COVID-19 among Smokers and Non-smokers in Erbil City, Kurdistan Region, Iraq

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ABSTRACT

Background and objectives: Coronavirus disease (COVID-19), a severe respiratory syndrome caused by a novel strain of coronavirus (SARS-CoV-2), became a global public health concern and was declared a pandemic by WHO. The associations between smoking and COVID-19 infection and the outcomes were ambiguous. This study aimed to determine the associations of self-reported confirmed cases of COVID-19 among smokers and to compare it with the rate among non-smokers in Erbil City.

Methods: This cross-sectional house survey was conducted between September 2021 and June 2022 through a multi-stage cluster sampling method on a sample of 2601 respondents in Erbil city through direct interviews using a specially designed questionnaire to collect data.

Results: The mean age was 38.75 + 13.79 years (range 18 to 76 years). More than half (58.9%) of the sample were males. The proportion of current daily smokers was 44.3%, and 33.2% were those who had never smoked before. 17.5% of the sample were infected by the COVID-19 virus during the pandemic. There was a statistically significant association between the occurrence of COVID-19 and the age, gender, marital status, education level, occupation, smoking status, and socioeconomic level of participants.

Conclusion: The occurrence of COVID-19 among smokers was significantly higher than among non-smokers. A statistically significant association was found between self-reported confirmed cases of COVID-19 and the age, gender, marital status, education level, occupation, smoking status, and socioeconomic level of participants.

Keywords: Smoking; Household; Survey; COVID-19; Non-smokers

INTRODUCTION

Since being reported in China in late December 2019, coronavirus disease (COVID-19), which is a severe acute respiratory syndrome caused by a novel strain of coronavirus (SARS-CoV-2) became a global public health concern and then on March 11, 2020, WHO declared COVID-19 a pandemic [1]. Although at first associations between smoking and COVID-19 infection and the outcomes were ambiguous, to date the reported data about tobacco smoking and COVID-19 disease adverse prognosis remain controversial [2]. Smoking is the greatest risk factor for developing chronic obstructive pulmonary disease (COPD) leading to pulmonary inflammation. Smoking in addition to COPD is related to all-cause mortality due to cancer (mainly lung cancer) [3], other respiratory infections, and cardiovascular disease [4, 5]. Up to researchers' knowledge, it was necessary to evaluate the smoking status and the risk of coronavirus infection. As a result, this cross-sectional house survey was carried out to determine the association between self-reported confirmed cases of COVID-19 among smokers and to compare it with the rate among non-smokers.

METHODS

A descriptive cross-sectional household survey was carried out among a sample of residents in Erbil city to determine the associations of self-reported confirmed cases of COVID-19 among smokers and to compare it with the rate among non-smokers. The study was conducted in Erbil city, the capital of the Kurdistan Region-Iraq, between September 1, 2021, and June 30, 2022. A sample of 2601 residents of both genders, aged 18 years or over, who gave their consent to participate in the study, comprised the sample selected using a multi-stage cluster sampling method, and 25% of quarters in each municipality were chosen randomly based on the administrative map of the city, and then through the systematic random sampling method, households in each quarter were selected (Table 1). Data was collected through direct interviews with the participants using a specially designed questionnaire comprising socio-demographic and economic features, besides smoking-related questions. Smoking status was determined using the WHO criteria for smoking as a current daily smoker, an occasional smoker, an ex-smoker, and a never-smoker [6]. The socioeconomic level of participants was calculated based on the socioeconomic index for health research in Iraq [7]. Data were analyzed using the SPSS software (version 25). Means were calculated to summarize numerical variables and proportions for the categorical variables. The Chi-square test was used to compare the proportions. A p-value of ≤ 0.05 was considered statistically significant. Ethical approval for this study was granted by the Ethics Committee of the College of Medicine, Hawler Medical University (2020/11/4, Number 7). Informed consent was provided by all participants; verbal consent was taken from all the samples and they had been informed about the purpose of the study.

Table 1: Distribution of the required sample according to the Erbil quarters

Municipality	Municipality population	250/100,000	No. of quarters	25% of quarters	No. of sample/ quarter	Required Sample
M 1	45576	147.048556	11	3	49	147
M 2	96276	310.629405	22	6	52	311
M 3	110964	358.019457	26	7	51	358
M 4	338100	1090.86170	34	9	121	1091
M 5	97884	315.817532	23	6	53	316
M 6	117040	377.623349	25	6	63	378
Total	805840	2,599.9999	141	37		2601

RESULT

The mean age + SD was 38.75 + 13.790 years. About one-quarter (25.1%) of the sample were 50 or older. More than half (58.9%) were males and married (57.1%). Concerning education level, 30% were illiterate or had a primary education level.

A total of 795 (30.6%) were semi-skilled manual workers, and 1182 (45.4%) perceived that their economic situation was from middle socioeconomic levels (Table 2).

Table 2: Distribution of the study population by socio-demographic characteristics

Variables	No.	(%)
Age Groups		
Less than 20	176	(6.8)
20 - 29	647	(24.9)
30 - 39	597	(23)
40 - 49	525	(20.2)
50 and more	656	(25.1)
Gender		
Female	1069	(41.1)
Male	1532	(58.9)
Marital Status		
Single	984	(37.8)
Married	1485	(57.1)
Divorced	21	(0.8)
Widowed	111	(4.3)
Education		
Illiterate/ Primary	781	(30)
Intermediate	306	(11.8)
High school or vocational	469	(18)
Graduates*	1045	(40.2)
Occupation		
Unskilled manual	534	(20.5)
Semi-skilled manual	795	(30.6)
Skilled manual	693	(26.6)
Others**	579	(22.3)
Socioeconomic Level		
Low	1134	(43.6)
Middle	1182	(45.4)
High	285	(11)
Total	2601	(100)

* Including Institute, College, and higher education
** Including associate professionals, skilled or highly professionals, and senior managers

As presented in Table 3, more than 44% of the participants were current daily smokers, 14.5% were occasional smokers, 8% were ex-smokers and about one-third (33.2%) never smoked. A total of 460 (30.1%) of the sample started cigarette smoking at the age of 15-19 years, while the lowest rate, 87 (5.7%) indicated less than 15 years. Less than half (46.6%) of the participants have ever tried waterpipe smoking; 835 (68.9%) started waterpipe smoking at an age of fewer than 30 years. Regarding the frequency of waterpipe smoking, the highest rate (37.2%) smoked waterpipe every day.

Table 3: Distribution of the study population by smoking-related characteristics

Variables	No.	(%)
Smoking Status (n=2601)		
Current daily smoker	1153	(44.3)
Occasional smoker	376	(14.5)
Ex-smoker	207	(8)
Never smoker	865	(33.2)
Age of starting cigarette smoking (n=1529)		
Less than 15	87	(5.7)
15 – 19	460	(30.1)
20 – 24	440	(28.7)
25 – 29	290	(19)
30 and more	252	(16.5)
Ever tried waterpipe smoking? (n=2601)		
No	1390	(53.4)
Yes	1211	(46.6)
Age of starting waterpipe smoking (n=1211)		
Less than 15	21	(1.7)
15 – 19	241	(19.9)
20 – 24	333	(27.5)
25 – 29	240	(19.8)
30 and more	376	(31.1)
Frequency of Waterpipe smoking (n=1211)		
Everyday	450	(37.2)
Once Weekly	193	(15.9)
Once every 2-4 days	381	(31.5)
Sometimes	187	(15.4)

During the COVID-19 pandemic, 17.5% of the study population was infected by the virus. The majority of those infected by the Virus (87%) stopped smoking during the disease period, but mostly (almost all of them) (99.2%) returned to smoking after recovery (Table 4).

Table 4: Distribution of the study population by COVID-19-related characteristics

Variables	No.	(%)
During the COVID-19 pandemic been infected by the virus? (n=2601)		
No	2147	(82.5)
	454	(17.5)
If Yes, did you stop smoking during the disease period? (n=454)		
No	59	(13)
	395	(87)
Returned to smoking after symptoms disappeared? (n=395)		
No	3	(0.8)
Yes	392	(99.2)

Table 5 shows that the occurrence of COVID-19 was significantly (P= 0.001) higher among males (24.5%) than among females (7.3%) and among those from the intermediate education level (26.5%) than the other groups. The confirmed cases of COVID-19 among smokers were (29.2%) which was significantly (P= 0.001) higher than among non-smokers (0.7%). The infection with COVID-19 was slightly higher among the age group 40-49 years compared to the other age groups, divorced, skilled manual /non-manual workers, and participants who were from high socioeconomic levels.

Table 5: Infection with COVID-19 by socio-demographic characteristics of the sample

Variables	Infected by COVID-19				Total	P-value
	Yes		**No**			
	No.	(%)	No.	(%)		
Age Groups						
Less than 20	19	(10.8)	157	(89.2)	176	
20 - 29	126	(19.5)	521	(80.5)	647	
30 - 39	105	(17.6)	492	(82.4)	597	0.012
40 - 49	106	(20.2)	419	(79.8)	525	
50 and more	98	(14.9)	558	(85.1)	656	
Gender						
Female	78	(7.3)	991	(92.7)	1069	0.001
Male	376	(24.5)	1156	(75.5)	1532	
Marital Status						
Single	182	(18.5)	802	(81.5)	984	
Married	264	(17.8)	1221	(82.2)	1485	0.001
Divorced	4	(19)	17	(81)	21	
Widowed	4	(3.6)	107	(96.4)	111	
Education						
Illiterate/ Primary	113	(14.5)	668	(85.5)	781	
Intermediate	81	(26.5)	225	(73.5)	306	0.001
High school or vocational	93	(19.8)	376	(80.2)	469	
Graduates*	167	(16)	878	(84)	1045	
Occupation						
Unskilled manual	69	(12.9)	465	(87.1)	534	
Semi-skilled manual	138	(17.4)	657	(82.6)	795	
Skilled manual /non-manual	148	(21.4)	545	(78.6)	693	0.002
Others**	99	(17.1)	480	(82.9)	579	
Smoking						
No	7	(0.7)	1065	(99.3)	1072	0.001
Yes	447	(29.2)	1082	(70.8)	1529	
Socioeconomic Level						
Low	167	(14.7)	967	(85.3)	1134	
Middle	231	(19.5)	951	(80.5)	1182	0.006
High	56	(19.6)	229	(80.4)	285	
Total	**454**	**(17.5)**	**2147**	**(82.5)**	**2601**	

* Including institute, college, and higher education
** Including associate professionals, skilled or highly skilled professionals, and senior managers.

Discussion

The study found that below half of the participants were from the middle socio-economic level. This result is consistent with a study on a group of men in Mosul, Iraq [8]. In this study, (44.3%) were current daily smokers. Numerous studies demonstrate a substantial variance in the reported prevalence of current smoking, (40.08%) in Saudi Arabia [9], and (26.4%) in Libya [10]. The discrepancies in the reported prevalence of smoking may be explained by the various study sites, sample frames, demographics of the enrolled populations, and cultural and religious considerations. Self-reported cases of COVID-19 during the pandemic were about (17.5%). The majority of those infected by the virus (87%) stopped smoking during the disease period but most (99.2%) returned to smoking after recovery. The infection by the COVID-19 virus was significantly higher among the age group 40-49 years (20.2%), males (24.5%), divorced (19.0%), and those with an intermediate education level (26.5%). In this study, infection by the COVID-19 virus was significantly more (21.4%) among participants who worked in skilled manual or non-manual occupations; furthermore, COVID-19 among smokers (29.2%) was significantly higher than among non-smokers (0.7%). The reported role and association of smoking with COVID-19 are highly controversial. Several studies agreed that COVID-19 was more prevalent among smokers than non-smokers [2, 11, 12], while the opposite result was reported by other studies [13, 14]. A prospective cohort study conducted early in the pandemic about the risk of severe COVID-19 disease among 8.3 million participants in the UK observed that smokers had a noticeably lower probability of developing COVID-19 disease and being admitted to the ICU and reported the incidence of ICU admission, which was 88% lower in heavy smokers compared to non-smokers [15]. In contrast, a study reported that current smoking was independently associated with self-reported confirmed COVID-19 infection [2]. Additionally, several studies revealed a substantial association between smoking history and several negative outcomes, such as severe COVID-19 and mortality [16-18].

CONCLUSION

The occurrence of COVID-19 among smokers was significantly higher than among non-smokers. A statistically significant association was found between self-reported confirmed cases of COVID-19 and age, gender, marital status, education level, occupation, smoking status, and socioeconomic level.

CONFLICT OF INTEREST

The authors report no conflict of interest.

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