ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 14, Issue, 11, pp.22737-22743, November, 2022
DOI: https://doi.org/10.24941/ijcr.44299.11.2022

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

COVID-19 CASES RISE THAT CORRELATES WITH INCREASED DETECTION OF NEW VARIANTS IN JAZAN REGION, 2022, KSA

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ARTICLE INFO

Article History:
Received 24th August, 2022
Received in revised form
18th September, 2022
Accepted 25th October, 2022
Published online 30th November, 2022

Key words:

COVID, Pandemic, Delta variant, Omicron, Transmission.

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ABSTRACT

Background: The future of covid-19 in the community can be placed under assumptions and predictions. The first assumption is that the virus will be mutating at a constant interval and each new mutation will be severe and result in a high mortality rate. The technology will allow the production of vaccines almost immediately and efficiently. Another assumption is that the new variant will be overcome with existing vaccines. For instance, the case of the new delta variant of COVID-19 has put forward a new problem because it cannot be mitigated with available vaccines. ***Methodology:*** Based on a comprehensive secondary dataset taken from the infectious disease and prevention department of health affairs in the Jazan region of the Kingdom. The time frame was selected from March 2020 to March 2022. This study aimed to determine the difference between the 1st, 2nd, and 3rd pandemic waves of COVID-19 and detect the dominant variant in each wave of COVID- 19, and correlate the rising transmission rates as well as the infectivity of the disease among index cases in addition to their close contacts. We reviewed a covid-19 variant in every epidemic wave with its positive rate, mortality rate with percentage and actual figures, transmissibility between persons, and the infective cases of COVID-19. ***Results:*** 514 main patients and their close contacts were assessed in the research, and the term was chosen from March 2020 to December 2021. Data from January 2020 was also collected to enhance a recent poll. The prevalent variation in the first wave was discovered to be a type-A variant, the positivity rate was 29 percent , and the case fatality rate was 1.5 percent per cent of the entire. In the 2nd wave, the positive rate was 24 percent , while the case fatality rate was 0.9 percent. Moreover, the delta variation was the most prevalent, and Omicron dominated the 3rd wave with the greatest positive rate compared to other variants, which was 39 percent. Bearing in mind that the case fatality rate was lowest in the 3rd wave compared to previous waves (0.1 percent). Nearly 72.8 percent of patients were impacted by the Delta variant, 16.2 percent were affected by the Alpha variant, and 2.8 percent were afflicted owing to N50IT. The vaccine was categorised based on significant and mild side effects with vaccination frequency, requirement for medical help, timeframe following side-effects encountered, medicaments, and therapy required. The Delta variation holds first position with a total percentage of 72.8 percent, although 81.9 percent of the male was impacted by the Delta variant; compared with a female, the male gender was affected more by the Delta variant. ***Conclusion*****:** The preventive measure against COVID-19 developed by the Saudi Arabia region was implemented in the Jazan region was conformed to the above statistics 10.3% of infection spread rate through close contact. In the 2nd wave, the positivity rate was 24%, while the case fatality rate was 0.9%. Moreover, the delta COVID variant was the most prominent variant, whereas Omicron dominated the 3rd wave with the highest positivity rate relative to other variants (39%). Bearing in mind that the case fatality rate was lowest in the 3rd wave compared to other waves (0.1%). The age group (15 up to 49 years) was the most vulnerable to COVID-19transmission. Further study is recommended.

Citation: ***Osama H. Khalid, Abdu A. Dahlan, Yahya A. Maslamani, Yehya Hejri, Salem Alsahhari, Mohammed Elamin et al.*** **2022.** "Covid-19 cases rise that correlates with increased detection of new variants in JAZAN REGION, 2022, KSA*". International Journal of Current Research*, 14, (11), 22737-22743.

INTRODUCTION

Healthcare professionals are concerned about COVID-19. New strains of covid-19 are predicted (Al-Osail, 2017). Because the virus mutates and creates more virulent and deadly strains, a continual and sustainable vaccination schedule is crucial (Alghamdi, 2014). How covid-19 spreads is a big worry that demands prompt response since containing the airborne sickness is difficult. Virus is discriminatory in severity (Zhou, 2020). Young people seldom develop symptoms but may carry the infection. Immunizing new SARS-CoV-2 patients is necessary (Wu, 2020). Covid-19's future trend will likely be like influenza, which needs yearly vaccine. Assumptions and forecasts about covid-19's future exist. First, the virus will mutate constantly, and each new mutation will be severe (MOH, 2020). The technique will enable rapid vaccination manufacture. Another assumption is that current vaccinations will work. For example, the novel delta version of COVID-19 cannot be neutralised by current vaccinations (World Health Organization). The variation spreads twice as fast and has twice the fatality rate (Tang, 2020). Cultural problems and vaccination misconceptions may cause individuals to reject the new vaccine. Because the virus discriminates, individuals, especially the young, may feel safe and not require immunisation (Wise, 2020). The new strains will be deadlier and more severe. The novel strain delta variation challenges current vaccinations (9). Virus-affected patients can only be helped by vaccine. Concerns with complete vaccination include vaccine trust, age groupings, and underlying conditions (Petrosillo, 2020). Age and underlying condition influenced the current covid1- immunisation effort. Chronic sickness patients are prone to become sick from covid-19 (Ahsan, 2021). The elderly and chronically sick are given precedence. The elderly get vaccines better than the young. Young people are the future vaccine community. 15-35-year-olds are less impacted by the virus than those over 60. Young people are prone to oppose vaccination and breach Covid-19 standards (Alamer et al., 2021). Current concern is reducing dissemination using existing vaccinations. Mixed vaccine results, in which some vaccinations work and others don't, hinder an efficient immunisation programme (Al-Hanawi et al., 2010). Young people need to know how the vaccination prevents the spread of current variations and new strains (Knowledge). Scientists hypothesise on how viruses mutate; high population growth encourages mutation. As the virus replicates in various persons, its genome will vary, causing mistakes that may induce a worse strain (Alhasan et al., 2021). This influences how strain is mitigated.

Objectives

General Objectives: This study aims to correlate between detection of new variants of COVID-19 and raising of transmission and infectivity of the disease in the Jazan region.

Specific objectives

- To correlate between detection of new variants of covid-19 and raising of transmission and infectivity of disease in the Jazan region.
- To investigate socio-demographic characteristics of COVID-19 cases and detection of new variants in the Jazan region, 2021.
- To determine the secondary attack rate of infection among close contacts of new variants cases.
- To compare the covid-19 first three waves in terms of Infectivity and case fatality rate of the disease.

METHODOLOGY

This is a retrospective study; secondary data will be reviewed. This is a retrospective cohort study in the Jazan region K.S. An included laboratory-confirmed of seeing new variants of COVID19.

The study period was from March 2020 to August 15, 2021, (350), so secondary data will be reviewed.

Sample Size and Sampling Technique: Based on a comprehensive secondary data set taken from the infectious disease and prevention department of health affairs in the Jazan region of the Kingdom. The time frame was selected from March 2020 to March 2022. This study aimed to determine the difference between the 1st, 2nd, and 3rd pandemic waves of COVID-19 and detect the dominant variant in each wave of COVID- 19, and correlate the rising transmission rates as well as the infectivity of the disease among index cases in addition to their close contacts. We reviewed a covid-19 variant in every epidemic wave with its positive rate, mortality rate with percentage and actual figures, transmissibility between persons, and the infective cases of COVID-19. A total of 514 primary cases and close contacts were reviewed in the study.

Statistical Analyses: The researcher presents descriptive outputs, as well as discussions will be made based on descriptive statistics and the chi-square test, which will be used to test the associations between; the detection of covid-19 new variants and selected socio-demographic characteristics and other categorical variables; data will be entered and possessed using SPSS version (25).

Research importance and expected benefits: Association between COVID-19 cases rise and increasing the rate of detection of new variants in the Jazan region, KSA is expected

RESULTS

Detection of new variants of COVID-19 and raising of transmission In the following Table 1, the socio-demographic details of the respondent are illustrated.

Table 1. Socio-demographic details of COVID 19

S.no	Variable	Percentage
1	Exact age, mean±SD	38.43±6.73
Gender		No.%
2	Male	265 (51.6%)
3	Female	249 (48.4%)
4	Total	514 (100%)
Age		
5	0-4 years	5 (.1%)
6	5-14 years	39 (7.6%)
7	15-24 years	100 (19.5%)
8	25-49 years	254 (49.4%)
9	50-64 years	72 (14%)
10	65-79 years	36 (7%)
11	80 years or More	8 (1.6%)
12	Total	514 (100%)
Nationality		
13	Non- Saudi	72 (14%)
14	Saudi	442 (86%)
15	Total	514 (100%)
Residence		
16	Jazan	168 (32.7%)
17	Sabia	52 (10.1%)
18	Bish	19 (3.7%)
19	Abu Arish	79 (15.4%)
20	Alaardah	15 (2.9%)
21	Samatah	57 (11.1%)
22	Ahad AL masarha	25 (4.9%)
23	ALdarb	8 (1.6%)
24	Fifa- Aldair-Bani Malik	8 (1.6%)
25	Farasan	11 (2.1%)
26	Outside of Jazan Region	72 (14%)
27	Total	514
Occupation		
28	Student	138 (26.8%)
29	Private sector	45 (8.8%)
30	Government Employee	140 (27.2%)
31	Health Worker	12 (2.3%)
32	Military worker	25 (4.9%)
33	Non – Employee	154 (30.0%)
34	Total	514 (100.0%)

In the survey, 514 participants attempted the study, out of which 12 were removed based on incomplete details. For further analysis, 426 numbers of validated responses were considered by applying the normalization process. Gender distribution for the above study was approximately equal. Nearly 50.5% of males and 49.5% of females participated in the survey. Participants might range from offrom5-49 years experience with the highest percentage of 48.4%.In the second place, the highest percentage of age group participating in the survey was 15-24 years, followed by 14.6% of the participant from 50-the 64 age groups,1.4% participant of people participant ting the age group of 80 years above. Based on nationality, the study population was 86.6% of participants from Saudi, remaining 13.4% from non-Saudi. Based on the occupation, 26.1% of government employees participated in the survey, compared with government employee students who participated with 27.2%, and from the private sector, 8.2% participated in the study. Table 2 shows the different types of variants such as COVID19 that affected the people of Alpha, Delta, L452R, N50IT, TBC, Beta, Nigeria, and Delta plus in the Jazan region. Nearly 72.8% of people were affected by the Delta variant, 16.2% were affected by the Alpha variant, and 2.8% were affected due to N50IT.

Table 2. The new variant types' impact on people

S.No	New Variant	Frequency	Percentage
1	Alpha	69	13.4
2	Delta	310	60.3
3	Omicron	88	17.1
4	L452R	7	1.4
5	N501T	12	2.3
6	TBC	1	0.2
7	Beta	20	3.9
8	Nigeria	3	0.6
9	Delta puls	4	0.8
9	Total	514	100

Table 3 shows vaccine side effects. Several variables assist predict vaccination's effect. Table 3 lists significant and minor side effects, immunisation frequency, requirement for medical care, timeframe following side-effects, medications, and therapy required or not. 55.2 percent of respondents reported moderate side effects, 20.1% reported major side effects, and 25% reported no negative effects.

Table 3. Vaccine-Related Side Effects Descriptive Statistics

S.No	Vaccine side effects	Frequency	Percentage
The severity of vaccine-related side effects			
1	Major	86	20.10%
2	Minor	238	55.20%
3	No side effects reported	102	24.70%
4	Total	426	100%
Minor side effects			
5	Low-grade fever, chills, and headache	85	35.70%
6	Myalgia and arthralgia	73	31.10%
7	Pain at the injection site	33	13.90%
8	Fatigue and tiredness	47	19.30%
9	Total	238	100%
Major side effects			
10	High-grade fever	47	54.60%
11	Dyspnoea	36	41.80%
12	Anxiety	3	3.40%
13	Total	86	100%
Side-effects experienced timeline(major & minor)			
14	Less than twelve hours	18	5.60%
15	12-24hours	266	82.10%
16	24-48hours	40	12.30%
17	Total	324	100%
Minor side effects need medical assistance			
18	Yes	0	0%
19	No	238	100%
20	Total	238	100%
Major side effects need medical assistance			
21	Yes	6	6.90%
22	No	80	93.20%
23	Total	86	100%
For treatment of Minor side effects, medicine taken			
24	Yes	172	72.30%
25	No	66	27.70%
26	Total	238	100%
For treatment of Major side effects, medicine taken			
27	Yes	6	6.90%
28	No	80	93.10%
29	Total	86	100%

Table 4. Cross Tabulations of the severe side effects with social demographic characteristics based on a new variant

S.no	New Variant	Female	Male	Total
1	Alpha	48(18.1%)	21(8.4%)	69(13.4%)
2	Omicron	54(20.4%)	34(13.7%)	88(17.1%)
3	Delta	134(50.6)	176(70.7%)	310(60.3%)
4	L452R	4(1.5%)	3(1.2%)	7(1.4%)
5	N50IT	7(2.6%)	5(2%)	12(2.3%)
6	TBC	1(0.4%)	0(0.0%)	1(0.2%)
7	Beta	12(4.5%)	8(3.2%)	20(3.9%)
8	Nigeria	3(1.1%)	0(0.0%)	3(0.6%)
9	Delta plus	2(0.8%)	2(0.8%)	4(0.8%)
Total		265(100%)	249(100.0%)	514(100.0%)
Percentage		100.00%	100.00%	100.00%
Pearson Chi-square		25.604a		
df		8		
Asymptotic significance(2-sided)		0.001		

Minor adverse effects included low-grade fever, chills, headaches, injection site soreness, myalgia, arthralgia, lethargy, and sleepiness. The vaccination caused fever, dyspnea, and anxiety. 41.8 percent experienced Dyspnoea, while 3.4% expressed Anxiety. 82% of vaccine recipients had negative effects within 12-24 hours. 5% of vaccine recipients experienced adverse effects within 12 hours. Everyone responds since they don't take drugs for mild effects. 6 percent of patients require treatment for major adverse effects following vaccination, while 93.2% do not experience considerable discomfort. Minor side effects don't need medical attention. 72.3 percent of respondents require medication for mild vaccination-related difficulties, while 93.1 percent do not choose pharmaceutical supplements for serious concerns; instead, they prefer 6.9% of respondents seek medicine for substantial side-effects. Paracetamol controlled major and moderate vaccine adverse effects. Ibuprofen, meloxicam, and caffeine were recommended for significant and moderate vaccine adverse effects. All individuals had recovered by the survey. Most governments worldwide confront issues owing to widespread vaccination myths and misunderstandings. Vaccine-induced COVID-19 mimicking syndrome has been reported. Some nations reported vaccination-related blood clots and thromboembolism. Few nations have halted the vaccination due to growing vaccine-related issues to prevent harming people. Rarely, patients with heart issues and diabetes have died as a side effect of the immunisation. A small minority had problems, while a large number profited from immunizations. After immunisation, a small group in Jazan had blood clots and thrombosis. This study examined the effect of novel COVID-19 variants to earlier studiesby (Ahsan et al. 2021; Alsofayan et al. 2020).

Socio-demographic characteristics of COVID-19 and detection of new variants: The ongoing global pandemic of COVID-19 burden was increased with its different kinds of virus mutation at varying paces.

Another variant of the COVID-19 virus poses an unforeseeable danger to the world. In Table 4 above –the level of significance of the study to find the association between socio-demographics (gender) associated with sample characteristics based on the variant was cross-tabulated. In Table 4 above, Pearson's chi-square and Asymptotic significance were calculated to find the level of importance of the new variant. From the above Table 4, the Delta variant occupies first place with a total percentage of 72.8%, whereas 81.9% of the male was affected by the Delta variant; compared with a female, the male gender was affected more by the Delta variant. Following the Delta variant, the Alpha variant occupies second place, with a total of 69% of the response affected due to the Alpha variant. In the case of Alpha, a variant female was affected high in number compared with the male with a percentage of 9.8% and female was high with a percentage of 22.7%. The other mutation Beta variant occupies third place with 4.7% of both males and females affected by this variant. Out of which 5.7% of females and 3.7% of males got infected with the Beta virus. The other new variant such as L452R, N50IT, TBC, Nigeria, and Delta plus affected a mere number of people 1.6%, 2.8%, 0.2%, 0.7%, and 0.9% respectively.

Table 5. Cross Tabulations of the severe side effects with social demographic Characteristics based on the type of the vaccine

Sno	Type of Vaccine	Female No.%	Male No.	%	Total No.	%
1	AstraZeneca Oxford	41 (15.5%)	67	(26.9%)	108	(21%)
2	Pfizer Biotech	75 (28.3%)	76	(30.5%)	151	(29.4%)
3	Sinopharm	0 (0.0%)	4	(1.6%)	4	(0.8%)
4	Moderna	7 (2.6%)	5	(2%)	12	(2.3%)
5	No Vaccine	142 (53.6%)	97	(39%)	239	(46.5%)
Total		265	249		514	
Percentage		100.00%	100.00%		100.00%	
Pearson Chi-square		18.592a				
df		4				
Asymptotic significance(2-sided)		.001				

Table 6. Cross Tabulations of the severe side effects with social demographic Characteristics based on outcome after getting affected with COVID-19

S.no	COVID-19 affected rate	Female No.%	Male No.%	Total No.%
1	Recuperative	261 (98.5%)	246 (98.8%)	507 (98.6%)
2	Death	4(1.5%)	3(1.2%)	7(1.4%)
Total		265	249	514
Percentage		100.00%	100.00%	100.00%
Pearson Chi-square		.089a		
df		1		
Asymptotic significance(2-sided)		0.766		

Table 7. Cross Tabulations of the severe side effects with social demographic Characteristics based on Quarantine

Sno	Quarantine	Female No. %	Male No. %	Total No. %
1	Home Quarantine	258 (97.4%)	241 (96.8%)	499 (97.1%)
2	Hospital Quarantine	7 (2.6%)	8 (3.2%)	15(2.9%)

The ongoing burden of COVID-19 was reduced with the help of vaccination. The rapid spread of the pandemic was controlled by vaccination to reach the proper herd immunity. The above Table 5 shows a different type of vaccine used in Jazan, a southern region of Saudi Arabia. Pfizer-BioN Tech, Sinopharm, and AstraZeneca Oxford were different types of vaccines approved by the government of Saudi Arabia for the rapid prevention of disease (Alamer, 2021). The above Table 5 shows that a total of 54.7% of the respondent does not take any vaccine, 22.8% of respondent take Pfizer Biotech and 21.6% of respondent take AstraZeneca Oxford. To reach satisfactory coverage of satisfaction, national efforts must be increased to create awareness among the people toward the COVID-19 vaccine. Increasing the number of doses, nasal, multivalent, and alternating the vaccine help tackle different mutations of COVID-19. Taking appropriate steps in the minimal possible time help to reduce the spread of new variant.

In the present study, it was noted that the above Table 6 illustrates that 99.1% of the total participants were recuperative from infection with COVID-19. Unfortunately, a total of 0.9% of people died due to the rapid spread of the disease (λ=.000a). The risk of secondary bacterial infections was linked to viral infections of the respiratory tract. The incidence of secondary bacterial infection has been reported as a significant cause of death during COVID-19(Silva, 2021). Rather than community-acquired infection, secondary infection during COVID-19 was considered a significant cause of the disease. The length of ICU hospitalization and mortality rate was increased due spread of bacterial colonization. To avoid the spread of infection during COVID-19 Home quarantine and hospital quarantine were strictly followed to prevent the disease. The effective reproduction of COVID-19 was reduced by adapting Quarantine. The above Table 7 shows a total of 97.4% of the respondent was home quarantined, and 2.6% of the respondent was quarantined in a hospital out of which 2.4% was female and 2.8% of the male respondent was quarantined in the hospital. Overall in above Table 8, we found that 61.3% of respondent experienced low to moderate symptoms out of which 65.9% of female and 56.7% of a male was countered. Further, we found that 36.9% of respondents have no symptoms during the spread of the disease, followed by 1.9% of people who experienced several symptoms during COVID-19.

The comparison of different social demographic characteristics does not help us to evaluate the real-time impact of COVID-19, in this study we focussed on gender and analyzed the impact of COVID-19 with impacts perspectives such as new variant, type of vaccine, Quarantine, severity of symptoms and outcome of the patient after getting affected with COVID-19 infection (AI-Hanawi et al. 2020; Saeed et al. 2021).Secondary attack rate of infection among close contacts of new variants cases. The above Table 9 shows the number of respondents affected and acts as a source of the rapid spread of infection. According to the analysis, the data in above Table 9 represents that 74.6% of infection was spread through community contact. In the next place, traveling occupies second place in the spread of infection with a percentage of 18.8%.On the other hand, health workers and unknown contact occupy a 0.9%, and 5.6% respectively in the spread of infection. The awareness and preparedness of the targeted community members help to control the spread of the COVID-19 infection. Further measures were taken by the government of Saudi Arabia to reach the target infected people beyond borders and help them to recover from current situations and to prevent the spread of infection from them to others. The elimination goals of the spread of infection through community people were managed by improving the awareness in the general population related to COVID-19 and insisting they follow the mandatory preventive measures. Table 10 shows the descriptive statistics of COVID-19 vaccination dosage. The first dose of vaccination was taken by 27% of the respondent and the second dose of vaccination was taken by 18.3% of respondents. The considerable population in the world was affected by COVID-19 infection considered a global health issue in the world. By June, July August 2019, the spread of infection starts its first wave. Due to lockdown and travel limitations decrease the number a spread of diseases. Additionally, Table 10 shows that 54.7% of the respondent was not taken the vaccine leads to an increase in the number of cases in the second wave. Infected people can transmit the disease before they show the symptoms of infection was considered a major disadvantage in the spread of infection. In the above Table 11, shows the descriptive statistics of COVID-19 based on the number of contacts.12.7% was considered the highest percentage in the above

Table 8. Cross Tabulations of the severe side effects with social demographic Characteristics based on the severity of symptoms

Total	265	249	514
Percentage	100.00%	100.00%	100.00%
Pearson Chi-square	.148a		
df	1		
Asymptotic significance(2- sided)	0.701		

Table 9. Descriptive statistics of COVID-19 spread source of Infection

Sno	Source of Infection	Frequency	Percentage
1	Community contact	318	74.6%
2	Health Workers	4	0.9%
3	Travel	80	18.8%
4	Unknown contact	24	5.6%
	Total	426	100%

Table 10. Descriptive statistics of COVID-19 based on Vaccination dosage

Sno	Vaccine count	Total	Percentage
1	No vaccine	239	46.5
2	First Dose	116	22.6
3	Second Dose	145	28.2
4	Booster Dose	14	2.7
	Total	514	100%

Table 11. Descriptive statistics of COVID-19 based on number of contacts

Sno	No of Infected	Frequency	Percentage
1	0	106	24.9
2	1	29	6.8
3	2	44	10.3
4	3	54	12.7
5	4	52	12.2
6	5	64	15
7	6	40	9.4
8	7	10	2.3
9	8	15	3.5
10	9	2	0.5

Table 12. Descriptive statistics of COVID-19 based on secondary attack among contacts

Sno	No of Infected	Frequency	Percentage
1	0	351	82.4
2	1	37	8.7
3	2	14	3.3
4	3	6	1.4
5	4	10	2.3
6	5	3	0.7
7	6	3	0.7
8	8	1	0.2
9	9	1	0.2
	Total	426	100

Table 13. Descriptive statistics of COVID-19 based on a comparison among the first three waves

total no of cases	dominant variant	ending date	starting date	No of wave
53702	**	w52, 2020	w12, 2020	First wave
111765	Delta	w37, 2021	w10, 2021	Second wave
94269	Omicron	w12, 2022	w51, 2021	Third-wave

case fatality rate	total no of deaths	Positivity rate	Total of samples tested for PCR
1.5%	824	29%	184256
0.9%	1009	24%	460318
0.1%	105	39%	241764

Table, indicating that 3 member infections lead to affect a higher number of close contact. Moreover, findings reveal that 24.9% of the respondent was not subjected to any infection with close contact. Compared with other preventive measure settings of the Jazan region, the above findings in Table 11 indicate very compliance observed in public places. Respondent was knowledgeable about COVID-19 and its transmission methods but the preventive methods followed by them were limited, leading to the transmission of the virus from one contact to another as indicated in the above Table 11 with a percentage of 15% of infection spread through close contact. The preventive measure against COVID-19 developed by the Saudi Arabia region was not implemented in the jazan region was conformed to the above statistics 10.3% of infection spread rate through close contact. Table 12 displays COVID-19 secondary infection data. The novel SARS-COV-2 variant spreads the second wave among contacts. The new viral variety quickly replaced another mutation, and cell infections spread quickly in humans. Vaccines must be modified. The novel SARS-COV-2 variant didn't effect people differently. In early infections, COVID-19 variations grow and decrease according on morality, active cases, and critical cases. Early infection of COVID-19 begins in June-July 2020, and the infection rate rises in June-July 2020. Cases fall rapidly in July-September 2020. April-September 2021 is the second wave. 82.4% of respondents were not impacted by the second wave. 8.7% of second-wave respondents were impacted. Saudi Arabia's health ministry worked hard to reduce infections. Second-wave population impacted was minimal. Mandatory immunizations reduce sickness in public spaces and workplaces.

Knowledge and attitude about infectious illnesses were linked to population fear. Seafood and live animals, animal interaction, and human-to-human transfer are key secondary infection sources. Human-to-human transmission plays a major role in secondary infection dissemination. Nausea, vomiting, cold, runny nose, sore throat, and high fever were secondary symptoms of COVID-19 in contacts. In the early stages of a secondary infection, few symptoms appear. In the early stages of the illness, it was difficult to tell whether the responder needed medical assistance, which hampered further attacks among contacts. By the time an infected individual discovers they're afflicted, they may have disseminated the illness to a significant number of others, leading to a secondary attack. In our study, we compared the effect of COVID-19 with novel variations in the Jazan region of Saudi Arabia, although earlier research concentrated on the Delta Variant (Alhasan et al., 2021; COVID Alsofayan, 2020; Saeed, 2021; Salam, 2021). The above Table 13 illustrates the descriptive statistics of COVID-19 based on a comparison among the first three waves. Droplets from coughing, sneezing, and intimate contact played a significant role in the spread of COVID-19 during the first wave. Even though the fecal-oral route and moving physical objects lead to rapid infection distance from one person to another. In the second wave, the spread of disease was estimated at 111765 and was considered the highest number of cases recorded compared with the other two waves, as illustrated in Table 13. Similar to the First and second waves, respondents in the third wave thought the vaccine was available for treating COVID-19 infection. In all the three waves, hand washing for twenty seconds, Avoiding touching our eyes, nose, and mouth, Covering the mouth during cough, getting vaccinated at the right time, wearing a face mask, taking antibiotics, social distancing, and disinfecting mobile phone was considered as effective preventive measures for the spread of COVID-19. The respondent's opinion is divergent regarding contracting the novel coronavirus with them. During the first wave, the respondent believed they would deal with the virus-like regular Flu. But in the second wave, it would be difficult for most people to recover from a pandemic. Further, in the Third Wave, the perception of coping with the infection quickly increases. 1.5% in the first wave, 0.9% in the second wave, and 0.1% of the respondent in the third wave were noted with fatality rate during the spread of COVID-19. The virus spread was evident by the least number of respondents in the third wave. Compared to the first waveless number of respondents in the second and third waves, it predicates that the respondent was a virus, which gives a reason to be nervous.

Among the three variants in Table 13 above, the Delta variant affects more people than other variants. In the second wave, people were met with the threat of losing a loved person, having not enough savings until the end of an emergency, the health system is overloaded, and recession, small companies running out of business, becoming unemployed, leading to the spread of infection and increase in the number of cases during the second wave.

DISCUSSION

Many SARS-CoV-2 mutations have developed after the WHO proclaimed COVID-19 a pandemic. Our research examined the prevalence and magnitude of the Delta variation in western Saudi Arabia in June 2021. Our study population (n = 101) included 87.8% delta variations. The Delta variation was connected with a rise in COVID-19 cases in the UK, USA, and India. The Delta variant caused 40.9% of COVID-19 infections in Saudi Arabia between April and June 2021. More males than women were infected with SARS-CoV-2 delta, similar with Italy and the US (20). Although the virus may infect anybody, most of our patients were 20 to 30 years old, as proven by research in India and the U.S. This may be because most Saudis are between 20 and 30 years old. Most patients in our trial got at least one dose of the vaccine, and we discovered a revolutionary infection (Forni, 2021; Lurie, 2022). After two doses of the vaccination, 76 persons in New York got infected with COVID-19. A UK study of 621 people indicated that 25% of fully vaccinated people who had household contact with the Delta strain acquired the illness, compared to 38% of unprotected people. 17 confirmed cases have travelled. In England, 29.5% of delta variations had travelled internationally (Al-Tawfiq, 2020). 56 people with the Delta variation contacted a confirmed case of COVID-19, indicating that it is highly infectious. We established a Ct value of 26.5 for NextSeq and 27.9 for NovaSeq as criteria for creating high-quality genomes. High-quality genomes have fewer than 10% cryptic nucleotide fragments and >100 genome coverage. Sequencing samples with a Ct value> 35 has shown that a considerable number of readings are compatible with the human genome, independent of the collection technique, leading to genealogical and variation inconsistencies (Puranik, 2021). We demonstrate that claims of interesting variants, such the Delta variety's distribution, are consistent with US and worldwide data. We detected 161 SARS-CoV-2 variations in our dataset between April and June 2021, and the top 10 genera are consistent with previous findings. RNA viruses are naturally superior, thus each new strain may become dominant (25). Increasing positive instances in summer and winter 2021 might indicate vaccination illnesses. Although Mu variants make up just 0.1% of the existing database, 77 B.1.621 (Mu) positive samples have been found since June 2021. SA and other collecting techniques will be compared. According to this investigation, NP and SA are the best samples for SARS-CoV-2 control sequencing experiments (Attia, 2022). More information and study are required to clarify collection sensitivity. Most test specimens were from people who indicated they hadn't been immunised. The general demography of all examined sequences were poor, restricting the capacity to stratify variation distribution across geographical regions and across gender, age, and other characteristics (Boscolo-Rizzo, 2019). A infectious B.1.1.529 (Omicron) variant from South Africa was found in November 2021. This variation rapidly became widespread in the US and abroad, accounting for 98% of SARS-CoV-2-positive patients (Al Bahrani, 2021). As this variation causes S gene deletion, positive patients may be ignored. The proper test for SARS-CoV-2 positive individuals must identify the N and Orf genes. Omicron's subdivision (BA.2) is expanding in population, which has led to more optimism in Europe and the U.S. (Naemi, 2021). Our research contains flaws. Without baseline data, we couldn't start a comparison research. Our study's genomic analysis wasn't random. When assessing clinical and epidemiological importance, remember the study's limitations. First, genetic sequencing and epidemiology data from geographic regions impacting novel variations are restricted, which might alter outcomes. As additional sequences are accumulated, the relative frequency of specific lineage mutations may shift.

The new types merely represent the current temporary trend, which needs extended follow-up, especially fatalities.

CONCLUSION

In conclusion, the virus spread was evident by the least number of respondents in the third wave. Compared to the first waveless number of respondents in the second and third waves, it predicates that the respondent was a virus, which gives a reason to be nervous. The people who resistance vaccination should be allowed to ask questions and answers given them with supported demonstration and proof. For instance, the myth that vaccines might be used by the government to control birth is unjustified. The group of people should be allowed to visit a vaccine manufacturing center to witness every ingredient added, the method used, and get educated on such aspects in a manner that is fundamental in the outcome and significant in the process. The next step is the introduction of COVID-19 as part of learning like HIV to create awareness regarding the various and how to mitigate it. This was it changes the thinking of the upcoming population. The final approach is through mass campaign and promotion, promoting door-to-door vaccination to overcome the problem is critical.

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