

**INCIDENCE OF COVID-19 INFECTION AMONG SMOKERS IN KIRKUK, IRAQ**Goljameen Midhat Abdulla<sup>1</sup> and Ozdan Akram Ghareeb<sup>2\*</sup><sup>1,2</sup>Department of Pharmacy, Kirkuk Technical Institute, Northern Technical University, Iraq.

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**ABSTRACT**

Coronavirus disease 2019 (COVID-19) was first identified in Wuhan, China, in December 2019. It subsequently spread throughout the world, causing a global pandemic. Smoking affects the lungs and is therefore considered to increase the risk of respiratory infections and COVID-19 and cause more severe symptoms. In this cross-sectional study participated 100 workers in private medical laboratories in Kirkuk, northern Iraq, during the period between December 2021 and February 2022. The results showed that the percentage of smokers infected with COVID-19 reached 70% among them. Thus, we have concluded that there is a strong possibility that smoking is a risk factor for contracting this infection.

**KEYWORDS:** COVID-19, respiratory infections, medical laboratories, smokers.**1. INTRODUCTION**

It is known that infection with corona virus disease-2019 (COVID-19), the infectious disease that first reported in Wuhan, China, in December 2019, has caused a global pandemic.<sup>[1-3]</sup> Millions of infections were reported in several countries around the world, including many horrific deaths.<sup>[4]</sup> This pandemic was considered a public health problem that affected the entire world and caused great social and economic losses.<sup>[5,6]</sup> Infection with COVID-19 causes respiratory illness that may lead to severe progressive pneumonia<sup>[7]</sup>, multi-organ failure<sup>[8]</sup>, and death in critically ill patients.<sup>[9]</sup> The Coronavirus usually enters the body through the mucous membrane of the upper respiratory tract through the nose and mouth.<sup>[10,11]</sup> Smoking and electronic cigarettes increase the risk and severity of lung infections due to damage to the upper airways and decreased pulmonary immune function in particular<sup>[12]</sup>, and smokers are more susceptible to infectious diseases than others.<sup>[13]</sup> Smoking harms the immune response within the respiratory system, making smokers more vulnerable to infectious disease pathogens.<sup>[14]</sup> Active smoking and smoking history are associated with severe COVID-19 infection, so the idea of exposure to this infection should serve as a driving force for patients and those at risk to maintain good hygiene practices and stop smoking.<sup>[15]</sup> There has been widespread interest in recent media reports that smoking may exert a protective effect against COVID-19 infection, leading the World Health Organization to issue a statement urging caution regarding these claims, and stressing that there is no evidence to confirm a link between smoking and nicotine

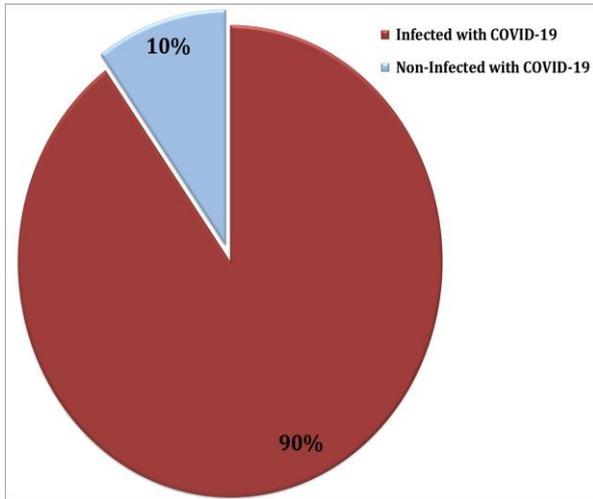
in the prevention or treatment of COVID-19.<sup>[16,17]</sup> Thus, there remains a clear lack of evidence regarding the relationship between smoking and severity of this infection. The aim of this study is to evaluate the effect of smoking status on the clinical severity of COVID-19.

**PATIENTS AND METHODS**

This cross-sectional study included (100) individuals working in private medical laboratories in Kirkuk, northern Iraq, which lasted from December 2021 until February 2022. The study included both genders, aged 18 years old and above, infected previously with COVID-19 or not, and who formally agreed to participate in this study. Individuals less than 18 years of age, as well as those who refused to participate in this study, were excluded. A special questionnaire was designed for the study and was filled out by the participants, and their answers were documented, including smoking status, COVID-19 infection after they were confirmed with a positive PCR test result and symptoms that accompanied their infection. After obtaining the final data, descriptive statistical analysis was applied using the SPSS system, and it was presented in figures and tabulated in the form of clear frequencies and percentages.

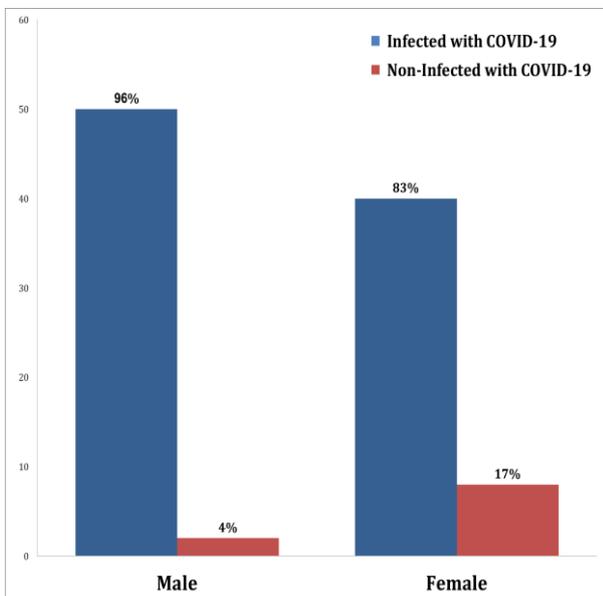
**RESULTS AND DISCUSSION**

According to the basic characteristics of the (100) participants, it was found that (52) of them were male and (48) female. The results showed that the infection rate was (90%) as shown in figure (1).



**Figure 1: Prevalence of COVID-19 infection among participants.**

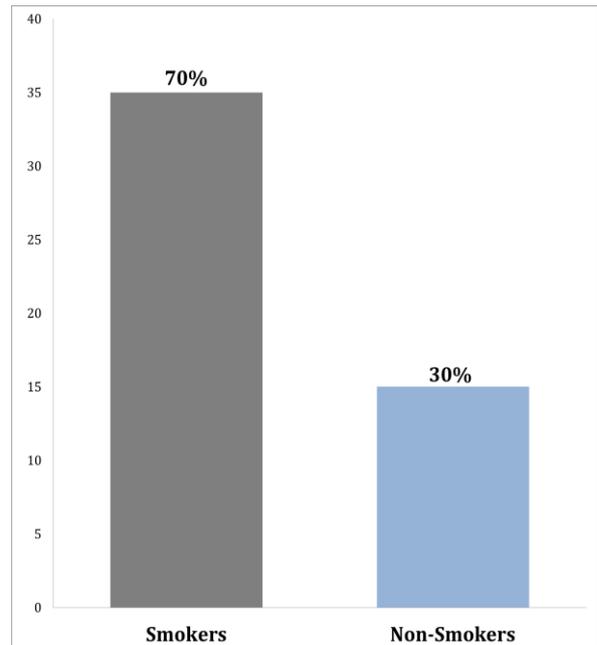
The incidence of infection in females was (83%) versus (17%) non- infected, while the infection rate in males reached (96%) versus (4%) non-infected as explained in figure (2).



**Figure 2: Rates of COVID-19 infection among participants by gender.**

Among (50) infected males, (35) of them were smokers (70%) versus 15 (30%) non-smoker as illustrate in figure (3). This finding is supported by a previous study by Tattan-Birch *et al* (2021) in England, who concluded that current smokers and long-term former smokers had higher odds of reporting COVID-19 compared with never smokers in adjusted analyses, but there were no significant differences between people who use nicotine replacement therapy or e-cigarettes.<sup>[18]</sup> In the largest available meta-analysis among the peer-reviewed literature, Reddy and colleagues confirmed that smoking significantly increased COVID-19 risk and death. Their analysis indicated that smoking represents one of the risk factors that can be most immediately modified to reduce

the significant morbidity rates associated with the disease.<sup>[19]</sup>



**Figure 3: Incidence of COVID-19 infection among smokers.**

As for clinical features (Table 1) that participants with Covid-19 complained of, the highest rate (96%) was for fever, while the lowest rate (23%) was for intestinal disorders. Our results were consistent with several previous studies, Faiq *et al.* (2021) found that fever was common sign (91%) among COVID-19 patients.<sup>[20]</sup>

**Table 1: Clinical features of studied COVID-19 patients.**

Clinical Features	Total=90 (100%)
Fever	86 (96%)
Dry Cough	70 (78%)
Fatigue	74 (82%)
Sore Throat	68 (76%)
Dyspnea	32 (36%)
Hyposmia	71 (79%)
Hypoguesia	73 (81%)
Intestinal disorders	21 (23%)

In general, smoking addiction is harmful to human health, and there are several diseases that affect smokers to a greater extent than non-smokers. It has been proven that smoking harms the safety and health of the smoker and others around him, and the risk of diseases resulting from the toxic substances it contains, which are considered among the factors that lead to a change in the proportions of white blood cells and platelets. Smoking also causes chronic inflammation in the mucous membrane of the upper respiratory system, and disrupts mucociliary activity causes increased mucus secretion and lung cancer.<sup>[21,22]</sup> Smoking affects and damages the lungs, so it increases the risk of respiratory infections and makes it easier for COVID-19 to invade lung tissue,

causing more serious symptoms and increasing the risk of death.<sup>[23]</sup> Studies have also shown that people with respiratory diseases caused by tobacco use are more likely to develop severe symptoms of Covid-19 infection. In addition, acute exposure in the laboratory allows for the occurrence of a more serious close epithelial disease of COVID-19 by reducing the mucosal innate immune response and proliferation of airway basal dendritic cells and has implications for the spread and severity of disease in exposed subjects to cigarette smoke, with more severe viral infection and cell death.<sup>[24,25]</sup> Smoking patients with various comorbidities are more susceptible to infection with COVID-19 and have a worse prognosis for the virus as well as for their comorbidities.<sup>[26]</sup> Further investigation into the interaction between smoking and COVID-19 is warranted to accurately assess the risk of developing COVID-19 among smokers, and progression to mechanical ventilation or death in COVID-19 patients.

### CONCLUSIONS

The current study found that smokers have an increased risk of developing severe cases of COVID-19 infection. Smoking is one of the bad health habits, so it is recommended to quit or reduce smoking, or replace it with healthy habits that are more beneficial to the body. Due to the negative pulmonary effects of cigarettes, it is recommended not to use them to reduce lung infection.

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