


# Emergency management to avoid the spread of the COVID-19 pandemic in Gaza Strip

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## Abstract

Gaza Strip is exposed to the danger of the novel coronavirus pandemic 'nCOVID-19' spread, which exacerbates the crises severity on this besieged area since 2007. This study aims to identify the preventive actions during the action effectiveness implemented by the Central Emergency Committee and the Ministry of Health to reduce the coronavirus spread in Gaza Strip. The researchers have followed the descriptive and the analytical methodology of the purposive sample responses data from the preventive medicine workers, the security team, and the members of the Central Emergency Committee. The most important results of the study showed that targeted peoples have been reexamined several times to ensure that they are recovered from the disease with an average of 81.0%. The reliability and accuracy of the detection tests of the coronavirus disease were of an average of 79.33%. In addition, the results demonstrate the existence of a strong correlation between the preventive action taken by the Central Emergency Committee and the effectiveness of the procedures to prevent the coronavirus pandemic. Also, the study shows a statistical significance effect at the level of significance ( $\alpha \leq 0.05$ ) regarding the prevention procedures from the coronavirus pandemic and the effectiveness of the procedures.

## KEYWORDS

effectiveness, Gaza Strip, Ministry of Health procedures, nCOVID-19, quarantine, prevention measures

## 1 | INTRODUCTION

Coronavirus has appeared and spread from China between October and December 2019. Hubei Province, which has a population of 11 million people, has been affected more than other countries and most infections were concentrated in its capital, Wuhan. Then, the epidemic has reached all continents except Antarctica, where the outbreak began around the world in many countries such as Italy, Spain, the United States, and elsewhere adjacent to Gaza Strip.

Today, the risk of the coronavirus spread increases, and there is no information about its halt in the world. The number of people who were infected with the coronavirus until the writing of this study is more than 9.6 million cases and more than 493 thousand have died.<sup>1,2</sup>

Therefore, all countries are working to limit the spread of nCOVID-19 within residential communities by preparing to contain the virus, isolating the healthy areas and preventing movement between cities and governorates. Moreover, they work on making early detection of infections, exchanging the full data with the World Health Organization<sup>3</sup> and doing other health preventive procedures related to the health legislation and laws.

Countries should focus on limiting human-to-human transmission, preventing the spread of infection through international borders, and contributing to the international response through communication and cooperation in increasing theoretical, scientific, and applied knowledge of dealing with the emerging virus. In addition, it is important to develop and collaborate in scientific research and pharmaceutical experiments.

Additional support should be offered to the poor countries, which are suffering from complex emergencies under occupation or weak health systems, in order to strengthen the epidemiological and viral surveillance of emerging infectious diseases. Supporting these is necessary even if they have early warning systems because it may not be sensitive enough to detect emerging infectious diseases.<sup>4</sup>

Gaza Strip, in particular, which has been under siege since 2007 is suffering from complicated emergency procedures. The health system before the emergence of the coronavirus in Gaza Strip faces a shortage of medicines and medical consumables that may reach 50%, not to mention the medical devices worn out and power outage.<sup>5</sup> All these challenges affect the services provided to the citizen and put pressure on the health system in normal situations, so how would the health situation be if the novel coronavirus spread in the Gaza Strip.

Moreover, one of the serious challenges is that the medical helps provided by the World Health Organization and friendly countries needs time to obtain approval from the Israeli side to enter Gaza Strip, which affects negatively on the work of the Central Emergency Committee.

In Palestine, procedures were taken to prevent the spread of the coronavirus and to avoid its consequences, as the number of infections reached 172,896 cases, 1,918 of whom died until 20/1/2021.<sup>6,7</sup>

The Central Emergency Committee in Gaza Strip, consisting of the Ministry of Health, the Ministry of Interior and the Ministry of Social Development worked on:

- Preventing returnees from abroad to access the people within Gaza Strip by imposing the compulsory quarantine since 15/3/2020.
- Preparing 18 quarantine facilities distributed in all the governorates regions in Gaza Strip.
- Selecting quarantine centres in the field hospital in Rafah span for 100 cases, as well as the European hospital for treating infectious patients with coronavirus.
- The number of service providers in quarantine centres is 211 employees, 51% of them are military crews and 17.5% are medical crews, while 1.3% are maintenance workers.<sup>6</sup>
- Equipping health posts in the quarantine centres provided with medicines, medical supplies, various medical and administrative teams, where the medical staff number in each centre is of more than 80.

- PCR examination is performed for all inmates in the quarantine facilities on the fourth day.
- The positive cases after examination are immediately transferred to the isolation hospital for the treatment of corona.
- Reexamination is performed again on the 20th day since the beginning of the quarantine. Then, the quarantines are removed if the results are negative with the recommendation of staying at home.
- Contacts of returnees from abroad are compulsory quarantined for confirmed cases for a period of 21 days from the date of contact. The PCR examination is performed on the fourth day of contact. The examination is repeated on the 20th day since the beginning of the quarantine and if the examination is not available the quarantine continues to 28 days.

Figure 1 illustrates the map of Gaza Strip displaying the quarantine centres sites and the number of confirmed cases of coronavirus until 20/1/2021. It is clear that the Ministry of Health in Gaza examined 254,050 cases that of 26.08 percent of the total examinations conducted in the Palestinian territories until 20/1/2021.<sup>6</sup>

The number of quarantined people who came from abroad in the quarantine centres in Gaza Strip reached 569, distributed over all the quarantine centres<sup>8</sup> until 9/6/2020. Then, after the infection spread within the community in the Gaza Strip, the Central Emergency Committee implemented the following measures:

- Home isolation for the injured and the families of the injured.
- Close residential areas where the disease is spreading.
- Curfews imposed on all citizens on Friday and Saturday.
- Transferring dangerous cases to the European Hospital in Rafah.

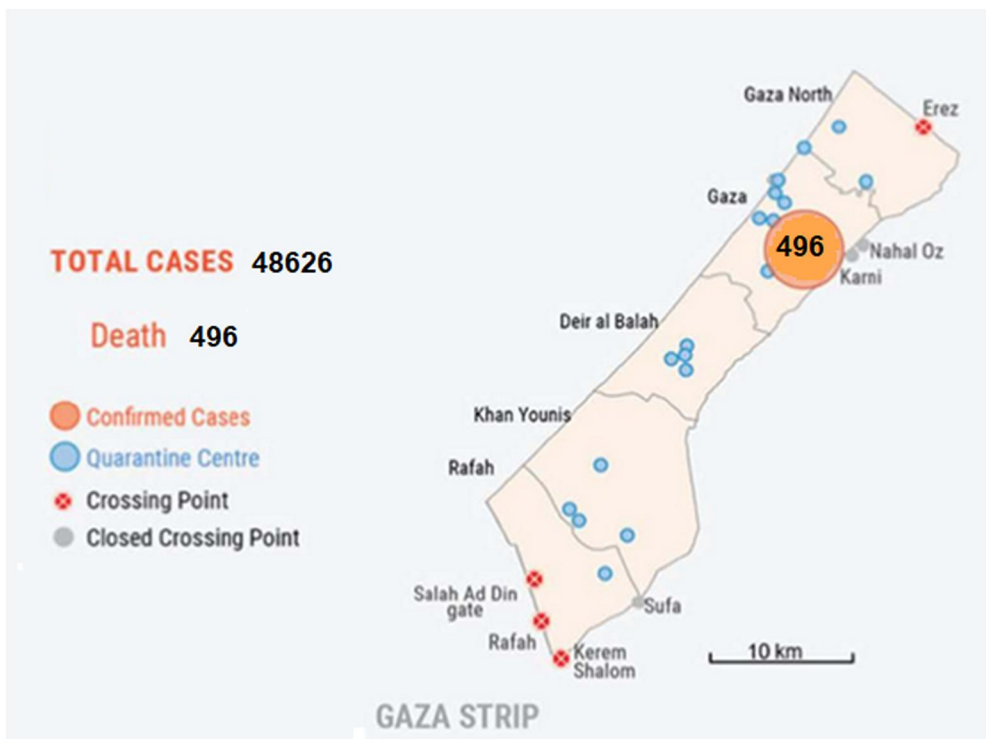


FIGURE 1 The Emergency Committee producers and Covid-19 examinations in Gaza Strip<sup>7</sup>

Figure 2 clarifies the procedures implemented by the Central Emergency Committee in dealing with the returnees from outside Gaza Strip. The process of sorting the returnees after the examination is based on their infection with coronavirus and then the infected cases are taken to quarantine facilities.

Many countries have taken decisions to close the borders, suspend flights and examine the returnees of citizens before integrating with the populations to prevent the spread of the novel coronavirus within societies. In addition, they have taken closure measures in gathering places such as markets, squares and worship places.<sup>9</sup>

In the case of the Palestinians living in what is described as the largest open prison in the world, preventive measures and containment of COVID-19 will be very difficult, especially as the epidemic has reached Gaza Strip from the returnees from abroad. Since 2007, Israel has imposed a land, air and sea blockade on two million Palestinians in Gaza Strip, 1.4 million of them are refugees, which made them susceptible to overcrowding in one of the most densely populated areas in the world.<sup>10</sup> Therefore, discovering one infected case with coronavirus within the population in Gaza Strip will be catastrophic on the huge population density in a small geographical area such as Gaza Strip.

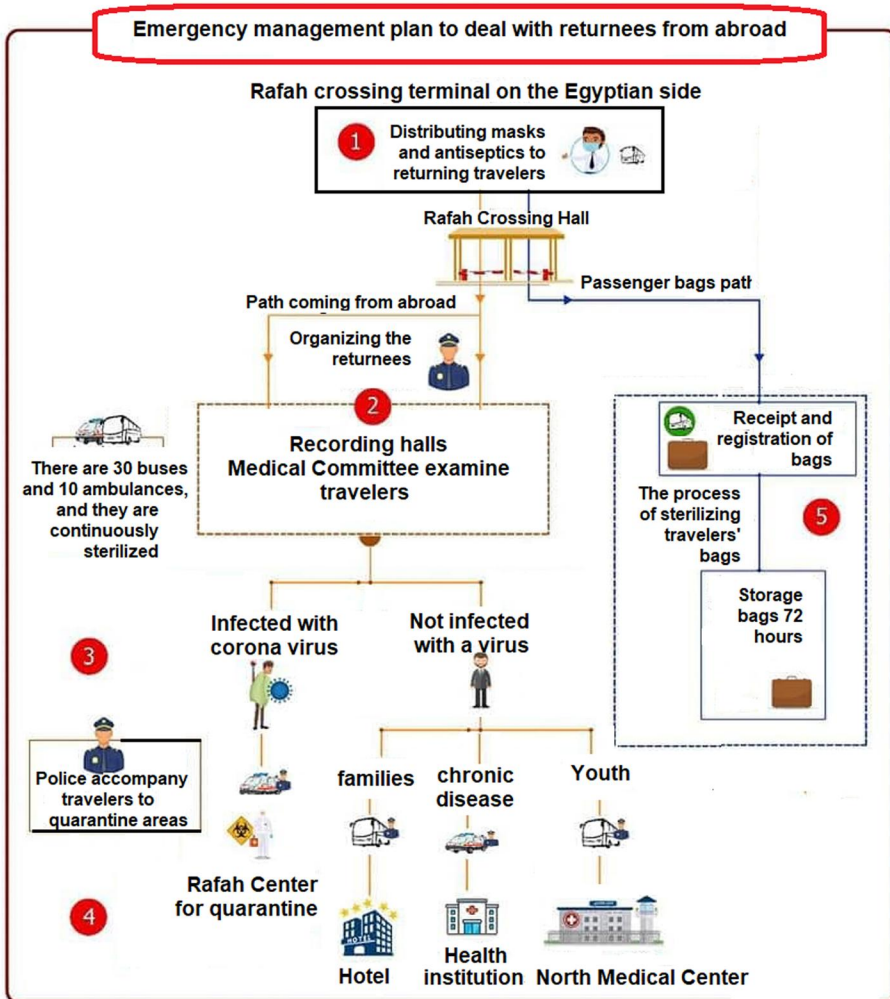


FIGURE 2 This shows the Emergency Committee procedures for dealing with returnees from abroad<sup>8</sup>

Emerging infectious diseases such as nCOVID-19 require rapid responses from the Ministry of Health besides the community awareness about the seriousness of the epidemic, the epidemiological surveillance, the development of strategies to contain the coronavirus spread efficiently and the decreasing of the burden associated with this disease.<sup>11</sup>

The main factors that contribute to the spread of the new coronavirus infection in the Gaza Strip include:

- Great overcrowding in a small area.
- The siege imposed on the Gaza Strip.
- Lack of medical capabilities.
- Overcrowding of refugee camps in the Gaza Strip.

According to an interview with the coordinator of the emergency operations room in the Gaza Strip, Salah (2020) as well as with the director of public relations in the Ministry of Health, Abu Namous (2020) to obtain information about the capabilities of the Ministry of Health to confront coronavirus they explained that:

- Allocating 30 quarantine centres for those coming from the Rafah and Beit Hanoun crossings as a precaution until 25/8/2020, then, the policy of home isolation became effective in quarantine operations.
- Coronavirus examinations were conducted for returnees from the Gaza Strip crossings, where the infectious cases were isolated for 21 days in quarantine places, they were not allowed to enter the Gaza Strip area except after making sure that they are not carrying the infection.
- On 25/8/2020 and after the coronavirus spread in the community of the Gaza Strip, the number of tests for detection of the infected cases increased.
- The Ministry of Health conducts 1,000 to 6,000 coronavirus examinations daily, which lead to a severe decrease in the available laboratory materials required for these tests.
- According to the examination results, it was observed that the highest number of injuries in 2020 was on 15/12/2020, as the percentage of the confirmed infected samples reached 45% of the examined samples.
- The number of coronavirus infected cases that admitted daily in the European Hospital ranges between 30 and 40, while the hospital capacity is 300 beds, 200 of them are fully used in the intensive care unit.<sup>12</sup>
- The clinical capacity assigned for coronavirus patients in the Gaza Strip is 800 beds distributed between the European Hospital in Rafah and in other hospitals in Gaza Strip (Al-Aqsa Hospital, Al-Indonesian Hospital, Nasser Hospital and Al Shifa Hospital).
- There are 21 health care centres distributed geographically across the Gaza Strip that prepared to take samples for coronavirus testing.

## 2 | STUDY DESIGN

This study was designed for:

1. Contributing to the evaluation of the Central Emergency Committee procedures to limit the spread of the coronavirus in Gaza Strip.
2. Helping the emergency operation planners in preparing plans that manage the emergency work to limit the spread of infectious diseases.
3. Reinforcing and improving the security and safety methods in the educational environment in order to protect lives and property, which are considered the most important scientific development resources in Gaza Strip.
4. Identifying the strengths and weaknesses of the prevention measures used to limit the spread of the coronavirus.

5. Determining the obstacles that obstruct the Central Emergency Committee to limit the spread of the virus in Gaza Strip.

The problem of this study is confined to assessing the procedures of the Central Emergency Committee and the Ministry of Health in limiting the spread of the coronavirus within residential communities in Gaza Strip.

Furthermore, one of the study problems is to identify obstacles that the Central Emergency Committee faces to reduce the spread of infection of the coronavirus in residential communities.

The study problem can be formulated in the following question:

**How effective are the emergency measures done by the Central Emergency Committee to reduce the spread of the coronavirus in Gaza Strip?**

The researchers followed the descriptive and analytical method in the analysis of the data collected from respondents using the questionnaire tool that targeted the Central Emergency Committee, the purposive sample of preventive medicine workers, and the security team responsible for protecting and transporting the returnees and quarantined people in addition to analysis the Ministry of Health and the Gaza Central Emergency Committee reports.

## 2.1 | Study objectives

The objectives of the study are:

1. Identifying the procedures of the Ministry of Health to limit the spread of the coronavirus in Gaza Strip.
2. Identifying the procedures of the Central Emergency Committee to limit the spread of the coronavirus in Gaza Strip.
3. Determining the effectiveness of the procedures of the Central Emergency Committee in the Gaza Strip to limit the spread of coronavirus infection.
4. Determining the effectiveness of the Ministry of Health measures in the Gaza Strip to limit the spread of coronavirus infection.

## 2.2 | Study limits

This study was applied to the preventive medicine workers, who have a relationship with operations to reduce the spread of the coronavirus in Gaza Strip including the security team in the Ministry of Interior, the Central Emergency Committee, Medical Personnel, and preventive medicine in the quarantine facilities. The study was conducted during the time period April, May and June of 2020.

The study population consists of all workers in the Central Emergency Committee, the Preventive Medicine Committee and the Ministry of Interior especially the worker in the emergency operations, in addition to specialized researchers. A purposive sample of 70 respondents was taken, the questionnaire was distributed to all members of the study sample, and the number of questionnaires retrieved was 65. After examining the questionnaires, five questionnaires were excluded due to the failure to fulfil the conditions required to answer the questionnaire, and thus the number of the questionnaires analysed was 60.

Table 1 shows the characteristics of the study sample, the frequency, and the percentage of each variable in the sample. In addition, 'others' means the specialized researchers from the senior-level management in the Ministry of Health and the Central Operations Room.

TABLE 1 Study sample characteristics

Variable	Position	Repetition	Percentage
Functional title	Head of Department	9	15.0
	Member of the Central Emergency Committee	6	10.0
	A doctor	9	15.0
	Quarantine team	8	13.3
	The security team in charge of protection	14	23.3
	Others	14	23.3
Years of service	5 years or less	6	10.0
	From 6 to 10 years	13	21.7
	From 11 to 15 years	18	30.0
	16 years and over	23	38.3
Degree	Diploma	5	8.3
	Bachelor	27	45.0
	M.A.	18	30.0
	Ph.D.	10	16.7
Workplace	Ministry of Health	28	46.7
	Ministry of Interior	25	41.7
	Member of the Central Emergency Committee	3	5.0
	Other	4	6.7

### 2.3 | Study tool

The main tool of the study was the questionnaire which prepared as follows:

1. A preliminary questionnaire was prepared and designed by researchers for use in collecting data and information.
2. An initial field test study has conducted for the questionnaire and it has modified appropriately.
3. The questionnaire has distributed to all individuals of the sample to collect the data for the study.

The questionnaire was divided into two parts as follows:

The first part contains the personal information of the study sample. The second part contains three fields that address the procedures of the emergency management to avoid the spread of the coronavirus pandemic in Gaza Strip as follows:

**The first field** addresses the procedures of the Ministry of Health, it consists of 12 paragraphs.

**The second field** addresses the procedures of the Central Emergency Committee, it consists of 16 paragraphs.

**The third field** addresses the effectiveness of procedures to prevent the coronavirus pandemic, it consists of 15 paragraphs.

Each paragraph was answered according to 5-point Likert scale, as shown in Table 2.

The sincerity of the structural consistency of the study fields is given in Table 3. Table 3 shows the correlation coefficients between the rates of each field of the study with the overall rate of the questionnaire paragraphs. The total rate shows that the outlined correlation coefficients are indicative at the significance level of 0.05, where the

TABLE 2 5-point Likert scale

Period (the paragraph average)	4.2-5	3.4-4.2	2.6-3.4	1.8-2.6	1-1.8
The evaluation	Very high	High	Average	Low	Very low
The score	5	4	3	2	1
The proportional average	84%–100%	68%–84%	52%–68%	36%–52%	20%–36%

TABLE 3 the correlation coefficient between the rate of each field of the study and the overall average of the questionnaire items

Field title	The probability value	The correlation coefficient
The Ministry of Health procedures	0.000	0.609**
The Central Emergency Committee procedure	0.000	0.862**
The effectiveness of the coronavirus preventive procedures	0.000	0.683**

probability value of each field is less than 0.05 and the calculated  $r$ -value is greater than the tabular  $r$ -value which equals 0.361.

The  $r$  tabular value is at the significance level of 0.05 and the degree of freedom '28' equals 0.361.

The researchers used the Alpha Cronbach13 method to measure the stability of the questionnaire<sup>13</sup> as a second method for measuring stability. It is shown that the stability coefficients are high, as the stability factor for all paragraphs of the questionnaire reached 0.884, which is greater than the standard 0.70.

### 3 | RESULTS AND DISCUSSION

To achieve the targets of the study and to analyse the collected data, several appropriate statistical methods were used via the Statistical Package for Social Science (SPSS). The following is a set of statistical methods used in data analysis:

To be consistent with the questionnaire paragraph content, the sample responding average must be greater than 60% and the mean is greater than the neutral average (3); otherwise, the paragraph is not positive which means that the sample members are not consistent with its content.

The main question is 'how effective are the prevention measures implemented by the Central Emergency Committee to limit the spread of the coronavirus in Gaza Strip at the level of significance ( $\alpha \leq 0.05$ )'.

#### 1. The extent of the effectiveness of the Ministry of Health measures to limit the spread of the new coronavirus in the Gaza Strip.

The results of the respondents answers are given in Table 4, which summarized as follows:

These results related deeply to the Ministry of Health action as shown in Table 4. The highest weighted paragraphs according to the prorated average are 'specimens are reexamined several times to ensure that people recovering from the disease are free from the disease' with a prorated average of 81.0%, and the paragraph 'coronavirus detection tests are accurate and reliable' with a prorated average of 79.33%. This indicates that the Ministry of Health concern not to let the infected cases of the returnees from outside entering the population community and the Ministry of Health works to track communication and quarantine procedures as means to reduce the infection transmission.<sup>14</sup>

The lowest weighted paragraph is 'I expect that there are infected cases with the coronavirus who entered through the crossings before the quarantine procedures' with a prorated average of 35.67%. The respondents were



**TABLE 4** The effectiveness of the Ministry of Health measures to limit the spread of the coronavirus in the Gaza Strip

No	The paragraph	The order	The prorated average	The standard deviation	The arithmetic
1	Specimens are reexamined several times to ensure that the recovering cases are free from the disease	1	81.00	0.79	4.05
2	Coronavirus tests are accurate and reliable	2	79.33	0.69	3.97
3	The Ministry of Health has sufficient expertise to carry out coronavirus tests	3	79.00	0.79	3.95
4	Recovered persons are reexamined several times periodically to ensure that the disease does not return	3	79.00	0.81	3.95
5	Communication with suspects or recovering cases from the disease continues by the Ministry of Health after the appearance of negative results	4	75.00	0.91	3.75
6	The cause of death is determined for each patient in the last period	5	74.33	0.96	3.72
7	Examination devices and supplies are available in the Ministry of Health to allow for the conduct of tests for the community and for returnees from abroad	6	72.67	0.88	3.63
8	There are statistics that determine the cause of death in the period of corona's discovery	7	71.33	0.93	3.57
9	There are statistics for pulmonologist deaths in the last 2 months	8	65.33	1.09	3.27
10	There are statements of suspected infected cases with the coronavirus in the community	9	58.67	1.46	2.93
11	People's fear of quarantine may prevent them making tests in hospitals if symptoms similar to the virus appear	10	56.33	1.21	2.82
12	I expect the presence of infected cases with coronavirus who entered through the crossings before the quarantine procedures	11	35.67	1.14	1.78
All paragraphs (Ministry of Health procedures)			68.97	0.41	3.45

expected with a low degree that there are no cases of the novel coronavirus that have been discovered within the population communities in Gaza Strip until this moment.

In addition, the average for all paragraphs of the first field (Ministry of Health procedures) is equal to 3.45, which is greater than the neutral average value (3). The standard deviation is 0.41, the prorated average is 68.97%, which is greater than the neutral prorated average (60%), which is less than 0.05. This indicates that the procedures of the Ministry of Health to limit the spread of the coronavirus in Gaza Strip were of medium effective at the level of significance ( $\alpha \leq 0.05$ ).

## 2. The extent of the effectiveness of the procedures of the Central Emergency Committee to limit the spread of the novel coronavirus in Gaza Strip.

The results of the respondents answers are given in Table 5, which summarized as follows:

The highest paragraphs according to the average are 'there is a Central Emergency Committee in Gaza Strip' with a prorated average of 91.0%, and 'there are protective clothing and tools for the teams working in quarantine

**TABLE 5** The effectiveness of the measures taken by the Central Emergency Committee to limit the spread of the coronavirus in the Gaza Strip

N	The paragraph	The order	The prorated average	The standard deviation	The arithmetic
13	There is a Central Emergency Committee in the Gaza Strip	1	91.00	0.62	4.55
14	There are protective clothing and tools for working teams in quarantine places	2	87.67	0.83	4.38
15	The information about the pandemic development is advertised to the public through various media	3	87.00	0.92	4.35
16	There are thermal devices in the Palestinian crossings for the initial examination of the suspected cases	4	85.67	1.03	4.28
17	There are awareness and educational programs for returnees to Gaza Strip	5	85.33	0.78	4.27
18	There are daily reports on the achievements of the Central Emergency Committee and on pandemic developments in Gaza Strip	6	84.67	0.93	4.23
19	Providing trained medical teams to deal with infected and suspected patients	7	83.33	0.83	4.17
20	There is a special call number to guide citizens of the Gaza Strip on the coronavirus	8	81.33	1.04	4.07
21	There is joint coordination between the Ministry of Health and other ministries to combat the coronavirus pandemic	9	80.33	0.81	4.02
22	There are special health facilities for the patients and suspects	10	79.67	1.07	3.98
23	There are awareness and educational programs for the community in the Gaza Strip	11	79.33	0.97	3.97
24	There are special preventive methods for handling corpses from the coronavirus	12	77.67	1.03	3.88
25	There are medical instructions to guide citizens in the event of symptoms similar to the coronavirus	13	72.00	1.01	3.60
26	There is financial funding from international agencies and the government for supporting the efforts of the Central Emergency Committee	14	49.67	0.95	2.48
27	There is joint coordination with the Ministry of Health in Ramallah to combat the coronavirus pandemic	15	48.33	1.11	2.42
28	There is financial and medical support provided by the Ministry of Health in Ramallah to the Ministry of Health in Gaza to combat the pandemic	16	44.67	0.98	2.23
All paragraphs (Central Emergency Committee procedures)			76.10	0.54	3.81

places' with a prorated average of 87.67%. These results are justified as equipped quarantine places have been built on an area of 14 dunums in Rafah city in the southern Gaza Strip,<sup>15</sup> which can accommodate 500 people. And there are quarantine places in the northern Gaza Strip that can accommodate 500 people on an area of 13 dunums<sup>15</sup>, as shown in Figure 3.



FIGURE 3 Building quarantine areas in the Gaza Strip<sup>14</sup>

The quarantine areas are field hospitals equipped with all the equipment and supplies for the purpose of countering this virus. In addition, there is a possibility of using them as fast-setting field hospitals in far places, where it is possible to provide these field hospitals with the clean and safe solar energy systems.<sup>16</sup>

The lowest paragraphs were 'there is financial and medical support and medical supplies provided by the Ministry of Health in Ramallah to the Ministry of Health in Gaza to combat the pandemic' with a prorated average of 44.67%, and 'there is joint coordination with the Ministry of Health in Ramallah to combat the coronavirus pandemic' with a prorated average of 48.33%. This is due to several factors such as the siege imposed on Gaza Strip, the political division, and geographical factors that obstruct the arrival of the aids to Gaza Strip because of the lack of connection between Gaza Strip and the West Bank.

Table 5 shows that the average of all paragraphs of the second field (Central Emergency Committee procedures) is 3.81 which is greater than the neutral average value '3'. The standard deviation is 0.54, the prorated average is 76.10% and it is greater than the neutral prorated average '60%'. This indicates that the procedures of the Central Emergency Committee to limit the spread of coronavirus in Gaza Strip were highly effective at the level of significance ( $\alpha \leq 0.05$ ).

### 3. The effectiveness of the procedures to prevent the coronavirus pandemic.

The results of the respondents answers are given in Table 6, which summarized as follows:

Table 6 illustrates the results of the effectiveness of the measures to prevent the coronavirus pandemic. The highest paragraphs according to the prorated average are 'there is tight control over the crossings so that the returnees are examined and quarantined within strict procedures' with a proportional average of 92.33%, as well as the paragraph 'the compulsory quarantine procedures for the returnees from abroad have achieved satisfactory results' with a prorated average of 91%. These strict measures are important to protect the population within the surveillance strategies based on the required epidemiological data in order to follow up the conditions of the returnees from abroad such as the country he/she visited, the length of staying there; the time spent before returning to the home country.<sup>17</sup> Moreover, one of surveillance strategies is to prepare isolated private rooms in the hospital where the returnees are transferred to reduce the risk of the disease outbreak until lab test results come out to treat them according to the preventive strategies.<sup>18</sup>

TABLE 6 The effectiveness of preventive measures to limit the spread of the coronavirus in Gaza Strip

No	The paragraph	The order	Prorated average	Standard deviation	Arithmetic average
29	There is tight control over the crossing, so returnees are checked and quarantined under strict procedures	1	92.33	0.61	4.62
30	The compulsory quarantine procedures for returnees from abroad have achieved satisfactory results	2	91.00	0.70	4.55
31	I have high confidence in the measures being taken by the Central Emergency Committee to combat the spread of the coronavirus	3	83.00	0.80	4.15
32	No cases of coronavirus infection were found in the community in the Gaza Strip	4	77.00	1.67	3.85
33	Despite the imposed measures, there is population in parks and on the shores of the Gaza Sea	5	75.00	0.95	3.75
34	Domestic quarantine procedures have failed by the returnees	6	73.00	1.20	3.65
35	A coronavirus case has been discovered among the returnees	7	69.67	1.60	3.48
36	There is a steady growth in the number of infections with coronavirus detected among the returnees from abroad	8	62.00	1.04	3.10
37	The Gaza Strip community is bound by the Central Emergency Committee instructions to avoid the infection with the coronavirus	9	56.33	0.97	2.82
38	There is concern that there may be infected cases with coronavirus inside Gaza Strip	10	51.00	1.20	2.55
39	There are doctors and members of medical or security teams who have been infected with quarantine facilities	11	44.33	1.12	2.22
40	There is concern that there may be infected cases with the coronavirus who entered Gaza Strip from the crossings before the quarantine procedures	12	43.00	1.15	2.15
41	A suspected coronavirus cases have been discovered in the community inside Gaza Strip	13	35.00	1.28	1.75
42	There were cases of escape from the quarantine centres	14	32.33	1.08	1.62
43	The discovery of cases that infected with the virus again after recovering and leaving the quarantine centres	15	29.67	0.91	1.48
	All paragraphs (effectiveness of coronavirus pandemic prevention measures)		60.98	0.39	3.05

The lowest paragraphs are 'the discovery of infected cases with coronavirus of whom recovered from the virus in the period of the quarantine' with a prorated average of 29.67%, and 'There have been returnees escape from the quarantine centres' with a prorated average of 32.33%.

There was only one case of escape, and he was caught within hours. After the medical examination, it was free from the coronavirus.<sup>19</sup> Therefore, it is important to raise the awareness level of the citizens and the workers in the quarantine facilities about the serious danger of the coronavirus prevalence within societies and how dangerous it will be if the virus transmitted from the returnees to the residents.<sup>20</sup>

Table 6 shows that the average of the third field (the effectiveness of coronavirus pandemic prevention measures) is 3.05 which is greater than the neutral prorated average '3'. The standard deviation is 0.39 and the prorated average equals 60.98% which is greater than the neutral prorated average '60%'. This indicates that the effectiveness of the coronavirus pandemic prevention measures was medium at the significance level ( $\alpha \leq 0.05$ )

In general, as shown in Table 7 it turns out that the average of all the questionnaire paragraphs (43) in the three fields is 3.44, which is greater than the neutral average value '3'. The standard deviation is 0.32, the prorated average equals 68.68% and it is greater than the neutral prorated average '60%'. This indicates that the preventive procedures effectiveness taken by the Central Emergency Committee and the Ministry of Health to reduce the spread of the coronavirus in Gaza Strip was significant at the level of significance ( $\alpha \leq 0.05$ ).

### 3.1 | Test hypotheses of the study

#### 3.1.1 | The first main hypothesis

There is no statistically significant relationship at the significance level ( $\alpha \leq 0.05$ ) between the preventive measures taken by the Ministry of Health and the effectiveness of the measures to prevent the coronavirus pandemic.

The Pearson test was used to find the relationship between the preventive measures taken by the Ministry of Health and the effectiveness of the procedures to prevent the coronavirus pandemic at a significant level  $\alpha = 0.05$ . The results in Table 8 show that the coefficient of relationship value is 0.661, and the probability value is 0.000, which is less than 0.05. This indicates a big significant relationship between the preventive measures taken by the Ministry of Health and the effectiveness of the coronavirus virus prevention pandemic at the significance level  $\alpha = 0.05$ .

#### 3.1.2 | The second main hypothesis

There is no statistically significant relationship at the significance level ( $\alpha \leq 0.05$ ) between the preventive measures taken by the Central Emergency Committee and the effectiveness of the measures to prevent the coronavirus pandemic.

TABLE 7 Results of all fields

No	Field	Sum of paragraphs	Prorated average	Standard deviation	Arithmetic average
1	Ministry of Health procedures	12	68.97	0.41	3.45
2	Effectiveness of coronavirus pandemic prevention measures	16	60.98	0.39	3.05
3	Central Emergency Committee procedures	15	76.10	0.54	3.81
	All fields	43	68.68	0.32	3.44

TABLE 8 The coefficient of relationship between the preventive measures taken by the Ministry of Health and the effectiveness of the measures to prevent the coronavirus pandemic at the level of significance  $\alpha = 0.05$

Field	The effectiveness of the coronavirus procedures	statistics
The Ministry of Health procedures	0.661**	The correlation coefficient
	0.000	The probability value
	60	The sample size

The Pearson test was used to find the relationship between the preventive measures taken by the Central Emergency Committee and the effectiveness of the procedures to prevent the novel coronavirus pandemic at the level of significance and the results are shown in Table 9. The correlation coefficient value is 0.835, and the probability value is 0.000, which is less than 0.05. This indicates a strong relationship between the preventive measures taken by the Central Emergency Committee and the effectiveness of the coronavirus prevention procedures at the level of significance.

### 3.1.3 | The third main hypothesis

Is that there is a statistically significant impact at the level of significance ( $\alpha \leq 0.05$ ) of the coronavirus pandemic prevention measures and the effectiveness of the coronavirus virus prevention measures.

Multi-linear regression analysis was used to identify the effect of the independent variables (Ministry of Health procedures and Central Emergency Committee procedures) on the dependent variable (effectiveness of coronavirus pandemic prevention measures). It has been found from the results given in Table 10 that the regression equation is reasonable for predicting, where the calculated value of 'F' equals 35.97 and it is statistically significant at the level of 0.05, as the probability value equals 0.000 which is less than 0.05. This indicates a statistically significant effect at the level of significance ( $\alpha \leq 0.05$ ) of the coronavirus pandemic prevention measures and the effectiveness of pandemic prevention measures coronavirus.

The value of the adjusted coefficient of determination is  $R^2 = 0.579$ , in other words, the rates of variation explained by the independent variables that entered the regression equation from the dependent variable variation is high, of a response rate of 57.9%.

The regression equation can be written as: Multi-Linear Regression Formula sample,

$$\hat{Y} = 0.035 + 0.642 \cdot X_1 + 0.319 \cdot X_2$$

where the variables in the formula mean: Y, dependent variable: effectiveness of coronavirus pandemic prevention measures;  $X_1$ , Ministry of Health procedures;  $X_2$ , Central Emergency Committee procedures;  $b_1$ ,  $b_2$ , regression coefficients for the independent variables.

## 4 | CONCLUSION

The novel coronavirus 'COVID-19' will continue spreading in the world nations because of the humans need to travel and move across borders. Therefore, it is important to work on reducing it by using all medical and administrative means and preventing returnees from abroad from reaching residential

**TABLE 9** The correlation coefficient between the prevention measures taken by the Central Emergency Committee and the effectiveness of the measures to prevent the coronavirus pandemic at the level of significance ( $\alpha \leq 0.05$ )

Field	statistics	The effectiveness of the coronavirus prevention procedures
The Central Emergency Committee procedures	The correlation coefficient	0.835**
	Probability value	0.000
	The sample size	60

TABLE 10 Multi-linear regression analysis (effectiveness of coronavirus pandemic prevention measures)

Independent variables	Indicative or not indicative	Probability value sig.	T value	Standard Regression coefficients Beta	The standard error	Regression coefficients
The constant	Not indicative	0.224	1.227		0.029	0.035
The Ministry of Health procedures	Indicative	0.000	24.663	0.643	0.026	0.642
The Central Emergency Committee procedures	Indicative	0.000	14.641	0.381	0.022	0.319
Variance analysis ANOVA						
The probability value = 0.000			Test value = 35.97 F			
The adjusted interpretive coefficient value 0.579 = $R^2$			The correlation coefficients value 0.761 = R			

areas before making sure that they are not infected with the coronavirus, so we recommend the following:

- Achieving complete control of all international terminals to prevent infection from outside reaching the housing estates.
- Working to prevent the mass gatherings in parks and beaches and impose fines on violators.
- Requesting international bodies to increase the financial funding allocated to support the efforts of the Central Emergency Committee in Gaza strip in the response phase and the recovery phase from the effect of the novel coronavirus.
- Increasing inter-agency coordination with the Ministry of Health in Ramallah to combat the coronavirus pandemic, away from political conflicts.
- Enhancing effective community participation in educating the Palestinian community about the seriousness of the outbreak of the novel coronavirus and work to prevent it.

#### ACKNOWLEDGEMENTS

We would like to thank the Ministry of Health in Gaza, as well as the Ministry of the Interior and the Central Emergency Committee in the Gaza Strip for helping us to accomplish this scientific article.

#### ETHICAL STATEMENT

Not applicable.

#### AUTHORS CONTRIBUTIONS

All authors contributed to the idea of this work and all have co-written the manuscript. All authors approved the final version of the manuscript.

#### FUNDING

Research funding is provided by researchers only.

#### DATA AVAILABILITY STATEMENT

Data available on request from the authors. The data that support the findings of this study are available from the corresponding author upon reasonable request.

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**How to cite this article:** Musalam AMA, Abunamous RES, El-Ashgar NM, Alhana AS. Emergency management to avoid the spread of the COVID-19 pandemic in Gaza Strip. *Int J Health Plann Mgmt*. 2021;1–16. <https://doi.org/10.1002/hpm.3260>