Goldsmith Workers (GSWs): A Skilled Job & Status of Illness

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ABSTRACT

Background: This study was conducted among the goldsmith workers of different goldsmith's workshops located Islampur of Dhaka city to find out respiratory illness among them. `

Methodology: It was a descriptive cross sectional study. By purposive sampling a total of 120 goldsmith workers were interviewed about respiratory problems using questionnaire and checklist.

Result: The study revealed out of 120 respondents 5% were illiterate, 40% had education upto Primary level and 55% respondents had education at secondary level and above. Around 31.7% and 30.8% respondents had monthly income 7100-9000 and 9100-11000 taka respectively. Most of them had length of service 6-20 years (72.5%) and 25.8% had length of service >20 years. The study showed 37.5% had been suffering from respiratory illness and among them 75.6% were suffering from cough for 3months or more in a year, 66.7% suffering from cough with phlegm, 18.9% Blood mixed phlegm, 71.1% running nose/ sneezing and 33.3% were suffering from breathlessness. 96.7% respondents had knowledge on use of personal protective equipments (PPE). Around 58.3% respondents were smoker and their mean duration of smoking habit was 15.59 (7.36) years. PEFR was significantly low (p<0.001) both in sitting and standing position among the respondents suffering from respiratory problems. Mean PEFR on sitting position was 426.22 L/min and 430.33 L/min in standing position in respondents with respiratory problems. Conclusion: This indicates 37.5% respondents are suffering from chronic obstructive pulmonary disease and necessitates preventive and therapeutic measures to minimize sufferings of goldsmith workers.

Key Words: Respiratory illness, Goldsmith workers.

Introduction

From the ancient period of human life, peoples were engaged in making ornaments with gold of various designs to make themselves beautiful. With advancement of civilization people also changed their life style and have inclined to increased use of varieties design of ornament. A group of people are engaged for making different type of ornaments with gold, known as goldsmith worker.[1]

Work related disabilities represent a major public health problem. Despite modest reduction in the number of occupational injuries and illness, the number of lost work days related to these injuries or illness continue to rise.[1]

The people who work in goldsmith workshops develop various types of health problems similar to the problems of blacksmith. Goldsmith workers are directly exposed to coal dust, fumes of wax and acid. Coal dust, fumes of wax and acid may cause pulmonary and non pulmonary problems. Pulmonary problems are sneezing, rhinitis; cough with or without sputum, breathlessness, chest pain etc. Non pulmonary effects are musculoskeletal pain, mechanical injury, conjunctivitis, foreign body in the eyes, dermatitis, vertigo, headache, hyperacidity etc. Toxic chemicals may cause dermatitis, irritation of respiratory tract, irritation of GI tract and impairment of nervous system.[2]

This study was performed to find out respiratory problems among the goldsmiths of selected workshops in Dhaka city to reveal important and

significant information regarding their respiratory problems, so that some specific measures may be taken to prevent or minimize such problems among the goldsmith workers in future.

Methodology

A descriptive cross sectional study was done among the goldsmith workers in different goldsmith workshops located Islampur of Dhaka city from March 2009 to June 2009. The study area was selected purposively as there are many goldsmith workshops located in that area. Data were collected from 120 respondents through face to face interviews with the help of questionnaire ad checklist. Respiratory tests like PEFR (Peak Expiratory Flow Rate) in sitting and standing position by PEFR meter, Chest expansibility, breadth sound were also examined. After data collection data were consolidated, processed and edited by using computers to reduce errors. Statistical methods were used for analysis and interpretation of data.

Results

Among 120 respondents 40.8% belonged to age group of 36 45 years and 37.5% age group 26 35 years. The mean ($\pm$SD) age was 36.14 ($\pm$8.01) years. Only 5%) respondents were illiterate and educational level of others were 40% primary, 40.8% secondary and 14.2% higher secondary level. Most of the respondents had monthly income 7,100 9,000 (31.7%), followed by 9,100 11,000 (30.8%), 5,100 7,000 (20.8%), >11,000 (10.2%) and <5,000 (6.7%) Taka/month. Mean ($\pm$SD) monthly income was Taka 8,608.33 ($\pm$2,208.83). (Table-1)

Around half of the total respodents 52.5% were working as gorith and 25% as chila. Length of service as goldsmith was <5 years in case of only 1.7% respondents, for others, it varied in between 6 and >20 years, 20% for 6 10 years, 25% for 11 15 years, 27.5% for 16 20 years and 25.8% for >20 years. The mean ($\pm$SD) length of service was 17.26 ($\pm$7.11) years. Maximum number of respondents work for up to 8 hours per day (66.7%) and 20% for 9 10 hours.The mean ($\pm$SD) working hours was 8.73 ($\pm$1.14). (Table-2)

Out of 120 respondents, respiratory problem was present in 45 (37.5%) and absent in 75 (62.5%) workers.(Figure-1)

Among the 45 respondents with respiratory illness, all 45 (100%) were suffering from cough, 34 (75.6%) from cough for 3 months or more in a year, 30 (66.7%) when coughing usually brings phlegm, in 4 (18.9%) phlegm were blood mixed, 32 (71.1%) running nose and/or sneezing and 15 (33.3%) experienced breathlessness.(Table-3)

Maximum number of respondents were aware on the use of Personal Protective Equipment (PPE) at workplace (96.7%).(Table-4) But only 52.5% uses goggles and 46.7% use masks. (Figure-2)

58.3% respondents were smokers. In order of frequency, out of these 70 smokers, 25 (35.7%) smoked >15 cigarettes/sticks per day, 20 (28.6%) smoked 11 15 sticks/day, 14 (20%) smoked 6 10 sticks/day and 11 (15.7%) smoked <5 sticks/day. The mean ($\pm$SD) sticks/day smoked was 14.89 ($\pm$7.38).Duration of smoking habit of these 70 smokers. Around 40% has smoking habit of >16 year. The mean ($\pm$SD) duration of smoking habit was 15.59 ($\pm$7.36) years. (Table-5)

The mean ($\pm$SD) chest expandability status was 3.10 ($\pm$0.41) cm among respondents. 70.8% had chest expandability of <3 cm, 21.7% had 3.1 3.5 cm and 7.5% had 3.6 4.0 cm.(Table-6)

PEFR was significantly low (p<0.001), both in sitting and standing position, among respondents suffering from respiratory problems. Mean ($\pm$SD) PEFR in sitting position was 426.22 ($\pm$65.45) L/min in respondents suffering from respiratory problems and 472.00 ($\pm$61.01) L/min in respondents not suffering from any respiratory problem. In standing position PEFR was 430.33 ($\pm$64.49) and 476.13 ($\pm$61.65) L/min, respectively. (Table-7)

Table-1: Distribution of baseline characteristics of respondents   n=120

Characteristics	Frequency
Age	11(9.2)
16-25	45(37.5)
26-35	49(40.8)
36-45	15(12.5)
>45	
Level of education	
Illiterate	6(5.0)
Primary	48(40.0)
Secondary	49(40.8)
Higher secondary	17(14.2)
Monthly income	
5,000	8(6.7)
≤5100-7000	25(20.8)
7100-9000	38(31.7)
9100-11000	37(30.8)
>11000	12(10.2)

Percentage in parenthesis

Table-2: Distribution of respondents by working hour and length of service   n=120

Characteristics	Frequency
Working section	
Gorith	63(52.5)
Chila	30(25.0)
Chetting	13(10.8)
Polishing	13(10.8)
Manager	1(0.8)
Working hour per day	
<8 hr	80(66.7)
9-10 hr	36(20.0)
11-12 hr	3(2.5)
13-14 hr	1(0.8)
Length of service	
≤5 yrs	2(1.7)
6-10 yrs	24(20.0)
11-15 yrs	30(25.0)
16-20 yrs	33(27.5)
>20 yrs	31(25.8

Percentage in parenthesis

Figure 1: Status of respiratory symptoms among respondents

Table-3: Respiratory symptoms of the respondents (n=45)

Cough	45	100.00
Suffer from cough for 3 months or more in a year	34	75.6
Coughing, usually brings phlegm	30	66.7
Blood mixed phlegm	4	18.9
Running nose and/or sneezing	32	71.1
Breathlessness	15	33.3

Table-4: Knowledge of the respondents on PPE use (n=120)

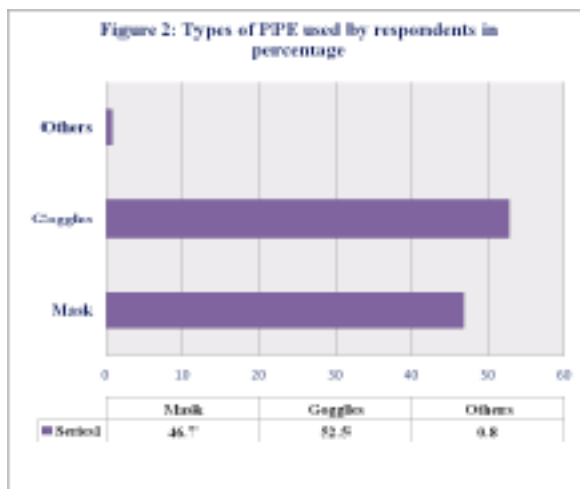| Knowledge on PPE use	Number	Percentage
Yes	116	96.7
No	04	3.3

Figure 2: Types of PPE used by respondents in percentage

	Mask	Goggles	Others
Series1	46.7	52.5	0.8

Table-5: Smoking habits of the respondents

Parameters	Number	Percentage
Smoking habit (n=120)		
Yes	70	58.3
No	50	41.7
Number of cigarettes smoked per day (n=70)		
≤5	11	15.7
6-10	14	20.0
11-15	20	28.6
>15	25	357
Mean±SD		14.89±7.38
Duration (years) of smoking habit (n=70)		
5	6	8.6
6-10	17	24.3
11-15	19	27.1
16-20	14	20.0
>20	14	20.0
Mean±SD		15.59±7.36

Table-6: Chest expandability status of the respondents

Chest expandability (cm)	Number	Percentage
≤3	85	70.8
3.1 -3.5	26	21.7
3.6 -4.0	9	7.5
Mean±SD		3.10±0.41

Table-7: Effect of respiratory symptoms on PEFR

PEFR (L/min)	Respiratory symptoms present (n=45) (Mean±SD)	Respiratory symptoms absent (n=75) (Mean±SD)	p value
Sitting position			
Mean±SD	426.22±65.45	472.00±61.01	0.0001
Range	280.0 -550.0	340.0 -580.0	
Median	420.0	470.0	
Mode	390.0	420.0	
Standing position			
Mean±SD	430.33±64.49	476.13±61.65	0.0001
Range	270.0 -555.0	350.0 -590.0	
Median	420.0	480.0	
Mode	400.0	500.0	

Unpaired Student's t - test

Discussion

This study was undertaken to find out some facts and figures regarding the respiratory problems affecting the goldsmith workers. Also some demographic data pertaining to the goldsmith workers were intended to be investigated. It was never an object of this study to diagnose respiratory ailments among the goldsmith workers since that would require more time, money, technical knowhow as well as manpower and effort which was not available to the researcher. Instead, to find out the magnitude of respiratory problems among the goldsmith workers the emphasis was on the history of the patient which was obtained through a questionnaire. To supplement this, physical examination was done as well as peak expiratory flow rate was ascertained. The motive behind taking PEFR was not to diagnosed to any disease, rather it was through that PEFR would be a good indicator of lung function. Since PEFR is reduced in obstructive lung diseases, Low value of PEFR may reflect latent or imminent obstructive lung disease like asthma, chronic

bronchitis, emphysema - or at least impaired lung function. It was observed from the study that most of the workshops were very dusty, overcrowded and deviated of proper ventilation. In most cases, workers lived in this place in a crowded manner. So these were their working places as well as home where they lived.

This study identified that the working people of goldsmith workshops are male. This is a profession which female workers almost never taken up. Majority (40.8%) of them are of age group (16-25years). No one of them found below 16 years. The average monthly income of the workers was Tk. 8608/=, majority (31.7%) of the workers earn monthly within 7100-9000 Taka. The educational level of the studied workers differs from the workers of different industrial sector. The majority (40.8%) of the studied workers were found with secondary level.

Regarding the length of service of the goldsmith workers the majority (27.5%) of the respondents found who are working in goldsmith workshops for 16-20 years, a good number (25.8%) served more than 20 years. It means that the turning over of employee from this occupation is very less, unless and until they become incapable of working. All the respondents reported during the study that they have to work in goldsmith workshop for more or less 8 hours a day with 1-2 hour interval. It depends upon the work load of the workshop. Generally the goldsmiths have weekend holyday on Friday.

From the study it was found that maximum number of respondents (58.3%) were smokers. This correlates with the social trends in our country which is alarming. Of the smokers (88.5%) smoked 6-10 sticks per day. The proportion of respiratory problems among the goldsmith workers is 45 (37.5%). In this study it was found that symptoms of respiratory problems out of 45 respondents with respiratory problems running nose and / sneezing (71.1%), cough (100%), suffering from cough for 3 month or more in a year (75.6%), phlegm (66.7%), blood mixed phlegm (18.9%).A study showed, long exposures to workplace gases and fumes were significant risk factor for pulmonary fitness amongst the goldsmiths of Indian unorganized sectors. Long exposure to those pollutants abruptly altered the lung functions of the workers.[3]

The findings of other authors reveal, the fumes of various metals, acids, and gases were associated with the deterioration of the pulmonary efficiencies of the

goldsmiths.[4] Sheel et al launched a term "dysanaptic," which they meant the disproportionate growth. They reported that restriction to the alveoli and parts of the upper respiratory tracts might be caused by disproportionate growth of the airways and the lung parenchyma and that dysanaptic growth could lead to the development of different types of lung diseases.[5]

Regarding the PEFR it was found that PEFR was significantly low (p<0.001) both in sitting and standing position, among respondents suffering from respiratory problems. Mean PEFR in sitting position was 426.22 L/min, and standing position 430.33 L/min in respondents suffering from respiratory problems, and mean PEFR in sitting position 472.00 L/min, and standing position 476.13 L/min in respondents not suffering from respiratory problems.

Chattopadhyay et al. showed that constant exposure to fumes and gaseous pollutants were associated with reduced forced vital capacity and peak expiratory flow rates, which could cause an alteration of respiratory health. The validity of assessment of PEFR over the other standard PFT (Pulmonary Function Test) indices lies in the context that the other indices (e.g. FEV1) are more sensitive in assessing bronchoconstriction of the airways while PEFR can be an effective measure for home monitoring of lung function.[6]

A study done among the weaving workers: assessment of lung function by peak flow meter. Study showed that the mean PEFR of the workers who were suffering from respiratory diseases was 406.75 L/min. and was significantly lower than that of the workers (509.30 L/min.) who had no respiratory diseases.[7]

In this study mean chest expansibility was 3.10±0.41cm. From another study it was found that PEFR was directly proportional to the chest expansion irrespective of sex and age but for the same age group and same chest expansion, PEFR differed by sex. So chest expansion is not only parameter controlling PEFR.[8]

Conclusion

This study comes to the conclusion with the realization of importance for occupational safety and health for the goldsmith workers who are at risk. Respondents were very much aware about the irritating dust hazards but many of them did not use personal protective equipments during the period of work. Pulmonary

symptoms like running nose, sneezing, cough were more common among them due to exposure to coal dust, fumes of wax & acid resulting significantly lower levels of lung functions. The occurrence of respiratory problems was found to be directly proportional to the length of service of the respondents and the occurrence of respiratory problems increased with the increased number of cigarettes smoked per day. Proper preventive measures should be taken and the affected cases should be given proper treatment facilities for the betterment of the labour force.

Conflict of interest: We have no conflict of interest.

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