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| Fig. 1: Distribution of the respondents based on age group (n=200) |

Fig 1 shows the percentage of age groups of 200 workers. Among the different age groups, the highest number of workers 30.0% laid on greater than 55-65 years of age group and smallest percentage of workers 20% laid on 25-34 years of age group.

Table I:Distribution of Sex of respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Sex of Respondent | Frequency | Percent |
| Male | 131 | 65.5 |
| Female | 69 | 34.5 |
| Total | 200 | 100.0 |

Table I represents the percentage of gender of the 200 workers. Among male and female, the highest number of workers 65.5% (n=131) were male and smallest percentage of workers 34.5% (n=69) were female.

Table II: Distribution of Smoking of respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Smoking Status | Frequency | Percent |
| Yes | 106 | 53.0 |
| No | 94 | 47.0 |
| Total | 200 | 100.0 |

Table II represents the percentage of the workers’ smoking status. Among smokers and nonsmokers, the highest number of workers 53% (n=106) were smoker and smallest percentage of workers 47% (n=94) were nonsmoker.

Table III: Distribution of Smoking and Pattern (n=200)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Smoking | COPD | | Total | p-value |
| No  (n=122) | Yes  (n=78) |
| Yes | 56 (45.9) | 50 (64.1) | 106 (53.0) | 0.012 |
| No | 66 (54.1) | 28 (35.9) | 94 (47.0) |

Table III represents the percentage of COPD pattern with the workers smoking status. Among the 200 workers, 122 were no COPD. Among them, 45.9% (n=56) were smoker and 54.1% (n = 66) were nonsmoker. Among the total workers, 78 had COPD. Among them, 64.1% (n=50) were smoker and 35.9% (n=28) were nonsmoker.

Table IV: Distribution of length of Service of respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Working Length | Frequency | Percent |
| 5-10 Years | 118 | 59.0 |
| 10-15 Years | 43 | 21.5 |
| 15+ Years | 39 | 19.5 |
| Total | 200 | 100.0 |

Table IV represents the percentage of the workers of different service length. Among the different groups, the highest number of workers 59% (n=118) has a service length between 5-10 and smallest percentage of workers 19.5% (n=39) has a service length about 15+ years.

Table V: Distribution of Protective equipment using among the respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Protective equipment | Frequency | Percent |
| Yes | 26 | 13.0 |
| No | 174 | 87.0 |
| Total | 200 | 100 |

Table V represents the percentage of the workers’ using protective equipment. Among users and non-users, the highest number of workers 87% (n=174) were non-users and smallest percentage of workers 13% (n=26) were non-users of protective equipment.

Table VI: Distribution of BMI category of the respondents (n=200)

|  |  |  |
| --- | --- | --- |
| BMI Category | Frequency | Percent |
| Underweight | 42 | 21.0 |
| Normal | 141 | 70.5 |
| Overweight | 17 | 8.5 |
| Total | 200 | 100 |

Table VI represents the percentage of BMI category of workers. Among underweight, normal weight and overweight workers, the highest number of workers 70.5.5% (n=141) were normal and smallest percentage of workers 21.0% (n=42) were in underweight, rest were overweight.

Table VII: Distribution of cough in the respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Cough | Frequency | Percent |
| Yes | 100 | 50 |
| No | 100 | 50 |
| Total | 200 | 100 |

Table VII represents the percentage of having cough in workers. Among all workers, having cough or not having cough have equal percentage (50%) in both groups.

Table VIII: Distribution of sputum production in the respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Sputum Production | Frequency | Percent |
| Yes | 57 | 28.5 |
| No | 143 | 71.5 |
| Total | 200 | 100 |

Table VIII represents the percentage of sputum production among the worker. Among all workers, the highest number of workers 71.5% (n=143) have no sputum and smallest percentage of workers 28.5% (n=52) have sputum.

Table IX: Distribution of breathlessness in the respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Breathlessness | Frequency | Percent |
| Present | 95 | 47.5 |
| Absent | 105 | 52.5 |
| Total | 200 | 100 |

Table IX represents the percentage of breathlessness of the worker. Among breathlessness category, the highest number of workers 52.2% (n=105) were informed of no breathlessness and smallest percentage of workers 47.5% (n=95) were said “yes”.

Table X: Distribution of COPD pattern among the respondents (n=200)

|  |  |  |
| --- | --- | --- |
| Pattern | Frequency | Percent |
| Obstruction (NR) | 78 | 39.0 |
| Obstruction(R) | 11 | 5.5 |
| Restriction | 36 | 18.0 |
| Normal | 75 | 37.5 |
| Total | 200 | 100 |

Among the 200 workers, 39% (n=78) were in obstruction (NR) COPD pattern and 5.5% (n=11) were in obstruction (R) COPD pattern. Restriction COPD pattern were in 18% (n=36) and 37.5% (n=75) of COPD has normal COPD pattern.

**N=78**

Table XI: Distribution of age group among the respondents (n=78)

|  |  |  |
| --- | --- | --- |
| Age | Frequency | Percent |
| 25-34 | 0 | 0.0 |
| 35-44 | 19 | 24.4 |
| 45-54 | 27 | 34.6 |
| 55-65 | 32 | 41.0 |
| Total | 78 | 100 |

Table XI represents the percentage of age groups of 78 workers (Obstruction (NR) only). Among the different age groups, the highest number of workers 41.0% (n=32) laid on greater than 55-65 years of age group and smallest percentage of workers 0% (n=0) laid on 25-34 years of age group.

Table XII: Distribution of gender among the respondents (n=78)

|  |  |  |
| --- | --- | --- |
| Sex | Frequency | Percent |
| Male | 60 | 76.9 |
| Female | 18 | 23.1 |
| Total | 78 | 100 |

Table XII represents the percentage of gold severity with the gender of workers who were only obstruction (NR). Among male and female, the highest number of workers 76.9% (n=60) were male and smallest percentage of workers 23.1% (n=18) were female.

Table XIII: Distribution of gender and smoking among the respondents (n=78)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Smoking | Sex | | Total | p-value |
| Male  (n=60) | Female  (n=18) |
| Yes | 47 (78.3) | 3 (16.7) | 50 (64.1) | ?? |
| No | 13 (21.7) | 15 (83.3) | 28 (35.9) |

Table XIII represents the percentage of smoking with the gender of workers who were only obstruction (NR). Among male and female, the highest number of workers 78.3% (n=47) were male and smoker, smallest percentage of workers 16.7% (n=3) were female and also smoker.

Table XIV: Distribution of smoking in pack of the respondents (n=78)

|  |  |  |
| --- | --- | --- |
| Pack (Year) | Frequency | Percent |
| Greater than 10 | 46 | 59.0 |
| Less than or equal to 10 | 4 | 5.1 |

\*\*28 data were missing here.

Table XIV represents the percentage of pack smoking by workers who were only obstruction (NR). Among 78 workers, the highest number of workers 59.0% (n=46) were smoke greater than 10 pack in a year and rest smoke less than 10 pack in a year.

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| Fig. 2: Distribution of service length of the respondents (n=78) |

Fig 2 represents the percentage of the workers of different service length who were only obstruction (NR). Among the different groups, the highest number of workers 48.7% has a service length between 15+ years and smallest percentage of workers 7.7% has a service length about 5-10 years.

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| Fig. 3: Distribution of Protective equipment using among the respondents (n=78) |

Fig 3 represents the percentage of the workers’ using protective equipment who were only obstruction (NR). Among users and non-users, the highest number of workers 91% (n=71) were non-users and smallest percentage of workers 13% (n=26) were non-users of protective equipment.

Table XV: Distribution of GOLD severity among the respondents (n=78)

|  |  |  |
| --- | --- | --- |
| Gold Severity Grade | Frequency | Percent |
| Mild (FEV1>80%) | 8 | 10.3 |
| Moderate (FEV150-79%) | 46 | 59.0 |
| Severe (FEV1 30-49) | 22 | 28.2 |
| Very Severe (FEV1 <30) | 2 | 2.6 |
| Total | 78 | 100 |

Among the 78 workers, 10.3% (n=8) were in mild and 59% (n=46) were moderate. Severe grade was in 28.2% (n=22) and 2.6% (n=2) of very severe grade.

Table XVI: Distribution of Service and Gold Severity (n=78)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| GOLD Severity Grade | Working Length | | | p-value |
| 5-10 | 10-15 | More than 15 |
| Mild | 0(0%) | 4(50%) | 4(50%) | .797 |
| Moderate | 3(6.5%) | 22(47.8) | 21(45.7) |
| Severe | 3(13.6%) | 7(31.8) | 12(54.5) |
| Very Severe | 0(0%) | 1(50.0) | 1(50) |
| Total | 6(7.7) | 34(43.6) | 38(48.7) |

Table XVI & Fig 4 represents the percentage of gold severity with the different service length of the workers who were only obstruction (NR). Among the total mild workers, 50% (n=4) were more than 15 years of work length, none have mild severity whose working length were 0%. Among very severe grade, 50% (n=1) had service length between 10-15 years and 50% (n=1) were more than 15% of working length group.

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| Fig. 4: Distribution of Service and Gold Severity (n=78) |

Analyses using data case and control together

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|  |
| Fig. 5: |

|  |
| --- |
|  |
| Fig. 6: |

N = 106

Smoker + Slica exposure

Table XVIII:

|  |  |  |
| --- | --- | --- |
| Pattern | Frequency | Percent |
| Obstruction (NR) | 50 | 47.2 |
| Obstruction(R) | 4 | 3.8 |
| Restriction | 19 | 17.9 |
| Normal | 33 | 31.1 |
| Total | 106 | 100 |

Among the 106 workers (smoker with silica dust worker), 47.2% (n=50) were in obstruction (NR) pattern and 31.1% (n=33) were in normal COPD pattern.

Table XVII: Association between Exposure to smoking plus Silica (vs Smoking) and COPD

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Exposure | COPD | | OR | 95% CI | P-value |
| No | Yes |
| Smoker & Silica exposure | 56 (42.1) | 50 (68.5) | 2.99 | [1.64-5.46] | <0.001 |
| Smoker | 77 (57.9) | 23 (31.5) | Ref. | - |

OR: Odds Ratio; CI: Confidence Interval

Table XVII present odds ratios and 95% confidence intervals (CI) for COPD different exposure. The logistic regression analysis shows that workers who were smoker and worked in silica dust were significantly more likely to effected by COPD (OR 2.99; 95% CI 1.64–5.46) compared to the only smoker workers.