Original Research Article

Associated with the morbidity of the Bidi workers in village (Chhatar Gachh), Kishanganj district

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Abstract

Tobacco consumption is the leading preventable cause of disease, disability and premature death, but little is known about its deleterious effect on the health of workers handling tobacco. **Methods:** Present study was conducted in the village of Chhatar Gachh. Chhatar Gachh is a large village located in Pothia Block of Kishanganj district, Bihar with total 1188 families residing. The Chhatar Gachh village has population of 5993 of which 3110 are males while 2883 are females as per Population Census 2011. A vast majority of the people live in the villages. Which is Muslim majority, with Muslims forming about 87.4 per cent of the population, there are also Hindus of whom are Surajpuris(Rajbanshi). There also are small Santal pockets. The study period of the present study was from April 2018 to January 2019, **Results:** Most of the Bidi workers are in the age group 15-40 years, Most of the Bidi worker's BMI are normal, About 62.7% of Bidi workers in the Middle upper class. Majority (89.1%) of study participants were female. Most of the study population (97.7%) were Muslim. 71.8% participants were married and 91.4% belonged to nuclear family. 29.9% study subjects were illiterate. In respiratory system total 59.1% of Bidi worker were suffering from respiratory morbidity. Thus, all the dimensions of the study variables reveals that the health hazards existing in the Bidi rolling. **Conclusion:** This research revealed the high prevalence of morBidities and other occupational related hazards among study population as well as some of the modifiable risk factors of like Hypertension, DM, duration of work. Use of personal protection equipment's (such as gloves, masks, first aid facility etc).might reduce of these morBidities and Hazards of Bidi workers.
Key words: tobacco, hypertension, tuberculosis, diabetes mellitus, respiratory distress.

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INTRODUCTION

The organization of production process of Bidi at Pothia block in Kishanganj district could be of two types. In Factory System there is a direct relationship in between the Bidi merchants and the workers who roll Bidi at the factory shed. In Contractor System there is no direct relationship in between the workers and the Bidi merchants. The contractors act as middleman in between them. The Bidi merchants appoint some contractors who provide raw materials to the home based Bidi workers who roll Bidi at their home and return it to the merchants' factory via the contractors. Recent industrialization and globalization are changing the visage of occupation morbidity drastically all over the world. Traditionally labour oriented markets are moving towards greater automation and mechanization, paving way to more diverse set of occupational related diseases and injuries. Exposure to occupational hazards increases the risk of morbidity and mortality.[1] The Bidi rollers are starting their profession at very early age of their life. A number of health problems have been reported especially for the woman Bidi rollers. The continuous exposure to the tobacco dust became the source of some

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common diseases to almost all workers. The process of Bidi rolling releases large amount of waste particles of tobacco and Tenduleaves and that dusty work environment seriously affect the workers. The rollers are not using protective clothes, gloves or masks and are directly exposed to dusty environment. For the woman who worked at home in small huts with very little ventilation, the tobacco dust remains in the home where woman and their families eat, sleep and spend their entire time. This results they are being constantly exposed to conditions that mare more hazards to their health. The Bidi dust that is in the air therefore affects not only the Bidi roller but also their entire family too, leading to respiratory problems. The main health problems associated with Bidi rolling are body ache and eye strain. The most commonly found problems are asthma, tuberculosis, back strain, spondelitis, swelling of lower limbs and digestion problems. For woman the problems related to menstruation and pregnancy where they have heavy bleeding and lower back pain during menstruation and pain in lower abdomen. The woman employees are always affecting large number of miscarriages. Accessibility to health care facilities is not in satisfactory levels to these employees. Though the laws which seek to protect the interest of Bidi workers, the real benefit dose not reach the workers. The law is flouted in various ways and the workers are exploited. They are helpless because of poverty and lack of awareness. The labour laws are evading by the middle men, contractors and manufacturers by resorting to various tactics. The Bidi sector started as a house hold occupation gradually changed in to organized sectors and also co-operative societies are formed work together in Bidi making process and to improve the conditions of workers. At present the main problem which faces the workers are their poor socio economic status, education and training, which force them to work in unsafe environmental conditions. Our government has provided various welfare measures and schemes for the Bidi workers, like health schemes, education schemes, housing scheme, and social security etc. But the socio economic status of the Bidi workers remain at law level since the welfare measures are insufficient in comparison to the number of Bidi workers. This poor socio economic status of Bidi workers forced them to work continuously for hours in improper working posters and beyond the normal working capacities. This situation led to the development of health hazards among Bidi rollers. So there is a need to identify the occupational health hazards and the problems associated with their safety. The Govt. of India as well as various state governments with the support of judiciary has launched tobacco free initiatives in the form of legislations and notifications.

Some of the health effects experienced by Bidi workers include pain and cramps in the shoulders, neck, back and lower abdomen.[2] The incidence of tuberculosis and bronchial asthma is higher than that among the general population, according to research by the Factory Advisory Services and Labor Institute in Bombay, a unit of the Labor Ministry of India.[3]The International Labor Organization cites ailments such as exacerbation of tuberculosis, asthma, anaemia, giddiness, postural and eye problems, and gynaecological difficulties among Bidi workers.[4]Reports from asearly as the 1970s relate the concerns of trade union leaders in Maharashtra that 50% of Bidi workers eventually died from tuberculosis or asthma.[5]Diseases such as tuberculosis are more easily transmitted when ventilation is poor and many Bidi workers work inside smoky households with open hearths, exposed to tobacco dust as wellas indoor air pollution. Tuberculosis is also associated with poor nutritional status. Bidi rollers often complain of loss of appetite, due to monotony as well as the smell of the raw materials. Bidi workers recognize the negative health effects and some women attempt to reduce harm bydrinking small amounts of nutritional supplements (tonic) or taking multi-vitamin injections, apopular practice in some areas of South India.[6]

Morbidity refers to the diseases and illness, injuries and disabilities in a population. Morbidity indicators are used to supplement mortality data to describe the health status of a population. Mortality indicators do not reveal the burden of ill health in a community, as for example, mental illness and rheumatoid arthritis. In general, countries at higher stages of social and human development report higher morbidity rates and vice versa. Morbidity statistics also tend to overlook a large number of conditions which are sub clinical, that is hidden part of the ice berg of the disease. The organization and production process of Bidi in Pothia block under Kishanganj district. In Factory system there is a direct relationship between the Bidi merchants and workers who roll Bidi at the factory shed. In Contractor system there is no direct relationship between Bidi merchants and workers. The contractors act as middle man in between them. The Bidi merchants appoint some contractors who provide raw materials to the home based Bidi workers who roll Bidi at their home and return it to the merchants' factory via contractors. This study was conducted at chhatar Gachh in pothia block, where the maximum concentration of home based Bidi workers can be found within the Kishanganj district.

METHODS

Type of study: Community based observational study.
Study design: Cross -sectional study.

Study area: Present study was conducted in the block of Pathia of Kishanganj district in Bihar**.** Chhatar Gachh, is a place located in Bihar, region.

Geography of Chhatar Gachh:

Chhatar Gachh. is a Village in Pothia Block in Kishanganj District of Bihar State, India. It belongs to Purnia Division . It is located 25 KM towards North from District head quarters Kishanganj. 11 KM from Pothia. 353 KM from State capital Patna Chhatar Gachh. Pin code is 855117 and postal head office is Taiyabpur . Koltha (4 KM) , Kharudah (5 KM) , Jiran Gachh (6 KM) , Jahangirpur (7 KM) , Paharkatta (7 KM) are the nearby Villages to Chhatar Gachh.. Chhatar Gachh. is surrounded by Thakurganj Block towards North , Islampur Block towards East , Kishanganj Block towards South , Goalpokhar-I Block towards South .

Chhartar Gachh Profile:

According to 2011 report, In Chhatar Gachh village population of children with age 0-6 is 1200 which makes up 20.02 % of total population of village. Average Sex Ratio of Chhatar Gachh village is 927 which is higher than Bihar state average of 918. Child Sex Ratio for the Chhatar Gachh as per census is 1048, higher than Bihar average of 935. Chhatar Gachh village has lower literacy rate compared to Bihar. In 2011, literacy rate of Chhatar Gachh village was 56.60 % compared to 61.80 % of Bihar. In Chhatar Gachh Male literacy stands at 62.08 % while female literacy rate was 50.51 %.

Study setting:

Six villages under Pothia block namely

Study period:

The study period of the present study was from April 2018 to January 2019, total period of 10 months.

Inclusion criteria:

- People staying at least 6 months at his residence.
- At least 6 months of work experience was the criteria for eligibility of the study.

Exclusion criteria:

- Not available after 3 successive home visits.
- Unwilling individuals.

Sample size:

Based on the prevalence 36% of a study conducted by Srinivasan, Dr.Pilangoetal(give in reference) with relative allowable error 15% the sample size will be 105 using formula $4pq / L^2$

Study technique:

- Interviews of people from house to house visits with predesigned pretested structured interviewer administered questionnaire.
- Anthropometric measurement and physical examination.
- Review of Medical records.

RESULTS

Table 1: Distribution of the Study Participants according to demographic, socioeconomic and environmental Characteristics (n = 174)

Variables	Category	Number(%)
Age in completed years	15 – 30 yrs.	105 (60.3%)
	30 - 41 yrs.	35 (20.1 %)
	42 - 50 yrs.	20 (11.5 %)
	51 yrs onwards.	14 (8.0%)
	Mean ± SD	26 ± 11
sex	Male	19 (10.9 %)
	Female	155 (89.1%)
Education	Illiterate	52 (29.9 %)
	Up to primary(Class I- IV)	72 (41.8%)
	Middle (Class V-VIII)	48 (25.7 %)
	Secondary(IX -X)	1 (0.6 %)
Marital Status	Unmarried	47 (27.0 %)
	Married	125 (71.8 %)
	Widow	2 (1.14 %)
Income As per B. G. Prasad Scale, 2018 PCI<811,(Lower class) 800-1500 (lower middle class), 1500-2500 (Middle class), 2600-5000 (Middle upper class), 5500-and above (Upper Class)	1500-2500 (Class III) 2600-5000 (Class II) 5500-and above (Class I)	57 (32.7%) 109 (62.7%) 08 (4.6%)
Religion	Hindu	04 (2.3 %)
	Muslim	170 (97.7 %)
Type of family	Nuclear	159 (91.4%)

Variables	Category	Number(%)
	Joint	15 (8.6%)
No. of Family Members	Mean ± SD	5 ± 2
Wife's occupation	Unskilled	21 (12.0 %)
	Housewife	153 (88.0%)
Husband's occupation	Skilled labour	23 (13.2%)
	Unskilled	151 (86.8%)
Type of house	Semi pukka	96 (55.2%)
	Pukka	78 (44.8%)
Type of latrine	Sanitary	142 (81.6%)
	Other	32(18.4 %)
Source of water supply	Tube well	174 (100.0%)

Table 2: Distribution of the Study population according to work habit Characteristics (n = 174)

Variables	Category	Frequency (%)
Duration of work	< 5yrs	42 (24.1%)
	5 to 10 years	82 (47.1%)
	>10yrs	50 (28.7%)
	Mean ± SD	7 ± 3
Working hours (per day)	7-8 hrs	112(64.4%)
	8-9 hrs	42(24.1%)
	10-11 hrs.	20 (11.5%)
	Mean ± SD	8 ± 2

Table 3: Distribution of the Study population according to Self Reported morBidities (n = 174)

Variables	Category	Number (%)
Cough	Yes	109(62.6%)
	No	65(37.3%)
Duration of cough (n=205)	<15d	74 (67.9%)
	15-30d	33 (30.3%)
	>30d	2 (1.8 %)
Expectoration	Yes	95(54.6%)
	No	79(45.4%)
Sneezing	Yes	24(13.8%)
	No	150(86.2%)
Chest pain	Yes	61(35.0%)
	No	113(65.0%)
Breathlessness	Yes	95(54.6%)
	No	79(45.4%)
burning of eyes (during or after work)	Yes	22(12.6%)
	No	152(88.4%)
Watering of eyes	Yes	25(14.4%)
	No	149(85.6%)
Headache	Yes	19(10.9%)
	No	155(89.1%)
Dizziness	Yes	13(7.5%)
	No	161(92.5%)
Vertigo	Yes	16 (9.2%)
	No	158(90.8%)
Hyperaesthesia	Yes	12(6.9%)
	No	162(93.1%)
Hypo aesthesia	Yes	15(8.6%)
	No	159(91.4%)
Nausea	Yes	20 (11.5%)
	No	154 (88.5%)
Itching	Yes	12(6.9%)
	No	162(93.1%)
scabies	Yes	26 (14.9%)

Variables	Category	Number (%)
	No	148 (85.1%)
-Dermatitis	Yes	4 (2.3%)
	No	170 (97.7%)
Musculoskeletal Problems Both Sides where applicable	(Duration 7 days)	
Neck	yes	145 (83.3%)
	no	29 (16.7%)
Shoulder	yes	135 (77.6 %)
	no	39 (22.4%)
elbow	yes	112(64.4 %)
	no	62 (35.6 %)
Wrist	yes	42 (24.1%)
	no	132 (75.9%)
Hip /Thigh	Yes	55 (31.6%)
	No	119 (68.4 %)
Knee	Yes	98(56.3 %)
	No	76(43.7 %)
Upper Back	Yes	92(52.9%)
	No	82(47.1 %)
Lower Back	Yes	105(60.3 %)
	No	69 (39.7%)
Ankle/Feet	Yes	72(41.4%)
	No	102(58.6 %)
Anxiety	Normal	111(63.7%)
	Mild	23 (13.2%)
	Moderate	27 (15.5%)
	Severe	13 (7.5%)
Depression	Normal	135 (77.6%)
	Mild	31(17.8%)
	Moderate	08 (4.6%)
Mental stress (by Das scale)	Normal	133(76.4%)
	Mild	32 (18.4%)
	Moderate	09(5.2%)

Table 4: Distribution of Study population (Female participants of reproductive age group) according to past obstetric complications (in last 10 years) (n = 103)

Variables	Category	Number (%)
Spontaneous abortion	Yes	05(4.8 %)
	No	98 (95.2 %)
Low birth weight	Yes	15 (14.6 %)
	No	88 (85.4 %)
Still birth	Yes	04(4.9 %)
	No	99 (95.1 %)

*Out of 155 female participants 99 belonged to reproductive age group (15-49 yr)

Table 5: Distribution of the Study population according to history of chronic diseases (in last one month) (n = 174)

Variables	Category	Frequency (%)
Tuberculosis	Yes	15 (8.6%)
	No	159 (91.4%)
Diabetes Mallitus	Yes	30 (17.2 %)
	No	144 (82.8 %)
Hypertension	Yes	19 (10.9 %)
	No	155 (89.1 %)
Ischemic Heart Disease	Yes	12 (6.9 %)
	No	162 (93.1 %)
Asthma/COPD	Yes	45 (25.8 %)
	No	129 (74.2 %)

Table 6. Shows the distribution of Bidi workers according to Examination (n=174)

Clinical Exam. finding	Category	Frequency (%)
pallor	Present	15 (8.6 %)
	Absent	159 (91.4%)
clubbing	Present	10 (5.7 %)
	Absent	164 (94.3 %)
cyanosis	Present	11 (6.3 %)
	Absent	163 (93.7%)
oedema	Present	22 (9.4 %)
	Absent	152 (90.6 %)
lymadenopathy	Present	19 (12.6 %)
	Absent	155 (87.4 %)

Table 7: To find out the factors associated with the morbidity of the Bidi workers(n=52)

Variable	Category	Poor health
		Number (%)
Age	>25 yr (Mean)	29 (55.8%)
	≤25 yr	23 (54.2%)
Sex	Female	50 (90.2%)
	Male	02 (09.8%)
Education	Up to primary	23 (44.2%)
	Above primary	29 (55.8%)
Marital status	Married	44 (84.6%)
	Others	09 (15.4%)
PCI per month	≤ Rs 5000 (median)	32 (61.5%)
	>Rs 5000	20 (38.5%)
Type of Family	Joint	16 (30.8%)
	Nuclear	36 (69.2%)
Type of housing	Semi pukka	29 (55.8%)
	Pukka	23 (44.2%)

Table 8: Logistic Regression by Forward Conditional method

	Independent variable		Dependent variable	
			AOR (95% CI)	P-value
Step 1	age	Yes	0.322	0.001
Step2	age	Yes	0.212	0.000
	Duration of work	yes	2.147	0.000
Step 3	age	Yes	0.168	0.002
	Duration of work	yes	11.23	0.000
	Manufacturing of Bidi	yes	0.187	0.000
Step 4	age	Yes	0.214	0.001
	Duration of work	yes	6.744	0.000
	Manufacturing of Bidi	Muslim	0.142	0.002
	Type of Family	Joint	3.255	0.001
Step 5	age	Yes	0.124	0.000
	Duration of work	yes	7.324	0.000
	Manufacturing of Bidi	yes	0.125	0.001
	Type of Family	Joint	2.150	0.001
	Education	Illiterate	0.425	0.002

- Variables entered on step 1. age
- Variables entered on step 2. duration of work
- Variables entered on step 3. Manufacturing of Bidi
- Variables entered on step 4. Type of Family
- Variables entered on step 5. education

DISCUSSION

An epidemiological study was conducted for a period of ten months in block of Pothia and villege of Chhatar Gachh in Kishanganj district under Bihar. A total of 174 study subjects were interviewed and Data was collected. This was a descriptive study with cross-sectional design to assess morbidity profile of Bidi workers among adult population.

Out of total of 174 study subjects, The age structure of the study subjects had been categorized into four groups, namely: 15- 30 years,30-41 years,42 50 years and 51 years onwards, with majority of the subjects(60.3%) belonging to the 15-30 years age group followed by 20.1% in 30 - 41 years age group and lowest (8.0%) were aged 51 years and above. Mean and SDvalue of age was 26±11. Mahesh v hedge, Ajiths, Kavithashettyetal, 2015 in study of Bidi workers revealed that the mean age of women in the study was 37 years (range, 20 to40years).[7] Madhusudan m, Dipak patil, Jayarams *et al* study where mean age of the study subjects was 40.8 years (SD 11.3).[8] KouserBanu K, Sitalakshmi R. PadmavathiRetal *et al* study where both sexes of age were 20 to 50 years .[9] It was observed that these findings in my study were similar to the findings of previous studies of several research workers mentioned above. In my study with174 respondents in the age group15 years and onwards it was found out that pre valence was (89.1%) of study subjects among females and 10.9% among males. Madhusudan m, Dipak patil, Jayarams *et al* study of Bidi worker (98.2%) were females and 8 (1.8%) were males.[7] Thus the results of above study were similar to that of my study. Significant proportion women worked as a Bidi roller in rural area and dependent for their livelihood. In fact, some economists have used the term labour of love. In this study Women worked due to earning extra money for their future economic security and livelihood during seasonal period. With respect to Religion more than three fourths of the respondents (97.7%) are practising Islamic faith and only (2.3%) belong to the Hinduism as opposed to the B.K Sharma *et al* study where 71% practiced Hinduism whereas 24.4% belonged to the Islamic faith .Whereas Sanjoy Kumar Chanda *et al* study had contrastingly different results with 93.3% subjects practising Islam and only 6.7% practising Hinduism.[10] Madhusudan m, Dipak patil, Jayarams *et al* study (431)Bidi workers where Hindu 336(77%) Muslim 98(22%).[8] The respondents showed wide range of highest attained educational level 41.8% of the subjects had completed till up to primary of education, 1% till secondary and 25.7% till middle classes .But only 29.9% were illiterate. Among the Bidi workers 0.6% were chewing commercial and non-commercial smokeless tobacco products like gul, gutkhas, khaini, and 0.8% were current smoker and 0.5% were current alcoholic. This substance had a close relationship with that of occurrence of oral morbidity this low socio-economic poor education backward aged class workers also believe that chewing betal was beneficial for health.

The results are different from Sarfaraz Khan *et al* study, Rinko Kinoshita *et al* study ShahnajParveen *et al* study and Rashmi Sharma *et al* where 31% , 52.9% , 50% and 42.9% of the respondents were illiterate respectively. . Chandra kanta das *et al* study that illiterate 60% and literate 30% were present. Madhusudan m. Dipak patil, Jayarams *et al* study,(22%) subjects were illiterates, Primary (26%) Middle (34% Secondary (16%) PUC/Degree (2%).[8] Moreover B.K Sharma *et al* study showed that 30% of the subjects were graduate and 14.5% post graduates unlike the present study where only 7.3% respondents had completed graduation and none had studied till post graduation level[11] Talking about the employment status of the respondents, were employed in skilled or semi-skilled jobs but majority of the married respondents were homemakers (88.0%) where majority of the married respondents were homemakers. But a Ghana study had 89% of the respondents being employed in a job.[12] According to the Modified B.G Prasad scale (May 2014) majority of the respondents (42.7%) belonged to Level IV of socio-economic status whereas none belonged to Level I. Besides, 83.3% of the respondents belonged to nuclear family with only 91.4% residing in a joint family set up similar to other studies where mostly the respondents belonged to nuclear family. But a study conducted in A.P had majority of subjects (58%) hailing from joint families. Majority of the respondents (71.8 %) were married with only (27.0%) being unmarried. These percentages were different from the Muzamil Jan *et al* study(65) where 50% of the respondents were married and the rest were unmarried. Besides 85.6% of the married respondents were married before the age of 18 years.. Madhusudan m, Dipak patil, Jayarams *et al* study (431) Bidi worker where status Married 329(75%)Not married 36(8.4%)Widowed 67(15%) Divorcee / separated 7(1.6%) .[8] Almost half (62.7%) of study population belonged to Class II, followed by a quarter (32.7%) in Class III and least 4.6% belonged to class1 socio-economic class as Per Modified B.G Prasad Scale-2018. in this study most of the workers belonged to lower socio economic status. In the present study two third of the study population (55.2%) lived in semi pucca type of house. Shows the univariate and multivariate logistic regression model prepared to determine the respondent's Univariate linear regression presented Age, Marital status, Occupation, Per Capita Income and Family Type as statistically significant predictors of Morbidity of study subject. This Logistic regression was done taking those independent variables which were found significant in

bivariate analysis namely age, Education, type of family, manufacturing of Bidi,

CONCLUSION

The household Bidi rolling industry is a high risk occupation to develop various types of health problems. In respiratory system of Bidi worker were suffering from respiratory morbidity. This research revealed the high prevalence of morBidities and other occupational related hazards among study population as well as some of the modifiable risk factors of like Hypertension, DM, duration of work. Use of personal protection equipment's (such as gloves, masks, first aid facility etc).might reduce of these morBidities and Hazards of Bidi workers. Therefore targeted interventions that promote healthy life styles and reduce the risk factors along with screening for early diagnosis would help in reducing the burden of morBidities and its complications. Future research will be needed to determine the stability of the correction factors for the reduction of the morBidities and Hazards regarding Bidi worker.

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