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Occupational health problems among rural women engaged in agricultural and household activities in Assam

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Abstract

Rural women play a vital role in agricultural production and household management in Assam; however, their extensive involvement in physically demanding activities exposes them to various occupational health hazards. The present study was conducted to assess the participation of rural women in agricultural and household activities, identify occupational health problems, and evaluate the severity of musculoskeletal discomfort among rural women in selected districts of Assam. The study was carried out in Jorhat, Golaghat, and Sivasagar districts, and a total of 120 respondents were selected using the snowball sampling technique. Data were collected through a structured interview schedule, and musculoskeletal discomfort was assessed using the Corlett and Bishop Body Part Discomfort Scale (1976). The findings revealed that rural women were actively engaged in a variety of agricultural, household, and allied activities, particularly weeding, harvesting, drying, livestock management, food preparation, and household cleaning. The major health problems reported by the respondents included back pain (88.46%), skin burns due to high temperature (87.69%), joint pain (78.46%), itchy rashes (76.15%), fatigue (73.07%), and stress (69.20%). Severe musculoskeletal discomfort was predominantly observed in the lower back, upper back, neck, knees, thighs, and feet, mainly due to prolonged engagement in repetitive and labour-intensive activities performed under awkward working postures. The study highlights the considerable drudgery and occupational health burden experienced by rural women and emphasizes the need for ergonomic interventions, occupational health awareness, and drudgery-reducing technologies to improve their health, productivity, and overall quality of life.

Keywords: Rural women, occupational health, musculoskeletal discomfort, agricultural activities, ergonomics

Introduction

Agriculture is the backbone of the Indian rural economy and plays a vital role in ensuring food security, employment generation, and poverty reduction. As one of the most important sectors of the Indian economy, agriculture contributes significantly to the country's Gross Domestic Product (GDP) and supports the livelihoods of nearly half of the population. The contribution of agriculture to India's GDP increased from 17.8 per cent in 2019–20 to 19.9 per cent in 2020–21, highlighting its continued importance in economic development [1,2]. India possesses the second-largest agricultural land area in the world, and agriculture remains the primary source of livelihood for a large proportion of the rural population [3].

Women constitute a crucial part of the agricultural workforce and make substantial contributions to agricultural production and rural livelihoods. They actively participate in a wide range of agricultural operations, including land preparation, sowing, transplanting, weeding, harvesting, threshing, winnowing, grain storage, livestock management, and post-harvest processing. Besides agricultural work, rural women perform household activities such as cooking, cleaning, childcare, water collection, fuelwood gathering, and household maintenance. It has been reported that women are involved in nearly 70 per cent of major farm activities and constitute about 60 per cent of the farming population in India [4]. During peak agricultural seasons, rural women spend approximately 8–9 hours per day in agricultural work in addition to 3–4 hours

devoted to household responsibilities, resulting in a substantial physical workload [5].

The dual burden of agricultural and household responsibilities exposes rural women to considerable occupational health risks. Most agricultural and household activities are labour-intensive and involve repetitive movements, forceful exertions, manual handling of loads, and prolonged awkward postures such as bending, squatting, kneeling, standing, walking, and twisting. These ergonomic risk factors place excessive stress on muscles, tendons, ligaments, and joints, leading to fatigue, discomfort, and musculoskeletal disorders (MSDs), which commonly affect the neck, shoulders, back, wrists, knees, and lower limbs [6]. Agriculture is widely recognized as one of the most hazardous occupations because of the high prevalence of work-related injuries and musculoskeletal disorders. Studies have shown that prolonged squatting and bending during agricultural operations significantly increase the risk of lower back and knee pain among women agricultural workers [7–9].

Apart from ergonomic hazards, rural women are frequently exposed to dust, smoke from biomass fuel, pesticides, crop residues, extreme temperatures, insect bites, and sharp agricultural tools. Continuous exposure to these hazards may lead to respiratory problems, skin and eye irritation, heat stress, fatigue, and occupational injuries, adversely affecting their health, work efficiency, and overall quality of life.

In Assam, agriculture remains the principal occupation of the rural population, and women play a significant role in crop cultivation, livestock rearing, and household management. Despite their substantial contribution, information on the occupational health problems experienced by rural women engaged in agricultural and household activities remains limited. Understanding the prevalence of these occupational health problems is essential for developing ergonomic interventions, promoting occupational health and safety, and reducing drudgery among rural women. Therefore, the present study was undertaken to assess the occupational health problems experienced by rural women engaged in agricultural and household activities in selected districts of Assam.

Materials and Methods

Locale of the Study

The present study was conducted in selected villages of Jorhat, Golaghat, and Sivasagar districts of Assam. Following the sanction of the project, ten villages from two blocks of each selected district were identified in consultation with the District Circle Officers, Government of Assam, and the respective Krishi Vigyan Kendras (KVKs). Based on the information obtained, villages where women were predominantly engaged in agricultural activities along with household responsibilities were selected for the study.

Prior to data collection, preliminary discussions were held with village heads and local authorities to explain the objectives of the study and ensure smooth implementation of the research programme. An initial survey was conducted to identify potential respondents and establish baseline information. The snowball sampling technique was employed to identify eligible participants for the study.

Sample Selection

The study sample comprised 120 rural women engaged in agricultural and household activities from the selected villages of Jorhat, Golaghat, and Sivasagar districts of Assam. Respondents were selected using the snowball sampling technique. Women having at least one year of experience in

agricultural and household activities were included in the study to ensure adequate familiarity with the tasks performed and the associated occupational health problems.

Data Collection Tools

Data were collected through a structured interview schedule developed in accordance with the objectives of the study. Personal interviews were conducted with the respondents to obtain information regarding their socio-economic characteristics, participation in various activities, health problems, and musculoskeletal discomfort. The interview schedule consisted of the following three sections:

Section I: Socio-economic Profile

This section included information related to age, educational qualification, caste, marital status, family type, monthly family income, primary occupation of the family, type of cultivation, operational landholding, working hours per day, and work experience in agricultural and household activities.

Section II: Participation in Agricultural and Household Activities

This section assessed the extent of participation of rural women in various agricultural operations, household activities, and livestock-related activities.

Section III: Occupational Health Problems

This section focused on identifying the occupational health problems experienced by the respondents and assessing the severity of musculoskeletal discomfort associated with agricultural and household activities. The standardized Body Part Discomfort Scale developed by Corlett and Bishop (1976) was used to evaluate discomfort in different body regions. Respondents were asked to indicate the level of discomfort experienced in each body part, and the responses were recorded and analyzed accordingly.

Statistical Analysis

The collected data were coded, tabulated, and analyzed using appropriate statistical tools. Descriptive statistics such as frequency, percentage, were employed to summarize the data and interpret the findings.

Results and Discussion

Socio Economic profile of the selected Farm Women

The finding revealed that 52.66 percent of the respondents belonged to the age group of 31-40 years followed by 28.66 percent of the respondents from the age group of 41-50 years and 14.66 percent from the age group of 20-30 years, and lastly only 4 percent were in the age group of 51-60. As per the caste the data revealed that more than 50 percent of the respondents belonged to Other Backward Class (OBC), followed by 23.33 percent belonging to the Scheduled Caste (SC) and 13.33 percent of the respondents belonged to General Caste. Regarding the Marital status of the respondents elicited that 74.66 percent of the respondents were married. The data also highlighted that 14 percent of the respondents were widows, and 11.33 percent of the respondents were unmarried. Moreover, nuclear families had the half of the representation making up 47.33 percent of the total. This was followed by joint families, which constituted 28 percent, and extended families, which accounted for 24.66 percent. As far as educational status is concerned it was observed that 40.66 percent of the respondents were pursuing higher secondary, followed by more than 30.66

percent of the respondents who were from high school and 8.66 percent of the respondents were graduate. Regarding the occupational status majority of the respondents actively engaged in agricultural activities 74percent followed by 11.33percent of the respondents involved in service and 8.66 percent of the respondents were daily wage earner. It was found that the half of the of respondents 50 percent monthly income of Rs. 11,000 to Rs. 20,000 which was followed by 27.33percent of Rs. 21,000 to Rs. 30,000 and 17.33percent having Rs.1000 to Rs. 10,000 all the data represents in (Fig1).

Landholding, area of cultivation, working hours and years of experience of the selected farm women.

The study revealed that 100% of the respondents owned agricultural land and cultivated rice, while 68.66percent respondents grew seasonal vegetables and 35.33percent cultivated tea on their land. In terms of landholding size, 66

percent of the respondents possessed 11–15 bighas, of land followed by 25.33percent with 5–10 bighas land and 7.33percent respondents had 16–20 bighas of land. All respondents cultivated rice and vegetables for both household consumption and commercial purposes, whereas tea was cultivated exclusively for sale. With regard to daily working hours, 78percent of the respondents worked for more than 8 hours per day, 15percent worked for 4–6 hours, and 7.33percent of the respondents worked for 2–4 hours per day (Fig. 2).

Pre Harvest Activities performed by Farm women

A major proportion 90 percent of the respondents were involved in weeding activities, followed by 72.66percent involved in land preparation, and 65percent in seed preparation and sowing 57.33percent. The data further revealed that 96.66 percent of the respondents were involved in harvesting and bundle-making activities, as represented (Fig 3).

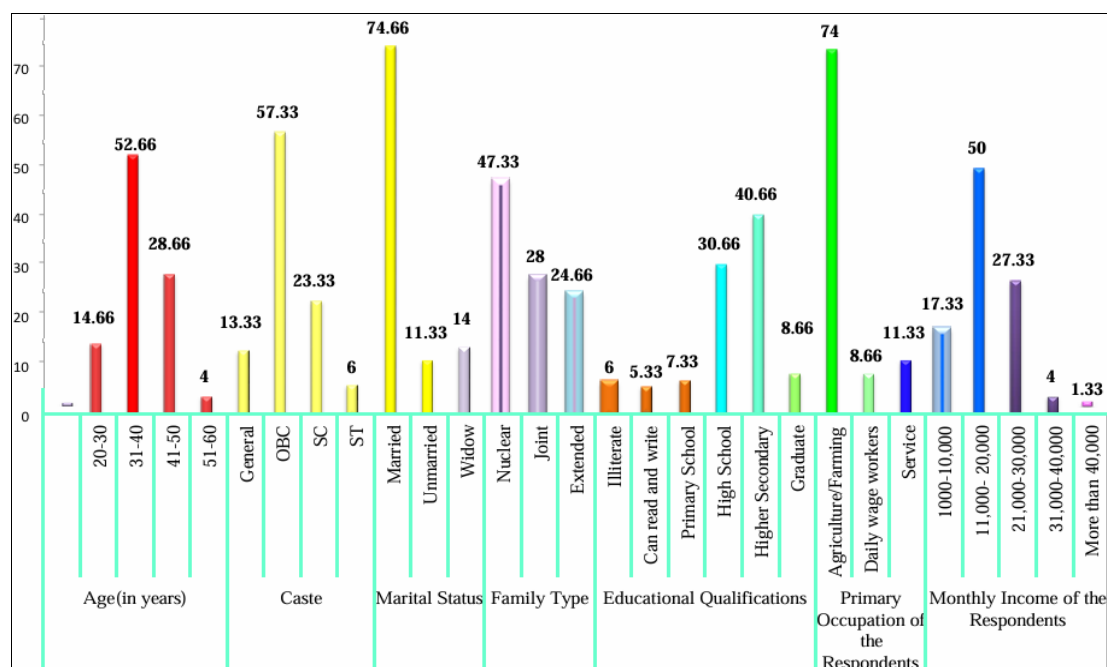


Fig 1: Socio Economic profile of the selected Farm Women

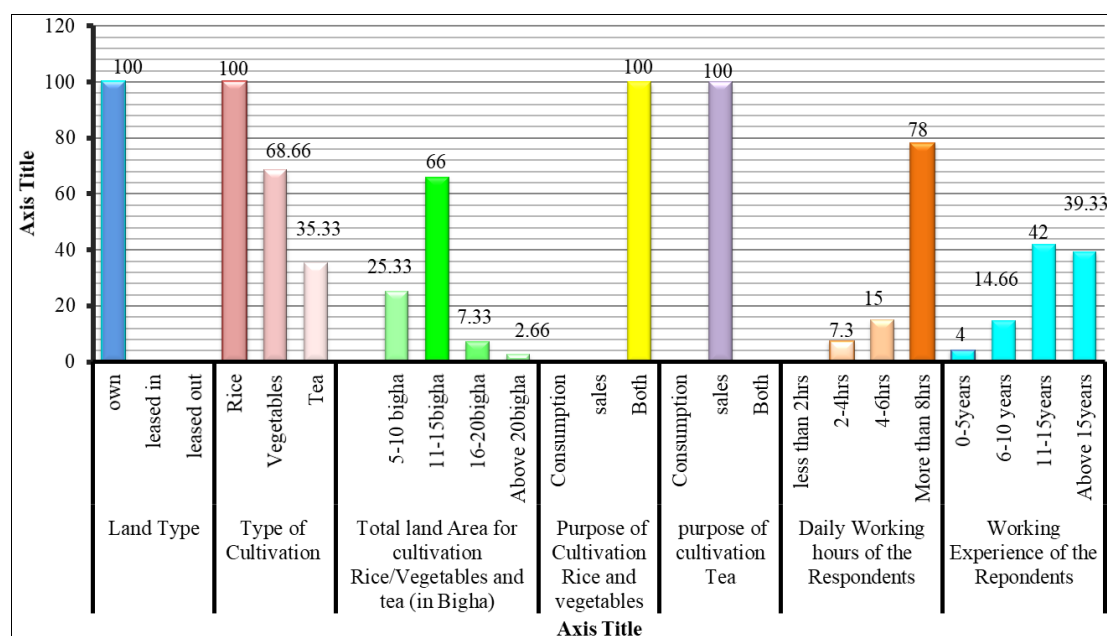
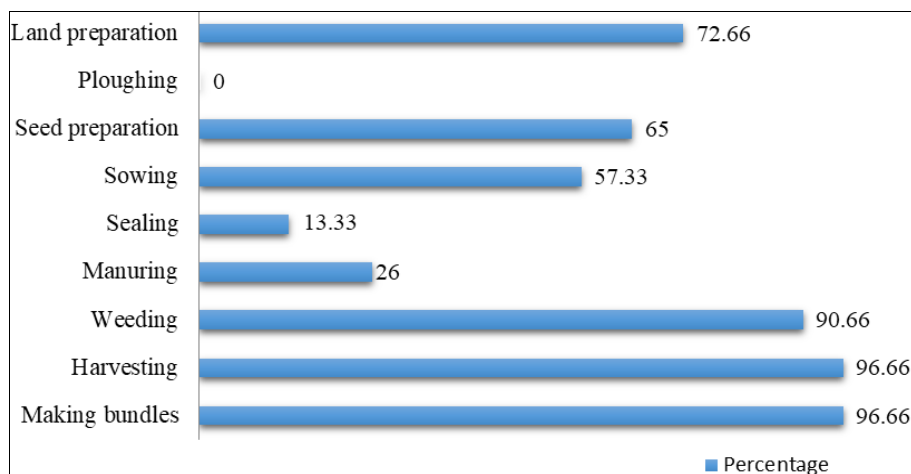
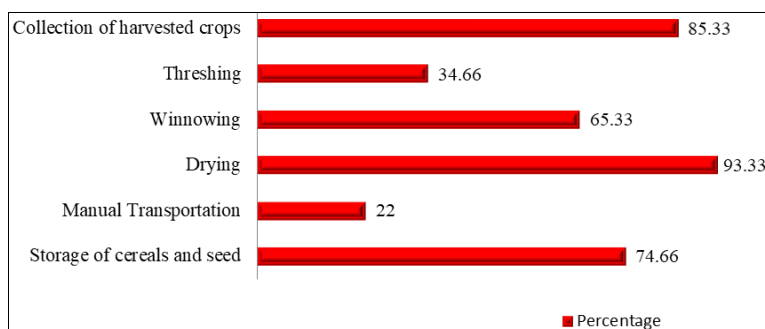


Fig 2: Landholding, area of cultivation, working hours and years of experience of the selected farm women

**Fig 3: Pre Harvest Activities****Post- Harvest Activities performed by Farm Women**

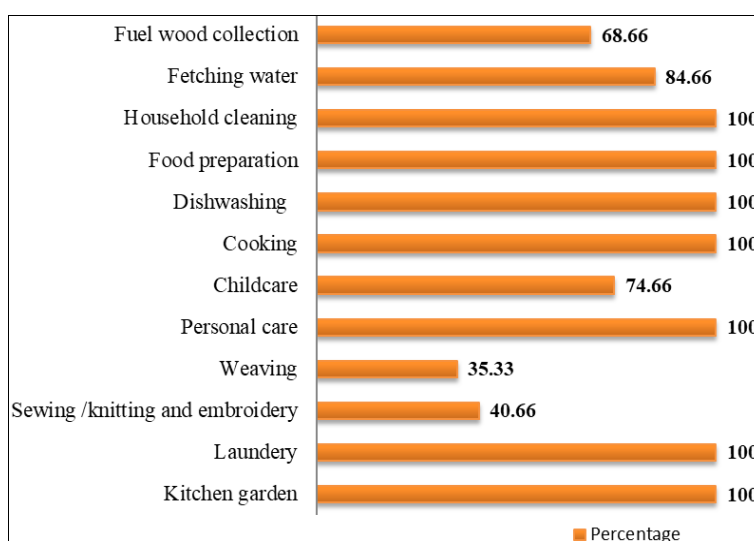
The data revealed that 93.33 percent of the respondents were engaged in drying activities. It was further observed that

85.33percent of the respondents were involved in the collection of harvested crops, followed by storage of cereals and seeds 74.66percent and winnowing 65.33percent (Fig 4).

**Fig 4: Post- Harvest Activities performed by the Farm Women**

The data elicited that 100%of the respondents were engaged in cleaning, food preparation, dishwashing, cooking, personal care, laundry and kitchen gardening, followed by fetching water

(84.66%), child care (74.66%) and fuel wood collection (68.66%) (Fig.5).

**Fig 5: Role of farm women in various House hold Activities**

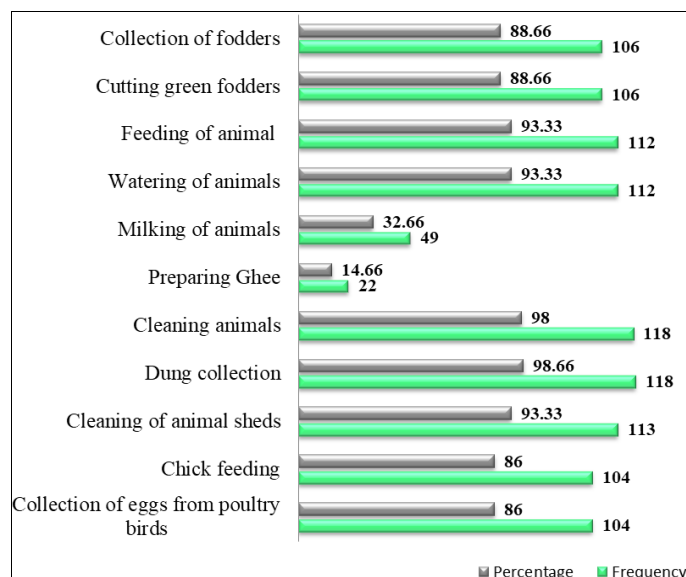


Fig 6: Role of Farm Women in various Allied Activities

Role of Farm Women in various Allied Activities

From the findings, it was observed that (98.6%) of the respondents involved in dung collection followed by cleaning animals (98%), cleaning of animal sheds (93.33%), feeding of animals (93.33%), watering of animals (93.3%). The data also

revealed that (88.66%) of the respondents involved in cutting and collection of fodders and (86%) of the respondents engaged in chick feeding and collection of eggs from poultry birds which is depicted in (Fig6).

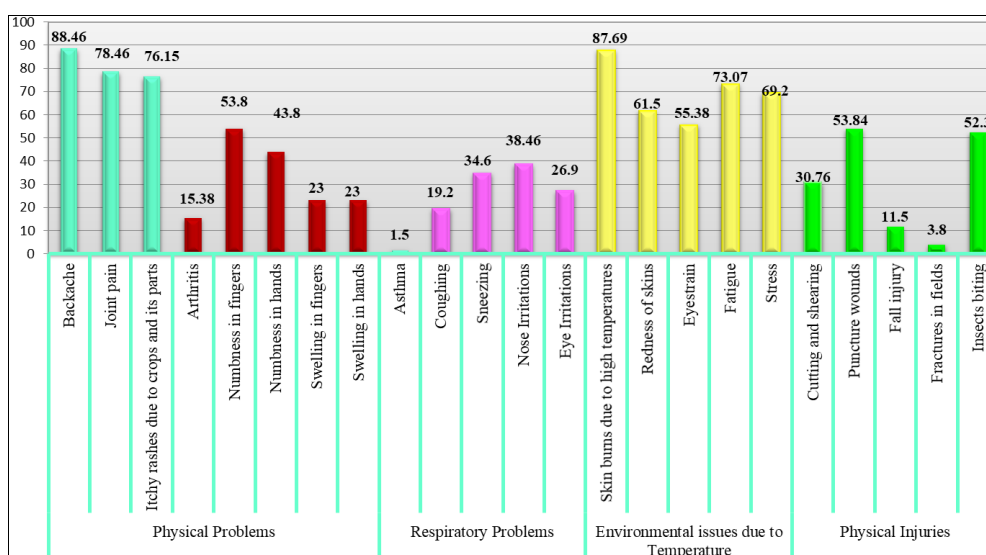


Fig 7: Health issues experienced by farm women during agricultural and household activities

The findings of the study highlighted various physical health problems encountered by the respondents due to their involvement in agricultural and household tasks. Back pain was the most commonly reported issue, affecting (88.4%) of the respondents. This was followed by joint pain, experienced by (78.46%) of respondents, suggesting the impact of repetitive and physically demanding activities. However, 76.15 per cent of the respondents reported dermatological issues such as itchiness and rashes, primarily resulting from continuous exposure to crops and their residues. About half of the respondents 53.80 percent experienced numbness in their fingers, which can be linked to extended periods of manual labor and the frequent use of non-ergonomic traditional tools (Fig 7).

A prolonged exposure to environmental irritants during agricultural and household activities significantly contributes to the development of respiratory problems among rural women. Tasks such as cleaning grain, sweeping, cooking with traditional

biomass fuels, and working in dusty fields often expose individuals to high levels of particulate matter, smoke, pollen, and other airborne pollutants. The absence of protective gear and poor ventilation further exacerbates these conditions, increasing the likelihood of respiratory distress. In the present study, 38.46 per cent of the respondents reported suffering from respiratory issues, particularly nose irritation, during agricultural and household tasks. Further it was observed that 34.6 percent of the respondents who experienced frequent sneezing, and 26.9 per cent reported eye irritation (Fig 7).

Also, exposure to high temperatures during agricultural and household activities presents notable health risks for women. Without adequate protection, prolonged work in such conditions can lead to skin burns, fatigue, and psychological stress. In the present study, a highest percent (87.69%) of the respondents reported skin burns due to extreme heat. This was followed by 73.07 percent who experienced fatigue and 69.2 per cent

reported stress. Further, 55.38 per cent reported eyestrain, likely from working in bright sunlight or smoky indoor environments without use of personal protective equipments (Fig 7).

Lastly, frequent engagement in agricultural and household tasks without proper safety measures often exposes women to various forms of physical injuries. The use of sharp tools, contact with thorny plants, and lack of protective clothing contribute significantly to these risks. In the present study, 53.84 percent of the respondents reported injuries such as puncture wounds while performing routine activities which was followed by 52.3 percent experienced insect bites during fieldwork or household chores, and 30.76 percent who suffered from cuts and shearing injuries. These findings underscore the urgent need for awareness and access to protective equipment to reduce the occurrence of work-related injuries among rural women (Fig 7).

Severity of body pain experienced in upper body parts (1-18) during agricultural and household activities

Table 1 presents the information on the severity of body pain experienced in the lower body parts (1-18) by rural women during agricultural and household activities. According to the data, it was found that, 45.33 percent of the respondents reported moderate pain in left clavicle and right clavicle followed by 38.66 percent of the respondents reported moderate pain in right shoulder and right forearm. Almost 37.33 percent of the respondents experienced moderate pain in right forearm which was followed by 20 percent of the respondents experienced mild pain in wrist followed by 18.66 percent of the respondents reported pain in right and left palm and 18 percent only experienced the mild pain right arm (Table 1).

Table 1: Severity of Body Pain Experienced in Upper Body Parts (1-18) during agricultural and household activities of the farm women

			Very Severe Pain		Severe Pain		Moderate Pain		Mild Pain		No Pain	
			f	%	f	%	f	%	f	%	f	%
Upper Body Parts	1	Neck	20	13.33	77	51.33	38	25.33	15	10	0	0.00
	2	Clavicle left	22	14.66	24	16	68	45.33	25	16.66	11	7.33
	3	Clavicle right	31	20.66	34	22.66	68	45.33	17	11.33	0	0.0
	4	Left shoulder	26	17.33	47	31.33	45	30	24	16	8	5.33
	5	Right shoulder	28	18.66	49	32.66	58	38.66	15	10	0	0.0
	6	Left arm	30	20	47	31.33	42	28	18	12	13	8.66
	7	Right arm	29	13.33	58	38.66	45	30	18	12	0	0.0
	8	Left elbow	30	20	28	18.66	49	32.66	24	16	16	10.66
	9	Right elbow	41	27.33	36	24	56	37.33	11	7.33	6	4
	10	Left forearm	35	23.33	39	26	47	31.33	20	13.33	9	6
	11	Right forearm	40	26.66	46	30.66	58	38.66	6	4	0	0.0
	12	Left wrist	29	19.33	41	27.33	39	26	28	18.66	13	8.66
	13	Right wrist	31	20.66	50	33.33	39	26	30	20	0	0.0
	14	Left Palm	32	21.33	37	24.66	36	24	28	18.66	17	11.33
	15	Right Palm	32	21.33	51	34	36	24	28	18.66	3	2
	16	Upper Back	48	32	60	40	38	25	4	2.66	0	0.0
	17	Mid Back	44	29.33	54	36	48	32	4	2.66	0	0.0
	18	Lower Back	66	44	60	40	16	10.66	8	5.33	0	0.0

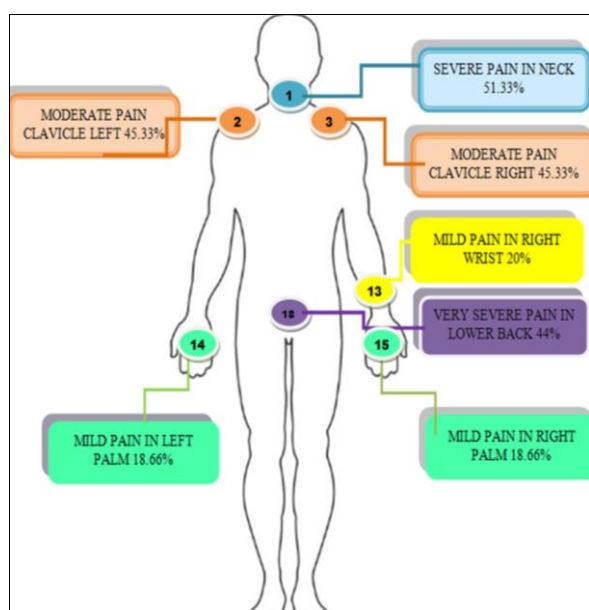


Fig 8: Severity of Body Pain Experienced in Upper Body Parts (1-18) during agricultural and household activities of the farm women

Severity of body pain experienced in lower body parts (19-27) during agricultural and household activities of the farm women

From the Table 2 it was clear that information on the severity of

body pain experienced in the lower body parts (9-27) by farm women during agricultural and household activities. According to the findings 40 percent of the respondents experienced very severe pain in both the left and right knees, followed by (37.33%) who reported very severe pain in the left and right thighs. More than 46 percent of the respondents experienced severe pain in both the left and right feet followed by 41.33 percent of the respondents reported moderate pain in the left and right legs, while just over one-fourth (27.33%) experienced mild pain in the buttocks.

Table 2: Severity of body pain experienced in lower body parts (19-27) during agricultural and household activities of the farm women

Sl.no	Lower Body Parts	Very Severe Pain		Severe Pain		Moderate Pain		Mild Pain		No Pain	
		f	%	f	%	f	%	f	%	f	%
19	Buttocks	26	17.33	25	16.66	47	31.33	41	27.33	11	7.33
20	Left Thigh	56	37.33	60	40	30	20	4	2.66	0	0.00
21	Right Thigh	56	37.33	60	40	30	20	4	2.66	0	0.00
22	Left Knee	60	40	66	44	24	16	0	0.0	0	0.0
23	Right Knee	60	40	66	44	24	16	0	0.0	0	0.0
24	Left Leg	37	24.66	49	32.66	62	41.33	2	1.33	0	0.0
25	Right Leg	37	24.66	49	32.66	62	41.33	2	1.33	0	0.0
26	Left Foot	42	28	69	46	39	26	0	0.0	0	0.0
27	Right Foot	42	28	69	46	39	26	0	0.0	0	0.0

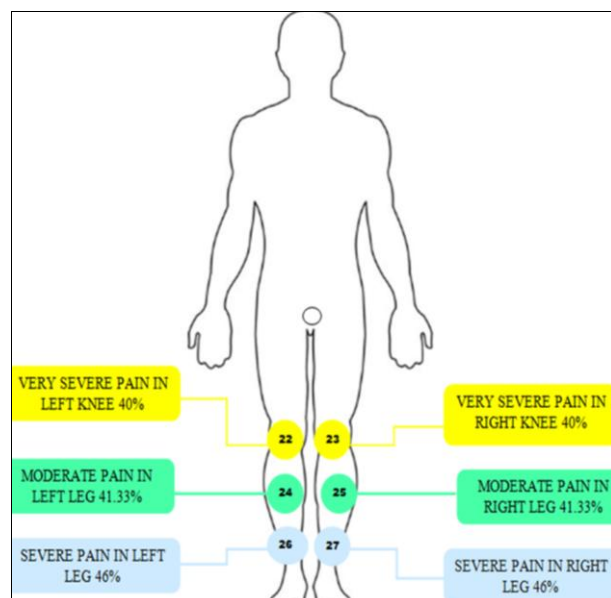


Fig 9: Severity of Body Pain Experienced in Lower Body Parts (19-27) during agricultural and household activity of the farm women.

Conclusion

The present study revealed that rural women in the selected districts of Assam are extensively involved in agricultural, household, and allied activities, resulting in a substantial physical workload and occupational health burden. The findings showed that a large proportion of the respondents experienced various health problems, including back pain, joint pain, skin burns, fatigue, stress, respiratory discomfort, and work-related injuries. Severe musculoskeletal discomfort was predominantly observed in the lower back, upper back, neck, knees, thighs, and feet due to prolonged working hours, repetitive tasks, manual handling of loads, and awkward working postures. The study highlights that the dual responsibility of agricultural and household work significantly affects the health and well-being of rural women. Therefore, there is an urgent need to promote ergonomic interventions, drudgery-reducing tools and technologies, occupational health awareness, and safe work practices to minimize health risks and improve the productivity and quality of life of rural women in Assam.

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Ethical Statement

Prior informed consent was obtained from all respondents before data collection. Participation in the study was voluntary, and confidentiality of the information provided by the respondents was maintained throughout the study.

Conflict of Interest

The authors declare that there is no conflict of interest.

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