

Occupational health status of construction workers: A review

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ABSTRACT

In the development of a country, construction industry has a significant role. About 350 million people of the world are directly involved in this sector, and the number is growing at a fast rate in the cities. Due to several occupational health risks, this sector is placed top of the list according to workplace accidents and injuries. Workers of this sector expose several types of fatal occupational health hazards daily. Moreover, socioeconomically poor people, particularly from rural areas, are engaged in this sector. Research on occupational health is highly needed to give safety and awareness to the mason workers. Present work is a review of researches from the available published articles to get a broad spectrum of occupational health problems of construction workers. Standard databases are used to collect articles on occupation, health, and working environment. Musculoskeletal disorders are very common among the construction workers. Workplace injuries are mainly due to improper use of personal protective equipments.


KEY WORDS: Occupational Health; Musculoskeletal Disorder; Construction Workers

INTRODUCTION

Industrialization plays a very important part in the economic development for a growing country with large population like India. Construction industry in India provides employment to about 40 million people.^[1,2] However, construction work is one of the most hazardous sectors where health risks are significant due to dusts, noise, chemicals, manual handling, vibrating tools, excessive loads, and lack of safety awareness.^[3] Higher rates of workplace injuries are reported among the illiterate and inexperienced construction workers in Ahmedabad, India.^[4] Building and Other Construction Workers (Regulation of Employment and working Conditions) Act, 1996 passed in

the Parliament to ensure the construction workers' safety, health, and welfare measures.^[5]

Daily average exposure to direct solar radiation is reported 7.94 h.^[6] Therefore, the risk factor of skin cancer/sunburn depending on skin type is well established.^[6,7] Low back pain is another major problem of construction workers.^[8,9] Moreover, construction workers are employed by vendors in a small group providing practically no health services. These workers are also maintained different kinds of postures during their work which is also very much harmful for their musculoskeletal system.^[10] Different types of hazardous working conditions, environmental stress conditions, lack of use of personal protective equipments (PPEs), prolong maintained of harmful working postures, low level of awareness on health hazards and poor hygiene practice, etc., are jointly affecting the health conditions of the workers. In addition, various socioeconomic factors such as poverty, poor diet, various communicable diseases, poor sanitation, lack of education, ill-paid, etc., are also responsible for their poor health.^[11] The object of the paper is to highlight the output of the researches on construction workers.

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LITERATURE REVIEW

Occupational health is neglected under the pressure of social and economic challenges in developing countries.^[12] Total estimated cost of all types of injuries in the construction industry in the USA is about \$11.5 billion.^[13] Cost of accidents, day loss, and illness are most effective measuring method for the assessment of construction workers safety program.^[14] However, occupational posture analysis was

first developed by Ovako Oy in 1973^[15] for the steel industry workers in Finland to compute workload. After that Ovako working posture analysis system are applied for workers of many sectors, namely, construction, transport, crane operators, agriculture, and fishing to analysis the working postures. There is a need to assess the risk factors and control measure for ensuring health and safety of the workers. The results of the investigations on the occupational health over the globe are documented in Table 1.

Table 1: Summary of earlier works

Year	Descriptions
1972	Musculoskeletal disorder was found as one of the most harmful factors for sickness absence and early retirement among the construction workers between January 1972 to June 1996 in Ireland ^[16]
1975	High risks of malignant diseases and accidental deaths are associated with the construction industry as reported over 13 years period ^[17]
1978	Construction workers under the age of 30 years and engaged in heavy physical activities were more prone to back injuries. Back pain was also more common among the concrete reinforcement workers due to forward bending ^[18,19]
1979	Due to lower back pain, early retirement had been reported among the Danish construction workers ^[20,21]
1982	Muscular strain in the shoulder muscles was common to construction workers ^[22]
1983	Knee degeneration symptoms were reported among the concrete reinforcement workers ^[23] Highest death rates were found among the ironworkers and the roof workers of construction industry in New Jersey, USA ^[24]
1986	Musculoskeletal disorders with obesity, hearing and lung impairments, increased rates of fatal injuries, and adversely affected working capability by musculoskeletal diseases were found among German construction workers ^[25-27]
1990	It was reported that heavy physical work and postural load with materials handling increases the lumbar spine disorders among concrete reinforcement and house paint workers ^[28]
1992	The prevalence of lower back pain was observed among Hamburg construction worker ^[29]
1993	Postural loads during hammering tasks of construction process are fallen in OWAS action category III and IV ^[30]
1994	Workers engaged in the construction industry suffered from workplace accidents and injuries due to lack of personal protective equipments and proper safety training ^[31]
1995	Musculoskeletal disorders were associated with physical factors in the construction industry ^[32] Seixas et al. had suggested an approach to assess acute construction sites injuries from a checklist of injuries associated with frequent occurring events ^[33] Chronic lower back pain was found among mason tenders ^[34] Strong associations between severe musculoskeletal pain with age, awkward postures, prolonged working hours, working duration, and heavy smoking were reported ^[35-37]
1996	Poor working postures with static positions and awkward trunk postures with manual handling of loads were found as the main factor affecting the musculoskeletal system ^[38,39] Overexertion stresses were obtained at the shoulders, elbows, and thighs among the scaffolding workers ^[40,41]
1997	Occupational health depended on the working conditions and type of building construction ^[42] High risk of lower back disorders observed among bricklayers having more than 10 years working experience ^[43]
1999	Physical workload during the construction work can be minimized by the use of auxiliary handling equipment ^[44] Due to heavy work, construction workers were affected from musculoskeletal injuries ^[45]
2001	Electronic inclinometer used in the posture analysis of construction work to estimate exposure frequency more accurately ^[46]
2002	Only 50cm rise from traditional height during brickwork can significantly reduce the lumbar compression loads of the bricklayers ^[47] A study in Hong Kong reported that poor OHS was the main factor for higher rates of workplace injuries and occupational health hazards ^[48] Upper extremities' and lower back pain were also found common problems among construction workers ^[49]
2002	Significantly increased rates of medically reported musculoskeletal disorders were found among the workers ^[50,51]
2003	According to Gervais, back disorders among the construction workers can be prevented by proper planning, training and management practice, biomechanical hazards minimization with suitable working conditions ^[52]
2004	Women construction workers had to work 10-12 h daily ^[53] Lower back discomfort and shoulder disorders of bricklayers can be minimized by mechanization of materials transport and working height adjustment ^[54,55] Risks of lower back, arms and legs pain with psychological stress were reported among the bricklayers and supervisors of construction industry ^[56,57]
2005	Working at high level, bodily actions, improper use or removal of personal protective equipment, overexertion, unguarded openings, poor working practice, lack of risk management, etc., Were the important causes for fatal falls of construction industry ^[58-61]

(Contd...)

Table 1: (Continued)

Year	Descriptions
2006	Slip, trip, and fall were found as the major factors for residential construction site injuries ^[62] Higher rates of musculoskeletal disorders in different body parts were observed among the retired construction workers ^[63]
2007	Jain had reported that the annual accident rates are 15.8/1000 workers which are eight times more from the manufacturing industries ^[64] Higher rates of mortality and psychological stresses with alcohol and drugs abuse were found in USA, Britain, and Europe ^[65]
2008	Migrant construction workers are victim of severe workplace accidents due to unable to follow the required safety measures ^[66]
2009	In Gondar City, Ethiopia, male workers found to be more prone to work-related injuries ^[67]
2010	A multivariate model was developed by Village and Ostry for minimizing the musculoskeletal injuries of construction workers ^[68]
2010	Increased rates of tobacco and alcohol consumptions with high morbidity status were found among migratory, unskilled male, and illiterate construction workers in India ^[69-72]
2010	84% construction workers of Murshidabad district of West Bengal, India had reported work-related musculoskeletal disorders after the day's work ^[73]
2011	Due to low wage, poor socio-economic condition was very common among the construction workers which leads them in severe stress and anxiety and also makes them addicted ^[74,75]
2012	Valsangkar and Sai had shown that musculoskeletal disorders have significant impact on physical, mental health and wellbeing of the construction workers ^[76,77]
2013	Intense lower back, upper back, and shoulder pain were reported among semi-skilled and un-skilled construction workers in Nigeria ^[78]
2014	In the construction sites, workers were the major victims of accidents due to negligence. Kadiri et al. had suggested that proper safety practice and safe workplace environment can reduce the risk of construction site accidents ^[79]
2015	In Addis Ababa, Ethiopia, higher rates of injuries among construction workers were reported which may lead to work-related disabilities, illness, and productivity loss ^[80]
2016	Near about 80% working postures were found harmful for the musculoskeletal system of the construction workers ^[81]

OHS: Occupational health services, OWAS: Ovako working posture analysis system

CONCLUSIONS

Most of these unorganized construction workers are migratory workers and come from different villages of the country. They have to work 10-12 h/day to fulfill the requirements within very short period. They are exposed to different physical, chemical, biological, mechanical, and psychosocial hazards during their daily working scheduled. Due to prolonged maintain of poor working postures, bent position, manual handling of heavy weights with repetitive work and lack of rest, and musculoskeletal disorders are common among them.^[82]

The prevalence of lower back pain, shoulder pain with other body parts discomfort is seen after the daylong hard work. These workers are experience fatal injuries and accidents in the workplaces due to poor body actions, negligence, improper use of PPEs, overexertion, and poor working practice. It is interesting to note that the most vital occupational hazard among the young construction workers is musculoskeletal symptoms at the starting of their working life.^[83,84] To improve job-specific preventive actions for construction workers, workers health surveillance program is developed by Boschman et al.^[85] "Best practices" for reducing musculoskeletal disorders are to be conducted for monitoring the occupational health.^[86-88] The integrated knowledge may initiate further research on occupational health of construction workers.

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