

Health Impact Analysis of Physical Workload on Rural Women Residing in Hilly Terrain of Uttarakhand

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ABSTRACT

Rural women in India have always been viewed as a gender which is best suitable for household work and not as a conventional monetary contributor. In general, life is difficult for rural women but it's even harder to live in mountains where basic requisite for living conditions such as potable water, fuel wood, cattle fodder, and hospital etc., never comes easy and leads to manual material handling of the tasks such as awkward or restrained heavy lifting, carrying, pushing, or tugging. It is a major health concern among rural women causing long-term suffering, disability, reduced productivity, and increased medical expenses among rural women due to the well-established risk factor of excessive physical labor. Present study investigates the probable catalysts pertaining to the physical health of rural women native to the mountainous region. 150 women from Amsore village of Uttarakhand were enrolled for this study. All the participants were evaluated using a semi-structured questionnaire for demographic profile and Borg scale of perceived exertion for activities impact assessment. Fetching water (100%), fodder collection (71.33%) and firewood collection (80%) were reported as the most exertion inducing tasks causing physical stress to the women. Low income, unemployment, and poverty, as well as inadequate education, poor sanitation, hazardous working environments, and a lack of access to health care, have been identified as major contributors to health disparities. In order to increase socio-economic contribution and lower the frequency of health injuries among women, these findings urge for preventive efforts and safety guidelines.

Key words: Mountainous region, Rural women, Physical health, Stress

Objectives of The Study

- To evaluate the effects of household and allied activities on the physical health of the rural women residing in the mountainous region.
- To provide strategies for physical stress reduction among rural women living in hilly regions

Introduction

The far-flung dwellings of Uttarakhand remain largely isolated, small-sized villages dispersed far

and wide. In this context, it must be noted that drudgery and misery are associated with the lives of rural hill women. In sustaining economic activities, women's unpaid work plays a vital role equivalent to 3.1% of GDP (Gawade, 2018). According to NSSO (2014) data, 49.1 percent of rural women residing in Uttarakhand are employed in domestic work, which includes doing mundane household work like gathering firewood/fodder, cooking, cleaning, fetching water from faraway sources and etc. Women feel overwhelmed by the time pressure and unmet obligations as the demands increase to meet all the

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nurturing and functioning roles in an unfavorable terrain (Sharma, 2018; Almeida and Fernandes, 2017). Ergonomic risk factors involved in the routine activities of these women include awkward postures, bending, repetition, manual material handling, forceful exertions, insufficient rest breaks, static or sustained postures (Singh and Arora, 2010; Singh S, 2017). Among these risk factors; performing the same or similar tasks repetitively, performing the same motion or series of motions continually or frequently for an extended period of time and with-holding heavy load is the root cause of musculoskeletal disorders in rural women of hilly areas (Vyas, 2014; Mishra *et al.* 2017).

Collecting firewood and cattle fodder are significant, unpaid task done by women. Firewood is utilized for cooking and heating water by 9 out of 10 homes in rural Uttarakhand (Joshi, 2017) and it can cause long-term physical damage to women's back-bone, head, hands, and legs. Similarly the activity of milking the cattles, fodder collection or fetching water from faraway natural sources of water, consumes lot of time and energy, reduces women's capacity and opportunity to engage in productive activities (Cavallari *et al.* 2016; Njenga, 2021). In live-stock management, scraping manure slurry is a necessary, time-consuming and exhausting task. The dung odour that is detected in the animal shed is a complex mixture of gases, resultant of the uncontrolled anaerobic decomposition of manure affecting the indoor air quality of the building (Darre, 2014).

Materials and Methods

Present study was conducted in Amsaud village panchayat of Dugadda block in Pauri Garhwal district in Uttarakhand selected purposively as these villages have Low quality of life that is, difficult physical access, poor soils and low fertility, low agricultural productivity, low quality animal husbandry, increasing depletion of the water supplies, lack of technology and social infrastructure (roads, rivers, electricity, telecommunications, schools and hospitals). Out of total population 150 women were selected to collect data for the study by simple random sampling. Body Mass Index (BMI) and Borg (2010) Rating of Perceived Exertion was used for quantitative measure of perceived exertion during five physical activities performed by the respondents.

Results and Discussion

Majority of the women were unemployed (100%), had up to intermediate level education (72%) and were managing medium- sized (55.3%) joint families (63.33%) with a monthly household income of less than Rs. 5000 (53.33%).

Body Mass Index (BMI) BMI measurements reveals that 34 percent of respondents were in the low weight category with 28 percent of respondents under Chronic Energy Deficiency (CED) Grade III (mild) category indicating severe energy deficiency. 4.6 percent respondents were classified under CED Grade II (moderate) and two percent of respondents were in the critical CED grade III (severe) category.

Rating of Perceived Exertion: Because of the musculoskeletal injuries and disorders caused by a mismatch between a worker's competence and the physical demands of their job, the efficiency and productivity of worker is significantly affected. Respondents fetched water twice a day which was a strenuous chore causing spine and limb discomfort for women in hilly terrain. Table 1 shows that RPE reported by 100 percent of women scored very heavy as they considered fetching water to be a demanding task.

These findings highlight the need for proper water availability, particularly for vulnerable populations like women who live in mountainous terrain as it severely impacts their physical and psychological health. Milking cows and goats is a physically demanding and strenuous activity. 6 percent of women perceived milking as a very heavily laborious activity, while 62.5 percent rated it as heavy. Specifically, the female workers reported the highest frequency of physical discomfort from all three ergonomic work factors (repetitive and monotonous work, lifting heavy objects and awkward working positions). Carrying fodder from faraway places is a herculean task. According to the 71.33 percent of the respondents, the perceived exertion was very heavy followed by 20.6 percent for whom the activity was heavy and the rest perceived fodder collection as moderately exhausting task. 80 percent of respondents considered wood gathering to be very difficult task, while 20 percent considered it a difficult and exhausting exercise. Women categorized animal shed cleaning as a heavy task (68.6%) or very heavy (31.33%). These rural women gather cow/goat dung with their hands and carry the load overhead for the

Table 1. Distribution of respondents according to the assessment of perceived exertion in activities performed

S. No.	Activity	Total time spent	Rating of Perceived Exertion* (n=150)					Total (%)
			Very light(1) f	Light(2) f	Moderately heavy (3) f	Heavy(4) f	Very Heavy(5) f	
1.	Fetching water	1.5-2 hrs	-	-	-	-	150	100
2.	Milking	30 min	-	-	46	95	9	100
3.	Collecting Fodder	2-3 hrs	-	-	12	31	107	100
4.	Collecting Firewood	2-3 hrs	-	-	-	30	120	100
5.	Cleaning animalshed	1 hr	-	-	-	103	47	100

disposal of dung, fodder and feed material. They cleaned the floors by constantly scraping cow dung from the floor with their fingernails and then collecting it with the palm of both hands which is both unhygienic and unergonomic.

Strategies for physical stress reduction: To improve the quality of life of women residing in hilly regions, one must focus on in making the work easier and comfortable as well as ergonomic interventions administration for maximizing efficiency and productivity. Trainings can be given on importance of minimizing the static load, avoiding the pressure points, reducing excessive motions; good posture and rest periods that can ease the energy and time consumption required in laborious task. The triple “R” (recognition, reduction, and redistribution) approach can be used to ergonomically, design, integrate and organize household work by reducing the energy expenditure and by re-organizing the activities as per the requirement of rural women.

Conclusion

It is evident from the majority of women were in a danger of acquiring various diseases as a result of nutritional deficiencies, affecting their working capacities and rendering them prone to work-related health hazards. Lower farm productivity and lack of quality food products availability can be a major contributor to the nutritional deficiency in the women. Repetitive and monotonous work followed by lifting heavy objects while working were the factors most frequently reported as causing physical discomfort among rural women. Fetching water and collecting firewood activities will increase the worker's risk for developing musculoskeletal disorders. Governing authorities must design administrative policies for providing potable water and transportation facilities to the women. This study will aid the ergonomists for redesigning work, work process and tools for making work easy and comfortable for the rural women in the hilly areas.

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