**Discussion**

In the current study, a majority (61.0%) of the workers were in the age group of 40+ years. However, those suffering from COPD were found to be in the elderly group (>40 years, 85.9%). It may be because of direct effects of different risk factors along with lung compliances. A prevalence study conducted in Bangladesh also found that gender (male) was an important contributing factor to COPD (Biswas & Chowdhury, 2017). In this large population-based cohort study of the general Dutch population of 40 years and older, the overall incidence rate of physician-diagnosed COPD was 2.92/1000PY. Based on these data the risk to be diagnosed with COPD in the coming 40 years was 12.7% for a 40-year-old male and 8.3% for a 40-year-old female. The incidence increased with age, and was higher in men than in women. Known risk factors of COPD were confirmed such as smoking status, male gender and increasing age. Mortality was high; especially in very severe COPD patients with one-year mortality (Afonso, Verhamme, Sturkenboom, & Brusselle, 2011).

The relatively low-income status in workers is also contributory to the overall burden of COPD in Sylhet, especially at the family and individual levels. According to previous study, poor economic conditions, poor domestic cooking environment, and environment may worsen COPD; and due to the low-income status, workers may still lack the financial resources to seek proper treatment (Lamprecht et al., 2011). In our study, middle income earning workers are more risk to get COPD disease.

Our findings establish the joint risk of smoking and occupational exposures in a study that rigorously defined COPD based on a physician diagnosis of COPD, medical treatment for the condition, and objective evidence of airway obstruction. In the latter study, the combination of smoking and occupational exposure was associated with a nearly five-fold increase in the risk of COPD (De Meer, Kerkhof, Kromhout, Schouten, & Heederik, 2004).

Exposure to both smoking and occupational factors portended an especially high risk of COPD. The joint analysis of smoking and workplace exposures implies that elimination of one, but not the other risk, will not be fully effective for reducing the burden of COPD in the population.

We found that the joint exposure to smoking and occupational factors combined to increase the risk of COPD. This observation extends our earlier results in a different population-based sample in which COPD was based on survey responses and not spirometry (Blanc et al., 2009; Trupin et al., 2003). Another study has also found interaction effects between smoking and occupational exposure for the risk of chronic bronchitis or chronic bronchitis plus airway obstruction (GOLD stage II or greater) (Boggia, Farinaro, Grieco, Lucariello, & Carbone, 2008).

The overall prevalence of COPD in the areas studied among smokers above 40 years was 80%. The prevalence of COPD was higher in male workers. Smoking workers who use biomass (76.9%) and have COPD. In Bangladesh, most of the villages use traditional stoves for cooking with biomass, which might influence the development of COPD. FEV1/ FVC was also significantly reduced among those who were using biomass compared with those using LPG or natural gas (Biswas & Chowdhury, 2017). Similar studies conducted in turkey (Ekici et al., 2005), found that the prevalence of COPD in the exposed group was higher than that in the LPG group (28.5 vs. 13.6% crude OR=2.5, CI=1.5–4.0, P=0.001). The fraction of COPD attributed to exposure to biomass smoke after adjusting for possible confounding factors was 23.1% (95% CI: 13.4–33.2). A study conducted in China (Liu et al., 2007), also found the use of biomass as a risk factor of COPD.

According to our results, low occupational status and low income were associated with a higher incidence rate and risk of COPD, which were in line with previous studies that have shown associations between low socioeconomic circumstances and risk for COPD (Kanervisto et al., 2011). When we grouped the individuals by smoking status, the associations between socioeconomic circumstances and COPD were seen mainly among the smokers. However, it is also possible that other COPD risk factors such as exposure to environmental or occupational air pollutants contribute to the relationship between social class and COPD in smokers (Hajat, Hsia, & O’Neill, 2015). It is possible that smokers with low socioeconomic circumstances on average consume more cigarettes and quit smoking less often than smokers from high socioeconomic groups (Osier & Prescott, 1998). Moreover, exposure to occupational dust, fumes, and toxic substances in the workplace are also more common in low socioeconomic groups. Therefore, the increased risk for COPD among the smokers with low socioeconomic circumstances might reflect an increased susceptibility for exposure to smoking in these individuals. Other factors such as indoor and outdoor air pollutants, crowding, poor nutrition, slower intrauterine growth of lung function or increased occurrence of childhood respiratory infections are other potential explanations of the socioeconomic differences in COPD (Mannino & Buist, 2007). Among them, some factor we can’t add in our study.

Many aspects of the relationship between COPD and occupational exposures await further investigation. Some findings, including those from our group, suggest that prior occupational exposures may not only be associated with COPD, but may also carry a risk of more severe disease once established (Blanc et al., 2004). This potential effect, however, remains to be explored more fully. In this study of an urban population, lower socioeconomic circumstances such as low occupational status and low income were significantly associated with an increased risk of COPD. The relationships remained significant after adjustments for lifestyle and biological factors including smoking status. This relationship was mainly observed in smokers and no significant relationship between socioeconomic circumstances and COPD was found in those who never smoked.

**Conclusion**

The low level of published research on COPD has posed a major challenge to policymakers and many stakeholders, as there are not yet enough evidenced-based findings that can contribute to informed policy making to tackle this disease burden (Laraqui et al., 2000). It has been suggested that the low research output reflects the poor recent availability of research funding for COPD by funding agencies, which in turn reflects their lack of priority given to COPD (Abdool-Gaffar et al., 2011). It is also similar in Sylhet as well as Bangladesh. The data on COPD in Sylhet is limited, with the few published studies only available from some cities in Bangladesh. However, it is evident from those studies that the burden of COPD on dust workers in Bangladesh is significant. With continued urbanization, rapid ageing and lack of corresponding measures to check the effects on the population, the burden of COPD will continue to grow and it is set to become one of the major public health problems in Bangladesh.

There is need for more research on COPD prevalence, incidence, sequelae and mortality, along with well-designed trials, to identify how to effectively reduce risks from exposure to biomass fuels and tobacco smoking. With improved awareness of this problem, policy makers and governments of many African nations should give more attention to NCDs such as COPD, fund relevant research to improve evidence for decision making, and thus make informed decisions on preventive and treatment strategy options, and so help counter the rising disease burden over the next decade.