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A STUDY ON OCCUPATIONAL HEALTH HAZARDS AMONG BEEDI WORKERS IN KANNUR DISTRICT, KERALA

Occupational Health

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ABSTRACT

Context: A beedi is a leaf rolled cigarette made of coarse uncured tobacco. Beedi rolling is a labour-intensive job and exposes the workers to tobacco dust for hours daily. Chronic exposure to unburnt tobacco and working continuously in improper postures makes them vulnerable to various health issues. **Aim:** To study the working conditions and health hazards among the beedi workers in Kannur district, Kerala **Methods and materials:** A cross-sectional study, using A validated close-ended questionnaire was conducted among 384 workers from ten primary units of a Co-operative Beedi Manufacturing society in Kannur district, Kerala from January 2020 to June 2020. **Results:** The median age of the workers was 53 years. Four-fifth of the participants (78%) worked for eight hours a day and rolled 800 beedis per day on average. They were working in dusty environment and in improper postures. Almost 90% of the participants had some health issues, the common being problems related to eye (90%), musculoskeletal problems (87%), and respiratory problems (66%). Almost half of the participants had problems related to skin. **Conclusions:** Beedi rollers works in the dusty environment without proper protective wears and in the same posture continuously for hours which makes them vulnerable to various health issues. Conducting awareness programmes on risk reduction at the beedi manufacturing units by governmental or non-governmental organizations might reduce the health problems related to the profession.

KEYWORDS

Occupational hazards, beedi, Kerala

INTRODUCTION:

A beedi is a leaf rolled local cigarette made of coarse uncured tobacco. There are approximately 800 million beedi sold every year in India and is perhaps the biggest industry among the unorganized sectors which employs around four million people, predominantly women.[1] Even though Kerala doesn't produce any raw materials required for the industry, it is one of the major beedi producing states in India and employs around four lakh people.[2] Beedi rolling is a labour-intensive job and the workers are exposed to tobacco dust four to ten hours daily. Due to lack of education, training, and the poor socio-economic conditions, they are forced to work continuously in improper work postures and in dusty environment causing various health hazards[3]. Studies shows that improper working posture and repetitive tasks can contribute to musculoskeletal disorders.[5] Beedi rollers are exposed to unburnt tobacco mainly through cutaneous and nasopharyngeal routes.[4] Exposure to tobacco can cause various respiratory, skin, and gastro intestinal diseases.[6] The International Labour Organization cites that beedi rolling can cause asthma, fatigue, postural problems and eye strains.[7] Studies have proposed that higher occupational exposure to tobacco can lead to higher probability of health hazards.[8,9] There exists limited evidence on the occupational health problems and their associated factors among beedi workers in India. The study was carried out to assess the working condition and health hazards among the beedi workers.

Subjects and Methods:

An cross-sectional quantitative study was carried out among the beedi workers in Kannur district, Kerala. The study was conducted among the workers in the primary units of a co-operative society from January 2020 to June 2020. A two stage sampling procedure was adopted in this study – random selection of ten primary units at first stage, and a random selection of required respondents in the second stage. Assuming half of the beedi workers may or may not have occupational health problems, the sample size for this study was calculated as 384. From the list of beedi manufacturing units in the district, ten primary units selected randomly and the number of workers in each unit were obtained and sample allocation was done in proportion to the size of each unit. All the beedi rollers who were at least 18 years of old and engaged in beedi rolling for more than one year were included in the study. Managerial staffs and those who were absent or not willing to participate were excluded from the study. Informed consent was taken to participate in the study.

A content validated close-ended questionnaire and an observation check list was used for data collection. The questionnaire captured information on the socio-economic status, work profile, work-place health, and health problems, musculoskeletal problems, respiratory problems, and problems related to eye and skin. Using a checklist, observations were made to assess the working condition in the primary units, and included aspects such as having ventilation, lighting, work posture and other facilities for the employees. The study protocol was approved by Institutional Ethics Committee and registered in the clinical trial registry of India. Data was entered into Microsoft excel and data analysis was carried out using SPSS 16. Chi-square test was used to find the association between exposure variables and outcomes, and a p-value less than 0.05 was considered statistically significant.

RESULTS:

The age distribution of the participants are given in table 1. The median age of the participants was 53 years (IQR 50,56) and 97% of beedi workers were females. Only 45 participants among 384 had a private health insurance and majority of them (88%) did not have health insurances of any kind.

Table 1: Background characteristics of the respondents, n=384

Variable	Category	Frequency
Age (In years)	<50	75 (20%)
	50-54	171 (45%)
	>54	138 (36%)
Gender	Male	11 (97%)
	Female	373 (3%)
Marital status	Single	4 (1%)
	Married	337 (88%)
	Divorced	19 (5%)
	Widowed	24 (6%)
Education	No formal education	13 (3%)
	Class I to IV	84 (22%)
	Class V to IX	241 (63%)
	>=HSC	46 (12%)

Health Seeking	Public facility	230 (60%)
	Private facility	154 (40%)

All the participants of the study were full time permanent workers involved in beedi rolling process. Among the 384 participants, 43% of the participants were working in beedi industry for more than 30 years, (IQR 28,34). Almost four-fifth of the participants worked for eight hours in a day and 67% of them took only 20-30 minutes break in a day during the work. Almost everyone adopted sitting in chair for doing their work and rolled 800 beedi on average per day.

Health profile of the participants were studied to understand the prevalence of underlying comorbidities and to assess the awareness regarding usage of protective wears. In past six months, two-third (67%) of the participants had taken less than five days of sick leaves, while 29% of them took 5-14 days. Only 9% participants used mask sometimes and the rest (91%) did not use any personal protective equipment during their work. Among the participants, 23% had diabetes and 27% had hypertension. Other health problems were also prevalent among 30% of the workers which mainly included pain in different parts of the body (38%), allergy and sneezing due to dust (21%), headache (14%), generalized weakness/fatigue (7%) and numbness of limbs (3%).

Table 2. Work profile of the participants, n=384

Variable	Category	Frequency
Years engaged in beedi work	<28	130 (34%)
	29-34	165 (43%)
	>35	89 (23%)
Duration of work (In hours)	<=8	301 (78%)
	>8	83 (22%)
Duration of break (In minutes)	<20	40 (10%)
	20-40	259 (67%)
	>40	85 (22%)
Number of beedi rolled in a day	<=800	222 (58%)
	>800	162 (42%)
PPE use (Face mask/Gloves)	Yes	33 (9%)
	No	351 (91%)

Table 3 shows the prevalence of various health problems among the beedi rollers. The respiratory problems reported by the participants (66%) included shortness of breath, wheezing, cough, and phlegm. Around 87% of the participants had problems related to musculoskeletal systems, the common being pain/discomfort in shoulder (43%) and lower back (42%). About 90% of the participants had problems related to eye, blurred vision in particular (86%). Almost half of the participants reported dermatological problems such as callosities (26%) and skin itching (21%) among others.

Table 3 : Prevalence of health problems among the participants, n=384

Variable	Category	Frequency
Respiratory problems	Shortness of breath	180 (47%)
	Wheeze	126 (32%)
	Cough	121 (32%)
	Phlegm	47 (17%)
Musculoskeletal problems	Neck	103 (27%)
	Shoulder	167 (43%)
	Elbow	60 (16%)
	Wrist	90 23%)
	Upper back	63 (16%)
	Lower back	160 (42%)
	Hips/thigh	32 (8%)
	Knee	129 (34%)
	Feet/ankle	102 (73%)
Dermatological problems	Skin itching	79 (21%)
	Roughness	65 (17%)
	Callosities	99 (26%)
	Tanning	28 (7%)
	Rashes	12 (3%)
Problems related to eye	Blurred vision	331 (86%)
	Eye irritation	114 (30%)
	Watering eye	31 (8%)
	Redness	38 (10%)

Chi-Square test for independence of attributes was administered to check (at a significance level of 0.05) whether the instances of musculoskeletal problems, respiratory problems, dermatological problems, and problems related to eye were associated with the number of beedi rolled per day and number of years engaged in beedi rolling.

Table 4 : Association between number of beedis rolled per day and health problems

Exposure variable	Outcome variable	p-value
No. of beedis rolled per day	Musculoskeletal problems	0.564
	Respiratory problems	0.734
	Ocular problems	0.156

Table 5 : Association between work experience and health problems

Exposure variable	Outcome variable	p-value
Work experience (years)	Musculoskeletal problems	0.258
	Respiratory problems	0.411
	Dermatological problems	0.726

It was observed that occurrences of skin problems and problems related to eye were significantly associated with the number of beedis rolled per day and work experience respectively.

Table 6 : Association between number of beedis rolled per day and skin problems

No. of beedi rolled per day	Number of participants with any of the skin problems, n(row%)	Number of participants without any skin problems, n(row%)	Total number of participants	p-value
<=800	69 (43%)	93 (57%)	162	0.013
>800	123 (55%)	99 (45%)	222	

It was observed that the association between number of beedis rolled per day and skin related problems were found to be statistically significant (p=0.013). The result indicates that people rolling more than 800 beedis per day were more vulnerable to skin diseases.

Table 7 : Association between work experience and eye symptoms.

Work experience (years)	Number of participants with eye symptoms, n (row%)	Number of participants without eye symptoms, n (row%)	Total number of participants	p-value
<28	111 (85%)	19 (15%)	130	0.042
29-33	141 (93%)	10 (7%)	151	
>34	96 (93%)	7 (7%)	103	

Among the participants who were working in the beedi industry for more than 28 years, 93% of them had problems related to eye. The association between years of work in beedi rolling and eye related problems were found to be statistically significant (p=0.042) which shows that occurrences of eye problems were dependent on the number of years engaged in beedi rolling.

Working environment assessment has shown that all the beedi manufacturing units had adequate lighting and ventilation. Out of the ten units, six units had clean and orderly work area but only three had hand/eye wash facility. Eating area or cafeteria was not present in any of the units, and the workers were eating in the same stations where they roll beedi. There was no proper fire response plan adopted in any units. None of the units provided PPE (face masks or gloves) to the workers. Even though working in standing position is avoided, they were working in forward bending posture for long with repetitive movement of shoulder, arm, and wrist. None of the workers were informed about the risks related to these improper work postures, and no training has been given in this regard.

DISCUSSION:

Beedi workers face numerous health problems, possibly due to direct inhalation or exposure to tobacco dust and sitting in one position continuously for hours with repetitive movements. Apart from comorbid conditions like diabetes and hypertension etc.., some respondents were suffering from allergy, headache, and weakness. It was clear that Musculoskeletal problems, respiratory problems, and problems to skin and eye were common among the beedi workers. In this study, majority (90%) complained of problems related to eye,

followed by musculoskeletal problems (87%). Problems of eye as reported by the workers mainly included blurred vision, irritation, and redness. Similar findings were seen in studies, where 70% of the workers had problems to eyes.[10] Exposure to tobacco and the resultant changes in epithelium and mucus membranes have also been reported.[11]

The most common musculoskeletal problem as reported by the workers included shoulder pain, lower back pain, neck pain and pain in knee joint. Similar study among the beedi workers in Andhra Pradesh reported that about 90% of the workers developed pain in various parts of the body, the most frequent being shoulder pain and back pain.[12]

Respiratory problems were also prevalent among the workers and most of them complained about shortness of breath, wheezing, cough, and phlegm. Studies have detailed the effects of tobacco dust on respiratory system.[13,14]

Skin manifestations reported includes callosities, skin itching, rough skin and pigmentation. Skin diseases among tobacco workers have also been reported [15].

The occurrences of problems related to eye and skin were comparatively higher among workers with longer work span and those who rolled a greater number of beedis in a day.

Allergy, headache and generalized weakness or fatigue were other common health problems encountered in this group. The toxic effects of nicotine in the body manifesting similar health issues have been reported in studies.[16].

The study revealed that women beedi rollers faces numerous health problems. There is a need to impart education to the beedi rollers regarding the health hazards caused by tobacco and the need to use protective clothing such as mask, gloves etc. Also, there is a need to provide awareness regarding risks of working in improper postures for longer duration.

CONCLUSION:

Beedi rollers mostly work in the same posture continuously for hours and in the dusty environment without using proper safety measures such as mask, gloves etc.. Occupational health hazards such as musculoskeletal problems, respiratory problems, and problems related to eye and skin were prevalent among workers which is more likely due to the longer working hours and continuous exposure to tobacco. Conducting awareness programmes on risk reduction and regular medical check-ups at the beedi manufacturing units by governmental or non-governmental organizations might reduce the health problems related to the profession.

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