insecurity arises, children's malnutrition also declined. Additionally, factors including food accessibility, vitamin consumption, water and sanitation, and dietary habits were important for child growth stunting and nutritional status. The study came to the conclusion that children's stunting and nutritional status are influenced both simultaneously and indirectly by economic class and experiencing deficiencies in nutrition.

Keywords: Children, Household Food Insecurity, Nutritional Status, Socio-economic Status, Poverty.

Introduction

The foundational factor that influences and determines everyone's health, physical appearance, body mass, and metabolism is their nutritional intake.

---

[*] PhD Scholar, Institute of social and cultural studies, Punjab University Lahore, Punjab, Pakistan. Email: rafay2130@gmail.com
[**] Lecturer, Government Post Graduate College Timergara, Pakistan. Email: latifullahpo@gmail.com
[***]PhD Scholar, Institute of social and cultural studies, Punjab University Lahore, Punjab, Pakistan. Email: faisalmajeedch602@gmail.com

Poor nutrition increases susceptibility to illnesses and premature mortality, making it a significant issue, particularly for underprivileged and poor individuals. Poverty is a major contributor to food insecurity in households, leading to malnourishment and a host of health issues that affect both young and old individuals (Teko, 2023). Malnutrition, which literally translates to "poor nourishment," encompasses both overeating and undernutrition. While overnutrition and dietary changes have led to an increase in overnutrition, undernutrition remains the primary concern in the context of poorer nations. Unless otherwise specified, the World Food Program (WFP) considers chronic malnutrition as malnutrition (Abd alrazik et al., 2022).

Therefore, poor nutritional needs and illness are frequently the causes of malnutrition Children, in particular, are at risk due to their vulnerability to harmful environments, rapid response to changes in nutrition, and susceptibility to illnesses that lead to weight loss (Adeomi, Fatusi & Klipstein-Grobusch, 2022). . As a result, their nutritional status is regarded as a reliable indicator of community malnutrition. Therefore, survey data from that age category is used to make inferences about the state of the entire population, not just those under the age of five. There are various ways in which food insecurity in children may manifest, but measuring size and weight are the most common methods of detection (Kebede, Mengesha, Lindtjorn & Engebretsen, 2022).

The demographic index height for birth, or stunting, measures longitudinal growth that occurs before and after birth, with deficiencies signifying the aggregate, long-term impacts of poor nutrition and/or health (Hasan, Kader, Asif & Talukder, 2022). Wasting, on the other hand, signifies recent and severe weight reduction due to acute food deficits or severe illnesses. The height-specific physicochemical index weight shows muscle mass in relation to height. The anthropometric index weight for age, or underweight, indicates body weight in relation to age. It is a combination of stunting and wasting that is determined by a child's size and weight (Nonterah et al., 2022).

Undernutrition is one of the major risk factors for malnutrition, which is caused by a number of complex and interrelated factors. As per a widely accepted definition, a household has limited or uncertain physical and financial access to adequate and safe quantities of food that are nutritionally adequate for its members to lead an active and healthy life (Ashagidigbi, Ishola & Omotayo, 2022). Regarding new health measures, approximately

10 million children under the age of five die each year from diseases that may be prevented and treated. Malnutrition is to blame for more than one-third of these fatalities. MDG-1 aims to halve the burden of nutritional issues. Unfortunately, undernutrition, one of the primary causes of malnutrition, affects 146 million children under the age of five in developing regions (Sohel, Hossain, Sifullah & Rahman, 2022).

Urban families often consume meals that are high in calories and sugar, leading to high levels of both in their bodies. However, inadequate diets have resulted in many individuals suffering from malnutrition. The aspect of over-nutrition individuals is a problem that is prevalent in many countries, not just a select few (Gahamat, Rahman & Daud, 2022). The issue of poor nutrition refers to nutrient deficiencies that result in vitamin, iron, iodine, casein, and zinc deficiency in the internal organs. Overnutrition, on the other hand, involves excessive consumption of protein and energy sources. In a similar vein, MDG4 accomplishment resulted in a reduction of two-thirds in death rates. Malnutrition has a close relationship with child mortality rates, as it is believed to be a significant contributor to under-five deaths globally (Head et al., 2022).

Many countries are facing the dual burden of undernutrition and overnutrition, which imposes a heavy toll on households due to poor dietary choices. Now, nutrition-related nutritional deficiencies and, concurrently, the prevalence of poor diets and illnesses have driven the rise of macronutrients in society (Yeboah et al., 2022).). Food insecurity and malnutrition are two problems that are prevalent in low-income developing countries, particularly for newborns and children under the age of five. Previous research has shown that most people in the world live on less than $1 per day, and poorer countries are more affected by this challenge (Yazew, 2022).

Compared to affluent neighborhoods, communities facing financial difficulties often have poorer nutritional status. These risk factors are typically brought on by various infectious illnesses as well as by poor sanitation. However, social and cultural factors can also contribute to malnutrition (Rawat & Unisa, 2022). For instance, inadequate resources for children under the age of five have led to starvation as well as various ancillary cultural beliefs and practices. The physiological vulnerability component seems to have an impact on the kids' low nutritional condition. Due to poor nutrition, unhealthy mothers are unable to bear healthy

offspring. Therefore, nutrition statuses lead to unpleasant health conditions in women. The opposite impact is felt on the health of both mothers and children (Islam et al., 2022).

The impact of malnutrition is not limited to a child's physical body but also affects their intellectual development. Although malnutrition can decrease the future productivity and earning potential of children, it is important to identify and address the symptoms of malnourishment early on as they may become uncontrollable later in life (Ashagidigbi, Salau & Omotayo, 2022). In response, malnourished adults have a low working capacity and also less potential for doing work as compared to healthy food. These factors can result in lower productivity and income, as well as the inability to ensure food security for their families in the future (Ortiz-Marrón et al., 2022).

The child mortality rate has decreased from 90 percent to 35 percent, but this is still insufficient for achieving significant health improvements since many children are still dying However, statistical analysis of this figure shows that it is low, and health authorities have not addressed the true cause of child deaths. Fairly speaking, it is a truth that most affidavits do not specify the actual cause of Childs' passing (Syed, Raza, Bhatti & Eash, 2022). These risk factors are typically brought on by various infectious illnesses as well as by poor sanitation. Additionally, environmental and social variables can contribute to poverty (Razzaq, Majeed & Ali, 2022).

Additionally, inadequate resources for kids under the age of 5 have led to starvation as well as various ancillary cultural behaviours and beliefs The biological vulnerability component appears to contribute to the children's poor nutritional status. Moreover, due to poor nutrition, unhealthy mothers may be unable to give birth to healthy offspring, resulting in adverse health outcomes for both mothers and children (Kibria, Khan, Aleem & Haq, 2023).

Just as transient good food choices can harm the natural environment without deliberate planning for future generations, the sustainability of the environment is equally crucial for the health of people. Infant and toddler development can be impacted by poor nutrition, and family members depend on a healthy food supply. Moreover, individuals' poor nutritional health can affect the ability of family members to generate resources. For instance, parents with underweight children may be compelled to stay at home as they are unable to earn enough to support their families (Brazier et al., 2022).

The global community is facing a serious issue with the phenomena of stunting, wasting, and underweight children. Extreme malnutrition has a significant impact on healthy interactions, which are linked to human abilities and community welfare. Malnutrition is known to occur in civilization as a direct result of food insecurity (Hameed, Padda & Karim, 2022). Numerous occurrences of severe malnutrition in children from underdeveloped nations have been linked to a plethora of cases. Similar to how food insecurity is linked to unhealthy behaviour and poor emotional well-being, which leads to absenteeism, poor academic performance in mathematics, and constant student seeing the doctor for anxiousness and violence.

The cultural development of a nation is correlated with the availability of an adequate food supply. When these conditions are met, the socioeconomic development of that nation would be favorable. Similarly, improved academic performance of students is linked to food availability, and students' ability to study may increase with a healthy diet. A healthy lifestyle also increases an employee's eventual salary. The phenomenon of a good diet is likewise linked to potential earnings. Healthy eating promotes early childhood development, and a healthy community acts as a lever for national economic expansion (Hameed, Padda & Karim, 2022).

Poverty is the failure of a family or individual to meet the necessary usage in reaction to fluctuating prices, production, and income. Food insecurity encompasses a range of issues, from scarcity and cyclical hunger to unpredictable food access, and is defined as the inability to maintain food and nutritional security (Brazier et al., 2022).

Aims and Hypothesis

Adolescent poor nutrition and food insecurity are interconnected. One-third of global child mortality occurs among children aged five and below. Poor nutrition results in physical and mental impairments in children, which is another outcome of food insecurity in addition to the mortality of children. Malnutrition causes long-term harm to children, leading to subpar academic performance and has a detrimental impact on people's future quality of life. Food insecurity always worsens and exacerbates malnutrition in both infants and adults.

Similarly, undernutrition affects not just the general population but particularly parents and children, which results in significant losses in

success. The present study was aim to test the hypothesis of an association between food insecurity and malnutrition, a significant positive association between a greater level of domestic food uncertainty in rural areas, and nutritional status. Additionally, there is a correlation between income status and nutritional requirements, and water quality and sanitation are important predictors of people's nutritional intake.

Methodology

Participants: In this particular study, the participants consisted of individuals from families, including both males and females who were either married, separated, divorced, or widowed, with an age range of 18 to 45 (M = 25.07 and SD = 4.73), living in the Nankana Sahib district of Punjab. The sample size was (N=450), and a simple random sampling method was employed, which ensures that "each member of the population has an equal chance of being selected." This is a type of probability sampling. The relationship between family food insecurity and children's dietary patterns was evaluated using a correlational study design.

Measures: Malnutrition occurs when the availability of nutrient-dense, palatable food or the capacity to access such food is limited or uncertain (Anderson, 1990).

Food Availability: There seem to be regional variations in nutrition items as well as possibly climate and other reasons. Food supply refers to the economic, political, social, and legal rights of people to enough foodstuff for healthful eating.

Nutrient Consumption: Feed intake is the amount consumed each day that meets the nutritional demands of virtually all (97.5%) ostensibly healthy individuals in a specific age and sex group. The higher dose is correlated with the average daily consumption over time. Therefore, in this study, nutritional demands will be determined using nutrition criteria.

Dietary Variety: It refers to the variety of meals or dietary groups consumed in a certain length of time. Both the nutrition and food security groups have recently given diet and lifestyle variety indicators, which are determined by remembering the number of different foods or food types consumed within a specific time period, significant attention.

Water and Hygiene: Purification and clean water accessibility are essential for human health and well-being. In addition to promoting school attendance, livelihoods, and dignity and aiding in the development of

resilient communities in healthy environments, safe sanitation, and clean water are crucial for good health.

Stunting: The average height for birth is length and width -2 Z-score or less than 80% of the statistical population. It is a kind of growth retardation brought on by the persistent, long-term effects of physiology and/or dietary deficits. Stunting is therefore an indicator of not just poor nutrition but also a failure to meet basic necessities and, consequently, of severe poverty.

Wasting: weight-for-height < -2 Z-score or under 80% of the reference demographics' median body mass. Wasting is a low weight for height that demonstrates weight loss brought on by a lack of tissue and fat mass. It is an indication of hunger and shows that a family has insufficient food to eat. It is a sign of severe and acute malnutrition and typically results from nutrient deficiencies during such a shorter time span combined with sickness.

Underweight: Weight-for-age < -2 Z-score or under 80% of the reference population's mean average weight. Being u Underweight is a kind of chronic malnutrition. A useful instrument for assessing the effects of changes in food security over time is underweight, which is considered to be more susceptible to shifts in time and for a variety of factors.

Procedure: The investigator has requested assistance from female health workers (LHWs). In rural Pakistan, LHWs work in conjunction with traditional birth attendants to provide critical services to mothers and their children. The field study team received specialist training in organizing media appearance surveys through lectures, group meetings, and practice for seven days prior to visiting the research location. . They notified the research area of their daily inspection schedule and were advised to speak clearly to interview subjects, inform them of the importance of the research in their area of interest, speak to them in their mother tongue, and refrain from asking about extraneous issues. Lastly, they were asked to participate in simulated examinations as part of their training.

Data Analysis: All analysis results were obtained using the SPSS version 21 application, which is an analytic program for social sciences. A normality test was performed on all quantitative variables to assess the degree to which they were equally distributed. The mean, median, and mode values of the corresponding variables establish their normality assumption. To choose the most relevant group of variables for future research,

relationships among all of the study's explanatory variables were discovered using the Pearson correlation coefficient analysis. Multiple regression analysis was applied to determine how economic conditions, water cleanliness, and family food instability affect children's dietary habits.

Results

<u>Data Normality Calculation:</u> In SPSS V.21, for instance, the kurtosis and skew measurements were to utilized to analyze the assumption of normality. To examine the normalcy of data, kurtosis, and standard deviation behavior are often employed tests. The same data was found to be normal in that situation, and as George mentioned, all of the variables showed acceptable skewness and kurtosis values of 2. According to the table beneath, the skewness and kurtosis values for the water and sanitation variable were 0.685.

Table No.1: Data Normality Assessment of the Study Variable (N= 450)

Variables	M	SD	S	K	Mini	Maxi
Food Availability	2.72	0.348	0.685	0.424	2	3.9
Water And Sanitation	2.708	0.617	0.472	-0.176	1.43	4.57
Socio-economic Status	2.486	0.408	-0.384	-0.047	2.1	4.4
Household Food Insecurity	2.444	0.454	-0.321	-0.138	2.05	4.4
Nutritional Rank	2.711	0.593	0.63	0.305	1.64	4.64
Dietary Variety	2.331	0.734	0.944	-0.075	1.14	5

Nutritional Consumption	2.911	0.593	0.627	0.212	1.38	4.64

Note: M= Mean, SD= Standard Deviation, Mini = Minimum, Maxi= Maximum, S= Skewness, K= Kurtosis, SE= Standard Error.

Descriptive Statistics of Demographics

Table No.2: Distribution of Demographic Variables on Mean and Standard Deviation (N = 450)

Category	Mean	SD
Gender	1	0
Age	35.61	7.225
Education	5.1	1.307
Occupation	3.12	1.14
Residency	4.421	1.782
Gender of Children	1	0
Birth (Age)	2.671	5.5
Recumbent Length	65.51	4.14
Standing Length	81.31	3.452
Weight	9.812	2.682
0-23 Months, are you breastfeeding the child	1.47	0.484
0-23 Months stopped breastfeeding	2.36	0.502
0-23 Months child given water/foods	3.08	0.756

0-23 Months How many times as day besides breast milk	2.8911	0.7516
0-23 Month breastfeed the child In a day	2.34	0.985
Child vitamin a feeding	1.82	0.377

Pearson-Product Moment Correlation Analysis: Food affordability and occupational prestige were shown to have an adverse, statistically significant association. This shows how children's access to food is impacted by low SES. Additionally, a negative association was seen when it came to the availability of food, health, and cleanliness. Similarly, to this, there is a bad correlation between nutritional status and water and sanitation. Dietary variety and nutritional requirements were also found to be negatively correlated. Similarly, to this, there was a negative correlation between dietary variety and nutrient consumption. Malnutrition was influenced by independent factors such as socioeconomic position and family food shortages. For instance, whereas the other relationships were reported to be in the medium range, dietary diversity and nutrient intake were shown to have the strongest negative association ($r = -.850**$, p .001). The table that follows summarizes the correlation's findings.

Table No.3: Correlation among Observed Variables

Variables	HFI	SES	FA	WAN	NS	DD	NI
Household Food Insecurity	1	-	-	-	-	-	-
Socio-economic Status	-.518[**]	0.02	-	-	-	-	-

Food Accessibility	-.420**	-.518**	0.02	-	-	-	-
Water and Sanitation	-.533**	-.420**	-.432**	1.23	-	-	-
Nutritional Status	-.465**	-.235**	-.312**	-.355**	.021	-	-
Dietary Diversity	-.634**	-.331**	-.379**	-.648**	-.624**	1	-
Nutrient Intake	-.583**	-.467**	-.418**	-.850**	-.368**	-.617**	1

Note: HFI= Household Food Insecurity, SES= Socio-economic Status, NI= Nutritional Status, FA= Food Accessibility, WAS= Water and Sanitation, NS= Nutritional Status, DD= Dietary Diversity and NI= Nutrient Intake

Linear Regression Analysis

Table No.4: Predicting Role of Household Food Insecurity, Socio-economic Status and Nutritional Intake for Nutritional Status of Children (N=450)

Variables	Nutritional Status		
	B	SE	β
Household Food Insecurity	-.641	.069	-.465***
F	86.400***		
R^2	.216		
Socio-economic Rank	-.386 .245***	.014	-
	12.917***		

	.070

Note. *P<.05, **p<.01, ***p<.001

The important connections between HFI and nutritional status are shown in the tables above. Domestic food insecurity and nutritional rank had a strong inverse connection, as shown by the regression direct path (β = -.241, SE =.083, B = -.375, and P =.000). It indicates the existence of a strong inverse association amongst Nutritional rank and socio-economic status. Likewise to this, children's poor nutrition declines with wealth level. The fundamental premise of regression or R2 predicts a 7% change in a child's nutritional ranking. Additionally, the straight approach had unfavourable determinants for nutritional ranking. Thus, it can be said that the benefit associated plays a direct relationship-playing function with nutritional ranks. This finding confirms that children's malnutrition is influenced by their socioeconomic level.

Discussion

Food insecurity is a prevalent issue across the globe, impacting thousands of people. Similarly to this, food volatility jeopardizes people's livelihoods and lowers children's capacity to support themselves (Hameed, Padda & Karim, 2022). The main cause of malnutrition in children and individuals of various ages is undernutrition. In addition, it is a significant reason for death in this age range. The United Nations and the Establishment Clause of 1948 aim to eradicate malnutrition, rather than hunger. The "Food and Agricultural Organization" (FAO) said that agricultural production may aid in the socioeconomic and physical advancement of individuals. In this context, the term "rural livelihoods" refers to a sufficient supply of wholesome food that satisfies human nutrient value (Teko, 2023).

Additionally, Maxwell & Smith (2021) proposed three guidelines for ensuring food safety: availability, timeliness, and adequacy. Total calories may be provided by sustainable food production, which is a beneficial way to maintain people's health (Desogi et al., 2022). Furthermore, the ability to produce, obtain, and purchase food is referred to as the availability of food. Security and mealtimes address issues with hunger. Food security is threatened by changes in the food supply and poor agricultural production on a natural, market, state, and social level. Due to work and low income, families are finding it difficult to afford groceries on a daily basis (Adeomi, Fatusi & Klipstein-Grobusch, 2022).

Unstable economic conditions lead to lower food production and marketplace disruptions, which have a significant impact on daily dietary patterns and community eviction. Additionally, poor nutrition is cyclical, episodic, and persistent. For instance, chronic undernutrition happens when a household cannot achieve its nutritional needs and is therefore at risk of overeating Kebede, T. B., Mengesha, S., Lindtjorn, B., & Engebretsen, I. M. S. (2022). Similar to this, transitory food insecurity describes the varying food shortages within a community. Lastly, cyclical food insecurity is a pattern of inadequate food for individuals (Hasan, Kader, Asif & Talukder, 2022).

Pakistani has 210 million individuals and was frequently placed sixth in the world according to the population in earlier scientific publications. However, despite its large population, only 41.9% of households in the country have food security. Pakistan experiences a country-wide undernourishment rate of 28.4% during that same period. Compared to extreme hunger, which is 9.8%, intermediate hunger is 19.8% (Nonterah et al., 2022). The poor nutrition of families varies by area. For instance, in Pakistan, urban community members (52.4%) are less secure than rural people (60.6%). Pakistan is self-sufficient and has access to food, yet the Global Hunger Index notes that there is still undernutrition (Sohel et al., 2022). Pakistan ranks 14th out of 149 countries with a score of 32.6, behind only Ethiopia and Angola. The factors contributing to food insecurity in Pakistan include poverty, lack of access to healthy food, agricultural practices that lead to disasters, and the impacts of global warming (Islam, 2022).

Conclusion and Implications

Millions of Pakistanis in rural areas need food for their survival and living. Children, being the most vulnerable section of the population, are the most affected by food insecurity. The central region of Punjab, where most people reside, has the poorest nutritional status among children aged 6-59 months. Food insecurity prevalence is increasing at the household level, whereas malnutrition and the nutritional status of children are decreasing. While these are leading factors in child mortality. Malnutrition among children under five years of age probably has a major role in poor physical and cognitive development. The study revealed that more malnourished children aged 6 to 59 months were in rural areas. Unlike in other areas of the country, home insecurity has risen steadily over the past decade.

Pakistanis have inadequate nutrition and home security and have low socioeconomic status or family income, affecting nutrient intake among children. The study focused on two primary constructs: household food insecurity and nutritional status among children aged 6-59 months in various areas.

It is crucial to evaluate the nutrition treatments' efficacy, methods, and coverage to encourage supplementary feeding practices by the government. The government should prioritize the expansion of women's education and incorporate relevant material on maternal health and child nutrition into elementary school curricula to promote overall health.

References

Abd alrazik Desogi, M., Khalid, F. A., Mohamed, A. K., Hamza, A. M., Mohammed, S. S., Abdalla, A. O., ... & Mohammed, A. A. (2022). Effect of Household Food Insecurity on the Nutritional Status of Children under Five in North Kassala; Kassala State, Eastern Sudan. Journal of Food Security, 10(1), 25-31.

Adeomi, A. A., Fatusi, A., & Klipstein-Grobusch, K. (2022). Food security, dietary diversity, dietary patterns and the double burden of malnutrition among school-aged children and adolescents in two Nigerian states. Nutrients, 14(4), 789.

Ashagidigbi, W. M., Ishola, T. M., & Omotayo, A. O. (2022). Gender and occupation of household head as major determinants of malnutrition among children in Nigeria. Scientific African, 16, e01159.

Ashagidigbi, W. M., Salau, A. S., & Omotayo, A. O. (2022). Can nutrition-sensitive intervention and programmes reduce household's food insecurity among the communities affected by Boko-Haram insurgency in Nigeria?. Environmental Science and Pollution Research, 1-16.

Brazier, A. K. M., Moran, V. H., Sinclair, J. K., Fatima, S., Zaman, M., Nayab, D., & Lowe, N. M. (2022). Food insecurity: the adolescent experience in rural Pakistan. Proceedings of the Nutrition Society, 81(OCE5), E173.

Gahamat, M. F., Rahman, M. M., & Daud, M. S. (2022). Nutritional Status of Under-Five Children and The Relationship with Household Food

Wastage and Food Security in Samarahan, Malaysia. IIUM Medical Journal Malaysia, 21(4).

Hameed, A., Padda, I. U. H., & Karim, S. (2022). Spatial analysis of food and nutrition security in Pakistan: a holistic pathway towards zero hunger policies. GeoJournal, 1-23.

Hasan, M. M., Kader, A., Asif, C. A. A., & Talukder, A. (2022). Seasonal variation in the association between household food insecurity and child undernutrition in Bangladesh: Mediating role of child dietary diversity. Maternal & Child Nutrition, e13465.

Head, J. R., Chanthavilay, P., Catton, H., Vongsitthi, A., Khamphouxay, K., & Simphaly, N. (2022). Changes in household food security, access to health services and income in northern Lao PDR during the COVID-19 pandemic: a cross-sectional survey. BMJ open, 12(6), e055935.

Islam, Z., Kokash, D. M., Babar, M. S., Uday, U., Hasan, M. M., Rackimuthu, S., ... & Nemat, A. (2022). Food security, conflict, and COVID-19: perspective from Afghanistan. The American journal of tropical medicine and hygiene, 106(1), 21.

Kebede, T. B., Mengesha, S., Lindtjorn, B., & Engebretsen, I. M. S. (2022). Anaemia, anthropometric undernutrition and associated factors among mothers with children younger than 2 years of age in the rural Dale district, southern Ethiopia: A community-based study. Maternal & Child Nutrition, 18(4), e13423.

Kibria, Z., Khan, M. N., Aleem, S., & Haq, Z. U. (2023). Linkages between poverty and food insecurity in Pakistan: Evidence from urban and rural households in Peshawar. Pakistan Journal of Medical Sciences, 39(2).

Nonterah, E. A., Welaga, P., Chatio, S. T., Kehoe, S. H., Ofosu, W., Ward, K. A., ... & as members of the INPreP study group. (2022). Children born during the hunger season are at a higher risk of severe acute malnutrition: Findings from a Guinea Sahelian ecological zone in Northern Ghana. Maternal & Child Nutrition, 18(2), e13313.

Ortiz-Marrón, H., Ortiz-Pinto, M. A., Urtasun Lanza, M., Cabañas Pujadas, G., Valero Del Pino, V., Belmonte Cortés, S., ... & Ordobás Gavín, M. (2022). Household food insecurity and its association with

overweight and obesity in children aged 2 to 14 years. BMC Public Health, 22(1), 1-10.

Rawat, R., & Unisa, S. (2022). Influence of Household Food Insecurity on Nutritional Status of Scheduled Castes Children in Rural Areas of Barabanki District, Uttar Pradesh, India.

Razzaq, H. A. R., Majeed, M. F., & Ali, H. (2022). Effects of Socioeconomic Status and Food Insecurity on Stunting among Children aged 06-59 Months. Pakistan Social Sciences Review, 6(2), 986-995.

Sohel, M. S., Hossain, B., Sarker, M. N. I., Horaira, G. A., Sifullah, M. K., & Rahman, M. A. (2022). Impacts of COVID-19 induced food insecurity among informal migrants: Insight from Dhaka, Bangladesh. Journal of Public Affairs, 22, e2770.

Syed, A., Raza, T., Bhatti, T. T., & Eash, N. S. (2022). Climate Impacts on the agricultural sector of Pakistan: Risks and solutions. Environmental Challenges, 6, 100433.

Teko, F. (2023). Factors Related to Malnutrition among Children Below Five Years in Rengen Health Center III, Kotido District. INOSR Experimental Sciences, 11(1), 112-124.

Yazew, T. (2022). Risk factors of stunting and wasting among children aged 6–59 months in household food insecurity of Jima Geneti district, western Oromia, Ethiopia: An observational study. Journal of Nutrition and Metabolism, 2022.

Yeboah, E., Kuunibe, N., Mank, I., Parisi, D., Bonnet, E., Lohmann, J., ... & De Allegri, M. (2022). Every drop matters: combining population-based and satellite data to investigate the link between lifetime rainfall exposure and chronic undernutrition in children under five years in rural Burkina Faso. Environmental Research Letters, 17(5), 054027.