International Journal of Community Medicine and Public Health
Shaikh S et al. Int J Community Med Public Health. 2025 Jul;12(7):3202-3210
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20252118

Original Research Article

Occupation-related morbidity patterns and their determinants among beedi workers in Murshidabad District, West Bengal

Selim Shaikh[1], Nandu Krishna[2]*, Koustab Ghosh[2], Shubham Vivekanand Chawale[3], Jayita Pal[2], Lamabam Harit[2]

[1]Department of Environment and Occupational Health, Institute of Public Health, Kalyani, Kolkata, West Bengal, India
[2]Department of Epidemiology, All India Institute of Hygiene and Public Health, Kolkata, West Bengal, India
[3]Department of Community Medicine, Lady Hardinge Medical College, New Delhi, India

Received: 13 April 2025
Accepted: 07 June 2025

***Correspondence:**
Dr. Nandu Krishna,
E-mail: nandukrishna@yahoo.co.in

ABSTRACT

Background: Beedi workers are frequently exposed to various health hazards due to ergonomically poor working conditions and lack of safety standards, exacerbating worker risks. The current study aimed to determine major morbidities and their determinants affecting beedi workers of Murshidabad district, thereby laying a way forward to uplift their health and wellbeing.
Methods: A community based cross sectional study was conducted among 420 beedi workers from March to August 2021 in Murshidabad district of West Bengal. Multistage sampling was used to randomly select one village and one municipality of the district. A predesigned pretested questionnaire was used to conduct face-to-face interviews. Data were entered using Microsoft Excel and subsequently analysed in SPSS v20.
Results: Major morbidities among beedi workers were musculoskeletal followed by respiratory and ophthalmological conditions. Multivariate analysis revealed age, marital status, educational level, duration as a beedi worker (in years) and working posture were significant determinants of musculoskeletal morbidity, whereas age, duration as a beedi worker (in years) and number of beedi rolled per day were found to be significantly associated with respiratory morbidities. Similarly, age, education, duration as a beedi worker (in years), number of beedis rolled per day and place of work were found to be significant predictors of ophthalmological morbidities among beedi workers through multivariate analysis.
Conclusions: The occupational environment should be uplifted along with legislation to recognise this occupation as a part of organised sector. Furthermore, stricter authoritative actions are needed to regulate the current workload and improve the health status of beedi workers.

Keywords: Beedi rolling, Eastern India, Health hazards, Predictors, Work environment

INTRODUCTION

"Beedis" or "bidis" are slim, hand-rolled, unfiltered cigarettes made from a distinct type of tobacco known as 'beedi tobacco', which differs from that used in conventional cigarettes.[1] Often called the "poor man's cigarette", beedis in India consist of tobacco flakes rolled in tendu leaves and secured with a thread, making them the most widely used indigenous smoking tobacco product.[2] Globally, tobacco claims 8 million lives annually, with India accounting for 1.35 million deaths and a significant loss of disability-adjusted life years each year.[3-5]

Women are predominantly engaged in beedi rolling, and face regular exposure to toxic substances like nicotine, tar and tobacco dust, ultimately resulting in various harmful consequences including increased risk of all-cause mortality. [6,7] Previous studies have shown that beedi workers are frequently exposed to various health hazards due to ergonomically poor working conditions. The beedi industry being largely unorganized, suffers from a lack of awareness about safety measures, and exacerbates worker risks.[8] The beedi industry currently employs 5 million workers with nearly 2 million of them belonging to tribal communities. This sector represents a vulnerable, unorganised workforce that requires sensitive care and identification of specific factors deteriorating their health. [6-13]

An extensive review of the literature revealed numerous studies exploring the health profile of beedi workers and their working environments. However, most research has been descriptive and lacks predictive risk modelling through advanced statistical methods.[14-18] Although studies have been conducted in both rural as well as urban areas, specifically focusing on women workers, little attention has been paid to identifying those factors causing different occupation related morbidities. Effective disease prevention requires identifying these underlying determinants. The current study addresses this gap by employing multivariate regression analysis to identify demographic, socioeconomic and work-environment related factors associated with predominant occupation related morbidities, while also estimating the prevalence of different morbidities among beedi workers in Murshidabad district of West Bengal.

METHODS

A community based cross sectional study was conducted from March to August 2021 in Murshidabad district of West Bengal, where beedi rolling is a common livelihood among the residents. The study population consisted of all current beedi workers residing in the Jangipur Subdivision. The participants included those who gave informed consent for the study, aged more than 10 years and engaged in this occupation for at least 6 months. Those who were seriously ill or over 75 years of age were excluded from the study.

Jangipur subdivision of Murshidabad district was selected randomly out of the five subdivisions using multistage sampling. Within this sub-division, one rural block (Suti II) and one urban municipality (Dhuliyan) were chosen randomly using the lottery method. Subsequently, one village (Natun Chandra) under a gram panchayat (Jagtai – II) of Suti II block and one ward (ward number 8) under Dhuliyan municipality were chosen randomly. All the necessary administrative permissions were obtained from concerned authorities, and ethical clearance was obtained from Institutional Ethics Committee, Institute of Public Health, Kalyani. Informed written consent was obtained from each participant prior to data collection.

Sample size was calculated using Cochran's formula. Based on a previous study reporting a 19.41% prevalence of pallor and hoarseness among women beedi workers in the urban area of Nadia district, with a 95% confidence interval, 5% absolute precision, and a design effect of 1.75, the calculated sample size was 420. Using the probability proportional to size method, 280 samples were drawn from the village and 140 from the municipality as the population size of the selected village was twice that of the selected municipality. A line list of households with at least one beedi worker was compiled beforehand with the help of health workers. Participants were selected through simple random sampling from the list. If an individual was unavailable or did not consent, next person on the list was approached.

A semi-structured questionnaire was developed to gather relevant information about the socio-demographic, behavioural, housing and other work-related environmental characteristics of the respondents, with a subsequent section addressing occupation related morbidities. The questionnaire, initially prepared in English, was translated into Bengali by a linguistic expert, to ensure semantic equivalence. To verify the translation, it was retranslated into English by two independent researchers who were unaware of the initial English version. Face validity was assessed by public health experts, who also evaluated content validity for each domain. Reliability was also confirmed using the test-retest method. Pretesting and pilot testing were conducted, and the questionnaire was revised accordingly.

Data were imported into Microsoft Excel (MS-Excel 2019) for further cleaning and coding. Descriptive analyses and other statistical analyses were performed by using Statistical Package for Social Sciences (SPSS v20). Descriptive statistics summarized the socio-demographic, economic, behavioural, work environment and morbidity profiles of the beedi workers. Univariate and multivariate regression analyses were done to identify the determinants of predominant morbidities. The variables which were only found to be significant in bivariate analyses were included in multivariate logistic regression, with model's goodness of fit assessed using the Hosmer-Lemeshow test. All tests were two-tailed, and a p-value <0.05 was considered significant throughout the analysis.

RESULTS

The majority of the beedi workers belonged to the age group of 18-30 years (35.2%) with a mean age of 34.91±14.68 years. The study population was predominantly female (78.3%), all were Muslim (100%) and nearly half were illiterate (46.2%). Most of the workers were currently married (73.6%) and reported an average monthly income between Rs. 1000 to Rs. 1500 with a mean of Rs. 1525.00±312.08.

Table 1: Distribution of study population according to socio-demographic, occupation and housing characteristics (n=420).

Variables	Frequency (N)	Percentage (%)
Socio-demographic characteristics		
Age (in completed years)		
<18	51	12.1
18-30	146	35.2
31-40	96	22.9
41-50	55	13.1
51-60	53	12.6
>60	17	4.1
Sex		
Male	91	21.7
Female	329	78.3
Religion		
Muslim	420	100.0
Educational status		
Illiterate	194	46.2
Primary	137	32.6
Secondary	68	16.2
Higher secondary	20	4.8
Graduation & above	01	0.2
Marital status		
Married	309	73.6
Unmarried	79	18.8
Widowed	31	7.4
Divorced	01	0.2
Average monthly income		
1001-1500	244	58.1
1501-2000	165	39.3
2001-2500	9	2.1
2501-3000	2	0.5
Occupation related characteristics		
Years of work		
<5	61	14.5
5-10	103	24.5
11-15	84	20.0
16-20	62	14.8
21-25	20	4.8
26-30	35	8.3
>30	55	13.1
Place of work		
Indoor	402	95.7
Outdoor	18	4.3
Number of beedi rolled/day		
<500	35	8.3
500-1000	370	88.1
1001-1500	15	3.6
Average time of beedi rolling/day (in hours)		
1	3	0.7
2	240	57.1
3	172	41.0
4	5	1.2

Continued.

Variables	Frequency (N)	Percentage (%)
Average days of beedi rolling/week		
2	12	2.9
3	252	60.0
4	156	37.1
Cross ventilation at working area*		
Present	418	99.5
Absent	2	0.5
Adequate lighting at working area*		
Present	13	3.1
Absent	407	96.9
Working posture*		
Ergonomic	190	45.2
Non-ergonomic	230	54.8
Housing condition		
Type of house		
Pucca	10	2.4
Semi-pucca	402	95.7
Kutcha	8	1.9
Source of drinking water		
Piped/tap water	196	46.7
Tube well	224	53.3
Type of fuel used for cooking		
Firewood	197	46.9
LPG	1	0.2
Combination	222	52.9
Method of solid waste disposal		
Public dustbin	168	40.0
Open disposal	252	60.0

*as per observation during data collection

Table 2: Determinants of musculoskeletal morbidity (n=420).

Variables	Categories	Musculoskeletal morbidity		Test of significance (x2), df, P value	OR (95% CI)	AOR (95% CI)
		Yes N (%)	No N (%)			
Age (in completed years)	≥33*	189 (90.4)	20 (9.6)	78.091, df= 1, p=0.00	9.013 (5.283-15.375)	2.683 (1.372-5.249)
	<33	108 (51.2)	103 (48.8)			
Sex	Male	72 (79.1)	19 (20.9)	3.964, df=1, p=0.046	1.752 (1.004-3.005)	0.609 (0.302-1.226)
	Female	225 (68.4)	104 (31.6)			
Marital status	Currently married	253 (81.9)	56 (18.1)	70.350 df=1, p=0.00	6.879 (4.266-11.095)	5.017 (2.748-9.160)
	Others	44 (39.6)	67 (60.4)			
Education	Up to primary *	264 (79.8)	67 (20.2)	61.695, df=1, p=0.000	6.687 (4.028-11.100)	2.026 (1.081-3.797)
	Above primary	33 (37.1)	56 (62.9)			
Average monthly income	Up to 1500*	175 (71.7)	69 (28.3)	0.285, df=1, p=0.593	1.123 (0.734-1.716)	-
	Above 1500	122 (69.3)	54 (30.7)			
Duration of work as beedi worker (in completed years)	>15*	161 (93.6)	11 (6.4)	73.700, df=1, p=0.000	12.053 (6.230-23.321)	5.690 (2.580-12.551)
	Up to 15	136 (54.8)	112 (45.2)			
Number of beedi rolled/day	>600*	62 (64.6)	34 (35.4)	2.259 df=1, p=0.133	0.691 (0.426-1.121)	-
	Up to 600	235 (72.5)	89 (27.5)			

Continued.

Variables	Categories	Musculoskeletal morbidity		Test of significance (x2), df, P value	OR (95% CI)	AOR (95% CI)
		Yes N (%)	No N (%)			
Average time of beedi rolling/day (in hours)	>2*	118 (66.7)	59 (33.3)	2.420, df=1, p=0.120	0.715 (0.468-1.092)	-
	Up to 2	179 (73.7)	64 (26.3)			
Average days of beedi rolling/week	4 and	118 (63.8)	38 (46.2)	2.909, df=1, p=0.088	1.475 (0.943-2.307)	-
	above <4	179 (53.8)	85 (41.5)			
Ergonomic posture	No	146 (76.8)	44 (23.2)	6.291, df=1, p=0.012	1.736 (1.126-2.677)	1.423 (0.834-2.427)
	Yes	151 (65.7)	79 (34.3)			
*median, Hosmer Lemeshow test (p=0.063), Nagelkerke R Square=0.446						

Table 3: Determinants of respiratory morbidity (n=420).

Variables	Categories	Respiratory morbidity		Test of significance (χ^2),df, p value	OR (95% CI)	AOR (95% CI)
		Yes N (%)	No N (%)			
Age (in completed years)	>=33*	154 (73.7)	55 (26.3)	60.128, df= 1, p=0.000	4.974 (3.278-7.546)	2.377 (1.381-4.089)
	<33	76 (36.0)	135 (64.0)			
Sex	Male	51 (56.0)	40 (44.0)	0.077, df=1, p=0.781	1.068 (0.670-1.705)	-
	Female	179 (54.4)	150 (45.6)			
Marital status	Currently married	183 (59.2)	126 (40.8)	9.394 df=1, p=0.002	1.978 (1.274-3.070)	1.375 (0.805-2.347)
	Others	47 (42.3)	64 (57.7)			
Education	Upto primary*	199 (60.1)	132 (39.9)	18.108, df=1 p=0.000	2.821 (1.731-4.597)	1.369 (0.752-2.492)
	Above primary	31 (34.8)	58 (65.2)			
Average monthly income	Up to 1500*	138 (56.6)	106 (43.4)	0.758, df=1, p=0.384	1.189 (0.805-1.754)	-
	Above 1500	92 (52.3)	84 (47.7)			
Duration of work as beedi worker (in completed years)	>15*	137 (79.7)	35 (20.3)	72.840, df=1, p=0.000	6.524 (4.153-10.247)	3.737 (2.152-6.490)
	Up to 15	93 (37.5)	155 (62.5)			
Number of beedi rolled/day	>600*	42 (43.8)	54 (56.3)	6.091 df=1, p=0.014	0.563 (0.355-0.891)	0.506 (0.299-0.857)
	Up to 600	188 (58.0)	136 (42.0)			
Average time of beedi rolling/day (in hours)	>2*	93 (52.5)	84 (47.5)	0.608 df=1, p=0.435	0.857 (0.581-1.264)	-
	Up to 2	137 (56.4)	106 (43.6)			
Average days of beedi rolling/week	4 and above	90 (57.7)	66 (42.3)	0.860, df=1, p=0.354	1.208 (0.810-1.800)	-
	<4*	140 (53.0)	124 (47.0)			
Ergonomic Posture	No	94 (49.5)	96 (50.5)	3.917 df=1, p=0.048	0.677 (0.459-0.997)	0.669 (0.375-1.194)
	Yes	136 (59.1)	94 (40.9)			
Type of house	Kutcha/semi pucca	222 (54.1)	188 (45.9)	2.634, df=1, p=0.105	0.295 (0.062-1.407)	-
	Pucca	8 (80)	2 (20)			
Type of fuel used	Firewood	109 (55.3)	88 (44.7)	0.048, df=1, p=0.826	1.044 (0.710-1.535)	-
	Others	121 (54.3)	102 (45.7)			

Continued.

Variables	Categories	Respiratory morbidity		Test of significance (χ^2),df, p value	OR (95% CI)	AOR (95% CI)
		Yes N (%)	No N (%)			
Method of solid waste disposal	Public dustbin	102 (60.7)	66 (39.3)	4.005, df=1, p=0.045	1.497 (1.008-2.225)	1.539 (0.836-2.834)
	Open disposal	128 (50.8)	124 (49.2)			
Place of work	Indoor	219 (54.5)	183 (45.5)	0.306, df=1, p=0.580	0.762 (0.289-2.004)	-
	Outdoor	11 (61.1)	7 (38.9)			
*median, Hosmer Lemeshow test (p=0.061), Nagelkerke R Square=0.397						

Table 4: Determinants of Eye Related Morbidity (n=420).

Variables	Categories	Eye morbidity		Test of significance (χ^2),df, p value	OR (95% CI)	AOR (95% CI)
		Yes N (%)	No N (%)			
Age (in completed years)	>=33*	154 (73.7)	55 (26.3)	95.233, df=1, p=0.000	7.942 (5.140-12.270)	3.504 (2.026-6.058)
	<33	55 (26.1)	156 (73.9)			
Sex	Male	58 (63.7)	33 (36.3)	9.075, df=1, p=0.003	2.072 (1.283-3.346)	1.301 (.731-2.317)
	Female	151 (45.9)	178 (54.1)			
Marital status	Currently married	173 (56.0)	136 (44.0)	18.124, df=1, p=0.000	2.650 (1.679-4.183)	1.377 (0.763-2.486)
	Others	36 (32.4)	75 (67.6)			
Education	Up to primary *	190 (57.4)	141(42.6)	36.470 df=1, p=0.000	4.965(2.859-8.621)	1.996 (1.005-3.968)
	Above primary	19 (21.3)	70 (78.7)			
Average monthly income	Up to 1500*	128 (52.5)	116 (47.5)	1.694, df=1, p=0.193	1.294 (0.877-1.909)	-
	Above 1500	81 (46.0)	95 (54.0)			
Duration of work as beedi worker (in completed years)	>15*	129 (75.0)	43 (25.0)	74.218, df=1, p=0.000	6.300 (4.074-9.742)	2.779 (1.584-4.876)
	Up to 15	80 (32.3)	168 (67.7)			
Number of beedi rolled/day	Up to 600	171 (52.8)	153 (47.2)	5.157 df=1, p=0.023	1.706 (1.073-2.712)	1.896 (1.072-3.353)
	>600*	38 (39.6)	58 (60.4)			
Average time of beedi rolling/day (in hours)	>2*	82 (46.3)	95 (53.7)	1.443 df=1, p=0.230	0.788 (0.535-1.162)	-
	Up to 2	127 (52.3)	116 (47.7)			
Average days of beedi rolling/week	4 and above	80 (51.3)	76 (48.7)	0.229, df=1, p=0.632	1.102 (0.741-1.637)	-
	<4*	129 (48.9)	135 (51.1)			
Ergonomic Posture	No	103 (54.2)	87 (45.8)	2.747 df=1, p=0.097	1.385 (0.942-2.037)	-
	Yes	106 (46.1)	124 (53.9)			
Type of house	Pucca	6 (75.0)	2 (25.0)	2.078, df=1, p=0.149	3.089 (0.616-15.482)	-
	Kutcha/semi pucca	203 (49.3)	209 (50.7)			
Type of fuel used	Firewood	113 (57.4)	84 (42.6)	8.569, df=1, p=0.003	1.780 (1.208-2.621)	1.236 (.678-2.252)
	Others	96 (43.0)	127 (57.0)			
Method of solid waste disposal	Public dustbin	69 (41.1)	99 (58.9)	8.459, df=1, p=0.004	0.558 (0.376-0.828)	0.707 (0.376-1.329)
	Open disposal	140 (55.6)	112 (44.4)			

Continued.

Variables	Categories	Eye morbidity		Test of significance (χ^2),df, p value	OR (95% CI)	AOR (95% CI)
		Yes N (%)	No N (%)			
Place of work	Outdoor	14 (77.8)	4 (22.2)	5.904, df=1, p=0.015	3.715 (1.202-11.482)	4.546 (1.273-16.227)
	Indoor	195 (48.5)	207 (51.5)			
*median, Hosmer Lemeshow test (p=0.954), Nagelkerke R Square=0.375						

Concerning occupation related characteristics, a significant portion (44.5%) of the study participants were engaged in beedi rolling for the last 5-15 years with a mean duration of 16.76±11.9 years. Nearly all of them (95.7%) worked indoors. The majority rolled around 500-1000 beedis per day, with a mean of 605.71±135.27. On average, more than half of the workers were rolling beedi for two hours per day (57.1%) with a mean of 2.43±0.532 hours and three days per week (60%) with a mean of 3.34±0.532 days per week. Majority of the workers worked in areas where cross ventilation was present (99.5%), but almost all (96.9%) worked in ill-lighted places and more than half of them adopted non-ergonomical postures (54.8%).

In terms of housing conditions, all but one worker owned their own house, among whom majority (95.7%) were living in semi-pucca houses. More than half of the workers were using tube well as their primary source of drinking water (53.3%), a combination of firewood, LPG and kerosene for cooking (52.9%) and disposing off the solid waste by open disposal method (60%) (Table 1).

With respect to morbidity profile, a total of 302 study participants (71.9%) reported no illness in past 6 months, while rest of them had bouts of illness during the past 6 months including 72 (17.1%), 39 (9.4%), 6 (1.4%) and 1 (0.2%) of the subjects having one, two, three and four or more spells respectively. Regarding current illness, a majority (71.7%) were experiencing illness at present. The most prevalent being musculoskeletal symptoms (70.7%) followed by respiratory symptoms (54.8%) and eye symptoms (36.9%). The 'other' symptoms (25.7%) included weakness, easy fatigability, dental symptoms, dermatological symptoms, gastritis and headache. Among musculoskeletal symptoms, low back pain (36.1%) was most common followed by knee joint pain (9.1%), neck pain (5.4%) and shoulder joint pain (2.7%). Chronic illnesses were present in 46.7% (196) of study subjects, with hypertension being the most common (12.4%), followed by heart disease (2.4%), diabetes mellitus (1.8%), and the rest 16 (3.9%) of the study subjects suffered from more than one chronic disease.

Multivariate analysis revealed that individuals aged above 33 years, who were currently married, having education up to primary level, had been working for more than 15 years as beedi roller and not maintaining an ergonomic posture during work had higher odds of occurrence of musculoskeletal morbidity (Table 2).

In respect to respiratory morbidity, their age, duration as a beedi worker (in years) and number of beedis rolled per day were found to be significantly associated with respiratory morbidities among beedi workers as per multivariate analysis (Table 3).

Age, education, duration as a beedi worker (in years), number of beedis rolled per day and place of work were found to be significantly associated with eye morbidities as per multivariate analysis (Table 4).

DISCUSSION

Multiple studies have documented that occupational health hazards are significantly impacting beedi workers globally, including in India.[19,20] However, prior research has not been focused enough on identifying the specific factors associated with these health hazards, which, if elucidated, could guide the policy makers to better the existing interventions to enhance the wellbeing of beedi workers.

The current study revealed that a significant portion of the beedi workers were aged between 18-30 years (35.2%), predominantly female (78.3%), all Muslim (100%) and nearly half were illiterate (46.2%). Most workers were currently married (73.6%) with an average mean monthly income around Rs. 1525. These findings align with previous studies regarding age, gender and level of education even though the proportion of married workers had been found to be slightly lower (73.6%) compared to other studies (91%, 88% and 97%).[15,21-24] Regarding occupation related characteristics, nearly half of the study participants were beedi rollers for the last 5-15 years (44.5%) with a mean duration of 16.7 years, which is longer than reported in other studies.[14] The majority workers rolled 500-1000 beedis per day (mean of 605 beedis per day), consistent with the previous study findings. On an average, more than half of the workers spent two hours rolling beedis per day (57.1%) with a mean of 2.43±0.532 hours, indicating a declining trend in mean working duration as compared to the previous studies.[14]

The current study found that the musculoskeletal symptoms were the most predominant among beedi workers (70.7%), followed by respiratory (54.8%), eye (36.9%), and 'other' symptoms (25.7%). A scoping review conducted among beedi workers in 2023 reported the prevalence of musculoskeletal symptoms ranged from 34.6% to 87.0%, whereas respiratory disorders ranged

from 6.6% to 52.5% and ophthalmological conditions from 7.3% to 81%.[25] Regarding chronic illness, most common were hypertension (12.4%), heart disease (2.4%), diabetes mellitus (1.8%), and 3.9% suffered from more than one chronic disease. These figures were relatively low compared to a previous study, possibly due to inclusion of only diagnosed chronic diseases in the current study.[14]

The major morbidities identified in the current study were musculoskeletal, followed by respiratory and ophthalmological conditions. Multivariate analysis revealed that age, marital status, educational level, duration as a beedi worker (in years) and working posture were significant determinants of musculoskeletal morbidity. Meanwhile; age, duration as a beedi worker (in years) and number of beedis rolled per day were found to be significantly associated with respiratory morbidities. Similarly, age, education, duration as a beedi worker (in years), number of beedis rolled per day and place of work were found to be significantly associated with eye related morbidities. Previous research using bivariate analysis found age, duration of work (both in years and hours per day), number of beedis rolled per day as significant determinants of eye and musculoskeletal morbidity.[14]

Unlike earlier studies, which did not employ any advanced statistical methods to identify any such determinants, the current study utilized multivariate analysis, providing a multidirectional way forward for wellbeing of the beedi workers, i.e.; to develop and implement health educational and behavioral change models and also to assist the policy makers prioritize the pressing issues.

The current study had some inherent limitations due to its cross-sectional design. Since the temporality could not be established, the researcher proposes longitudinal study designs for future research. The study mostly dealt with self-reported data; hence social-desirability bias could not be eliminated. Additionally, as the study was conducted in Murshidabad district, the result may not be generalizable to population beyond the district.

CONCLUSION

In conclusion, the study revealed that major morbidities among the beedi workers were musculoskeletal followed by respiratory and ophthalmological conditions. Multivariate analysis revealed that occupational factors, such as duration of work, number of beedis rolled per day, place of work and working posture, along with other socio-demographic factors like age and educational level were significant determinants of these morbidities.

Beedi rolling being an unorganized sector, is facing unique challenges in regard to regulations and worker protection. Hence, the government should take steps to recognize this occupation under the purview of law and consider providing alternative livelihood where possible. Most importantly, develop sustainable policies to uplift their occupational environment, which in turn would decrease their workload and consequently decrease their morbidity.

ACKNOWLEDGEMENTS

The authors acknowledge the Director, Institute of Public Health, Kalyani for the technical support provided throughout the study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. American Legacy Foundation. Legacy First Look Report 4. The relationship between cigarette use and other tobacco products: Results from the 1999 National Youth Tobacco Survey. Revised printing, Oct 2000. Available at: https://www.researchgate.net/publication/46438571_American_Legacy_Foundation_The_relationship_between_Cigarette_Use_and_Other_Tobacco_Products_Results_from_The_2000_National_Tobacco_Survey. Accessed on 17 May 2024.
2. WHO report on the global tobacco epidemic 2021: addressing new and emerging products, in licence: CC BY-NC-SA 3.0 IGO. Geneva: World Health Organization; 2021. Available at: https://www.who.int/publications/i/item/9789240032095. Accessed on 17 May 2024.
3. He H, Pan Z, Wu J, Hu C, Bai L, Lyu J. Health effects of tobacco at the global, regional, and national levels: results from the 2019 global burden of disease study. Nicotine Tob Res 2022;24:864–70.
4. Murray CJ, Aravkin AY, Zheng P, Abbafati C, Abbas KM, Abbasi-Kangevari M, et al. Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. The lancet. 2020;396(10258):1223-49.
5. Global adult tobacco survey. India 2016-2017 report. New Delhi, India: Ministry of Health and Family Welfare - Government of India; 2017. Available at: https://pubmed.ncbi.nlm.nih.gov/33069327/. Accessed on 17 May 2024.
6. Gupta PC, Asma S. Beedi smoking and public health. New Delhi: Ministry of Health and Family Welfare, Government of India, 2008. Available at: https://sansad.in/getFile/loksabhaquestions/annex/175/AU4357.pdf?source=pqalshttps://ntcp.mohfw.gov.in/assets/document/Monograph%20on%20Bidi%20Smoking%20and%20Public%20Health.pdf. Accessed on 17 May 2024.
7. Gupta PC, Pednekar MS, Parkin DM, Sankaranarayanan R. Tobacco associated mortality

in Mumbai (Bombay) India. Results of the Bombay cohort study. Int J Epidemiol. 2005;34:1395–402.
8. Arora M, Datta P, Barman A. The Indian Beedi industry: trends in employment and wage differentials. Front Public Health. 2020;8:572638.
9. Sabale RV, Kowli SS, Chowdhary PH. Working condition and health hazards in Beedi rollers residing in the urban slums of Mumbai. Indian J Occup Environ Med. 2012;16:72–4.
10. Ranjit SA, Padmalatha C. Occupational illness of Beedi rollers in South India. Environ Econ. 1995;13:875.
11. Singh JK, Rana SVS, Mishra N. Occupational health problems amongst women Beedi rollers in Jhansi, Bundelkhand region, Uttar Pradesh. J Ecophysiol Occup Health. 2014;14:17.
12. Lok Sabha, Unstarred question no 4357 to be answered; 2021. Available at: https://sansad.in/getFile/loksabhaquestions/annex/175/AU4357.pdf?source=pqals. Accessed on 15 May 2024.
13. Joshi KP, Robins M, Parashuramulu V. An Epidemiological study of occupational health hazards among Beedi workers in Andra Pradesh. J Acad Indus Res. 2013;1:561–4.
14. Basu G, Sarkar D, Pal R, Roy SK, Dasgupta R. Morbidity Audit of Women Beedi Workers in an Urban Fringe of West Bengal, India. J Clin Diagn Res. 2018;12(3):LC05-9.
15. Senthilkumar N, Bharathi PS. A study on occupational health hazards among women beedi rollers in Tamilnadu, India. Int J Curr Res. 2010;11:117–22.
16. Yasmin S, Afroz B, Hyat B, D'souza D. Occupational health hazards in women beedi rollers in Bihar, India. Bull Environ Contam Toxicol. 2010;85:87–91.
17. Priyadarshini P, Singh T. Exploring factors influencing the morbidity among beedi workers in Thakurganj village, Kishanganj district. Int J Acad Med Pharm. 2023;5(4):2042-8.
18. Singh JK, Singh P. Occupational exposure and health risks in women beedi workers in India: A review. Int J Humanities Soc Stud. 2015;3(10):45-53.
19. Nag A, Vyas H, Nag P. Occupational health scenario of Indian informal sector. Ind Health. 2016;54(4):377-85.
20. Mukherjee M, Goswami A, Mazumdar D, Pal B. A study on health profile of beedi workers in West Bengal, India. Int J Adv Res Manag Soc Sci. 2014;3(8):17-25.
21. Thomas RA, Cheriamane DC, Irfan. A cross sectional study on health profile of female beedi rollers in a rural area in Mangalore. IOSR J Dent Med Sci. 2015;14(12):10-14.
22. Ramakrishnappa V, Kumari MP, Vishwanatha. Unorganized workers in beedi industry: a study on women beedi rollers of Karnataka, India. Int J Soc Sci. 2014;3:325-34.
23. Madhusudan M, Patil D, Jayaram S. Occupational health profile of beedi workers in coastal Karnataka. Nat J Com Med. 2014;5(2):157-60.
24. Kumar NS, Bharathi PS. A study on occupational health hazards among women beedi rollers in Tamilnadu, India. Int J Curr Res. 2010;11(1):117-22.
25. Tyagi J, Beri D, Ingale S, Sinha P, Bhaumik S. Occupational health hazards of beedi workers and their families in India: a scoping review. BMJ Global Health. 2023;8:e012413.

Cite this article as: Shaikh S, Krishna N, Ghosh K, Chawale SV, Pal J, Harit L. Occupation-related morbidity patterns and their determinants among beedi workers in Murshidabad District, West Bengal. Int J Community Med Public Health 2025;12:3202-10.