

Health status of plantation workers: A cross sectional study

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Abstract

Background and Objectives: Agricultural workers have a multitude of health problems, a fact often forgotten because of the widespread misconception that occupational health is mainly concerned with industry and industrialized countries. There is no study available on the health profile of rubber tappers in India to our knowledge. Hence the present study was undertaken with the objectives to describe the socio-demographic characteristics, assess the health profile, describe the occupational environment and related hazards and assess the Quality of life of rubber tappers. **Material and methods:** All 171 permanent employees of rubber plantations in a rural plantation constituted the study population. House-to-house visits and visits to the place of work were made and required information was obtained by interview using a semi structured pre-tested questionnaire. **Results:** Among the 171 tappers 70.2% were females and 29.8% were males. The prevalence of musculoskeletal disorders was observed among 30.4% of the study population. Skin lesions were observed in 10.5% of study group. There were no use of boots and gloves by any of the subjects. Body mass index in 43.86% of the population was not ideal where 26.9% were underweight and 16.96% were overweight. 45.1% of males consumed alcohol. There was no access to sanitation facilities at the workplace among 87.1% of the population. **Conclusion:** Musculoskeletal disorders were more common among those with > 2 visits made to shed with manual load and among those with a work experience of > 20 years in the rubber tapping occupation.


Key words: Plantation workers, musculoskeletal, occupational health.

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INTRODUCTION

By “occupational environment” is meant the sum of external conditions and influences which prevail at the place of work and which have a bearing on the health of working population. The industrial worker is placed in a highly complicated environment that is getting more complicated as man is becoming more ingenious. There

are three types of interactions in a working environment - Man and physical, chemical, and biological agents, Man and machine and Man and man. From the review of various literatures it was understood that little research has been conducted on the health profile of rubber tappers.

MATERIAL AND METHODS

A cross-sectional study was designed to study health status of all rubber tappers residing in the geographic region were included in the study. There were a total of 135 households. The study population was engaged in rubber tapping for more than one year. The necessary approval was obtained from Ethics Committee. A semi-structured, pretested questionnaire was used for collection of data. The study population was surveyed by house-to-house visit. Visits to place of work were made. The data collected was entered, analyzed and tabulated using a Microsoft Excel package of MS Office and SPSS 11.5 package of statistics.

RESULTS

Table 1: Demographic profile of Rubber tappers

Variables		N (%)	N (%)	N (%)
Gender		Female	Male	Total
		120 (70.2)	51 (29.8)	171 (100)
Age	<35 years	26 (15.2)	14 (8.2)	40 (23.4)
	36 - 45 years	40 (23.4)	12 (7.0)	52 (30.4)
	> 45 years	54 (31.6)	25 (14.6)	79 (46.2)
Education	Illiterate	13 (7.6)	2 (1.2)	15 (8.8)
	Primary school	42 (24.6)	15 (8.8)	57 (33.3)
	Middle school	43 (25.1)	15 (8.8)	58 (33.9)
	High school	19 (11.1)	13 (7.6)	32 (18.7)
	Intermediate or Post High School Diploma	3 (1.8)	5 (2.9)	8 (4.7)
	B.A/ Honors, M.A.	0 (.0)	1 (0.6)	1 (0.6)
Marital status	Married	107 (62.6)	48 (28.1)	155 (90.6)
	Unmarried	2 (1.2)	3 (1.8)	5 (2.9)
	Widowed	11 (6.4)	0 (.0)	11 (6.4)

The proportion of females (70.2%) was more than males (29.8%). Females were more in all age groups. Primary and middle school education accounted for 67.2%, only 9.3% of the workers were unmarried or widowed. The age ranged from 23 to 58 years with mean age of the study population being 42.98 years.

Table 2: Age wise distribution of musculoskeletal disorders

Musculoskeletal disorders	Present N (%)	Absent N (%)	Total N (%)	$\chi^2 = 8.97$ df= 2 p value=0.01
Age groups				
<35 YEARS	5 (12.5)	35 (87.5)	40 (100)	
36 - 45 YEARS	16 (30.8)	36 (69.2)	52 (100)	
> 45 YEARS	31 (39.24)	48 (60.76)	79 (100)	
Total	52 (30.40)	119 (69.60)	171 (100)	

Musculoskeletal disorders were more common in older individuals compared to the younger age groups.

Table 3: Sex wise distribution of musculoskeletal disorders.

Musculoskeletal complaints	Present N (%)	Absent N (%)	Total N (%)	$\chi^2 = 0.034$ Df= 1 p value=0.85
Sex				
Female	37 (29.41)	83 (70.6)	120 (100)	
Male	15 (30.83)	36 (69.17)	51 (100)	
Total	52 (30.40)	119 (69.6)	171 (100)	

Musculoskeletal disorders were more common among the males compared to females. However, this difference was not statistically significant.

Table 4: Obstetric history among women in the study population.

Parameters	N %	
Women who have attained menopause	42	(35.0)
N = 120		
Nulliparous	07	(5.93)
Births to ever-married women	1	12 (10.17)
N = 118	2	43 (36.44)
	3	47 (39.83)
	4+	09 (7.63)
History of Abortion in among the ever-married women	14	(11.86)
N = 118		
History of Stillbirths among the ever-married women	04	(3.38)
N = 118		
Contraception not used by currently married women	44	(57.89)
N = 76		

The total number of women in this study was 120 of which 118 were ever-married women. Of the 118 ever-married women 5.93% were nulliparous, and most (39.83%) of them had a birth order of 3. One woman had a birth order of 10, which was the highest. Abortions in ever-married women were reported in 11.86% and

stillbirths in 3.38%. There were a total of 107 currently married women. Excluding the menopausal and unmarried women there were 76 women who were currently married and were eligible for contraception use. But 57.69% of them were not adopting any method of contraception at the time of the study.

Table 5: Logistic regression predicting the likelihood of the study population reporting musculoskeletal disorders

Predictors	b	S.E.	Wald	df	Sig.	Odds Ratio	95% Confidence Interval	
							Upper	Lower
Workplace distance	0.646	0.387	2.788	1	0.095	0.867	0.292	2.572
Means of transport	-0.397	0.563	0.498	1	0.481	0.544	0.207	1.428
Number of visits with manual load	1.413	0.497	8.087	1	0.004	4.502	1.803	11.242
Number of years in tapping	1.083	0.371	8.538	1	0.003	2.941	1.482	5.833
Work posture	-0.271	0.374	0.524	1	0.469	0.555	0.288	1.072
Constant	-4.286	1.361	9.914	1	0.002			

b is the coefficient of the predictor variables

S.E is Standard error

Wald test is used to test the statistical significance of each coefficient (b) in the model.

df is the degree of freedom

Sig denotes Significance

Relationship between different work-related factors (predictor variables) and musculoskeletal disorders showed workers working for > 20 years with those working for < 20 years it was found that occurrence of musculoskeletal disorders were significantly more in those working for > 20 years. Comparing those workers making > 2 visits to the shed carrying manual load and those making lesser visits, the occurrence of musculoskeletal disorders were significantly more among those making >2 visits. Occurrence of musculoskeletal disorders between those subjects adopting standing work posture while tapping to those adopting leaning posture was not found to be significant. Similarly there was no significant difference between those walking to work and travelling by any motor vehicle, and also between those subjects who walked a distance of >6 kilometers and <6 kilometers to their respective workplace from their homes.

DISCUSSION

The average age of the study population was 42.98 years and the ages ranged from 23 – 58 years. KFDC employed individuals over the age of 18 and age of retirement is 58 years. This is because of the strict implementation of the Child Labor (Prohibition and Regulation) Act [Act No. 61, 1986]²⁷ whereas in the study done by C Nancy *et al*² among rubber tappers in Indonesia the age ranged from 33 – 40 years. The proportion of females (70.2%) was greater than males (29.8%) in this study which was in

contrast to the study done by T V Ushadevi *et al*¹ among rubber tappers in Kerala where only 4% of the tappers were women. In the present study 8.8% were illiterates and 5.3% had qualifications of SSLC and above which was lower compared to the study done by T.V.Ushadevi *et al*¹ where 4.5% were illiterates and 8.5% of tappers had educational qualifications of SSLC and above. This may be because of the known fact that literacy rates in Kerala are high. The level of education was also higher among rubber tappers in Indonesia where none were illiterates and 29.5% had qualifications above high school level. In the present study 50.87% had a work experience of > 20 years but C Nancy *et al*² reported that 7.25% of the sample Indonesian rubber tappers had a work experience of more than 20 years. Distance to the allotted plantation block was more than 6 kilometers two-way for 55% of the study population. Among those who walked to work, nearly half (46.5%) of them walked more than 6 kilometers to work and back home. 24.5% of rubber tappers use head light while tapping¹ whereas only 7.6% in the present study used head light. The present study revealed that 45.6% adopted a leaning forward posture and 54.6% adopted a standing posture while tapping rubber. But it is important to consider that posture is decided by the part of the tree, which is being tapped rather than the individuals' preferred posture. NFHS 3 reported that among adults in rural Karnataka over 37% were underweight, and 15% of women and 11% of men were overweight or obese. Only 49% of women and 55% of men were at a healthy weight for their height. In the

present study 26.90% were underweight and 19.61% of women and 11.76% of men were overweight or obese. Only 51.66% of women and 66.66% of men were at a healthy weight for their height. Both underweight and obesity were a problem in females. Musculoskeletal disorders, the most common disorder was observed in 29.4% male and 30.8% female in the present study. Agricultural workers, 41% male and 40% female workers reported musculoskeletal disorders that were higher.¹⁴ Accidents at work within the last year were reported by 39 tappers at a rate of 228 injuries/1000 workers per year. Traumatic accidents among farm workers and reported 116/1000 per year which is much lesser than what was observed in our study.²⁰ A study was carried out in Madhya Pradesh²¹ from 1995-1999 reported an overall incidence of 1.25/1000 workers/year agricultural injuries. This was also lesser than what was observed in our study. A farm workplace injury during the twelve-month period was reported by 40/1000 workers⁸ which is also lesser than our study. The high number of accidents at work in the present study may be attributed to the non-use of PPE. Skin lesions mainly dermatitis and callosity was observed in 10.5% of the population. This can also be because none of the rubber tappers use gloves while tapping. Abortions were reported in 11.7% and stillbirths in 3.3% among the ever-married women who were part of the present study. Agricultural workers in 2004 revealed that 20.6% of the ever-married women had undergone abortions, higher than our study. Stillbirths were reported in 2.4% of them, which is lesser than our study.⁴ Of the 118 ever-married women 5.93% were nulliparous and 47.46% had >2 children whereas the NFHS 3¹³ reported that 28.8% had a birth order of >2 among women in rural Karnataka. This may be attributed to the finding that 57.69% of women who were currently married had not been practicing any method of contraception at the time of our study which was higher compared to the NFHS 3³ report where 36% currently married women were not using any methods of contraception in rural Karnataka.

CONCLUSION AND SUMMARY

The total population of rubber tappers fulfilling the inclusion criteria living in the four colonies was included in the study. There were a total of 171 rubber tappers living in 135 households who were surveyed by house-to-house visit. Information about socio demographic profile, housing conditions and characteristics, occupational environment, observations on work nature of the rubber tapper at work place and health profile was obtained by interviewing the selected rubber tapper using a pre-tested structured questionnaire. The data was compiled and analyzed. Among the 171 individuals, 120 (70.2%) were females and 51 (29.8%) were males. The prevalence of

musculoskeletal disorders among the study population was 30.4%. This was found to be associated with the number of years of experience in the rubber tapping occupation and the number of visits made by a rubber tapper with manual load. Only 7.6% were using headlights at work. Accidents at work were experienced by 22.8% of the subjects. There was no use of boots and gloves by any one individual. Visual acuity problems were present in 24%, high blood pressure was observed in 9.35% and skin lesions were observed in 10.5% of the population. Among the ever-married women abortions were reported in 11.7% and stillbirths in 3.3%. Body mass index for nearly half (43.86%) the population was not ideal where 26.9% were underweight and 16.96% were overweight. Illiteracy was seen in 8.8% and educational qualification more than high school was observed in 5.3% of the population. Majority, 40.9% belonged to BG Prasad's socioeconomic class III. All individuals were exposed to domestic indoor air pollution as firewood was the main source of cooking fuel. There was no sanitation facility at the workplace for 87.1% of the population and in 11.85% of households. Only 22.96% households treated water prior to drinking. Tobacco abuse in either smoke or chewable form was the highest substance abused by 22.21% and alcohol was abused by 14.61% of the population.

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