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PREVALENCE OF COVID-19 AND ITS DETERMINANTS IN RAPARIN ADMINISTRATIVE AREA/ IRAQ: A SURVEY STUDY

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A - Koncepcja i projekt badania, B - Gromadzenie i/lub zestawianie danych, C - Analiza i interpretacja danych, D - Napisanie artykułu, E - Krytyczne zrecenzowanie artykułu, F - Zatwierdzenie ostatecznej wersji artykułu

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Abstract (in English):

Aim: Coronavirus is one of the dangerous viruses, whose name has become associated with a serious health problem in most regions of the world. COVID-19 is a new type of coronavirus that spreads rapidly from person to person and becomes a pandemic disease that WHO declared in early 2020. Determine the prevalence of COVID-19 (SARS-2) and explore the related risk factors in any community that would help local health providers provide health services and make plans for the prevention, diagnosis, and

treatment of patients effectively. Therefore, the purpose of this study was to determine the prevalence of COVID-19 and explore its determinants in Raparin administration.

Material and methods: Material and methods: A cross-sectional survey was conducted in Raparin Administration/Iraq, from 24th November 2020 to 18th January 2021. In total, 5205 individuals were collected in this survey, and a probability method using the cluster/multistage sampling technique has been used to assign survey samples.

Results: Results: According to this survey half of the participants were male (51%), and a majority of them were in the age group of 20-24 years old which was (16.4%). Almost 27 % of the surveyed participant was affected by covid-19. Low level of education, obese people, and having comorbidities were significantly associated with affected COVID-19 p-values>0.01, >0.01, and >0.01 respectively.

Conclusions: Conclusion: Nearly one-third of the survey people affected with COVID-19 and low level of education, have comorbidities, and are obese are more prone to get symptomatic COVID-19.

Short title
COVID-19 and its determinants in the Raparin district

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1. INTRODUCTION

Coronavirus is one of the dangerous viruses, whose name has become associated with a serious health problem in most regions of the world. COVID-19 is a new type of coronavirus that spreads rapidly from person to person and becomes a pandemic disease that WHO declared in early 2020. COVID-19 is in a family of zoonotic coronaviruses, such as the severe acute respiratory syndrome coronavirus (SARS-CoV-2) and the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) seen in the past decade. Initially, this disease was reported in the Wuhan city of China, and the first fatal cases were reported in late 2019 [1-3]. Coronaviruses have spikes that look like a crown

on their external surface so it was called the Coronavirus. Coronavirus is a small, enveloped, non-fragmented, single-stranded RNA virus, with genomes up to 32 kb, considered the largest RNA virus. Coronaviruses are classified into four subgroups that include alpha (α), beta (β), gamma (γ), and delta (δ) family [34-5].

Previous studies have shown that among those who have contact with COVID-19 cases that show symptoms of a respiratory infection, and their rate was 38% compared to non-contact people [6]. Since COVID-19 SARS-2 evolved into a pandemic in the past 20 months, numerous scientific evidence has been undertaken to determine the prevalence and risk factors that contribute to the occurrence of COVID-19. However, the number of confirmed cases has varied from country to country, while a community survey to estimate and determine the affected number and its relation is highly essential. In addition, Patient presentation symptoms may vary from one person to another, and the most commonly reported symptoms range from mild symptoms to severe symptoms which are fever, cough, diarrhea, fatigue, and anosmia, dyspnea[7]. However, various symptoms were reported, but risk factors that contribute to the occurrence covid are different from one group of people to another which might be due to unhealthy related behaviors or comorbidities of affected people[8]. Numerous scientific studies declared that patients who had comorbidities were prone to be severely affected by COVID-19 in comparison with other groups [9]. In addition, this virus may have fatal effects, especially on the elderly and those with chronic diseases [10]. In addition, obesity is also one of the factors that may affect the severity of symptoms [11]. As mentioned above, identifying affected people, and exploring related risk factors in any community will help local health providers to provide health services and make a plan for prevention, diagnosis, and treatment of patients effectively. Therefore, delineate the frequency of COVID-19 (SARS-2) and investigate the associated risk factors within any given community, which would facilitate local healthcare providers in delivering healthcare services and devising effective strategies for the prevention, diagnosis, and treatment of patients. Hence, the objective of this investigation was to ascertain the prevalence of COVID-19 and examine its causative factors within the Raparin administration.

2. Materials and methods
2.1. Design of the study

This survey study has been carried out using the cross-sectional design to find out the affecting rate of COVID-19 in Raparin District. It was a community-based study, a group of Nursing College students from the University of Raparin contributed to the data collection. These data were collected from 24th November 2020 to 18th January 2021.

2.2. Study sampling

In total, 5205 individuals were recruited for this survey, and a probability method using the cluster/multistage sampling technique has been used to assign a survey sample. Randomly some quadrant or district was selected in the first stage. After that, a cluster of households in the selected quadrants in the urban, suburban, and rural areas were included in the survey.

2.3. Administrative

This survey was approved by the University of Raparin, and official permission has been obtained from the public health administration of the area. Any individuals who did not give consent or did not answer all questions thoroughly were excluded from data analysis.

2.4. Data collection

A constructed questionnaire was used for data collection. All participants were interviewed about questions related to sociodemographics, health behavior, and COVID-19. Data regarding sociodemographic and health behavior were asked from all participants. Any individual who was clinically or laboratory diagnosed with COVID-19 during the disease pandemic was considered a study case, COVID-19 affected. Any subject aged more than 10 was included in this study.

2.5. Data analysis

All data were analyzed through SPSS- version 24. Descriptive analysis was conducted by presenting data in the tables in the form of frequency and percentage. Inferential analysis, using chi-square was used to test the significant determinants affecting COVID-19, sociodemographic, and health behaviors.

2.6. Results

According to study outcomes, almost 27 % of the surveyed participant was affected by COVID-19. Nearly, half of the participants were male (51%), married encompasses 61.5%, and 63.3% were living in urban. Approximately, half of the surveyed participants perceived barely sufficient economic status, and housewife was the highly frequent occupational status 26.2%. level of education was considered low, only 15.6% had graduated educational level, and participant age was mostly in the middle age group (30-34 years old).

Table 1. Sociodemographic characteristics of the surveyed population

Sociodemographic characteristic	Frequency	Percentage (%)
Gender		
Male	2696	51.8%
Female	2509	48.2%
Total	5205	100.0%
Marital status		
Single	1880	36.1%
Married	3203	61.5%
Divorced	15	0.3%
Widow/er	107	2.1%
Residential area		
Urban	3311	63.6%
Suburban	1174	22.6%
Rural	720	13.8%
Income		
Sufficient	1453	27.9%

Barely sufficient	2667	**51.2%**
Insufficient	1085	20.8%
Occupational status		
Jobless	521	10.0%
Governmental employee	937	18.0%
Self-job	759	14.6%
House-wife	1365	**26.2%**
Others	2	0.0%
Student	878	16.9%
Worker	602	11.6%
Retired	140	2.7%
Level education		
Illiterate	885	17.0%
Able to read and write	170	3.3%
Primary school	1034	19.9%
Secondary school	1659	**31.9%**
Institution	598	11.5%
College	811	15.6%
Postgraduate	48	0.9%
Age groups (years)		
<10	16	.3%
10-14	264	5.1%
15-19	584	11.2%
20-24	854	16.4%
25-29	546	10.5%
30-34	700	**13.4%**
35-39	507	9.7%
40-44	425	8.2%
45-49	391	7.5%
50-54	335	6.4%
55-59	151	2.9%
60-64	124	2.4%
≥65	308	5.9%

Table 2 noted that almost prevalence of COVID-19 was 27%. This study has demonstrated that nearly 13.3%, were smokers, and 26.3% do physical exercises. Almost 14.7% of the participants had chronic diseases and 13.3 % used protein as protective measures.

Table 2. Distribution of health behaviors among surveyed population

Health behaviors distribution	Frequency	Valid Percent
Affected by COVID-19		
Yes	1405	27.0
No	3800	73.0
Confirm by PCR case	718	13.8
Clinical case	687	13.2
Smoker		
Yes	703	13.5

No	4502	86.5
Total	5205	100.0
Alcohol consumption		
Yes	30	.6
No	5175	99.4
Total	5205	100.0
Do any exercise		
Yes	1379	26.5
No	3826	73.5
Total	5205	100.0
Do you have chronic diseases		
Yes	763	14.7
No	4442	85.3
Have use protein to improve immunity		
Yes	692	13.3
No	4513	86.7

Table 3 showed the determinants of COVID-19 affecting and death. The study has found that marital status, age, occupational status, and level of education have a significant relationship with affecting COVID-19, (P value was less than 0.05). COVID-19 was high among males, married, rural residents, government employees, insufficient economic status, and illiterate and postgraduate education levels. The mean age was 7 years higher significantly in the affected group than the non-affected group. The mean age of death was almost twofold compared to the affected group (65.12±14.8). Male gender has determined the affecting of COVID-19 and death due to COVID. The prevalence of death due to COVID-19 among males (2.3%) is significantly high compared to females (1.2%).

Table 3. Association between socioeconomic factors and affecting to COVID-19

Variables	Have been affected with COVID-19?		Death By COVID-19	P value
	Yes	No		
Gender				
Male	753(27.6)	1943(69.9)	80(2.3)	0.118
Female	652(25.6)	1857(73.0)	33(1.2)	
Total	1405(26.4)	3800(71.4)	113(2.12)	
Mean of age (years)	39.37±15.52	32.55±15.37	65.12±14.8	0.000
Marital status				
Single	329(17.5%)	1551(82.5%)		0.000
Married	1034(32.3%)	2169(67.7%)		
Divorce	2(13.3)	13(86.7%)		
Widow/er	40(37.4%)	67(62.6%)		
Residential area				
Urban	866(26.2%)	2445(73.8%)		0.162
Suburban	328(27.9%)	846(72.1%)		
Rural	**211(29.3%)**	509(70.7%)		
Occupational status				

Jobless	107(20.3)	414(78.8)	4(0.0)	0.000
Governmental employee	**387(40.3)**	550(57.3)	22(2.3)	
Self-job	207(27.1)	552(72.4)	3(0.4)	
House-wife	402(28.8)	963(68.9)	**32(2.3)**	
Student	107(12.2)	771(87.8)	0(0.0)	
Worker	130(21.6)	475(78.5)	0(0.0)	
Retired	65(46.4)	75(53.6)	0(0.0)	
Income				
Sufficient	390(26.8%)	1063(73.2%)		0.404
Barely sufficient	705(26.4%)	1962(73.6%)		
Insufficient	**310(28.3%)**	775(71.4%)		
Level of education				
Illiterate	305(34.5%)	580(65.5%)		0.000
Able to read and write	57(33.5%)	113(66.5%)		
Primary school	245(23.7%)	789(76.3%)		
Secondary school	333(20.1%)	1326(79.9%)		
Institution graduate	208(34.8%)	390(65.2%)		
College graduate	234(28.9%)	577(71.1%)		
Post graduate	**23(47.9%)**	25(52.1%)		

Table 4 revealed the factors which determine the COVID-19 affecting. The study has found no smokers, those presenting with chronic diseases, having close contact, those who have been protecting themselves, and obesity were significantly associated with affecting COVID-19, (P value less than 0.001). COVID-19 was high among non-smokers, those having a chronic disease, protecting themself, those obese, those doing physical exercise, and having close contact. The prevalence of death was significantly high among smokers and those having chronic diseases (P value less than 0.001).

Table 4. Association between health behavior and affecting COVID-19

Health behaviors	Have affected with COVID-19?		Death by COVID-19	P. value
	Yes	No		
Smoker habit				
Smoker	146(20.1)	557(76.8)	22(3.0)	0.000
Non smoker	1259(27.6)	3243(71.1)	91(1.9)	
Total	1405(26.4)	3800(71.4)	113(2.12)	
Pregnancy status				
Pregnancy	14(20.0)	56(80.0%)		0.135
Non pregnancy	**307(28.9%)**	755(71.1%)		
Exercise behavior				
Doing exercise	**379(27.5%)**	1000(72.5%)		0.646
Non doing exercise	1026(26.8%)	2800(73.2%)		
Chronic disease condition				
Having chronic disease	328(39.3)	435(52.1)	72(8.6)	0.000
Non having chronic disease	1077(24.0)	3365(75.1)	41(0.1)	
Total	1405(26.4)	3800(71.4)	113(2.12)	
Protective				

Protective self	**724(30.2%)**	1672(69.8%)		0.000
Non protective self	681(24.3%)	2127(75.7%)		
Body max index				
Low body weight	25(9.5%)	234(90.5%)		0.000
Normal body weight	560(23.4%)	1834(76.6%)		
Over weight	550(30.9%)	1230(69.1%)		
Obese	203(33.7%)	399(66.3%)		
High obese	67(40.4%)	99(59.6%)		
Total	1405(27%)	3800(73%)		

Discussion

SARS-2 poses a high transmitted rate and incidence rate compared with two predecessors, Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) [12-13]. In a short period, many people have been affected by COVID-19. Currently, nearly 150 million people have been affected by COVID-19 and in this number, nearly 125 million were recovered, hitherto less than 1% of the world population has been affected by COVID-19 [9,14]. According to a current survey, the affecting rate in the population was about 27%, affecting rate for confirmed cases was 13% (113 death cases have been not included). The result was high compared to worldwide data and Iraq, cumulative case rate was 2414/ 100 000 population according to WHO in the same month of 2021[14]. The high rate of affecting cases in this survey is related to the Iraqi surveillance which has not included the cases which have been confirmed in the private sector. A study has found the estimated seroprevalence of the general population to find out the accurate affecting rate. On November 1, 2020, this study estimated the nationwide cumulative COVID-19 prevalence (past and current infections relative to the population size) is 31% for Peru, 27% for Mexico, 22% for Brazil, 11% for the United Kingdom, 8.2% for France, 7.4% for Sweden [13]. In February 2020, the first case (R0) was reported in a survey on 502 populations in the research area (date) [1]. During these 14 months, COVID-19 affected its high prevalence. The high number of affecting cases in the short period could be related to health policy in the area and population demographic and health background. In a Korean study, low socioeconomic status was most vulnerable for affecting COVID -19 [15]. Socioeconomics was considered the main determinant of COVID-19 affection in this survey. The survey has found that married people, a highly aged population, government employees, and both low and high education levels were significantly affected by COVID-19. Governmental employees were more vulnerable in this study; this may be related to more contact. A study in the US has confirmed that high-proximity job and outdoor job has a significant association with affecting COVID-19 [16]. Correspondingly, the high effects of COVID-19 on married people may relate to close contact with spouses and age group 20-49. A study has confirmed that the ages of 20-49 years in India, or above 50 in other countries are highly susceptible to affecting COVID-19 [17]. Some other study has illustrated that the cumulative incidence of COVID-19 is high among male and age population [18]. In the current survey, the affect rate was also high in males, while was not significant. The mean of age among affected cases was 7 years higher compared to non-affected (32 years), and the mean of death was almost twofold higher compared to affected cases. Our finding was in parallel with the Korean study which indicated that the young age (20 -39 years) was more at risk for COVID-19, and gender had no significant difference [15]. Meanwhile, the mean age in

this survey is considered less compared to the Italian study [18]. In this study, age was significantly related to COVID-19 fatality. Regarding healthy behavior, nearly 13 % of the surveyed population used protein as prophylaxis and other protective measures. Nearly 15% had one or more chronic diseases, and 13% were a smoker. Health behaviors were also highly determined by the affecting rate of COVID-19. The affecting rate was significantly high among non-smokers, those having a chronic disease, protecting themself, those obese, those doing physical exercise, and those having close contact. Having a chronic disease in this study has also led to death. The high affecting rate and fatality of chronic diseases such as diabetes and obesity have been approved in many studies [15,19]. Some of the current findings such as protecting themselves, smoking, and doing physical exercise were negative to the published kinds of literature. However, a study has confirmed about severity and fatality of COVID in smokers, but there is no study to confirm about high susceptibility of a smoker to affect COVID-19 [20]. The current study has demonstrated that smoking decreases the risk of COVID-19 but has increased the risk of death.

Conclusion

COVID-19 is a prevalent disease, and younger age groups are highly risky groups that are affected by COVID-19, low educational level, obesity, having comorbidities, and non-smokers had a significant association with affected COVID-19. High age, smoking, and comorbidity determine covid-19 fatality.

Ethical considerations compliance with ethical guidelines

This study was completed following obtaining consent from the University of Raparin.

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AUTHOR'S CONTRIBUTIONS

Study concept, Writing, Reviewing the final edition by all authors.

Disclosure statement

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