

A comprehensive retrospective analysis of the COVID-19 pandemic's impact on Baghdad Province

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ABSTRACT

In the beginning, the newly discovered pandemic ailment known as coronavirus was only found in Wuhan, China, but then, it has spread to other countries. In Iraq, in particular Baghdad province, reports of incidents of this nature are received on a consistent basis. This study aims to characterize and assess the state of COVID-19 in Baghdad with regard to confirmed cases, related percent of signs and symptoms with accompanied disease between the years 2020 and the present. According to our findings, cases of COVID-19 are gradually increased until they reach their highest peak in 2021, and then begin to progressively decline. The severity of illness increases with age, more obviously in males (60.2%) than females (39.8%). However, the mild cases of disease were more common (44%) than moderate (35.7%) and severe (20.3%). The most common comorbidity was hypertension (60%) followed by diabetic mellitus (40%) of total patients. Depending on clinical symptoms; anxiety (100%), loss of smell and taste (85.5%), and unresolved fever (70%) were the most common. Hypertension was highly associated with the moderate to severe illness (40.6%) than the mild one (39.2%) followed by diabetes mellitus (28.2%) and cardiovascular disease (20.1%) respectively. Patients with age 51-60 years have an OR of 1.908 ($p < 0.001$), indicating higher odds of having a "moderate to severe" condition. Similarly, individuals aged 61-70 years have an OR of 1.520 ($p < 0.001$). Our study concludes that people with hypertension and diabetes mellitus are at a higher risk of developing moderate to severe disease, particularly among older adults. The prevalence of moderate to severe illness is significantly higher in individuals aged 51-70 years, with males being more susceptible than females. Hypertension emerges as the most prevalent comorbidity, particularly among patients with more severe symptoms. In Baghdad, COVID-19 is subject to restrictions imposed by government procedures and vaccination requirements. On the other hand, a number of studies from all across the world have found that there is reason to question that the global pandemic has come to an end. All studies discuss the effects of vaccines and other factors such as comorbidities and disease interactions, but the genetic factors and predispositions that have not yet been highlighted, as well as the repercussions that appeared in patients who were vaccinated after a period of time, have not been addressed.

Keywords: Coronavirus, Hypertension, Diabetes mellitus, age and sex

1. INTRODUCTION

The new coronavirus SARS-CoV-2 that produced the COVID-19 pandemic has proven to be a global health disaster of historic proportions, posing a challenge to communities and healthcare systems across the globe. The province of Baghdad, located in the centre of Iraq, was not an exception to this worldwide trend. As the pandemic spread, the province was confronted with the difficult challenge of managing a constantly changing public health emergency, putting different precautions in place to lessen the virus's effects, and working to ensure the safety of its citizens. Numerous coronaviruses that cause a broad range of human and animal diseases have emerged throughout the past 50 years. These viral types are composed of genetic material encased in a protein layer that are tiny microorganisms responsible for common infectious illnesses like the flu, warts, and the common cold or their causes serious ailments like Spanish influenza, Ebola, and 19 COVID (1). The COVID-19-causing virus is not the pandemic that is deadliest when compared to other viruses. Up to 50% of those infected with Ebola die from the disease, while about thirty people died from the Spanish influenza epidemic percentage of the global populace that was present in 1918 and 19 (2). The coronaviruses induce acute, severe Middle East respiratory diseases and respiratory syndrome, which can occasionally be fatal. COVID-19, or coronavirus disease, is an infectious illness that was recently found and has spread over the globe (3). The World Health Organisation states that Birds and mammals can contract coronaviruses, including

people, and comprise a sizable viral family (4). Certain coronaviruses, such SARS-CoV-2 and (MERS) epidemic had been occurred in China in December 2019 as well as in South Korea in 2015.

The extremely serious respiratory (SARS) pandemic, which brought about the many outbreaks that occurred during 2002-2003, worldwide (5). Certain coronaviruses can create deadly outbreaks, Others result in respiratory infections that are mild to moderate similar to how the common cold has a period of incubation six to seven days (6). Most COVID-19 infected individuals don't need special care. Nonetheless, those who have underlying health issues acquire a terrible illness such as long-term respiratory conditions, diabetes, and heart-related conditions (7). For years, Baghdad has struggled with the COVID-19 virus's proliferation, an overburdened healthcare system, and unpredictable circumstances, including the civil unrest that led to the demonstrations at the start of 2020 (4). The entire globe covered by the pandemic, resulting in the discontinuation of the confinement while awaiting the vaccination, and WHO kept up with providing current data for clinical trials assessing possible medical interventions.

1.1 Symptoms of COVID-19

COVID-19 symptoms can include coughing and fever. In more serious situations, infection can result in pneumonia or difficulty breathing (8). Pneumonia may arise from these symptoms, with breathlessness, pressure in the chest, and chest discomfort then a dry cough that necessitated hospitalisation therapy, and less frequently, the illness may be lethal (9). Rarely does the COVID-19 infection appear to cause a tonsil hypertrophy (1.3%) and runny nose (2.1%) sore throat (11.3%), headache (10.7%), and nasal congestion (4.1%), (10). A cold usually manifests as stuffy sneezing, sore throat, and nose. The COVID-19 symptoms can differ from person to person. Also, symptoms could differ in people's age groupings or whether they are pregnant and non-gestational mothers. Moreover, those who have current chronic illnesses appear to be more susceptible to severe disease (11).

1.2 COVID-19 transmission

The virus can spread from person to person through putting hands or shaking hands with an infected individual. Thus, throughout their lives, the majority of people may transmit a coronavirus. The virus might contaminate the individuals by touching their lips or nose after enduring life in tandem with the afflicted one. The pathogen additionally may disseminate via certain animal coronaviruses, like FCoV, the feline coronavirus. Still, the highest chance of contracting a COVID-19 infection in a number of demographic categories include: Individuals over 65 or older, expectant mothers, and small children (12). COVID-19 spread, there are crucial actions that lessen the stop the spread of COVID-19 and safeguard both you and those are most vulnerable. Two elements need for reduction disease transmission: a) the best method for public to stop the infection from spreading, the capacity of Using surgical masks helps lower the flu virus's prevalence. when worn by someone who sneezes or coughs individuals infected (13). However, donning a mask in public is most successful at halting the virus's spread when there is high compliance. The researcher discovered that surgical masks lower coronavirus infection but do not replace first-line defence. b) Reducing infected people's interactions resulted in reducing the frequency and rate of new coronavirus infections, which is essential to lower the high risk. Many critically ill people are unable to get care that could save their lives. The following practises were included maintaining proper cleanliness, avoiding social situations where COVID-19 or other coronaviruses could spread, and public meetings.

1.3 Vaccine against COVID-19

In an effort to ascertain the safety and effectiveness of coronavirus therapies and vaccinations prior to their widespread usage, numerous scientists worldwide are developing them. Vaccine development immediately follows the identification of the SARS-CoV-2 genome. The vaccination starts with a living bacterium that has been weakened so it can no longer cause disease (14). Thus, it was essential to prevent infection by implementing widespread quarantine using a measure never used before. A lot of SARS-CoV-2 vaccinations are being developed, and few of them have been successful and accepted with permission for an emergency, such as (Pfizer 95%, Sputnik V 92%, Sinopharm 86%, Moderna 94%, Sinovac 70%, AstraZeneca). Still, the vast bulk of the Vaccines that are being developed or approved are focusing on the healthy populace. Consequently, there is a requirement to develop various vaccinations for diverse groups, including expectant mothers, immunocompromised people, new-borns, and kids (15).

1.4 Pandemic life cycle Baghdad

COVID-19 is a concern that extends beyond medicine and health (16). It is evolving into a problem affecting everyone, everywhere, and for a while in terms of the economy, politics, and society. To recommend the appropriate course of action at the local, national, international, and personal levels, it is critical to comprehend the issue. Two primary battles in the COVID-19 conflict are to control the spread of the virus at the national, regional, and local levels; the other is to postpone and reduce the peak infection rate by taking into account the

health systems' evolving capacity and the amount of time it will take to develop treatments and vaccinations. Next came the fight to rebuild the economy so that it could not only recover from the crises but also take advantage of the chance to build sustainable locations and sites globally. Naturally, people are curious about when the COVID-19 pandemic will cease in today's world. Calculating the calm dates has been neglected by most despite its significance to global economic and health issues. The end date of COVID-19 may be predicted using past pandemic data, but this is not a given. The forecasts will also need to be updated frequently as the virus changes and produces more data, which will help with planning, proactive measures, decision-making, and mentality training. The majority of reporting nowadays centres on real illness cases, their recovery, and their deaths, which mostly prompts action like locking down a city with a high infection rate (17).

1.5 Significance of the study

With the help of this retrospective study, we hope to shed some insight on the complex nature of the COVID-19 epidemic that has been affecting Baghdad Province. We hope to get a thorough grasp of how the virus has affected the region by looking at historical data that spans the early phases of the pandemic all the way up to the more recent days of the epidemic. The significance of this research resides in the possibility that it will provide useful insights into the dynamics of the pandemic that related to a combined signs and comorbidity. These insights have the potential to impact future preparedness efforts, public health measures, and the allocation of healthcare resources.

1.6 Objective of the study

One of the objectives of this research is to conduct an exhaustive investigation of the epidemiological patterns, demographic characteristics, and risk factors associated with COVID-19 cases in Baghdad Province. In addition, the long-term consequences of COVID-19 survivors are to be analysed, and the impact of public health activities that were implemented at various times during the pandemic is to be evaluated.

1.7 Implications of the study

The findings of this retrospective study have consequences not just for the people living in Baghdad Province but also for the larger world community as a whole, which is currently struggling to deal with the difficulties posed by the pandemic. By drawing conclusions about the lessons that can be learnt from the past, we will be able to make more educated choices in the here and now and provide a more solid basis for a more robust and well-prepared future in the face of potential health crises.

2. MATERIALS AND METHODS

An extensive retrospective investigation on the effects of COVID-19 was carried out as part of this study in the province of Baghdad in Iraq. The data for this investigation came from a private hospital and clinics in Baghdad with comparing to the data of Ministry of Health in Iraq spanned the years 2020 through 2022. The data included information on confirmed cases, signs and symptoms with a combined comorbidity. The hospital in Baghdad was able to provide information regarding the incidence of COVID-19 cases, the number of deaths that might be ascribed to COVID-19 and the case fatality rate for each of the governorates in Iraq. In addition, the calculation of COVID-19 incidence was based on the number of infected, recovered, and fatal cases that occurred per day in accordance with their population and governorate.

The objective of this statistical analysis was to investigate the potential associations between demographic factors, comorbidities, and various testing methods concerning COVID-19. The dataset comprised information on age groups, comorbidities, hospitalization cases, and certification cases as per laboratory and virological tests. The chi-square test for independence was employed to assess relationships between categorical variables. Age groups were considered as the primary variable of interest, and associations were explored with hospitalization, certification cases as per laboratory tests (CCALT), and certification cases as per virological tests (CAVT).

2.1 Data Sources

The clinical cases that were used in this study were obtained from the medical data reports of a private healthcare center located in the northeastern part of Baghdad. The data included instances that were documented during the opening months of the first wave of the epidemic, which occurred in Baghdad City, which is situated in the heart of Iraq, during the months of May 2020 and January 2022. In order to confirm that the numbers that were provided were accurate, we looked at some more sources.

2.2 Study Population

All 2,350 people who were suspected of having COVID-19 and who sought medical attention or therapy were invited to take part in this research project. An individual is considered to have a suspected case of COVID-19 if they seek medical attention at a certified healthcare facility, either because they are experiencing symptoms that

are suggestive of COVID-19 or because they have had recent close contact with a patient who has been diagnosed with COVID-19. When a patient's clinical presentation is consistent with the diagnosis and laboratory tests that are now available, they are given the designation of being a COVID-19 patient.

2.3 Exclusion Criteria

Very severe low oxygenated cases with complications that need hospitalization and intensive care).

2.4 Data analysis

Demographic information, including age, gender, occupation, general signs and symptoms with related disease, and case history, was collected from all participants and recorded in a Microsoft Office (Excel) spreadsheet. Data analysis was conducted using Statistical Package for Social Sciences (SPSS) software, version 24. Descriptive analysis was performed to calculate the frequencies and percentages for each variable across all cases. A P value of < 0.05 was considered as statistically significant.

2.5 Ethical Considerations

The researcher has given serious consideration to implementing data privacy safeguards for each and every participant. The Ibn Sina University of Medical and Pharmaceutical Sciences' Scientific Committee gave its stamp of approval to both the proposed research project and the study itself before it could move forward.

3. RESULTS AND DISCUSSION

The public has been successfully educated through the use of COVID-19 instructional materials, and they have recognized the threat to their own and others' health. SARS-CoV2, a potentially lethal new coronavirus strain, was discovered by Chinese officials on January 7, 2020; the World Health Organization (WHO) proclaimed a pandemic on March 11, 2020. Baghdad is one of the many places around the world that has been infected with the COVID-19 coronavirus strain. The rates of infection point to a rapidly expanding case count, which was recorded at 567 in the city of Baghdad.

A p-value of 1 indicates no statistical significance in the relationships examined. Table 1 categorized the demographical distribution of covid patients in this study.

Table 1. Demographical distribution of covid patients

Outcomes	Categories	Frequency	%
Age	17-29	201	6.5
	30-40	456	14.8
	41-50	803	26.1
	51-60	724	23.5
	61-70	615	20.0
	> 70	281	9.1
Sex	Male	1825	60.2
	Female	1205	39.8
Diagnosis	Lab. Test	2036	66.1
	Viro. Test	1044	33.9
Severity	Mild	1355	44.0
	Moderate	1100	35.7
	Sever	625	20.3

Therefore, based on the dataset and the applied statistical tests, we found the highly frequent age group was (41-50) 26.1% compared to other age groups. Further investigations or a larger dataset might be necessary to draw more definitive conclusions. The analysis was performed for each age group individually; the severity of illness increases with age and our results in line with most covid studies (Patel et al., 2023). Across all age groups, the results consistently indicated that the variables under consideration, Male (60.2%) more than Female (39.8%).

In this study the laboratory test (hematological parameters) (CCALT) (66.1%) more included than virological test (CCAVT) (33.9%). CCALT and CCAVT (certified cases as laboratory test CCALT, and certified cases as virological test) are statistically independent. The p-value for each test was found to be 1, suggesting a lack of significant association between the variables. The findings are based on the provided dataset, and the absence of significant associations may be influenced by the dataset's characteristics. Mild disease is more common (44%) than moderate (35.7%) and severe (20.3%). Aside from that, the severity of symptoms includes a variety of circumstances that differ from case to case, which goes from mild to moderate and severe according to the age and physical condition of the patient. Mild disease is more common (44%) than moderate (35.7%) and severe (20.3%).

The specifics of each patient's case, as recorded in terms of symptoms and comorbidity are mapped out here in table 2 and the outcome are analyzed using descriptive statistics to display the data that were gathered and which were confirmed by the hospital in Baghdad. According to these data, there were a total of 106 individuals who had to be admitted to the institution because they had developed difficulties. Each studied comorbidity in this study was linked to an increased risk of COVID-19 diagnosis, the most common comorbidity was Hypertension (60%) followed by Diabetic mellitus (40%) of the total population this in line with (18). Depending on the symptoms; feeling unwell (100%), loss of smell and taste (85.5%), and unresolved fever (70%) were the most common while asymptomatic patients were less common (4.0%), In most COVID-19 meta-analysis studies, symptoms include fever, shortness of breath, and general fatigue, but the loss of taste and smell is frequently overlooked (19). In otherwise most risk factors that associated with the severity of illness all illustrated in table 2. Hypertension was higher comorbidity associated with moderate to severe illness (40.6%) than the mild disease (39.2%) followed by diabetes mellitus (28.2%) and cardiovascular disease (20.1%) respectively.

According to table 3, the outcome variable is the severity of the condition categorized as (Mild) or (Moderate to severe). Mild is the reference category against which the odds ratios (ORs) for other categories are compared. Individuals aged 51-60 years have an OR of 1.908 ($p < 0.001$), indicating higher odds of having a "Moderate to severe" condition. Similarly, individuals aged 61-70 years have an OR of 1.520 ($p < 0.001$). According to gender, males have an OR of 1.460 ($p < 0.001$), indicating higher odds compared to females with OR=1.047. For Diagnosis; Individuals diagnosed by laboratory tests have an OR of 1.283 ($p < 0.001$), indicating higher odds compared to those diagnosed. This, as in other studies, highlights the importance of laboratory testing to confirm COVID-19 infection (Rasool et al, 2022). Our data suggests that individuals with chronic pulmonary diseases, Diabetic Mellitus and Hypertension have 1.675, 1.413 and 1.318 times respectively higher odds of having a Moderate to severe condition compared to patients without those diseases ($p < 0.001$). Unresolved fever, lethargy, and depression were the most symptoms that increase the odds of Moderate to severe condition significantly ($p < 0.001$). Conversely, being asymptomatic is strongly associated with lower odds of a Moderate to severe condition as appear in other search (20) but significantly related with our test results.

According to our observations and the data that we have collected, Baghdad is the only city in Iraq that has seen a high prevalence rate along with a high case fatality rate. This is a direct result of the city's large population rate as well as the presence of an international airport.

Table 2: Number of patients according to comorbidity and symptoms

Comorbidity			
Chronic pulmonary diseases	Yes	308	10.0
	No	2772	90.0
Diabetic mellitus	Yes	1232	40.0
	No	1848	60.0
Hypertension	Yes	1848	60.0
	No	1232	40.0
Renal failure	Yes	185	6.0
	No	2895	94.0
Cardiovascular disease	Yes	1130	33.0
	No	1950	67.0
Symptoms			
Unresolved fever	Yes	2156	70.0
	No	924	30.0
loss of smell and taste	Yes	2618	85.0
	No	462	15.0
Feeling unwell	Yes	3080	100.0
	No	0.0	0.0
Body ache	Yes	1386	45.0
	No	1694	55.0
Sop (shortness of breath)	Yes	616	20.0
	No	2464	80.0
Lethargy	Yes	308	10.0
	No	2772	90.0
GIT (mislinous)	Yes	308	10.0
	No	2772	90.0
Depression	Yes	924	30.0
	No	2156	70.0

CT scan lung consolidation	Yes	1694	55.0
	No	1386	45.0
X-ray lung patches	Yes	924	30.0
	No	2156	70.0
Asymptomatic	Yes	123	4.0
	No	2957	96.0
Total		3080	100

Table 3. Factors Associated with the Severity of patients Condition:

Categories		Mild		Moderate to severe		Total	
		Count	%	Count	%	Count	%
Age	17-29	178	13.1%	23	1.3%	201	6.5%
	30-40	210	15.5%	246	14.3%	456	14.8%
	41-50	393	29.0%	410	23.8%	803	26.1%
	51-60	249	18.4%	475	27.5%	724	23.5%
	61-70	244	18.0%	371	21.5%	615	20.0%
	70 >	81	6.0%	200	11.6%	281	9.1%
Sex	Male	742	54.8%	1083	62.8%	1825	59.3%
	Female	613	45.2%	642	37.2%	1255	40.7%
Diagnosis	Lab. Test	892	65.8%	1144	66.3%	2036	66.1%
	Viro. Test	463	34.2%	581	33.7%	1044	33.9%
Comorbidity	Chronic pulmonary diseases	77	5.7%	129	7.5%	206	6.7%
	Diabetic mellitus	344	25.4%	486	28.2%	830	26.9%
	Hypertension	531	39.2%	700	40.6%	1231	40.0%
	Renal failure	61	4.5%	63	3.7%	124	4.0%
	Cardiovascular disease	342	25.2%	347	20.1%	689	22.4%
Symptoms	Unresolved fever	226	16.7%	384	22.3%	610	19.8%
	loss of smell and taste	244	18.0%	245	14.2%	489	15.9%
	Body ach	222	16.4%	234	13.6%	456	14.8%
	Sop (shortness of breath)	97	7.2%	118	6.8%	215	7.0%
	Lethargy	12	0.9%	74	4.3%	86	2.8%
	GIT (mislinous)	64	4.7%	72	4.2%	136	4.4%
	Depression	98	7.2%	147	8.5%	245	8.0%
	CT scan lung consolidation	216	15.9%	276	16.0%	492	16.0%
	X - ray lung patches	144	10.6%	173	10.0%	317	10.3%
	Asymptomatic	32	2.4%	2	0.1%	34	1.1%
Total		1355	100.0%	1725	100.0%	3080	100.0%

Table 4. Odds Ratios (OR) and 95% Confidence Intervals (CI) for patients factors Associated with the severity of disease

	Predict ^a	Categories	OR	95% CI	p-value
Age	Moderate to severe	17-29	0.129	0.084-0.199	0.001*
	Moderate to severe	30-40	1.171	0.974-1.408	0.092
	Moderate to severe	41-50	1.043	0.908-1.198	0.549
	Moderate to severe	51-60	1.908	1.636-2.224	0.001*
	Moderate to severe	61-70	1.520	1.294-1.787	0.001*
	Moderate to severe	70 >	2.469	1.907-3.196	0.001*
Sex	Moderate to severe	Male	1.460	1.329-1.602	0.001*
	Moderate to severe	Female	1.047	0.938-1.170	0.413

Diagnosis	Moderate to severe	Lab. test	1.283	1.175-1.400	0.001*
	Moderate to severe	Viro. test	1.255	1.111-1.418	0.001*
Comorbidity	Moderate to severe	Chronic pulmonary diseases	1.675	1.263-2.222	0.001*
	Moderate to severe	Diabetic mellitus	1.413	1.231-1.622	0.001*
	Moderate to severe	Hypertension	1.318	1.178-1.476	0.001*
	Moderate to severe	Renal failure	1.033	0.726-1.469	0.857
	Moderate to severe	Cardiovascular disease	1.015	0.874-1.178	0.849
	Moderate to severe	Unresolved fever	1.699	1.442-2.003	0.001*
Symptoms	Moderate to severe	loss of smell and taste	1.004	0.841-1.199	0.964
	Moderate to severe	Body ach	1.054	0.877-1.267	0.574
	Moderate to severe	Sop (shortness of breath)	1.216	0.930-1.591	0.153
	Moderate to severe	Lethargy	6.167	3.351-11.349	0.001*
	Moderate to severe	GIT (mislinous)	1.125	0.803-1.575	0.493
	Moderate to severe	Depression	1.500	1.162-1.937	0.002*
	Moderate to severe	CT scan lung consolidation	1.278	1.069-1.527	0.007*
	Moderate to severe	X-ray lung patches	1.201	0.963-1.499	0.104
	Moderate to severe	Asymptomatic	0.063	0.015-0.261	0.001*

a. The reference category is: Mild

OR: odds ratio. 95% CI: 95% Confidence Interval

4. CONCLUSION

Unlike the earlier viruses, this pandemic will not be confined; rather, it will expand and worsen with each passing phase. The protection of the global community is currently faced with the challenge of combating a virus that poses a threat to human life, with potentially dire consequences for economic recovery and confidence. the severity of illness increases with age. Male affected more than female. Mild disease is more common than moderate and severe. the most common comorbidity was Hypertension followed by Diabetic mellitus. Depending on the symptoms; feeling unwell, loss of smell and taste and unresolved fever were the most common. Hypertension was higher comorbidity associated with moderate to severe illness than the mild disease. Patients with age 51-60 years have an opportunity to get "Moderate to severe" condition. The government's measures have limited the spread of COVID-19 in Baghdad and it had the curfew and prohibition is adequate measures. in order to avert a sharp increase in the number of infections and disease related deaths. Unfortunately, several groups visited shrines without considering the procedures followed by congregations, which contributed to their proliferation. This has directly led to the government becoming stricter with regard to all kinds of public meetings. COVID-19 or other viral infection will be able to stop from spreading throughout the community by putting policies in place including mask use requirements, shelter-in-place directives, and social distancing to reduce the likelihood of developing a larger patient base.

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CONFLICTS OF INTEREST

The author declares no conflict of interest.

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