

The relationship between food security and nutrition security in construction workers

Somya Gupta^{1*}, Priyanka Sharma² and Dr. Gita Bisla³

¹Department of Food Science and Nutrition, Banasthali Vidyapeeth, Niwai, India

²Department of Food Science and Nutrition, Banasthali Vidyapeeth, Niwai, India

³Department of Food Science and Nutrition, Banasthali Vidyapeeth, Niwai, India

Abstract

Food security and nutrition security are critical determinants of health and productivity, especially among vulnerable and marginalized groups such as construction workers. Construction workers often face precarious employment, low wages, long working hours, and migratory lifestyles, which collectively limit their access to safe, affordable, and nutritious food. While food security emphasizes the availability, accessibility, and affordability of food, nutrition security goes beyond to ensure dietary quality, diversity, and adequacy of essential nutrients to meet physiological needs. The relationship between these two dimensions is particularly relevant for construction workers, who are exposed to physically demanding tasks and higher nutritional requirements but often rely on monotonous, calorie-dense, and nutrient-poor diets. Inadequate nutrition not only compromises their health and immunity but also reduces work capacity, increases susceptibility to occupational hazards, and perpetuates cycles of poverty and ill health. This abstract underscores the interdependence of food and nutrition security and highlights the need for integrated interventions such as workplace meal programs, nutrition education, and policy measures to enhance dietary diversity and nutritional well-being among construction workers. Strengthening this relationship is essential to improve their overall health, productivity, and quality of life.

Keywords: Food security, nutrition security, construction workers, health, malnutrition

Introduction

When people have physical, social, and financial access to enough safe, nourishing food that satisfies their dietary requirements and food choices and allows them to live active, healthy lives, this is referred to as food security [1, 2]. This well recognized definition states that there are four elements that make to food security: availability, access, usage, and stability [3]. Food availability, which is influenced by the production of food in the nation, local reserves, imported food, and/or assistance with food, is the actual presence of an adequate amount of food of a suitable standard of quality. A sufficient income or finances that enable the purchase of suitable food items for a healthy diet can help ensure food access [4]. The term "food utilization" describes a person's nutritional intake and capacity for utilizing the nutrients found in the food they eat [5]. The term stability/sustainability describes the period of time that is taken into account when discussing food and nutrition security. There is a constant chance that food security might be decreased or increased at any point in time. This implies that if availability of the right food is impossible to maintain for the duration as it is required, a person might continue to be food and/or nutrition insecure irrespective of whether their current consumption of food is optimal [6].

The Food and Agriculture Organization (FAO) describes nutrition security as the requirement to ensure that every member of the family have the ability to access a balanced diet that includes all the necessary nutrients and adequate amounts of water, as well as a hygienic living conditions, sufficient medical treatment, and care to make sure a life of wellness and physical activity. This emphasizes the element of health and reflects the dietary needs of the person or group in the context [7].

Why are construction workers vulnerable?

The majority of construction labourers are homeless and temporary migrants from the nation's less developed areas who have moved to cities in quest of work. Because of the short-term duration of their employment and the absence of a clear worker-employer connection, these workers are especially susceptible. They are also socially behind, illiterate, unskilled and lack the ability to negotiate [8]. Temporary shelters and accommodations set up along the side of the road house many hundreds of construction workers. They remain by the edge of the road or on a building

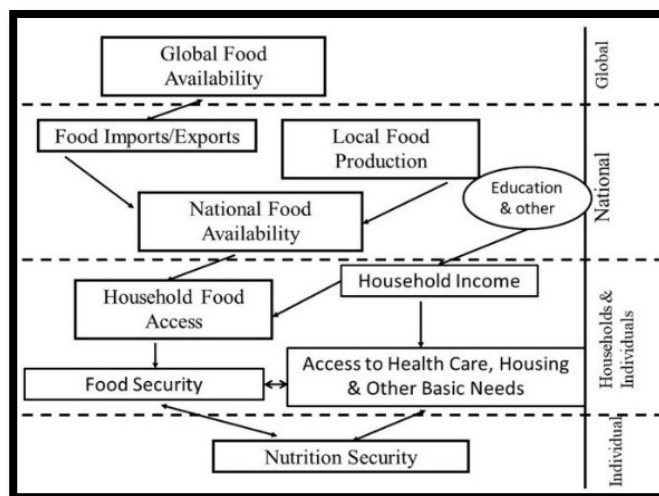
location or basement. The shelters do not have toilets, water, safety features, electricity, sanitary facilities and ventilation [9].

According to a study by Dharma Raj, labourers' monthly expenses for meals, family members, healthcare, and other expenses include savings and earnings. Together with a monthly savings of Rs. 1911, the average per-month expenses for family, food, healthcare, and other expenses were Rs. 4505, 2091, 1147, and 1798, respectively. As a result, labourers made Rs. 10278/- (less than \$160) per month. It was discovered that these labourers were the only earning members in their families [10].

Insufficient nutrition is one factor contributing to the poor health of building employees, according to research [11]. According to Men's Health Forum (MHF), research indicates that construction workers' inadequate food habits are partially caused by their generally absence of awareness regarding the inadequate nutritional content of the meals they frequently eat [12]. Similar findings were made by Wanjek, who looked into how employees generally ate and discovered that the absence of knowledge about nutrition caused workers to turn down nutritious meal offerings to the point where sellers stopped providing them as they lost business [11, 13].

Linking of food security and nutrition security

Drawing upon the two terminologies, "food and nutrition security" can be described as the state that ensures all individuals always have social, economic, and physical access to food that is eaten in amounts as well as quality enough to satisfy their nutritional demands, growth necessities and dietary preferences and is backed by an atmosphere of sufficient care, health care, and sanitation [14]. Nutrition and availability of food have long been nearly synonymous, mainly because food accessibility is uncertain for many people. Although it is not a guarantee, having accessibility to food is essential for proper nutrition [15].



Adapted from [16, 17, 18]

Food security and nutrition security status in construction workers

The food security that individuals had in their native region is lost as they migrate elsewhere. The sense of unfamiliarity and ignorance that accompany a new location is the primary cause of food insecurity. Following migration, there is a substantial reduction in variety of foods, which requires careful investigation. In order to deal with being away from family members, they might also start engaging in unhealthy habits [3, 19].

It was found that approximately 61% of those who worked made a maximum of Rs. 5000 per month, then following 25% who made between Rs. 5000 and Rs. 7500 per month and 11% who made between Rs. 7500 per month and Rs. 10,000 per month. The majority of them (99%) were not vegetarians. Three main meals a day—morning breakfast, afternoon lunch, and the evening meal—are typically consumed by workers. They mostly ate rice, chapati, vegetable made mostly of potatoes, etc. Animal protein (chicken, fish) was typically consumed once a week [20].

73% of them resided in kacha houses [20]. Construction workers might experience a decline in motivation and dedication to their work, which would lower their level of satisfaction with their jobs and effectiveness overall. Furthermore, the housing conditions of construction employees have a significant effect on workplace security [21]. The risk of infection and disease rises in facilities for housing with inadequate hygiene and sanitation, which may make it more difficult for workers to perform their jobs on a regular basis [22]. Their immune systems can be weakened by poor living circumstances, increasing their vulnerability to injuries and incidents at work [23]. Additionally, residing close to construction sites or dangerous locations without taking the necessary precautions can expose workers to dangerous substances and create workplace health risks, which can impair worker productivity and safety [24].

Another important factor affecting construction workers' productivity is their availability of medical care.^[25] Long-term days off from occupation can result from postponed detection and treatment of diseases caused by inadequate accessibility to health care and medical services. Due to diseases or neglected medical conditions, employees who are unable to obtain immediate medical attention may be inefficient on the job [24, 26].

According to Wanjek, the affordability and availability of nutritious food alternatives on the job site or in the vicinity, salaries, working hours (which involves the amount of time of breaks for meals, as people typically fail to choose nutritious food decisions when they are rushed), job-related and welfare amenities (like the presence for dining places), and the financial climate all have an impact on the nutrition of workers in construction. According to him, food from the streets is contaminated with bacteria, regional and nearby dining options can be pricey or scarce, and construction workers occasionally lack the funds or space to buy food. Furthermore, it was suggested that the situation was made worse by the unions' and employers' indifferent behaviour regarding nutrition. The union's primary priority was not the availability of food for workers on construction sites [13]. Employers in the construction industry typically prioritize completing deadlines and increasing revenues and efficiency over the health and well-being of their employees [27, 28].

Food insecurity and poor nutrition are common among construction workers, especially migrants, and have a significant impact on both the workers and their families. In Ahmedabad, for example, a study of children younger than five who lived on building sites found that 50.4% of them were classified as underweight, 40.5% stunted, and 22.1% wasted—much higher than the national average for the incidence of underweight. Extended hours of employment, an absence of parental supervision and time to rest, a lack of dietary variety, and inadequate sanitation and hygiene were all blamed by the study for these results [29].

Although data from factory employment instead of construction particularly shows that 20% of the male workforce have a BMI below 18.5 (a level associated with decreased labour productivity) and exhibit symptoms of vitamin and mineral deficiencies, these data also show severe energy malnutrition in adults in the workforce [30]. Due to restricted access to vital nutrients, clean drinking water, suitable housing, hygienic conditions, and medical care, construction workers have low nutrition security.

Health and Productivity Implications

Insufficient food intake among construction workers has been linked to bad health. This results in decreased sharpness, elevated dangers and incidences of accidents, incidents, and harms, decreased output and effectiveness, higher medical expenses for preventable illnesses and diseases, missed workdays, decreased revenue, and eventually a decline in GDP [31].

Construction workers, particularly men, had inadequate nutrient consumption, according to studies. The researchers claim that frequent dietary consumption of unwholesome foods, such as oily foods [12], beverages with added sugar and carbonated drinks [32], and generally foods of doubtful nutritional safety as well as quality [13], demonstrated a low intake of nutrition. Insufficient dietary intake raises the possibility of obesity, which in turn raises the risk of developing non-communicable illnesses that are ongoing [32,33]. This, in turn, causes health problems and, inevitably, lowers worker efficiency and security performance [31]. Research on construction workers (CW) in a number of nations has shown that cardiovascular disease (CVD) hazards are highly prevalent [33].

The fact that several migrant people relocate with their whole family, including children, is a significant factor in migration of workers in India. Prior studies conducted in India have demonstrated that, despite the fact that migration offers households financial possibilities, migrant kids in the area of arrival face a number of challenges. Because their accessibility to quality education is continuously interrupted by regular times of migration, migrant children, for example, have worse academic results. Similar to that, kids of seasonal or temporary migrants are more susceptible to

nutrition insecurity because they do not have quick availability of subsidized meals and perform poorer on the majority of wellness parameters than those who do not migrate [29].

Conclusion

The relationship between food security and nutrition security among construction workers is both complex and inseparable. While food security ensures that workers have access to sufficient quantities of food, nutrition security emphasizes the quality and nutrient adequacy of that food to meet their high physical and metabolic demands. Construction workers often face barriers such as low income, migration, irregular employment, and limited access to balanced diets, which compromise both dimensions simultaneously. Addressing food availability without ensuring nutritional adequacy fails to improve their health outcomes, productivity, and overall well-being. Therefore, policies and programs must focus on an integrated approach that enhances accessibility to affordable, safe, and nutrient-rich foods while promoting nutrition awareness. Strengthening this relationship is vital not only to safeguard the health and well-being of construction workers but also to improve their work efficiency, economic stability, and overall quality of life.

Acknowledgement

The authors would like to thank researchers and colleagues whose work served as the basis for this review. We also thank our peers for their insightful comments and helpful criticism while we were preparing this manuscript. Lastly, we express our gratitude for the resources and institutional support that enabled this work.

Declaration of Interest Statement

The authors declare that none of their personal ties or known conflicting financial interests might have appeared to have influenced the work described in the present paper.

REFERENCES

1. Chapter 2. Food security: concepts and measurement. . (2003). In FAO, *Trade reforms and food security conceptualizing the linkages*. (pp. 25-33). Rome: FAO.
2. Aysun Yüksel, A. H. (2024). Food insecurity status and related factors in minimum wages workers. *Karya Journal Of Health Science* 8(15), 8-15.
3. J Sanskriti, V. S. (2024). Food Security, Nutritional Status and Prevalence of Hypertension Among Industrial Migrant Workers in Chennai. *Indian Journal of Science and Technology*, 17(45), 4711–4721.
4. Nahla Hwalla, S. E. (2016). Nutrition security is an integral component of food security. *Frontiers in Life Science*; 9(3), 167-172.
5. Hannah Pieters, A. G. (2013). Conceptual framework for the analysis of the determinants of food and nutrition security . *FOODSECURE Working paper no. 13*.
6. Kwanele Siyabonga Simelane, S. W. (2020). Food and Nutrition Security Theory. *Food and Nutrition Bulletin*; 41(3), 367-379.
7. Food and Agricultural Organization, W. a. (2012). The state of Food Insecurity in the World: Economic growth is necessary but not sufficient to accelerate reduction of hunger and malnutrition. Rome, Italy.
8. S Manasi, M. L. (June 2021). *Migrant Construction Workers and Question of Inclusiveness: A Case Study of Bengaluru City*. Bangalore: Institute for Social and Economic Change.
9. Shaik Zabeer, L. R. (2019). Quality of life among migrant construction workers in Bangalore city: A cross-sectional study. *Journal of Family Medicine and Primary Care*; 8, 437-42.
10. Singh, D. R. (2018). Demographic and Socio-Economic Profile of Labourers in Construction Industry of Varanasi City (India). *Journal of Statistics Applications & Probability* , 151-159.

11. Chioma Okoro, I. M. (2015). Nutritional Awareness in the Construction Industry . *Department of Construction Management & Quantity Surveying, University of Johannesburg*, . South Africa: UJC Content.
12. Dr Pauline McGlone, F. W. (2009). Beyond the greasy spoon: Improving the diet of male construction workers. *Men's Health Forum*.
13. Wanjek, C. (2005). *Food at work: Workplace solutions for malnutrition, obesity and chronic diseases*. Geneva: International Labour Organization.
14. Ruel, M. (2013). Food Security and Nutrition: Linkages and Complementarities. In *The Road to Good Nutrition* (pp. 24-38). S.Karger AG.
15. UNICEF. (1990). Strategy for improved nutrition of children and women in developing countries. *UNICEF Policy review*.
16. Smith, L. C. (26-28 June 2002). Keynote Paper: The use of household expenditure surveys for the assessment of food insecurity. *Measurement and assessment of food deprivation and undernutrition*. Rome: FAO; International Scientific Symposium. Retrieved from FAO: International Food Policy Research Institute, Washington, DC, USA: <https://www.fao.org/4/Y4249e/y4249e08.html>
17. Pérez-Escamilla, R. (2024). Food and nutrition security definitions, constructs, frameworks, measurements, and applications: global lessons. *Frontiers in Public Health*; 12, 1-10.
18. UNICEF. (1998). The state of the world's children. *New York: Oxford University Press*.
19. Thin Nyein Nyein Aung, Y. S. (2022). Prevalence and Risk Factors for Hypertension among Myanmar Migrant Workers in Thailand. *International Journal of Environmental Research and Public Health*; 19, 3511.
20. Guddi Tiwary, P. .. (2012). Socio-economic status of workers of building constructions. *Indian Journal of Occupational and Environmental Medicine*; 16(2) , 66-71.
21. Geethu Mathew, N. R. (2016). Quality of life and probable psychological distress among male workers at a construction site, Kolar district, Karnataka, India. *Indian Journal of Occupational and Environmental Medicine*; 20(1), 54- 59.
22. WHO. (2018). *WHO Housing and Health Guidelines*. Retrieved from Geneva: World Health Organization : <https://www.ncbi.nlm.nih.gov/books/NBK535298/>
23. Techera U, H. M. (2016). Causes and Consequences of Occupational Fatigue: Meta-Analysis and Systems Model. *J Occup Environ Med*; ;58(10), 961-973.
24. Mangai, D. R. (26-27 August. 2023). Living condition of workers in the construction industry: a systematic literature review and bibliometric analysis. *Proceedings of International Mediterranean Scientific Research and Innovation Congress* (pp. 438-454). Antalya, Turkey.: International Science And Art Research Center.
25. (WHO). (2010). Increasing access to health workers in remote and rural areas through improved retention: Global policy recommendations. *World Health Organization*.
26. Wei Zhang, H. S. (December 2015). Illness related wage and productivity losses: Valuing 'presenteeism'. *Social Science & Medicine*, 62-71.
27. Deacon, C. H. (2003). The health status of construction workers. Master's dissertation. University of Port Elizabeth: South Africa.
28. Okoro, C. M. (25-26 September 2014). A review of factors influencing construction workers' nutritional uptake . *Proceedings of the DII-2014 Conference on Infrastructure Investments in Africa* . Livingstone, Zambia : UJC Content.
29. Divya Ravindranath, J-F. T. (2019). Nutrition among children of migrant construction workers in Ahmedabad, India. *International Journal for Equity in Health*.

30. A R Kumar, S. V. (1994). Anthropometric and clinical nutrition status of workers in some Indian factories. *Asia Pacific journal of clinical nutrition.*, 179-84.
31. C. S. Okoro, I. M. (14-15 March 2015). Relationship between Nutrition and Construction Safety Performance: Experimental work. *International Conference on food nutrition and Civil Engineering*. Dubai.
32. Hofman, A. T. (2014). Empowering healthy food and beverage choices in the workplace. *Occupational Health Southern Africa*, 20(5), 6-8.
33. Hood Thabit, N. B. (2013). Prevalence and predictors of diabetes and cardiometabolic risk among construction workers in Ireland: The Construction Workers Health Trust screening study. *Diabetes & Vascular Disease Research*; 10(4) , 337–345.