AN ANTHROPOLOGICAL STUDY OF OCCUPATIONAL HEALTH PROFILE AND WORKING CONDITIONS OF BEEDI MAKERS OF DISTRICT BILASPUR, CHHATTISGARH, INDIA

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ABSTRACT:

The present paper applying anthropological methods of fieldwork and principles of ergonomics attempts to study occupational health profile and working conditions of beedi makers of the district of Bilaspur in India. In this home based small scale industry females play very important role in rolling and making of poor men cigarette and all associated works are done without using any machinery or mechanical gadgets. Females involved in this industry work while staying in their home as per their contract or targets. Study also focuses on health related problems arising due to their occupation of beedi making. The study is outcome of rigorous anthropological fieldwork along with a pre-tested semi-structured interview schedule and was conducted in the months of June 2018 to December 2018. The study reveals that 38.63% males and 35.00% females from selected sample size of the study suffer from problem of high blood pressure and 49.90% of male respondents and 43.42% of female respondent beedi makers fall in the danger zone/Red Zone of Peak Flow Meter.

Key words: Beedi industry, Occupational health, Ergonomics, Sitting postures

I. INTRODUCTION

Beedi is considered as poor men Cigarette and is used by both males and females in rural as well as in urban areas of India. Bidi is the most popular tobacco smoking product in India and commands an overwhelming market share of 85% however; the bidi industry does not make any significant economic contribution to the Indian economy. Employees in unregistered sector receive no welfare benefits. (Bhaumik et.al. 2018) India occupies an important rank in the production of beedi and also second largest consumer of tobacco. (IPS, GATS 2010) Beedi making process is mostly a home based occupation exists in the form of small scale industry occupied by unorganized sector. The beedi industry is mainly a labour-intensive industry and millions of families are earning their livelihood in this industry. The total employment in the beedi industry in India is over 4.48 million. (Ministry of Labour, Government of India, 2004)

Beedi is made by rolling a dried, rectangular piece of temburni/tendu leaf (Diospyros melanoxylon) with 0.15-0.25 g of sun-dried, flaked tobacco into a conical shape and securing the roll with a thread. It is the most common smoked tobacco product in India (MoHFW, India, 2004; Arora et.al. 2020). About 7.7% of adults in India consume beedi (TISS, 2018; Arora et.al. 2020), which has a market share of 85% of all smoking products. (MoHFW, India, 2009-10; GATS 2010; Lal and Wilson 2012; Arora et.al. 2020)

Global Adult Tobacco Survey (GATS India 2009–2010) report revealed that in 2010 there were 120 million smokers of age 15 years or above in India. Studies analysed that male and female beedi smokers lose 6 and 8 years of their life due to tobacco use. (Jha et.al. 2008) Several health risks like Oral cancer, tuberculosis and other respiratory or vascular diseases are found to be associated with smoking of beedi. (Gupta and Asma, 2008; Nandi et.al. 2014) The total number of premature deaths caused by tobacco during the twentieth century has been estimated at about 100 million and, if current trends of tobacco use continue during the twenty-first century, the death toll is projected to go up to one billion. The World Health Organization (WHO), which provides these estimates, also predicts that India will have the fastest rate of rise in deaths attributable to tobacco in the first two
decades of the twenty first century. By 2030, it is estimated that the number of premature deaths attributable to tobacco would double to 10 million deaths every year, with about 7 million of the deaths taking place in developing countries. (MoHFW, 2004) Smoking of tobacco causes multitude of issues in case of developing country like India in the form of diseases, death and destitution; a complex triad of burden on a nation. (Reddi and Gupta, 2004; John et.al.2004)

The present study is related with occupational health status of the beedi makers of district of Bilaspur in the state of Chhattisgarh. The term ‘human occupation’ connotes that occupation is part of the human condition. Whatever else characterizes being human- our spiritual yearnings, our capacity for love- we also share an innate occupational nature. Some occupations which are directly related with human physical labour are generally affecting the human health. Such kinds of occupations are mostly based on factory work or home-based industries.

Beedi is a forest product and also worldwide known as poor man’s smoke or poor man’s cigarette and is enjoyed equally by males and females of rural, urban and tribal populations. A standard beedi contains smooth rolled tobacco flakes. Tendu (Diospyros melanoxylon) leaf is used as wrapper of beedi in beedi industry. Beedi manufacturing takes place in almost all major states of India especially in Gujarat, Karnataka, Madhya Pradesh, Chhattisgarh, Maharashtra, Andhra Pradesh, Tamil Nadu, Punjab, Orissa, Bihar, Uttar Pradesh and Kerala. Beedi rollers, whose job involves, rolling and tying of beedi, are constantly exposed to tobacco. Despite being identified as a hazardous occupation, beedi rolling remains extremely popular in India, especially among women. In view of increasing population, unemployment, poverty and illiteracy, beedi industry appears to be an easy way of earning a wage. Workers engaged in Beedi rolling are chronically exposed to tobacco flakes and dust via nasopharyngeal routes. Considering the high content of nicotine and other chemicals in beedi tobacco, these workers are at extremely high risk of developing systemic illness. Nicotine is a major component of tobacco, and has potential adverse health consequences. (Chattopadhyay et al., 2006)

Principles of ‘Ergonomics’ are also used in the present study. Ergonomics is a branch of science in which we study the human being in relation to their work environment or work place. It is the process of designing or arranging work place, products and system so that they fit the people who use them. The word ‘Ergonomic’ originate from two Greek words i.e. ‘ergos’ means work and ‘nomos’ means norms. The Ergonomic is used mainly in the industrial studies where various types of equipments are used to enhance the productivity. Physical as well as mental both conditions constitute to the subject matter of ergonomic studies. If work place and working environment is not suitable to do work, then it will lead to harmful conditions. Rationale and argument behind considering as well as including Beendi making process as an important area of ergonomics is that the people who are involved in the process of beedi making sit in the same posture/position for a very long duration without making any change. This longer duration of improper sitting position may produce harmful effects very much similar to life style diseases. The women engaged in beedi making suffer from various types of musculo-skeletal problems due to wrong sitting postures. It was also considered that ergonomic factors such as provision of a back rest and frequent rest periods could be helpful to remediate the musculo skeletal symptoms. Occupational health hazards of beedi makers remained neglected since long time and there is paucity of anthropological fieldwork based studies on this area and hence, an urgent need to study the health hazards in beedi makers and to suggest the remedial measures was felt by the authors.

II. MATERIAL AND METHODS

The proposed study, in order to have best results, resorted to Anthropological field work methods. The main focus of the study was on occupational health status and working condition with respect to sitting posture of beedi makers. Few important available literature and studies conducted earlier paved the pathway for this study includes Park (2007) titled ‘Text Book of Preventive and Social Medicine’ which were referred before the study was conducted. In the same sequel following works helped us to fix the track of our research.

Thomas et.al (2015) discussed the health conditions of female beedi rollers of Mangalore in India. The study attempted to correlate socio-demographic profile and working conditions and concluded that musculo-skeletal hazards need urgent care.

Hegde et.al. (2015) talked about prevalence of respiratory functions and lung function impairment among beedi workers and examined use of protective masks in reducing respiratory symptoms. The study opines that highly
significant difference exists in lung function leading to impairment has been found in experimental group workers. (p<0.001)

Joshi et.al. (2014) exploring the epidemiology of occupational health hazards among the beedi workers of Amarchinta of Andhra Pradesh enlist shoulder pain, musculo-skeletal disorders, breathlessness, acidity, dermatitis and tuberculosis as serious health hazards.

Mukherjee et.al. (2014) study of West Bengal women employed in beedi industry reveals that disorders like lung cancer, tuberculosis and gynaecological disorders are very common among them.

Jayram and Madhusudan et.al. (2014) in their study on beedi workers of coastal Karnataka explained most common morbidity among female beedi workers was musculo-skeletal followed by eye and respiratory problems.

Kouser et.al. (2014) in their study expressed their concern regarding respiratory impairment amongst beedi workers due to tobacco dust applying Pulmonary Function Tests (PFT) and and emphasised on adoption of strict preventive measures.

Shukla et. al. (2013) in their study investigate the role of working conditions in occupational health hazards among beedi rollers occupationally exposed to tobacco dust with reference to DNA damage in peripheral blood lymphocytes. Also they examined environmental conditions in occupational genotoxicity. The study recommended the need of protective masks and well ventilated work spaces.

Srinivasan and Ilango (2013) in their study on female beedi workers of Khajamalai region of the state of Tamil Nadu concluded that majority (72%) were subjected to various kinds of exploitations as they were working with contractors and also facing several health ailments.

Chakraborty (2013) analysed the health problems of females of Murshidabad area of west Bengal who are engaged in bundling of beedi products.

Vinay et.al. (2012) in their study on quilt manufacturing unit in Udham Sing Nagar of the state of Uttarakhand emphasised that in order to ensure safety and to reduce occupational health hazards while performing the activity, an ergonomically designed work station by introduction of improved technology option will be right choice which also enhances the productivity.

Elias and Saha (2005) investigated the impact of environmental pollution and quality of working atmosphere in tobacco industry and concluded that quality of working life was inferior to their male counterpart workers of the same industry.


After studying the various research literatures available on beedi makers/workers/rollers of various states in India such as Uttar Pradesh, Madhya Pradesh, Bihar, Karnataka, Tamil Nadu, Punjab and Chhattisgarh; Bilaspur district of the state of Chhattisgarh was selected for the proposed study.

**Study Area:**

The state of Chhattisgarh was separated from Madhya Pradesh in the year 2000 and became a new state. The state comprises of a total of 18 districts. Due to higher concentration of beedi workers in the state of Chhattisgarh, it was selected for the study. A primary pilot study was also conducted before major fieldwork in urban and semi-urban areas of the selected district of the state of Chhattisgarh. On the basis of pilot study and data on population, working conditions, wage rates and effect of social welfare schemes within the selected district, an area named as ‘Panchsheel Nagar Beedi Colony’ located in Tehsil/Block called ‘Tifra’ was selected for the study.
Sampling:
On the basis of Pilot Study and door to door survey, it was found that a total of 288 households lived in Panchsheel Nagar Beedi Colony’ and their population was 1440. From these, 212 households were selected where 848 individuals were involved in beedi making process. At least one or two individuals (preferably one male and one female) were selected on the basis of simple random sampling for the research purpose. Thus, total 424 respondents i.e., 380 females and 44 males were selected and were included in the study. Number of male members was very less in comparison to females because they left the beedi making industry few years back as they did not find it economically resourceful and got involved in some other occupations/jobs/works and hence, researchers were left with very limited options to include only few left over males who were still continuing with same occupation. All selected individual respondents belong to age group of 18-55 years and were involved in beedi rolling process from at least last twenty years.

Plate 1: Females rolling Beedi; source: Fieldwork (2018)

Devices and tools used:
Anthropometric measurements and BMI were taken after the methods provided by Wilder, H.H. (2010) in his ‘A Laboratory Manual of Anthropometry’ and Weiner, J.S. and Lourie, J.A. (1981) in ‘Practical Human Biology’. A semi-structured interview schedule was applied during fieldwork for qualitative data. Rapport establishment with the respondents was done and prior proper consent was taken from each and every respondent included in the study.

A simple and portable, easy to carry form of Spirometer device called ‘Peak Flow Meter (PFM)’ was used to assess lung capacity/lung function of beedi makers through ‘Peak Expiratory Flow (PEF)’ and to measure day to day changes in breathing status/respiratory diagnosis of selected individuals. PEF is a measure of how fast an individual is able to forcefully exhale after full inhalation. This kind of collected data can help us to determine if the airways of the individual are narrowing while working in polluted environmental conditions like tobacco dust or bad ventilated spaces etc. This helped the researchers in categorization lung capacity of respondents in different zones as per readings of PFM.
Blood Pressure of the respondents was taken applying digital B.P. machine. The readings were taken thrice on different stipulated time spans for accuracy of blood pressure readings. Quality control and calibration was performed on regular basis on all aforementioned devices and anthropometric instruments to ensure that devices and instruments were working appropriately. All precautions were followed during procedures for accuracy of metric data.
Interpretation of the Data and Results

**Table-1** Distribution of Beedi makers on the basis of Height

<table>
<thead>
<tr>
<th>Range (Height in feet)</th>
<th>No of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>&lt;5</td>
<td>11(25)</td>
</tr>
<tr>
<td>&gt;5</td>
<td>33(75)</td>
</tr>
<tr>
<td>Total</td>
<td>44(100)</td>
</tr>
</tbody>
</table>

Source- Corresponding Author’s Fieldwork (2018)

Note- Figures in parentheses indicate percentage.

**Graph-1** Distribution of Beedi makers on the basis of Height

Table 1 shows the distribution of beedi makers on the basis of their height in feet. It was found that most of the respondents attained stature of more than 5 feet i.e. 58.94% females and 75% males were above 5 feet of stature while, 41.05% females and 25% males were below 5 feet of height.

**Table-2** Distribution of Beedi makers on the basis of Weight

<table>
<thead>
<tr>
<th>Range (Weight in Kg)</th>
<th>No of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>&lt;50</td>
<td>5(11.36)</td>
</tr>
</tbody>
</table>
Table 2 shows the distribution of beedi makers on the basis of their weight (in kg). Most of the respondents were found to be in range between 50 to 70 kg (67.36% females and 63.63% males). Of the total respondents, 5.78% females and 11.36% males were having less than 50 kg of weight. 26.84% females and 25% males were in category of above 70 kg of weight.

Table 3 Distribution of Beedi makers on the basis of Body Mass Index (BMI)

<table>
<thead>
<tr>
<th>S.No</th>
<th>BMI Range</th>
<th>Number of Respondent</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Over weight (25.0-29.9)</td>
<td>08(18.8)</td>
<td>76(20)</td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Normal (18.5-24.9)</td>
<td>20(45.45)</td>
<td>171(45)</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Underweight (&lt;18.5)</td>
<td>16(36.36)</td>
<td>133(35)</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Total</td>
<td>44(100)</td>
<td>380(100)</td>
<td></td>
</tr>
</tbody>
</table>

Note- Figures in parentheses indicate percentage.
Table 3 shows the distribution of beedi makers on the basis of BMI (Body Mass Index). Most of the respondents were having normal BMI i.e. 45% females and 45.45% males were having normal BMI range and 35% females and 36.36% males were under weight as per the anthropometric requirements. 20% females and 18.8% males were found to be overweight.

Table 4 shows the distribution of the respondents on the basis of blood pressure. 41.5% females and 43.18% males were having normal blood pressure. While 35% females and 38.63% males were having high blood pressure. Remaining 23.4% females and 18.18% males were having low blood pressure. It is revealed by the table that the condition of blood pressure in the study area not satisfactory.
Table-5 Distribution of Beedi makers on the basis of Lung capacity using Peak Flow Meter

<table>
<thead>
<tr>
<th>Range</th>
<th>No of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>&lt;200 (Red zone)</td>
<td>18 (49.90)</td>
</tr>
<tr>
<td>200-300 (Yellow zone)</td>
<td>22 (50)</td>
</tr>
<tr>
<td>&gt;300 (Green zone)</td>
<td>04 (9.09)</td>
</tr>
<tr>
<td>Total</td>
<td>44 (100)</td>
</tr>
</tbody>
</table>

Source- Corresponding Author’s Fieldwork (2018)

Note- Figures in parentheses indicate percentage.

Graph-5 Distribution of Beedi makers on the basis of Lung capacity using Peak Flow Meter

<table>
<thead>
<tr>
<th>S.N</th>
<th>Type of Sitting Postures</th>
<th>No of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>1</td>
<td>Sitting on the floor without proper back support</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Sitting on the floor in cross legged position</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>Sitting on a stool without back support</td>
<td>09</td>
</tr>
<tr>
<td>4</td>
<td>Sitting on the floor with one leg folded and another leg in</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td>extended position</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sitting on a Cot/Takhat without proper support</td>
<td>04</td>
</tr>
<tr>
<td>6</td>
<td>Squatting posture</td>
<td>02</td>
</tr>
</tbody>
</table>

Table 5 shows the distribution of beedi makers on the basis of lung capacity. It is found that only 05% females and 9.09% males fall in green zone, 51.57% females and 50.00% males in yellow zone and 43.42% females and 49.90% males in red zone or danger zone. The percentage of yellow and red zone is higher in comparison to green zone. It indicates that they suffer from one or more types of lung disorders.

Table-6 Distribution of Beedi makers on the basis of sitting posture

<table>
<thead>
<tr>
<th>S.N</th>
<th>Type of Sitting Postures</th>
<th>No of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>1</td>
<td>Sitting on the floor without proper back support</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Sitting on the floor in cross legged position</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>Sitting on a stool without back support</td>
<td>09</td>
</tr>
<tr>
<td>4</td>
<td>Sitting on the floor with one leg folded and another leg in</td>
<td>02</td>
</tr>
<tr>
<td></td>
<td>extended position</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Sitting on a Cot/Takhat without proper support</td>
<td>04</td>
</tr>
<tr>
<td>6</td>
<td>Squatting posture</td>
<td>02</td>
</tr>
</tbody>
</table>
Table 6 shows the sitting postures of the beedi makers during their work hours. Seven types of sitting postures were found in the study area. Sitting on the floor without proper back support was very common sitting posture followed by the beedi makers. Most of the women i.e. 30.26%, sit in this position at time of beedi making which is followed by women sitting on the floor in cross legged position i.e. 25.26 %. Men mostly used this sitting position i.e. 29.54%. Of the male respondents, 25.00% of men sit on the floor without proper back support. 12.36% females and 20.45% males sit on a stool without back support. 8.15% females and 4.54% males were used to sitting on the floor with one leg folded and another leg in extended position. 7.10% females and 4.54% males followed sitting on a Cot/Takhat without proper support. 8.94% females and 4.54% males adapted to Squatting posture. 7.89% females and 6.81% males performed beedi rolling and other associated works while sitting in a posture bending their head and neck forward.

Various types of sitting postures of beedi makers in present study are as follows:

1) Sitting on the floor without proper back support
2) Sitting on the floor in cross legged position
3) Sitting on a stool without back support
4) Sitting on the floor in one leg folded and another leg in extended position
5) Sitting on a Cot/Takhat without proper back support
6) Squatting posture
7) Downward bending of head and neck during work

These are the sitting postures which are continuously used by the beedi makers of the study area. Knowledge of Ergonomics is immensely useful in understanding the various problems of beedi makers which originate due to their body posture.

Sitting postures of Beedi makers:

<table>
<thead>
<tr>
<th>Type</th>
<th>No of respondents</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting on the floor without proper back support</td>
<td>Male 6.81</td>
<td>30</td>
</tr>
<tr>
<td>Sitting on the floor in cross legged position</td>
<td>Male 30</td>
<td></td>
</tr>
<tr>
<td>Sitting on a stool without back support</td>
<td>Male 7.89</td>
<td></td>
</tr>
<tr>
<td>Sitting on the floor in one leg folded and another leg in extended position</td>
<td>Male 100</td>
<td></td>
</tr>
<tr>
<td>Sitting on a Cot/Takhat without proper back support</td>
<td>Male 7.89</td>
<td></td>
</tr>
<tr>
<td>Squatting posture</td>
<td>Male 6.81</td>
<td></td>
</tr>
<tr>
<td>Downward bending of head and neck during work</td>
<td>Male 7.89</td>
<td></td>
</tr>
</tbody>
</table>

Source- Corresponding Author’s Fieldwork (2018)

Note- Figures in parentheses indicate percentage.
Plate 11
(Plates 5-11 respectively: Sitting on the floor without proper back support, Sitting on a stool without back support, Sitting on the floor in cross legged position, Sitting on the floor with one leg folded and another leg in extended position, Sitting on a bed Cot/Takhat without proper support, Squatting posture (half leg bent), Downward bending of head and neck during work)

Table-7 Percentage Distribution of respondents according to morbidity/suffering from diseases

<table>
<thead>
<tr>
<th>S.No</th>
<th>Morbidity/Ailments</th>
<th>Number of respondents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>i</td>
<td>Musculo-skeletal problems</td>
<td>31(70.45)</td>
<td>342(90)</td>
</tr>
<tr>
<td>ii</td>
<td>Respiratory problems</td>
<td>18(40.90)</td>
<td>121(31.84)</td>
</tr>
<tr>
<td>iii</td>
<td>Eye ailment</td>
<td>06(13.63)</td>
<td>76(20)</td>
</tr>
<tr>
<td>iv</td>
<td>Constipation</td>
<td>10(22.72)</td>
<td>80(21.05)</td>
</tr>
<tr>
<td>v</td>
<td>Sleeping fluctuation</td>
<td>05(11.36)</td>
<td>18(4.73)</td>
</tr>
<tr>
<td>vi</td>
<td>Skin problems</td>
<td>03(6.81)</td>
<td>21(5.52)</td>
</tr>
<tr>
<td>vii</td>
<td>Hypertension</td>
<td>16(36.36)</td>
<td>116(30.52)</td>
</tr>
<tr>
<td>viii</td>
<td>Hypotension</td>
<td>11(25)</td>
<td>96(25.26)</td>
</tr>
<tr>
<td>ix</td>
<td>Loss of appetite</td>
<td>04(9.09)</td>
<td>26(6.84)</td>
</tr>
<tr>
<td>x</td>
<td>Headache</td>
<td>12(27.27)</td>
<td>188(49.47)</td>
</tr>
<tr>
<td>xi</td>
<td>Backache</td>
<td>29(65.90)</td>
<td>296(77.89)</td>
</tr>
<tr>
<td>xii</td>
<td>Dizziness/weakness</td>
<td>02(4.54)</td>
<td>16(4.21)</td>
</tr>
</tbody>
</table>

Source- Corresponding Author’s Fieldwork (2018)

Note- Figures in parentheses indicate percentage.

Graph-7 Percentage Distribution of respondents suffering from diseases
Table 7 indicates the percentage distribution of the respondents on the basis of morbidity pattern and prevalent diseases in the study area. Various types of health problems occur among beedi makers and some of them are very common. The present table shows that majority of the beedi makers suffer from musculo-skeletal problems. In the study area 90% females and 70.45% males suffer from musculo-skeletal problem. It followed by backache i.e. 77.89% females and 65.90% males suffer from it. 31.84% females and 40.90% males suffer from Respiratory problems. 25.26% females and 25.00% males suffer from Hypertension. 25.00% females and 25.00% males suffer from Hypotension. 21.05% females and 22.72% males suffered from Constipation. 20.00% females and 13.63% males suffered from different kind of ophthalmic or diseases pertaining to Eye. 6.84% females and 9.09% males suffer from loss of appetite. 5.52% females and 6.81% males suffer from dermatitis and skin problems. 4.73% females and 11.36% males suffer from sleeping fluctuation. 4.21% females and 4.54% males suffer from Dizziness/weakness. Thus, these are very commonly occurring morbidity/ailments among beedi maker families of the study area.

ILO (2001) report, bidi workers suffer from: “Postural problems (neck and low back pains), abdominal pains, eye problems, burning sensation in the throat, cough, asthma, T.B., bronchitis, excessive bleeding during menstruation, irregular and painful menstrual cycles, leucorrhrea, anemia, anemic body aches, dizziness from constant exposure to tobacco dust”. (ILO, 2001) A large literature has examined the health effects on bidi workers in India to reveal similar respiratory, dermatological, ophthalmic and podiatric issues related to foot, ankle and lower extremity. (Gupta et.al.2008; MoHW 2004; Mittal et.al.2008; Sen 2007; Ranjitsingh and Padmalatha 1995; Bagwe and Bhisey 1995; Swami et.al. 2006, Nandi et.al. 2014) On comparing the findings of the present study conducted among the beedi makers of Panchsheel Nagar Beedi Colony of Bilaspur district in the state of Chhattisgarh, it appears that they are suffering similar morbidity pattern as enumerated in aforementioned studies.

Findings and Discussion

It is concluded that the household beedi rolling industry is a high-risk occupation and gives rise to various types of health problems. The poor environmental conditions coupled with unhygienic conditions and long-time sitting in one position have been found to be the reasons for developing many types of health complaints. In current scenario, women beedi rollers as well as men both are exposed to long duration of tobacco dust and other indoor working environmental conditions for more and more production of beedi. Due to this occupational hazards lead to inevitable many health problems. The present study recommends that there is great need for implementation of comprehensive occupational and environmental health management strategies for this type of small-scale industries. Thus, all the dimensions of the study variables reveal that the health hazards existing in the beedi rolling environment experienced by the women as well as men beedi rollers are at an alarming stage. Although beedi rolling plays an important role in household economy both in terms of income and employment yet there is a need to impart education to the beedi rollers regarding the health hazards caused by tobacco and the urgent need to minimize tobacco exposure among the beedi makers and to use protecting equipment such as gloves, masks, first aid facility etc.
Creation of awareness among beedi makers regarding proper working conditions or sitting posture with arm and back rest and taking breaks at regular intervals of one and half hours of continuous work will help to reduce the occurrence of various health problems as well as musculo-skeletal related disorders.

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Conflict of Interest:
We have no conflict of interest to disclose.

**Informed Consent**

Participants of the study were well informed regarding methodology of research and prior informed consent was obtained from them.