

# **Identifying Worksite Intervention Strategies to Improve Construction Workers' Nutrition: A Review of Literature**

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## **Abstract**

The nutrition of construction workers appears to be understudied despite anecdotal evidence that suggests that it is closely linked to health and safety (H&S) performance and productivity of the workers on construction sites. The objective of this paper is to identify possible worksite interventions to improve the nutrition of construction workers. A review of literature based on both South African and international context was conducted from journal, conference proceedings, books, magazines, theses and dissertations. Findings revealed that supplementary feeding programmes, nutrition education and environmental and/organizational changes could beget better nutritional behaviour among construction workers, whose food choices comprise mainly of fast-foods and fizzy drinks. The study emphasizes the need for nutrition of construction workers to be given adequate consideration on worksites.

## **Keywords**

Construction workers, health and safety, nutrition, productivity, workplace interventions

## **1. Introduction**

The construction industry contributes enormously to the economy of any nation, in terms of employment and contribution to Gross Domestic Product (GDP). The sector accounts for 7% of global employment, that is, approximately 180 million construction workers worldwide (Ambekar Institute for Labour Studies, AILS), 2012; Women in Informal Employment, Globalizing and Organising (WIEGO, 2014) and accounts for about 10% of the total Gross Domestic Product (GDP), 7 – 10% of the GDP in developed economies and 3 – 6% in underdeveloped economies (WIEGO, 2014). In South Africa, the industry employs approximately 8% of the total labour force (Statistics South Africa (Stats SA), 2014b) and contributes about 4% to the nation's GDP (Stats SA, 2014a).

Despite the undeniable importance of the construction sector, the industry is still plagued with accidents and fatalities (Musonda, 2012). This is in spite of the attention being given to occupational accidents in many countries (Cameron and Duff, 2007; Hamalainen et al., 2009). Compared to other industries, the construction sector has the largest rates of accidents, injuries and fatalities, accounting for at least 60, 000 fatal accidents or 30 to 40% percent of world's fatal injuries (Murie, 2007; Fugar et al., 2010). Since the construction industry has a dismal reputation in safety and health, more effort should be made in terms of mitigating the occurrence of accidents and injuries on site, in addition to enforcing legislations (Hinze et al., 2013). Moreover, construction workers engage in dangerous and hazardous activities, in various (and sometimes dangerous) positions and in dirty ambience (Fugar et al., 2010). Given the inherent characteristics of the industry, construction workers' H&S are constantly at risk. Appropriate consideration needs to be given to construction workers health, safety and wellbeing (Hinze et al., 2013).

Measures aimed at improving construction safety have focused on engineering control or legislations (Cameron and Duff, 2007). Other strategies such as conformance to H&S systems (Health and Safety Executive (HSE), 2001), improvement through design and involving stakeholders such as clients, designers and contractors (Musonda, 2012) have also been advocated. However, Lunt et al. (2008) and Fugar et al. (2010) argued that emphasis should also be placed on behaviour change and risk-taking behaviour, but excluded nutritional behaviour. Such risk-taking behaviours include, inter alia, unhealthy lifestyle behaviours such as unhealthy eating which impairs judgement and result in accidents (Queensland Government, 2012; Melia and Becerril, 2009). Good nutrition, attained from consumption of a variety of foods from the different classes of foods including proteins, carbohydrates, vitamins, minerals, fats and oil, and water, could enable construction workers to maintain and sustain good physical and mental health which they need in order to perform their physically and mentally-demanding activities (Okoro et al., 2014).

Attention has been given to the nutrition of construction workers (Du Plessis, 2012; Lingard and Turner, 2015). However, the work by Du Plessis (2012) was conducted in Australia amongst young male construction apprentices and focused on the factors affecting the participants' food choices. Although Lingard and Turner (2015) identified healthy eating as a priority area for construction workers' health and safety, the study incorporated other lifestyle health behaviours such as smoking and alcohol consumption. The present paper focuses on ways of improving nutritional choices and behaviour of construction workers, with particular focus on worksite intervention strategies. Too often, food at work is seen as an afterthought or a hindrance by employers and is often a missed opportunity to increase productivity (International Labour Organisation (ILO), 2005). Thus, by highlighting possible ways of improving the status quo, the study could inform construction managers and employers of ways to develop relevant intervention strategies aimed at improving nutrition and thus health, safety and productivity of the workers. The objective of the study is therefore to identify possible worksite intervention strategies to improve construction workers' nutrition. The succeeding sections will present the status quo as regards construction workers' nutrition, as evidenced by extant literature. Potential nutrition intervention strategies for construction workers will be established thereafter.

## **2.The role of nutrition in improving construction health and safety performance and productivity**

### **2.1Nutrition of construction workers**

According to Murie (2007), malnutrition is wide-spread among construction workers, partly because basic on-site amenities, including inter alia, facilities for cooking and eating, are typically not provided. This view is supported by Wanjek (2005) who found that construction workers had no secluded areas to eat or facilities on site for food preservation (refrigeration) and this resulted in consumption of food contaminated by dust and debris and/or street foods, which are, sometimes, of questionable nutrition and safety.

Construction workers in India were reported to be bread-winners to large families and were poorly paid and this led to regular, but sometimes inadequate consumption of staple foods including rice, beans and potatoes (Tiwary et al., 2012). According to the authors, meat consumption was rare amongst these workers because they could not afford meat.

Additionally, the Men's Health Forum (MHF), (2009) revealed that construction workers' nutrition consisted mainly of fatty-foods which the workers consumed in the belief that they will be enabled to perform their physically-demanding tasks. This study reviewed existing evidence and conducted interviews with the construction workers and industry stakeholders. It was found that male construction workers were more inclined to have improper nutritional habits due to low level of nutritional knowledge.

A similar study concurred that male construction workers in Australia, especially younger ones, had poor nutrition (Du Plessis, 2012). This study focused on young apprentices in the construction industry. On the contrary, English and Bowen (2011) revealed that older construction workers had a lifetime of inadequate nutrition. This study investigated factors in personal H&S, which included inter alia, nutrition, of women in the South African construction industry. Likewise, Tugendhaft and Hofman (2014) expressed that construction workers in South Africa consume a lot of sugar-sweetened beverages and fizzy drinks, which make them obese and prone to diabetes and cancers.

There is undoubtedly a problem of poor nutrition amongst construction workers. However, eating behaviour is not a constant phenomenon, but will change with differing circumstances and experiences of an individual (Arganini et al., 2012) as well as support from employers (Wanjek, 2005; Du Plessis, 2011). The next section attempts to identify possible ways of improving construction workers' nutrition at the worksites specifically.

## **2.2 Linking nutrition with health, safety and productivity**

Inadequate nourishment can cut productivity by up to 20% (ILO, 2005). According to the World Health Organisation (WHO) and the ILO, occupational health is:

*"...the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities and; to summarize: the adaptation of work to man and of each man to his job."* (Coppee, 2011).

The above definition incorporates wellbeing at work. It was in this context that the ILO included nutrition as an element of a healthy workplace, alongside physical exercise, mental health, HIV/AIDS protection and programmes to reduce violence, stress and substance abuse (Wanjek, 2005).

Construction workers are a high risk group for poor health and occupational disability (Lingard and Turner, 2015). Their physical and mental health is poorer than that of the general Australian population (Du Plessis, 2011; Lingard and Turner, 2015). Other studies conducted in other parts of the world concur that construction

workers' health is deplorable partly due to poor nutrition (Groeneveld et al., 2011; Thabit et al., 2013). In Thabit et al. (2013), it was indicated that the prevalence of diabetes and cardio metabolic risks among Irish construction workers was partly as a result of poor nutrition. Similarly, Viester et al. (2012) reported that the prevalence of

overweight amongst construction workers was partly as a result of poor dietary behaviour. This study evaluated and developed a health intervention programme aimed at improving physical activity levels and dietary behaviour of blue collar workers of a large construction company in the Netherlands. The programme was tailored to the needs of construction workers, but included physical activity intervention schemes. This is inconsistent with the view that focusing on an aspect of lifestyle behaviour at a time maximizes effectiveness (Schroer et al., 2014).

Construction workers' poor health, in turn, affects their concentration, acuity, physical strength, and productivity and accidents could occur as a result of these effects of poor nutrition such as fatigue and obesity (Wanjek, 2005). In agreement, Quintiliani et al. (2007) expressed that an unhealthy diet is related to several adverse health outcomes such as heart disease, diabetes, stroke and cancer. Proper attention to workers' nutrition, and thus health and safety performance is therefore necessary. Furthermore, healthy workers are productive workers and improving their occupational health and safety can contribute to improving their employability (WHO, 2015). Worker productivity could be improved by varied nutrition (Wanjek, 2005; Du Plessis, 2011). Varied nutrition assists in maintaining good physical and mental health and allows for the sustenance of maximum concentration and alertness that are necessary to perform mentally and perpetually demanding tasks such as construction activities (Okoro et al., 2016).

### **3 Research methods**

In order to achieve the stated objective, which is to identify nutrition intervention strategies to improve construction workers' nutrition, a detailed review of previous literature was conducted. Literature spanning a 12-year period, from 2005 to 2016 was included in the study. Review materials were sought from electronic databases and search engines including Google, Academic Search Complete, Emerald and Ebscohost. The following key words and phrases were used in the searches: nutrition, construction workers, construction health and safety improvement, nutrition improvement, and workplace nutrition intervention. Various sources including journals, conference proceedings, magazines, theses, dissertations and government reports were consulted. The criterion for selection of review articles was that the work was conducted in the construction industry (particularly for review pertaining to the nutrition of construction workers) and/or that it is applicable to the construction industry (for research on improving nutrition). With focus on the nutrition intervention strategies, five studies, which specifically showed measured improvement or evidence of positive behavioural change after intervention among construction workers, were selected and reviewed.

### **4. Nutrition intervention strategies**

Nutrition interventions are deliberately planned actions, of various types. They are implementable depending on how the intervention is delivered, what is being delivered, the recipient, sought impact (e.g. improved health), changes in intermediary outcome behaviours and the nature of intervention in terms of whether it is preventative or curative (Habicht et al., 2009).

#### **4.1 Benefits of workplace nutrition interventions**

Workplaces are important settings for health promotion and disease prevention and should make possible healthy food choices and support positive nutritional behavior. Workers should be given the opportunity to make healthy food choices in the workplace in order to reduce their exposure to risks. Nutrition interventions at the workplace could also improve workers' morale, improve skills for health protection, improved health and sense of wellbeing (WHO), 2015). It is feasible to link worksite promotions to support worker health, such as through occupational health and safety initiatives (Quintiliani et al., 2007). For construction employers, in addition to improved health and safety performance of their workers, improved self morale, reduced staff turnover, reduced absenteeism, increased productivity and reduced health care and insurance costs are some of the benefits of instigating and implementing nutrition interventions for their workers (WHO, 2015).

#### **4.2 Worksite nutrition intervention strategies**

Research has shown that workplace nutrition strategies such as introducing healthy options menus, and nutritional education sessions illuminating on healthy eating behaviours and demonstrating cooking methods and practices are useful ways of improving nutrition. According to Quintiliani et al. (2007), nutrition interventions at the workplace have the potential to influence positive nutritional behaviours through multiple levels of influence, through direct efforts such as health education, and increasing availability of foods and through other indirect avenues such as social support and social norms of promoting healthy eating behaviours. These nutrition intervention initiatives, implemented by a number of construction companies, organizations and governments, are reviewed in this section.

Wanjek (2005) indicated that workplace campaigns involving educational programmes motivated employees to eat well. He found that a lack of employee education led to employees rejecting healthy food offering to the extent that vendors refused to provide them anymore because they didn't sell. The author opined that improving access to healthy foods by ensuring that food vendors at construction sites sell a variety of healthy nutritious foods can improve nutrition. If meals are not provided at the site, workers should be able to get reasonably priced and healthy foods nearby, as is the case in Japan where convenience stores selling boxed lunches are ubiquitous and within walking distance of construction sites owing to Japan's dense population.

Mapping out more time (by employers) for lunch breaks was also advocated in this study. In the author's view, workers who do not have enough time to eat could rely on snacks such as packet chips, sweets and fizzy drinks or burger and fries, instead of healthy lunches prepared at home with lots of vegetables and lean meat or fish or poultry. Providing special areas for eating and food preparation will also improve nutrition (Wanjek, 2005). Improving nutrition not only has to do with what people eat, but also how they eat; the environment/atmosphere/ambience in which they eat mattered greatly. Therefore special areas like mess rooms on construction sites, not only provide shelter from the dirty environment and inclement weather, but also provide means of food preservation and storage. Furthermore, meal vouchers or tickets which can be used to purchase ready-to-eat meals in affiliated eating places and given by the employers can encourage workers to eat healthily. In France, meal vouchers are commonly used by construction workers for particular restaurants selling healthy foods (Wanjek, 2005).

In Groeneveld et al. (2011), it was found that after six to twelve months of delivering individual counselling in the form of motivational interviews, there was a statistically significant beneficial effect

on snack and fruit intake amongst male construction workers which was sustained 6 months after the intervention had ended.

Additionally, Kuehl et al. (2014) found that significant programme effects for fruits and vegetable consumption after twelve weeks of thirty team-based activities including, inter alia, nutritional information sessions on the importance of healthy eating. Intervention participants increased fruits and vegetable consumption by two servings per day. The study also demonstrated that team spirit and social support could encourage healthy eating amongst co-workers.

According to Queensland Government (2012), supplementary feeding programmes support workers' effort to eat healthily. For instance, "fat-free Fridays" were offered as part of a health program (Your Health, Your

Future) implemented through a collaborative partnership between construction unions and subcontractors, aimed to offer a health and wellbeing program tailored for construction workers. Workers were offered free healthy meals at their on-site canteen over six months, during construction of the Gatton Correctional Centre. Evaluation at the end of the program which also included voluntary participation in health checks, individualized feedback and referral, monthly educational talks and seminars, demonstrated a 5-15% overall improvement in waist circumference, total cholesterol, blood glucose, physical activity levels and alcohol consumption; 25-35% overall reduction in blood pressure and nutrition scores; and a total group weight loss of 111.90 kilograms with an average loss of 3.6 kilograms per worker.

The more recent study by Lingard and Turner (2015) revealed that after fourteen weeks of implementing programmes including a „healthy options“ menu in the site canteen, healthy eating and cooking workshops, there were positive health behaviours. Workers identified the need to provide a work environment that is supportive of healthy behaviour as critical to the effectiveness of specific health promotion measures. However, this study included other health risk behaviours such as smoking, nutrition, alcohol consumption, insufficient physical exercise and overweight/obesity.

## **5. Discussion**

The above review evinces that construction workers indulge in unhealthy eating practices including consumption of fatty foods, fast-foods and sweetened foods and drinks. This seemed to suggest that construction workers' nutrition is unvaried and inadequate in quantity and quality. Consumption of varied foods (such as meat, eggs, fish, cereals, fruits, vegetables, rice, etc.) from the different food groups including carbohydrates, proteins, vitamins and minerals is uncommon amongst construction workers (Tiwary et al., 2012).

It was also shown that workplace environmental changes such as establishing designated areas for eating, provision of on-site facilities, nutrition policies such as meal vouchers, nutrition education, supplementary feeding programmes and social support from colleagues and friends can improve nutrition at construction sites. Provision of welfare facilities such as for washing before eating, safe drinking water, for preparing and eating meals as well as for food storage (refrigerator, cupboards and microwave) is very essential (Murie, 2007). Provision of canteens is vital for those who build canteens to prevent food contamination from site dust and tiny debris (Wanjek, 2005).

Construction employers can also work with food vendors on construction sites to provide and sell healthier and fortified foods at lower costs. Workplace meal programmes can prevent micronutrient

deficiencies and chronic diseases, obesity with modest investments that can be repaid in reduction of sick days and accidents (ILO, 2005). Predictably, Steyn et al. (2009) shared this view and argued in their South African study that nutrition interventions whereby changes were made with regard to increasing availability of healthy food options and selling at reduced prices, as well as involving dieticians in multi-media nutrition education programmes, proved to be successful in influencing positive dietary behaviours. In their review of lifestyle interventions in the workplace, Schroer et al. (2014) concluded that workplace health promotions should focus on either physical activity or weight or nutrition behaviour to maximize effectiveness.

## 6. Conclusion and recommendations

The construction industry makes an enormous contribution to any economy and as such, its workers' wellbeing including inter alia, nutritional wellbeing, is of paramount concern. Despite attempts to improve performance with construction laws and regulations H&S performance in the construction industry continues to be appalling world over. This underscores the need for increased focus on ways to prevent accidents, injuries and deaths on construction sites. One of such ways is through changing construction workers' unhealthy eating behaviour and improving nutritional intake. In order to meet the need for proper meals of construction workers, facilities should be made available for food storage and preparation which will encourage workers to bring "healthier" foods from home. Arrangements could also be made with food vendors to provide healthy foods and snacks at cheaper and affordable process. Ensuring that workers eat healthily would improve their health and in turn, reduce cost, improve quality of work and safety on construction sites.

This study only provides evidence from a review of literature. Future studies could adopt other approaches such as surveys to determine ways of improving the status quo with regard to construction workers' nutrition.

Further research could also attempt to investigate possible barriers to implementing the identified strategies.

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