

# Work Profile and Hazards Review Study of Workers in Small Scale Enterprises

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## ABSTRACT

The review study highlight the rigorous work profile of the workers in small scale industries and depict how the hazards caused to them in their daily life are affecting their health. Different hazards such as very severe pain in neck, head, shoulders, fingers, hands, and lower back were identified, always leading to various musculoskeletal disorders. A need to improve workstation and workplace environment to make it user friendly to workers is felt so the workers could be comfortable is highlighted in all the studies. The study has its focus majorly on the craft industries and presents the plight of the jewelers specially. Proper task analysis and work rest pattern are identified as useful to alleviate the mental fatigue and to improve work efficiency of the workers.

**Keywords:** Ergonomics, Hazard analysis, Innovation, Work profile, Workplace

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## INTRODUCTION

Artisans have been recognized as the backbone of India's economy from non-farm rural sector. They are accounted to be 7 million officially and 200 million unofficially. The unique work along with itself brings unique kind of problems. The prolonged and unnatural postures of craftsmen while making different masterpieces force them to not even get a comfortable sleep at night. The World Health Organization<sup>[1]</sup> in 2000 described musculoskeletal disorders (MSDs) as one of the leading causes of occupational injury and disability in both developed and developing countries. Glover *et al.*<sup>[2]</sup> described MSDs as the most notorious and common causes of severe long-term pain and physical disability affecting hundreds of millions of people across the world. They have also been recognized as leading causes of significant human suffering, loss of productivity, and economic burdens over society.<sup>[2]</sup>

The prevalence and risk factors of MSDs among craftsmen such as weavers and handicrafts workers can be identified using the assessment tools such as a Nordic body map, rapid upper limb assessment (RULA), rapid entire body assessment, ventricular assist device and overall discomfort scores, lifting Index, snook tables, and other anthropometric tools used to plot the MSD severity, work posture, and anthropometric dimensions of the craftsmen.<sup>[3]</sup> Tiwari and Gite<sup>[4]</sup> have studied the effect of work rest schedule on posture and physiological parameters. An experiment was conducted with five subjects to study the influence of four work-rest schedules on physical workload. It was indicated that the work-rest schedules did influence the physiological and postural workload because of the differences in working heart rate and postural discomfort. Hence, it had been concluded that minimum rest pauses of 15 min avoid excessive postural discomfort along with 45 min of the lunch break duration.<sup>[4]</sup> Keeping in mind the above facts, a review study has been carried out by representing various studies by other global authors, who have ever tried to bring in light the adversities of various artisans in ergonomic terms.

## REVIEW LITERATURE

Yamada *et al.*<sup>[5]</sup> administered 338 workers in clean rooms producing electronic parts in 12-h shifts to general health questionnaire and

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physical fitness tests compared to the 95 workers in 8-h shifts in management, clerical, and engineering workers. The 12-h shift workers complained of poor health, dissatisfaction with life, and poor recuperation from fatigue more than the 8-h shift workers an even highest in the daytime workers whereas, 12-h shift workers showed significantly lower fitness levels, and larger alcohol and cigarette consumption than the 8-h shift workers. Health promotion services at the workplace to long-hour shift workers needed devised ways to improve working conditions and environments for reducing fatigue at work.

Alexopoulos *et al.*<sup>[6]</sup> (2003) revealed that the socioeconomic status of the workers might be responsible for different MSDs and also, significantly positive association of low education was showed with MSDs.

Sukhpal<sup>[7]</sup> (2005) zoomed in livelihoods and potential importance of rural non-farm enterprises and products which remained neglected for a long time and tried to understand the dynamics and issues of this sector for the emerging opportunities in terms of new markets for rural non-farm products. Keeping focus on Gujarat, the nature and dynamics of production and market for wooden handicraft products in particular were examined for the concept and domain of rural non-farm sector in general. Problems were identified and strategies for better organization for products' manufacturing and marketing were suggested based on empirical evidence as it was reasoned the major problem in this sector,

besides poor backward and forward linkages, and lack of capital.

Bala *et al.*<sup>[8]</sup> assessed the mark of extension programs on the adoption level of improved technologies in agriculture and animal husbandry and observed a significant difference in the knowledge and adoption levels among self help group (SHG)-beneficiary and non-beneficiary groups. The study revealed that the importance or ranking attached to various agricultural practices has been almost the same by both the groups though with a significant gap in the extent of their adoption. The study has inferred that the extension programs organized by various extension agencies for SHGs constitute appropriate educational tools for the transfer of technology and raising the socio-economic status of rural people.

Dhar *et al.*<sup>[9]</sup> surveyed the musculoskeletal health of the workers of jewellery manufacturing sector in India. Jewellery making job require repetitiveness, excess force, awkward posture for long duration, and contact to sharp edge and hard surface that cause work related MSD (WRMSD), a major contributor that affect health and productivity of the worker. 358 workers of Pune were surveyed through modified NORDIC scale and physical examination that showed leading problems in region of neck (35.29%), low back (65.27%), knee (75.35%), and less in shoulder (4.75%), elbows (8.38%), wrist (4.47%), upper back (8.66%), hip/thigh/buttock (0.28%), and ankle/feet (2.23%). About 49.01% were normal with posture other than having protruded neck with round shoulders, protruding neck only, drooping or forwarded posture as 24.90%, 10.28%, 3.56%, 1.58%, and 5.93%, respectively.

Malar<sup>[10]</sup> identified the needs, aspirations, and attitudes of rural consumer in the study by focusing the areas such as the awareness magnitude of SHG products, influencing factors for consumers to buy the SHG products, of consumers' satisfaction level from SHG products, and problems of consumers in buying the SHG products. The study was conducted in Coimbatore city due to tough competition between mechanized products of large-scale companies and the SHG products in urban areas. To increase the sales and to assess the consumers' attitude and preferences toward SHG products, valuable suggestions were given.

Kar *et al.*<sup>[11]</sup> revealed the importance of work and rest cycle to eliminate the mental and physical boredom of the workers. Proper task analysis and work rest pattern were identified as useful to alleviate the mental fatigue and to improve work efficiency. Hence, it was concluded that optimal work-rest schedule minimized segmental fatigue and reduced WRMSD prevalence.

Bala *et al.*<sup>[8]</sup> (2012) examined the impact on women empowerment through micro entrepreneurship development and SHGs and addressed the particular opportunities and challenges faced by women entrepreneurs in rural areas. In addition to domestic responsibilities and childcare, rural women frequently had primary responsibility for agricultural production. In developing country like India having pathetic economic status of women in rural areas and very less opportunities of earning, the SHGs had paved the way for economic independence of rural women.

Thaker and Ahlawat<sup>[12]</sup> conducted a research study to identify the entrepreneurial interests, related training needs and factors associated to tribal women and classified entrepreneurial activities into nine categories, they studied the types of enterprises tribal women were interested in and related training needs which were expressed in accordance with the entrepreneurial interests. Education and economic motivation showed significant correlation with entrepreneurial interest. Education, annual income, and economic motivation showed significant correlation with entrepreneurial

training needs. Highly significant correlation was found between the entrepreneurial interests and entrepreneurial training needs.

Wani and Jaiswal<sup>[13]</sup> (2012) revealed the need, importance, and necessity of safety equipments such as facemasks, gloves, first aid facility, and proper uniform used for the protection of workers.

Kushalakshi and Raghurama<sup>[14]</sup> convinced rural entrepreneurship to be one of the solutions to reduce poverty, migration, economic disparity, unemployment, and develop rural areas and backward regions. The important role played by village or rural industries in the national economy, particularly in the rural development was because majority of the Indian population lived in villages, the back bone of the country. Employment opportunities in the rural areas could be generated through rural entrepreneurship with low capital cost and raise the real income of the people, along with its contribution to the development of agriculture and urban industries.

Batra and Chakravarty<sup>[15]</sup> discussed the role of SHGs based programs on the livelihood activities in the state of Haryana. The study identified various kinds of problems in livelihood activities such as low-income, less diversified activities, loan problems, and marketing. It was concluded that mere credit disbursing alone cannot contribute to the livelihood promotion on sustainable basis and suggested that efforts should be more focused on livelihood generation activities, focus on group based activities, and cultivation of risk-bearing ability among the members of the groups, new technical knowhow, and marketing skills.

Zulaikha<sup>[16]</sup> suggested that innovation in the rural craft industry does not only relate to economic value but also social value. Rural craftsmen struggle to gain market because of tight competition with modern craft industries. Even after having outstanding craft skills, their limitations in producing innovative crafts make it difficult to gain market. Assistance with some top-down approach to craftspeople put them in assistance with leading designers who make them follow designers' work plan. It might be successful sometimes but it overlooks craftsmen's capacity to reveal their uniqueness. Hence, the study proposed using bottom-up approach by making designers follow craftsmen's concept by participatory innovation approach.

Vashum *et al.*<sup>[17]</sup> revealed that the earnings of males cannot always be depended on by families anymore due to increased cost of living in the present society. Therefore, women need to be engaged in income generating activities to alleviate the poverty. The knowledge of technical know-how, financial management, and special schemes for the women by government, organizational management, and entrepreneurship is necessary to be exposed to women for their development.

Gandhi *et al.*<sup>[18]</sup> conducted an experiment on bead making activity in Mangali village of Haryana on 30 respondents involved in bead making activities. The biomechanical stress and health hazards of the workers were studied. Workplace environment for bead making workers was concluded as quite uncomfortable leading to low productivity and health hazards due to physical and environmental inaccuracy. A dire need for workstation and workplace environment for bead makers was suggested.

Gandhi *et al.*<sup>[18]</sup> (2017) identified bead making as the most drudgery prone activity involving different activities such as chopping wood, making beads, polishing, coloring beads, and sting making. 30 respondents from Mangali village, from Western Haryana in bead making, were studied for biomechanical stress and health hazards. Beads were made on a drill-type machine

which required high concentration but the area was poorly lighted and ill-ventilated carrying average temperature of 33°C and 69% humidity. Activity was done for 8 h producing 12,000 beads per person in a day. Noise level was 79 dB making longer durations of work uncomfortable. They had a micro tea break and lunch in-between, still stretching for 2–3 h in 80% sitting posture and 20% squatting posture. Cuts in fingers, saw dust in air causing eyes, and respiratory problems were the main hazards and high visual stress (80%) was reported at the end of the day. Very severe pain in neck, head (4.9 each) shoulders, fingers (4.8 each) hands, and low back (4.6 each) led to various MSDs. A need to improve workstation and workplace environment to make it user friendly to workers was felt so the bead makers could be comfortable.

Shree<sup>[19]</sup> developed a model for the success of SHGs by conducting focused group discussions with 32 groups which had taken up group enterprises. The model consisted of eight stages and differentiated the empowerment status of women before and after joining SHGs, which can get success in taking up enterprises if done systematically.

Jukariya and Singh<sup>[20]</sup> analyzed the average working postures of the goldsmiths at their working condition (cross-legged) by the RULA method. The work of goldsmiths, one of the fastest growing sectors, was unsystematic and marginal requiring high skill but paying very less to the workers. They used to perform task in very awkward postures which gave invitation to many occupational diseases. To find out the risk of MSDs in goldsmiths in Lohaghat city of Uttarakhand, 50 healthy male goldsmiths were randomly selected. Rapid upper body assessment was used as ergonomic assessment tool for manual task risk assessment and RULA was used to assess the stress of workers for all predominant postures by scoring them according to their severity of stress. Digital photography and video aids were recorded with artisan performing various task related to their work which was eventually analyzed. The analysis revealed that the posture required investigation and changes immediately indicating workers' adoption to awkward posture at their daily work process.

Dua *et al.*<sup>[21]</sup> (2019) revealed bead making as one of the small-scale entrepreneurs practiced in Mangali, a little known village in Hisar, Haryana, where work goes on at a feverish pace from dawn to dusk in more than 100 units, producing wooden beads for rosaries for the domestic as well as the export markets. A bead is a small, decorative object that is formed in a variety of shapes and sizes of a material such as stone, bone, shell, glass, plastic, wood or pearl, and with a small hole for threading or stringing ranging in size from under 1 mm to over 1 cm in diameter. An entrepreneur with his initiative, skill for innovation, ability to work for people's welfare, might open up many employment opportunities leading to growth of other sectors analyzing the bead works here. The gender participation was studied for analysis of posture adopted in different activities of bead making process and collected workstation data.

Melkani *et al.*,<sup>[22]</sup> 2020, revealed that prolonged exposure to uncomfortable sitting and drooping neck without any front support was found to be one of the reasons for grip fatigue among the bead stringing women of Mangali village Haryana. Women involved in string making and string finishing worked for an average of 6–8 h per day. They had been given a platform of 10 inches to put their hands over it and working while wrists were in a supported position. Each women working for 2 h with and without increased platform workstation was significantly found

the grip fatigue to be reduced by 10.45 for left hand while 18.75 for the right hand. Women felt a great difference and ease while doing other works immediately and afterward moving hands freely. The body posture got lifted to straight back and eyes and neck to see in front. Overall visual occupational improvement had been observed among the women.

## CONCLUSION

Conclusively, the Indian craftsmen in small scale enterprises are involved in different activities in a workplace which were poorly lighted, ill-ventilated, annoyingly noised, and heavily led to various MSDs. These were also accompanied along with some other local activities regarding farm and households. The low productivity and health hazards due to physical and environmental inaccuracy demand workstation improvement for bead makers. Besides, the poor conditions of women workers need to be tackled by providing them better entrepreneurial opportunities. A thorough study of work profile and hazards faced by women workers is necessary to provide better work and workplace interventions which would lead to enhanced comfort and productivity.

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