

Original Research Article

Health profile of adult beedi workers among unorganized sectors in Kolar city

Harish S.^{1*}, Prasanna Kamath²

¹Department of Community Medicine, East Point College of Medical Sciences and Research Centre, Bengaluru, Karnataka, India

²Department of Community Medicine, Sri Devaraj Urs Academy of Higher Education and Research Centre, Kolar, Karnataka, India

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*Correspondence:

Dr. Harish S.,

E-mail: drharryhari@gmail.com

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ABSTRACT

Background: Over 35 million people are involved in tobacco industry. Beedi rolling causes serious occupational health hazards to the workers and their family who are constantly exposed to tobacco dust and hazardous chemicals, compounded by factors at the place of work. Occupational diseases due to inhalation of tobacco dust and the other is the result of long hours of continuous sitting in an improper working posture.

Methods: A cross-sectional study was done among adult beedi workers residing in Kolar city. The study included 384 beedi workers. A pretested, semi-structured questionnaire was used to collect data.

Results: The study comprised of 384 study subjects, Among the health problems, most common were musculoskeletal problems involving 277 (72.02%) subjects, followed by respiratory problems among 159 (41.40%), eye problems among 46 (11.9%) and others 23 (5.9%). Most common chronic illness were found to be Hypertension in 43 (43.88%) followed by Asthma 26 (26.53 %), Diabetes mellitus 12 (12.24%), ischemic heart disease 7 (7.4%) and others 10 (10.20%). Lung functions were assessed by spirometry in 83 study subjects of whom 9.6% were having obstructive features, followed by 2.4% with restrictive features, 3.6% having mixed.

Conclusions: Musculoskeletal problem was the most common morbidity. Which was related to the working posture of continuous forward bending of the trunk. Educational status of such workers was found to play an important role in creating awareness and in turn utilization of welfare schemes.

Keywords: Occupational diseases, Morbidity, Beedi workers, Spirometry, Nordic questionnaire

INTRODUCTION

Beedi and cigar manufacturing is one of the traditional agro-based industry employing over 4.1 million workers in India. About 90 percent of them are “home workers” and majority of them are women.¹ The actual number of beedi workers are much higher as there are many unorganized sectors enrolled in beedi manufacturing in India.² Beedi making is mainly carried out by contractual, daily home-based system where women and children are involved in this work. Beedi rolling causes serious occupational health hazards to the workers and their

family who are constantly exposed to tobacco dust and hazardous chemicals, compounded by factors at the work place.³ Two types of occupational diseases have been identified in beedi workers. They are the injurious effect of inhaling tobacco dust and the other is a result of long hours of continuous sitting in an improper working posture.⁴ The occupational health hazards of beedi workers remain neglected for a long time and there is a need to study health problems among beedi workers and to reduce it.⁵ The present study was intended to identify occupational health problems among beedi workers and suggest relevant remedial measures to control health

hazards with regards to exposure and consequent occurrence of health hazards. Objectives were to estimate the health problems among adult beedi workers. To study the socio-economic status and living condition of adult beedi workers.

METHODS

Descriptive, cross-sectional, community-based study was carried in the urban area of Kolar city. Adult beedi workers aged more than 18 years, involved in beedi rolling for at least 12 months were included in the study. Beedi workers with thoracic cage abnormalities. Beedi workers with recent chest and abdominal surgery. Beedi workers with any known respiratory disease like asthma and COPD prior to joining the in beedi work. Individuals not giving consent for the study were excluded.

Two stage sampling was used to identify the beedi workers. Stage I, all the areas (wards) involved in beedi rolling were enlisted, and selected randomly. Stage II, in each selected area approximate centre of the area was located. A random direction of travel was selected from the centre of the area, and then the starting house was selected randomly. The beedi workers in each house were interviewed with pre tested, validated, semi-structured questionnaire. Proforma which consists of following 3 parts.

Section A

Demographic data which gives base line information of the workers such as age, marital status, religion, educational status, income, habits.

Section B

Structured interview schedule to assess, the working condition, length of working hours per day and years of service in the beedi making and practice of safety measures among beedi workers.

Section C

Structured interview schedule to assess, the occupational health problems like respiratory problems, musculoskeletal disorders using Nordic questionnaire, and other health problems among beedi workers.

After interview, spirometry was carried out among the sub sample (20%) of study subjects. Informed consent was taken to participate in the study. Sample size was estimated based on the prevalence rate of the various morbidities from the previous study using the formula.⁵ $n = Z^2pq/d^2$, depending upon the health problems Thus the sample size was 384 beedi workers. Data was entered in MS Excel and statistical analysis were performed using the SPSS version 22.0 software. Institutional ethical committee approval was obtained before start of the study.

RESULTS

The study included 371 (96.6%) females and 13 (3.4%) males. 111 (29.9%) were in the age group 35 to 44 years. The mean age of the study subjects was 39.86 years with standard deviation of 11.66. 147 (34%) were educated up to middle class, 96 (25%) subjects were illiterates. While 214 (55.7%) belonged to class IV modified B Prasad. 151 (39%) were working for more than 20 years and only 79 (20.6%) of them working for less than 5 years. Mean duration of work was 15.7 years with a SD of 8.57.

201 beedi workers (52.3%) out of 384 were working for more than 5 days in a week, followed by 159 (41.4%) for 3-5 days and 24 (6.3%) for less than 3 days. Mean no of days per week was 5.58 days with a SD of 1.259. 211 beedi workers (54.9%) were working 3 to 5 hours per day and only 40 (10.4%) for less than 3 hours in a day.

148 (38.5%) beedi workers were rolling 300 to 500 beedis per day, followed by 129 (33.6%) were rolling 501 to 800 beedis per day and only 51 (13.3%) were rolling more than 800 beedis per day. Mean no of beedis rolled per day was 541.6 beedis with SD of 208.89. 204 (53.1%) of beedi workers preferred rolling beedi inside the house, 147 (38.3%) were rolling beedi both inside and outside the house and few 33 (8.6%) were rolling only outside the house.

Figure 1 shows that 213 (55.5%) workers were living in houses with adequate cross ventilation, 275 (71.6%) were living in a house with adequate natural lighting and majority (94.8%) of the house adequate artificial lighting was present and in very few (5.2%) houses it was absent.

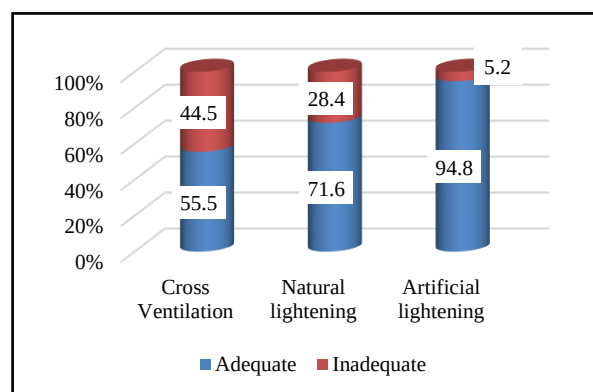


Figure 1: Distribution of indoor factors.

Table 4 shows that 166 (43.2%) were registered under beedi worker's welfare scheme and the rest 218 (56.8%) were not registered. 105 (29.7%) were aware of welfare schemes under beedi worker's welfare fund and the rest 270 (70.3%) were not aware. For statistical purpose educational status above the high school was clubbed as one group. Only 166 (43.2%) were registered under beedi worker's welfare scheme and the rest 218 (56.8%) were not registered. The table shows that as the educational status increased the registration in beedi welfare also

increased. This finding was statistically significant. Similar observation was observed for awareness of welfare schemes and education.

Table 5 shows that 70%, 68.2% and 78.9% beedi workers were having musculoskeletal symptoms who work for more than 5days, 3-5 days and less than 3 days per week respectively. The working days per week and number beedi rolled per day is also related to musculoskeletal problem directly, however this was not statistically significant. Figure 2 shows, out of 384 study subjects 72% had musculoskeletal problem, 23.9% had respiratory problems, 11.9% had eye problems and 5.9% had others' problems (Others include weakness, easy fatigability, dental symptoms, dermatological symptoms, gastritis, headache, menstrual problems). More than one type of morbidity was present in some beedi workers. Chronic illness was present in 98 (25.5%) beedi workers out of 384 subjects. Most common illness being Hypertension in 43 (43.8%) subjects followed by Asthma 26 (26.5%), diabetes mellitus 12 (12.24%), ischemic heart disease 7 (7.14%) and others 10 (10.2%) like goitre and cancer. More than one type of illness was present in some beedi workers.

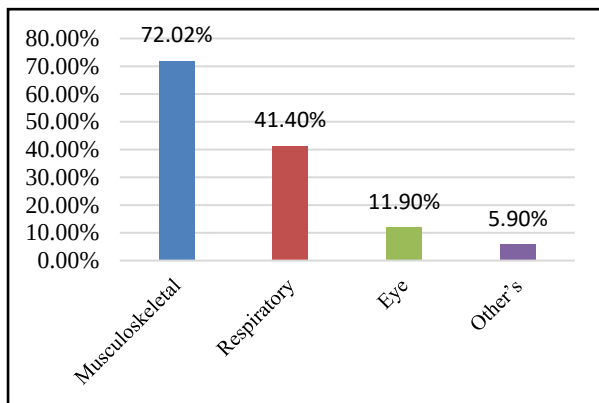


Figure 2: Distribution of morbidity profile of beedi workers.

Figure 3 shows most common symptom being low back pain 118 (30%) followed by knee joint pain 105 (27.3%), shoulder pain 50 (13%), elbow joint pain 49 (12.8%), ankle/feet pain neck pain 48 (12.5%), 43 (11.2%) and wrist joint pain 36 (9.4%).

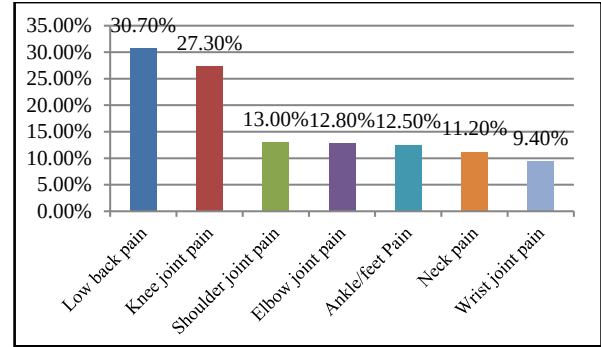


Figure 3: Musculoskeletal problems of Beedi workers.

Figure 4 shows most common symptom being cough 86 (22.40%) followed by breathlessness 38 (9.903%), wheeze 26 (6.80%) and others include rhinitis, throat burning 9 (2.30%). Out of 83 subjects on whom spirometry was performed, 8 (9.6%), 2 (2.4%), 3 (3.6%) and 70 (84.3%) were having obstructive, restrictive, mixed restrictive and obstructive and normal lung function findings respectively.

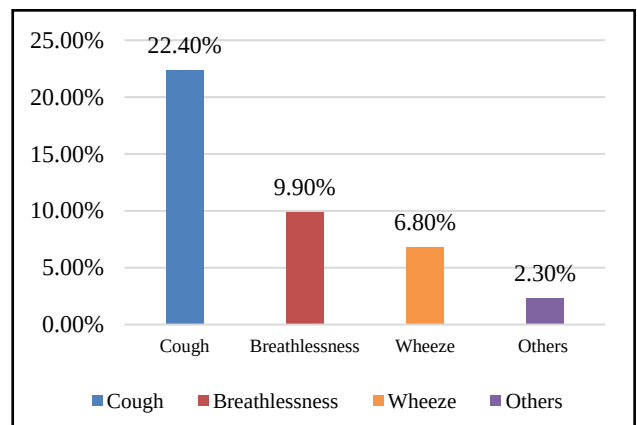


Figure 4: Distribution of respiratory problems among beedi workers.

Figure 5 shows that out of 83 subjects on whom spirometry was performed, 8 (9.6%), 2 (2.4%), and 3 (3.6%) were having obstructive, restrictive, mixed restrictive and obstructive respectively. 70 (84.3%) had normal spirometry findings.

Table 1: Socio demographic distribution of study subjects.

	No. of workers	Percentage
Age group (years)		
18-24	31	8.1
25-34	101	26.3
35-44	111	28.9
45-55	104	27.1
≥55	37	9.6
Sex		
Male	13	3.4
Female	371	96.6

Continued.

	No. of workers	Percentage
Religion		
Hindu	15	3.9
Muslim	355	92.4
Christian	14	3.6
Education status		
Illiterate	96	25.0
Primary school	96	25.0
Middle school	120	31.3
High school and above	72	18.8
Marital status		
Married	296	77.1
Unmarried	13	3.4
Widow	8	2.1
Divorce/separated	67	17.4

Table 2: Working pattern of beedi workers.

	No. of workers	Percentage
Duration of beedi rolling (in years)		
<5	79	20.6
5-10	31	8.1
11-15	67	17.4
16-20	56	14.6
>20	151	39.3
Working days per week		
< 3	24	6.3
3-5	159	41.4
>5	201	52.3
Working hours per day		
< 3	40	10.4
3-5	211	54.9
>5	133	34.6
Beedis rolled per week		
<300	56	14.6
300-500	148	38.5
501-800	129	33.6
>800	51	13.3

Table 3 Distribution of beedi workers according type of house and place of work.

	No. of workers	Percentage
House type		
Pucca house	211	54.9
Semi pucca house	173	45.1
Total	384	100.0
Place of work		
Inside the house	204	53.1
Outside the house	33	8.6
Both	147	38.3

Table 4: Distribution of beedi workers according to registration for welfare schemes and awareness of welfare schemes and relationship between registration status of welfare schemes and educational level.

	N (%)
Registration in beedi welfare schemes	
Present	166 (43.2)
Absent	218 (56.8)
Awareness of beedi welfare schemes	
Present	114 (29.7)

Continued.

	N (%)	
Absent	270 (70.3)	
Educational level	Registration of welfare schemes	
	Yes	No (%)
	N (%)	N (%)
Illiterate	31 (32.3)	65 (67.7)
Primary school	41 (42.7)	55 (57.3)
Middle school	56 (46.7)	64 (53.3)
High school and above	38 (52.8)	34 (47.2)
Total	166 (43.2)	218 (56.8)

0.047

Table 5: Relationship between working patterns and musculoskeletal problems.

Working pattern		Musculoskeletal problems		P value
		Present	Absent	
		N (%)	N (%)	
Working hours per day	< 3	28 (70)	12 (30)	0.093
	3-5	144 (68.2)	67 (31.8)	
	>5	105 (78.9)	28 (21.1)	
Working days per week	< 3	13 (54.1)	11 (45.9)	0.377
	3-5	115 (73.3)	44 (36.7)	
	>5	149 (74.1)	52 (25.9)	
No. of Beedi's rolled per day	<300	35 (62.5)	21 (57.5)	0.437
	300-500	104 (70.3)	44 (29.7)	
	501-800	97 (75.2)	32 (24.8)	
	>800	41 (80.3)	10 (19.7)	

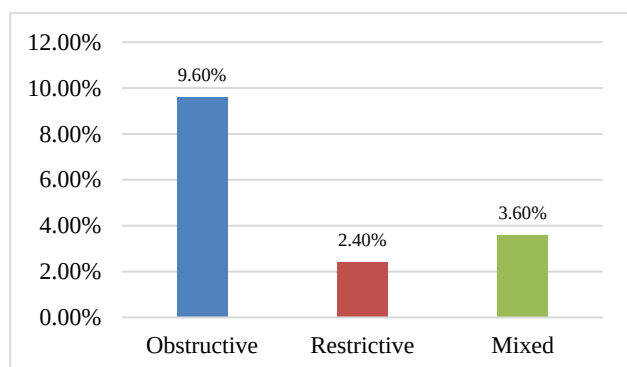


Figure 5: Results of pulmonary function test.

DISCUSSION

The mean age of the study subjects was 39.86 years with standard deviation of 11.66. whereas Ghosh P C et al, in 2005 reported that mean age was 45.9 years with a standard deviation 12.66.⁶ More than 90% of the study subjects were female beedi workers. Study done by Rajasekhar et al, in 2001 in Dakshina Kannada district reported that over 93% of beedi workers were females.⁷ Sudharshan et al, in 1999 reported that women constituted the bulk of beedi workers and employers and their contractors find this arrangement convenient because they could avoid both a) Reporting workers to the government and b) Providing legally required benefits.⁸ Our study shows that 53.9% of study subjects were working for more than 15 years.

Mean duration of work was 15.7 years with a SD of 8.57. According to the report from the beedi sector programme designed by ILO majority of women beedi workers have been rolling beedis for more than 15 years.⁹ Similar findings were noted in studies done by Rajasekhar et al, Madhusudan et al and Sudharshan et al.^{5,8,10} In our study 53% were working inside the house and 38.3% were working both inside and outside the house, whereas studies done by Anil M et al reported that 77% were rolling inside the house.

According to the report from the beedi sector programme designed by ILO, did not have separate room for rolling. Study done by Rajasekhar et al, showed that all the subjects undertook beedi work at home and over 90% of them did not have separate room for the work.^{6,7} Since the work is interspersed between household/domestic chores, it is often difficult to count the hours of work strictly devoted to beedi making. However, the pressure to fulfil targets being high, women often make adjustments with their time for food, sleep, rest, entertainment and social obligations, which make them at risk of health problems.¹¹ Musculoskeletal problems was commonest problem (72%) identified in our study. Studies done by Meena Gopal et al, Vinod Sen et al, Yasmin et al reported that 65%, 67 and 75% had musculoskeletal problem respectively.^{4,12,13} Our study showed that 23.9% had respiratory problems. Study done by Shahla Yasmin et al, reported 50% had respiratory problems. Study done by Rajasekhar et al, showed that the common respiratory

problems faced by beedi workers was asthma (6.3%). Study done by Vinod Sen, reported 11.13% of asthma. Study done by Meena Gopal reported that 9.7% cough.^{4,7,11,12}

The present study showed that 56% of subjects were registered as evidenced by the identity card. Also study done by ILO showed that only 50% had identity cards. A study by Rajasekhar et al was also found that only 44.4% out of 876 respondents had identity cards. This finding is also supported by other studies done by Rajasekhar et al and Ghosh et al.^{6,7,14,15}

In the present study 9.6%, 2.4%, 3.6% and 84.3% were having obstructive, restrictive, mixed restrictive and obstructive and normal spirometry findings respectively. Study done by Chattopadhyay et al, showed that there was a gradual decline of lung volume in exposed subjects as the duration of exposure increased. Respiratory impairments like restrictive, obstructive and combined restrictive and obstructive type among exposed workers as off whole were much higher (23.53%) compared to the control (3.56%).¹⁶ Study done by Chattopadhyay et al, to assess the respiratory response to tobacco dust among beedi binders showed that PFT (Pulmonary Function Test) values gradually reduced as the duration of exposure increased in beedi workers and as a whole 25.7% male and 11.2% female beedi binders had respiratory impairment. The pulmonary function impairments are of restrictive (7.34%), obstructive (11%) and combined (restrictive and obstructive) 7.34%. Among the females the corresponding values were 3.37% and 7.87%.¹⁷

Some limitations was that spirometry was done on only 20% of the study subjects due to constraints of time and logistics. Prevalence of eye problems was 31% among beedi worker, which could not be included in the study as it is difficult to assess them without assistance of specialist.

CONCLUSION

The study comprehensively showed that musculoskeletal problem were the most common morbidities among beedi workers involved in the beedi rolling activity, which was related to the number of years of service and the working posture of continuous forward bending at the trunk. There was also lack of awareness about welfare schemes as a result of which both registration and utilization was less among beedi workers. Education plays an important role in creating awareness and utilization of welfare schemes and this stresses the importance of imparting awareness regarding the preventive and promotional measures to the workers.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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