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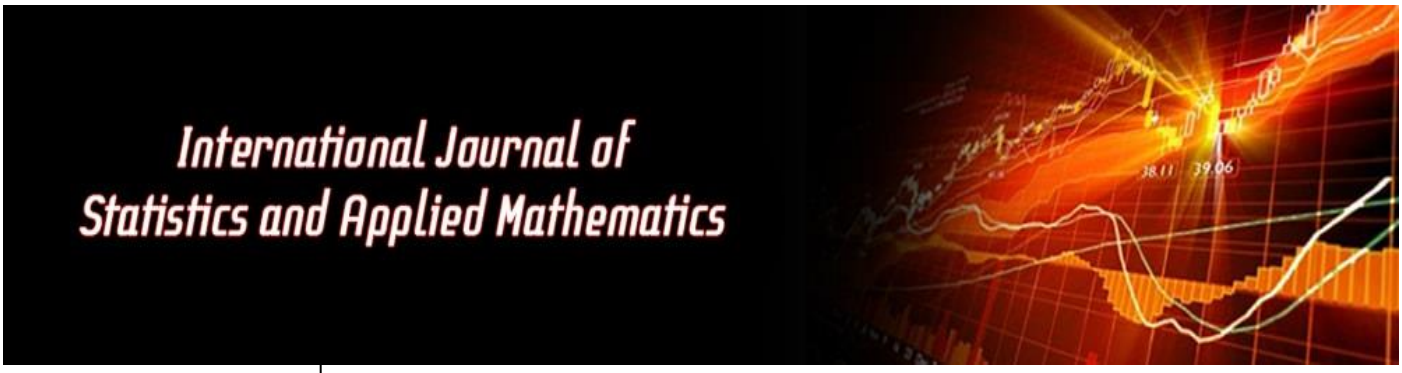

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Musculoskeletal disorders of artisans in informal sector

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Abstract
The study was conducted from October 2019 to January 2020 in North Karnataka of Karnataka state. A representative sample of 20 bamboo artisans was randomly selected from six selected villages in the study area. Thus the total sample comprises 120 bamboo artisans including both women and men. Keeping in view the objectives of the study, a random sampling technique was adopted.The majority of the respondents belonged to the middle age group followed by the young age group (40.00%) and the lesser (16.66%) percent were from the old age group. The highest mean score was given for the body tolerance of symptom problems during work was bearable in the lower back followed by palm/finger. Symptom frequency of problems related to the pain during work was quite often in the body parts like the lower back, followed by the buttocks. When respondents experienced pain in the body parts like the neck, shoulder and lower back respondents temporarily terminated the work and took rest for a while. There is a positive and highly significant relationship between the frequency of pain in the cutting and stripping activities. Whereas the relationship between the frequency of pain and weaving activity was positively significant. The positive and highly significant relationship between age and frequency of pain in the body parts like neck, shoulder, upper arm, lower arm, wrist, palm/finger, buttocks, knee, and feet/ankle among the old and middle age groups of respondents. Whereas the relationship between the young age group and the frequency of pain in the lower back is positively significant.

Keywords: Artisans, bamboo, body tolerance, musculoskeletal disorder, weaving

1. Introduction
Bamboo is one of the world's oldest materials and the industry is a thriving small-scale enterprise. Small-scale industries contribute significantly to an economy's overall growth (Seth, 2015)[8]

According to numerous research on occupational health hazards, musculoskeletal diseases and low back pain, allergic responses and other respiratory disorders, noise-induced hearing loss, physical strain, weariness, and stress are the most common health impairments. The fact that profits are strongly correlated with output and that most small and micro businesses cannot afford to hire the necessary manpower forces workers to put in long hours. Workers in the informal sector perform repetitive actions, carry heavy loads while adopting awkward postures, lift objects, twist, bend, push, and pull. These actions exhaust and strain the workers, which increases the risk of accidents and illness.[5, 2, 1].

According to the study, difficult postures in several body parts, including the neck, shoulders, elbows, wrists/hands, upper back, lower back, thigh, knees, and ankles, are key issues with handicraft production processes (Meena *et al*, 2011)

Based on this the following objectives are framed: To study the general information of the bamboo artisans and to examine the musculoskeletal disorder faced by bamboo artisans

2. Materials and Method
The current research was carried out in three important bamboo-growing districts in North Karnataka: Dharwad, Belagavi, and Uttar Kannada was conducted from October 2019 to January 2020. A random sample of 120 bamboo craftspeople was chosen at random from six villages in the study region (Narendra and Upinbatigeri village from Dharwad district,

Munavalli and Yeragatti from Belagavi district, Malagi and Palla from Uttar Kannada district). As a result, the whole sample consisted of 120 bamboo craftspeople, including men and women.

2.1 Type of Research: The research design adopted for the present investigation was exploratory type.

2.2 Exploratory Research: It is the research design for exploring, recording, analyzing and interpreting situations that exist in a selected environment.

2.3 Locale of the study: The study was conducted in three districts of Northern Karnataka *viz*., Dharwad, Uttar Kannada and Belagavi districts.

2.4 Selection of taluk: One taluk from each district was selected. Two villages were randomly selected from each selected taluk in the study area.

A coding plan was developed and code numbers were given to the collected data. The data was fed in excel sheet then imported to SPSS package with codes. These were subjected to computer analysis by using both MS Excel and SPSS 16 software.

3. Result and Discussion

3.1 General information of selected bamboo artisans

3.1.1. Age

Higher per cent of the respondents belonged to middle age group followed by young age group. Similar observation was made by Kamrul and Nayeema (2015) in their study, which shows that 56.00% of the respondents belonged to middle age group (30-50 years) followed by 25.00%of the respondents belonged to young age group (15-30 years).

3.1.2. Gender

More than 66.00% of the respondents were female followed by male.

3.1.3. Education

More than half of the samples attended primary school followed by illiterate. The results coated by Kalanzi*et al*. (2017) are similar that indicates majority of the respondents obtained primary education (58.00%) followed by illiterate.

3.1.4. Marital status

Maximum per cent of the respondents were married followed by widow. These results are in par with the results of Nwaihu*et al* (2015) which shows that 76.00% of the women were married and 24.00% of the respondents were single.

3.1.5. Annual family income

Majority of the respondents belonged to medium level of income (₹ 13,900 to ₹ 16,300) followed by low income group (₹ 16,300) and high level of income group (₹ 13,900). Reasons may be that artisans work only during summer and they cannot work and sell their bamboo products during rainy season.

Results from the (Table2) indicated that, work related body disorders while performing various activities among selected bamboo artisans. The highest mean score 2.53 was given for the body tolerance of the symptom problems which indicates that the body tolerance during work was bearable in lower back followed by palm/finger, shoulder neck, upper arm. Frequency of problem related to pain during work was quite often in the body parts like lower back and buttocks. When respondents experienced pain in the body parts like neck, shoulder and lower back respondents temporarily terminated the work.

There is positive and highly significant relationship to the frequency of pain to the cutting and stripping activities. Whereas the relationship between frequency of pain and weaving activity was positively significant.

The reasons maybe cutting and stripping activities requires more physical strength and the respondents needs to work with heavy sharp tools which causes occupational health hazards compare to weaving activity.

There is positive and highly significant relationship between the old age and body parts like neck, shoulder, upper arm, lower arm, wrist, palm/fingers, lower back, buttocks, knee and feet/ankle.

The relationship between age and frequency of pain in the body parts like neck, shoulder, palm/fingers and lower back, buttocks and feet/ankle among middle age group of respondents was found positive and highly significant. Positive and significant relationship was also found between frequency of pain in upper arm and lower arm with the same age group of respondents. The relationship between young age group and pain in lower back is positively significant. (Table3)

Positive and highly significant relationship between the age and pain rating in the body parts like neck, shoulder, wrist, palm/finger, lower back and buttocks among old age group. Whereas the relationship between age and pain rating in upper arm and lower arm, elbow, knee and feet is positively significant.

The relationship between age and pain rating in elbow, lower arm, shoulder, upper arm, knee and feet/ankle was found positive significant among middle aged respondents. While there is positive and highly significant relationship between age and pain rating in neck, wrist, palm/finger, lower back and buttocks. Further positive and significant relationship was observed between age and pain rating in palm/finger and lower back among young age respondents.

The reasons maybe that as the age increases the physical strength of artisan's maybe reduces which is required for performing bamboo activities, which leads to more chances of occurrence of pain and experienced more pain among artisans (Table4)

Table 1: General information of the selected bamboo artisansN=120

Sl. No.	Demographic variable	Frequency	Percentage
1	**Age**		
	Young (Up to 35 years)	48	40.00
	Middle (36-50 years)	52	43.34
	Old (Above 50 years)	20	16.66
2	**Gender**		
	Male	40	33.34
	Female	80	66.66

4	**Education**		
	Illiterate	53	44.17
	Primary school	63	52.50
	High school	4	3.33
	PUC	-	-
	Degree	-	-
	PG	-	-
5	**Marital status**		
	Married	85	70.83
	Unmarried	12	10.00
	Widow	23	19.17
6	**Family size**		
	Small(below 5)	58	48.34
	Medium(5-7)	46	38.33
	Large (more than 7)	16	13.33
7	**Family type**		
	Nuclear	73	60.83
	Joint	28	23.33
	Extended	19	15.84
8	**Annual income in rupees**		
	Low (<13900)	28	23.30
	Medium(13900/- to 16300)	56	46.70
	High >(16300)	36	30.00
Note- Multiple responses			

Table 2: Work related body disorders while performing various activities among selected bamboo artisansN=120

Sl. No.	Parameter	Neck	Shoulder	Upper arm	Lower arm	Elbow	Wrist	Palm/ Finger	Lower back	Buttocks	Thigh	Knee	Feet/ Ankle	Total
1	Body tolerance	2.32	2.40	2.12	2.12	1.52	1.34	2.42	2.53	1.95	2.00	2.01	2.00	**24.73**
2	Symptom frequency	3.33	3.20	3.00	2.90	3.12	3.55	3.73	4.05	3.92	3.80	3.72	3.64	**41.96**
3	Impact on work	2.00	2.00	1.00	1.52	1.00	1.83	1.92	1.97	1.95	1.93	1.92	1.95	**20.99**

Table 3: Relationship between age and frequency of pain in the body partN=120

Body parts	Up to 35 years	36-50 years	Above 50 years
	n=48	n=52	n=20
Neck	0.20	0.27	0.32(**)
Shoulder	0.14	0.27(**)	0.30(**)
Upper arm	0.14	0.16(*)	0.20(**)
Lower arm	0.18	0.19(*)	0.20(**)
Elbow	0.09	0.22	0.27
Wrist	0.11	0.21	0.26(**)
Palm/fingers	0.26(*)	0.34(**)	0.36(**)
Lower back	0.22(*)	0.27(**)	0.32(**)
Buttocks	0.15	0.22(**)	0.25(**)
Thigh	0.16	0.17	0.20
Knee	0.15	0.27(**)	0.30(**)
Feet /ankle	0.18	0.30(**)	0.31(**)
Note: **Significant at 1% level*Significant at 5% level			

Table 4: Relationship between age and pain rating in the body partsN=120

Body parts	Up to 35 years	36-50 years	Above 50 years
	n=48	n=52	n=20
Neck	0.14	0.16**	0.21**
Shoulder	0.16	0.18*	0.22**
Upper arm	0.12	0.18*	0.20*
Lower arm	0.15	0.18*	0.31*
Elbow	0.18	0.24*	0.26*
Wrist	0.20	0.24**	0.31**
Palm/fingers	0.20*	0.32**	0.34**
Lower back	0.30*	0.34**	0.36**
Buttocks	0.18	0.22**	0.29**
Thigh	0.14	0.17	0.19
Knee	0.16	0.20*	0.22*
Feet /ankle	0.09	0.12*	0.29*

Note: **Significant at one percent level

*Significant at five percent level

4. Conclusion

Majority of the respondents belonged to middle age group followed by young age group. The highest mean score was given for the body tolerance of symptom problems during work was bearable in lower back followed by palm/finger. Symptom frequency of problems related to the pain during work was quite often in the body parts like lower back, followed by buttocks. When respondents experienced pain in the body parts like neck, shoulder and lower back respondents temporarily terminated the work.

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