



Occupational Health Problems Amongst Women Beedi Rollers in Jhansi, Bundelkhand region, Uttar Pradesh

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Abstract: *The aim of this study was to investigate the prevalence of occupationally related health problems among women beedi rollers in Jhansi, Uttar Pradesh, Bundelkhand region, India. Beedi rolling is a serious occupational health hazard as these workers are constantly exposed to tobacco dust, fumes and other dangerous chemicals viz: nitrosamines and nicotine which are readily absorbed by the body through skin, respiratory epithelium and mucous membrane of mouth, nose and intestine. Exposure to tobacco dust is known to affect the respiratory tracts in humans. Present study revealed that women beedi rollers face numerous health problems possibly due to direct inhalation of tobacco flakes. This study included 216 females (mean age 39.17 ± 11.95 Years) actively involved in beedi rolling to ascertain the effect of beedi rolling on health. The study found that majority of the respondents complained problems i.e. joint pain, eye problems, Nervous and skin diseases. Increased systemic exposure to tobacco constituents was evident from the high levels of creatinine in urine samples. Thus beedi rolling causes serious health problems in women.*

Keywords: Beedi rollers, Creatinine, Health hazards, Occupational exposure, Tobacco dust.

Introduction

A beedi is a forest product also called as thin South Asian cigarette or poor man's cigarette or Indian country cigar. It contains 0.2–0.3 g of tobacco flake wrapped in a nonporous tendu (*Diospyrox melanoxylon*) leaf or temburni leaf and secured with coloured thread at both ends. The tendu leaf constitutes 60% of the weight of a beedi. The beedi leaf is 4 to 8 cm in length, diameter at the closed end is 0.6 to 0.8 cm and the width at the smoking end is 0.7 to 0.9 cm. Tobacco leaves mainly contain specific chemicals such as nitrosamines, formaldehyde, acetaldehyde, crotonaldehyde, hydrazine, arsenic, nickel, cadmium, benzopyrene, and potassium which are known toxins. Tobacco also contains nicotine which is readily absorbed by all the body tissues including skin, respiratory epithelium, the mucous membrane of the mouth, nose and intestine. According to Bagwe and Bhisey (1991) and

Swami *et al.* (1995) beedi rollers are exposed to unburnt tobacco, mainly through the cutaneous and nasopharyngeal routes. Beedi making essentially involves six steps; the first three are wetting, drying and cutting the tendu leaves then followed by placing tobacco inside the tendu leaf, rolling the leaf and securing it with a thread. Story of workers narrated by Swaminathan (2012) stated that Beedi workers in India, the third largest component of the work force in India after agricultural workers and textile workers, live and work in conditions of poverty and exploitation. Rolling beedi, an indigenous, handmade cigarette, has provided employment for millions of Indians (Mehra-Kerpelman, 2007). Beedi rolling is a popular small-scale industry in Jhansi, Uttar Pradesh, Bundelkhand region, India. It is an arduous, labour intensive task because each beedi is rolled individually. Beedi rolling is done by women and girls sitting at home and is regarded as primarily women's work. Srinivasulu

(1997) reported that 90% of beedi workers are women. In a situation peculiar to India, workers who process dry tobacco leaves into blends used for the manufacture of beedi the Indian version of a cigarette (Indian cigar), inhale large amounts of tobacco dust. Occupational health studies in this sector initiated as early as seventies amongst tobacco workers, showed an elevated level of

nicotine in the urine samples (Ghose *et al.* 1979). This study was made to assess the health problems faced by the women beedi rollers in India.

Materials and Methods

Bundelkhand region is a gateway between north and south India. It is located between 23°20' and 26°20' N latitude and 78°20' and



Fig. 1 Showing actual scenario of beedi rolling inside and outside the home.

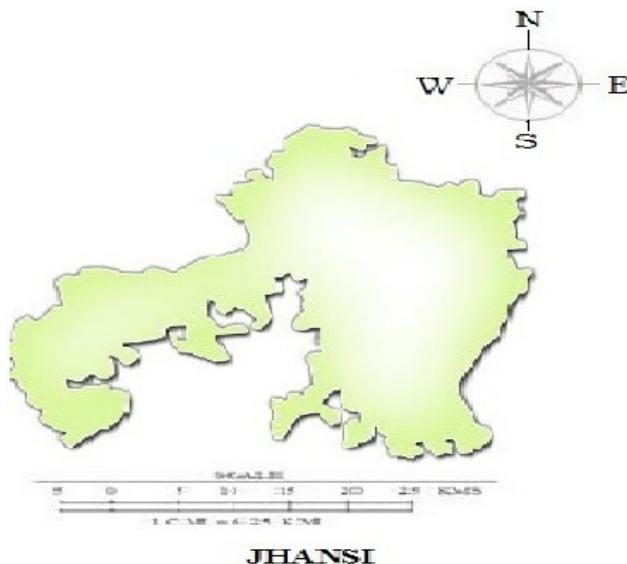


Fig. 2 Map showing study area.

81°40' E longitude (Fig. 2). Administratively the region comprises of thirteen districts.

A total 216 female respondents were selected that constitute a very high percentage of labour force in the beedi rolling at their homes. Female beedi rollers with no smoking or chewing habits were also monitored.

The study subjects were interviewed and a questionnaire was filled for each subject, which included details about their age, educational qualification, working year, daily working hours, beedi rolled per day, monthly income and health problems faced by them. Relevant information was collected by visiting the house of each beedi roller.

Urine sample was collected from each female beedi roller in 20 ml sterilized glass bottles and stored at 4°C temperature. This was followed by analysis of urine profile of 15 female beedi rollers and 15 controls. The control group was selected from the general women population

(mainly fruit, vegetable, fish sellers), with no history of occupational exposure to tobacco and without any tobacco smoking or chewing habits, but belonged to the same age group and socio-economic status as the women beedi rollers. Creatinine was determined by alkaline picrate method (Toro and Ackerman, 1975).

Results and Discussion

It was found that women in the age group of 31–40 years were mainly engaged in beedi rolling (Table 1). They had been working in this profession for 20–25 years, suggesting that they started their profession at an early age. The average daily working hours and beedis rolled per day are 8.16 and 428.47 respectively. About 90% of the women are illiterate. All respondents belonged to the poor socio-economic status. The average monthly income of women beedi rollers was Rs. 300–1500/-.

Table 1 General information of female beedi rollers.

S. No.	Parameter	No. of respondents (%) [*] Total beedi rollers (n = 216)	Mean ± SD
1.	Age in year (range)		
	15–30	47(21.76)	23 ± 4.68
	31–40	73(33.80)	35.26 ± 2.45
	41–50	59(27.31)	45.66 ± 3.02
	51–60	29(13.41)	54.79 ± 2.55
	61–75	08(03.70)	65.25 ± 4.46
2.	Sex – female	216(100)	-
3.	Socio-economic status – poor	216(100)	-
4.	Educational qualification		
	Primary (<10th Std.)	23(10.65)	5.87 ± 1.82
	Illiterate	193(89.35)	-
5.	Working characteristics		
	Working years range	(01–55)	24.40 ± 12.07
	Daily working hours range	(02–16)	8.16 ± 2.68
	Beedis rolled per day range	(100–1000)	428.47 ± 129.35
6.	Monthly income	Rs. 300–1500	

^{*}Percentage (%) of respondents under each category is given in parenthesis.

Various health problems as revealed by present survey amongst female beedi rollers are summarised in Table 2. The study revealed that women beedi rollers face numerous health problems possibly due to direct inhalation of tobacco flakes and dust and sitting in one position for hours at a time. These workers suffered from respiratory, eye, osteological, dermatological and nervous problems. Yasmin *et al.* (2010) reported that more than 70% of the beedi rollers

suffered from eye, gastrointestinal and nervous problems while more than 50% of the respondents suffered from respiratory problems, mostly throat burning and cough. More than 75% of the respondents faced osteological problems. Ranjitsingh and Padmalatha (1995) reviewed that beedi rollers were affected by respiratory disorders, skin diseases, gastrointestinal disorders, gynaecological problems, lumbosacral pain and are susceptible to fungal diseases,

Table 2 Summary of occupational health problems in female beedi rollers.

S. No.	Characteristics	No. of respondents (%)*
1.	Respiratory problems	
	Asthma	04 (1.85)
	Cough	19 (8.80)
	Tuberculosis (TB)	07 (3.24)
	Throat burning	11 (5.09)
	Chest pain	08 (3.70)
2.	Osteological problems	
	Shoulder pain	17 (7.87)
	Neck pain	06 (2.78)
	Swelling & pain in limbs	14 (6.38)
	Joint pain	51 (23.61)
	Back pain	16 (7.41)
3.	Eye problems	
	Eye watering	16 (7.41)
	Eye pain	04 (1.85)
	Eye burning	17 (7.87)
	Poor vision	36 (16.67)
4.	Nervous problems	
	Headache	32 (14.81)
5.	Skin problems	
	Skin tanning	42 (19.44)
	Rough skin	22 (10.19)

*Percentage (%) of respondents under each category is given in parenthesis.
n = 216

Table 3 Specific gravity and Creatinine of urine in women beedi rollers of Jhansi.

Parameter	Normal range	Control (n = 15)	Beedi rollers (n = 15)
Specific gravity	1.012 to 1.030	1.013± 1.050	1.017±1.070
Creatinine (gm/l)	0.90 – 1.60	1.40 ± 0.32	4.56 ± 2.94

Values are Mean ± SD.
n = 15.

peptic ulcer, haemorrhoids and diarrhoea. Numbness of the fingers, breathlessness and stomach pain including cramps and gas, have also been reported in beedi rollers (Dikshit and Kanhere 2000; Rajasekhar and Muley 2001).

Majority of the respondent complained problems related to musculoskeletal system specially joint pain (49%), eye problem specially poor vision (49%). Das and Pande (2000); Kuruvila *et al.* (2002) and Mittal *et al.* (2008), reported that postural pains, eye problems and burning sensation in the throat are common ailments in women beedi rollers. Present discretions are summarised in Table 2.

The respiratory problem specially cough (39%) was caused by direct inhalation of tobacco dust and flakes. Respiratory problems in workers occupationally exposed to tobacco has been confirmed by several workers (Valic *et al.*, 1976; Lander and Gravesen 1988; Kjaergaard *et al.*, 1989; Mukhtar *et al.*, 1991; Osim *et al.*, 1998; Bhisey *et al.*, 2006). The female beedi rollers also suffered from nervous and skin problems specially headache (33%) and skin tanning (44%) respectively. This may be due to nicotine and tobacco dust absorbed through the skin of the fingers and palm distributed throughout the body. Toxic effects of nicotine on nerves have been well explained (Taylor, 1996). Ratna and Kaur (1999) and Aghi and Gopal (2001) reported induration of the hands and complications of pregnancy in women beedi rollers. Sardesai *et al.* (2007) found that women beedi rollers deliver low birth weight babies.

The age difference between beedi rolling women and controls was insignificant. Creatinine value of the beedi rollers was significantly higher in comparison to the control subjects (Table 3). The normal value of creatinine for female is 0.9 to 1.6 gm/24 hours. It represents kidney dys function. Creatine is a source of energy for muscle contraction. Excess concentration of creatinine (anhydride of creatine) in urine is known as creatinuria. Increased quantities of creatinine are found in advanced stage of renal disease. It can be attributed to increased inhalation and nicotine.

The study revealed that women beedi rollers face numerous health problems possibly due to direct inhalation of tobacco flakes and dust range from about 1 to 100 µm in diameter. Preventive measures should be applied i.e. protective clothing such as gloves masks etc. Also, there is a need to provide alternative livelihood options from the point of view of economic viability and skills of women.

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