The Effectiveness of Quarantine Interventions on the Spread of Corona Virus 2019: A Systematic Review

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Abstract

BACKGROUND: The COVID-19 virus has become a terrible thing and is a serious threat to health globally which spreads very fast throughout the world with the number of cases increasing sharply and causing high mortality rates. This disease has become an international public health emergency.

AIM: This study aimed to systematically investigate the effectiveness of quarantine against the spread of disease due to the Coronavirus 2019 (COVID-19).

METHODS: Searching for articles was using electronic databases in English such as CINAHL (EBSCO), Science Direct, ProQuest, Scopus, Springer Link, PubMed, Willey Online Library, Clinical key, Academic Search Complete, MEDLINE, Taylor and Francis Online, Cambridge Core, and sage journals to review the literature published between 2019 and 2020.

RESULTS: Seven quarantine intervention programs were demonstrated to prevent and reduce the spread of COVID-19. The most common interventions were divided into four types of programs, namely: (1) Quarantine program: "Susceptible Exposed Infectious Recovered," (2) quarantine programs: Mitigation, quarantine program: Public health intervention, (3) quarantine programs based on laboratories, and (4) quarantine programs on cruise ships.

CONCLUSION: Successful interventions were characterized by a combination of multi-sectorial collaboration, community involvement, community-based service delivery, and broader programs both in scope and compliance. This program has proven to be beneficial in preventing or reducing the spread of COVID-19. Suggestion: The government can use these programs to prevent and reduce the spread of disease caused by COVID-19.

Introduction

The world is currently busy facing COVID-19 disease pandemic [1]. This virus is a terrible thing, it spreads very quickly throughout the world and the number of cases is increasing sharply [2]. This shows that this disease is a serious threat to health globally [3], [4]. So that the World Health Organization (WHO), in March 2020, declared that this situation was categorized as a pandemic [5], [6] and became an international public health emergency in January 2020 [7].

The novel coronavirus pneumonia was first identified in the Chinese city of Wuhan, referred to as Coronavirus disease 19 (COVID-19) by the WHO [8]. In December 2019, in Wuhan City, Hubei Province, China, became the center of an outbreak of pneumonia with no known cause, where this outbreak caused great attention both in China and internationally [9], [10]. This virus initially spread rapidly throughout China [11]. So the Chinese health authorities then carried out an immediate investigation to characterize and control the disease, including the isolation of people suspected of having the disease [12].

The COVID-19 cases are no longer limited to Wuhan alone but have spread to Hong Kong, Macau, and Taiwan [13]. In January 2020, the disease had spread to Thailand, Japan, Korea, the United States, Vietnam, and Singapore [5], [13], [14], [15]. Then in March 2020, the spread of COVID-19 began to seem uncontrollable, where only in the past week, the outbreak has emerged in all countries such as Iran, Iraq, Oman, Bahrain, Italy, Austria, and Croatia, and Japan. Italy is the ten cities where the virus is spreading rapidly [16].

The COVID-19 virus is suspected by experts to have spread secretly to many places. A modeling group at Imperial College London estimates that it is likely that about two-thirds of cases transmitted from China have not been detected [16]. There are concerns that the 2019-nCoV-induced outbreak could spread globally with the continuous transmission in countries around the world [17], [18], [19], [20].

The COVID-19 virus was identified by the International Committee on Taxonomy of Viruses (ICTV) as "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2), and a report from the ICTV Coronaviridae Study on February 11, 2020. The pneumonia outbreak became a global concern when The Wuhan Municipal Health Commission reported on December 31, 2019,

there were 27 cases of viral pneumonia, including seven critical cases [8]. As of February 14, 2020, there were a total of 48,548 laboratory-confirmed cases (1998 new) and 1381 deaths (121 new) reported in China, as well as 505 laboratory-confirmed cases (58 new) and two deaths (1 new) in 24 countries outside China [5].

The virus outbreak is spreading rapidly, reaching a total of more than 50,000 cases and 1000 deaths reported in China as well as 603 cases worldwide, [5], [21] this figure has surpassed the 2003 outbreak of SARS [22]. Then on April 6, 2020, the virus quickly spread to most countries around the world, affecting more than 1.1 million people, and causing nearly 63,000 deaths [5].

This virus is most similar to the SARS, [23] which in 2002–2003 was a major case in 37 countries [23], [24]. Common symptoms at the start of a disease with COVID-19 are fever, cough, and myalgia or fatigue. Meanwhile, less common symptoms include sputum production, headache, hemoptysis, and diarrhea [25]. The progression of the disease to acute respiratory distress syndrome occurred about 8–12 days after the onset of symptoms, and the greatest severity occurred about 10 days after the team [26] had the initial symptoms [4], [18], [27].

The WHO reported that the new coronavirus (2019-nCoV) was identified as the causative virus by the Chinese authorities on January 7, 2020. The risk factors for COVID-19 are estimated to be mainly transmitted through droplets from infected people [28], by air, shakes hands, skin touch, hugs, and being close to people with COVID-19. The risk factors for those who are prone to contracting COVID-19 are older age [25], children and infants [29], male sex, have a history of previous diseases such as diabetes mellitus, hypertension, and cardiovascular disease [18]. The COVID-19 case causes a high mortality rate [18] because it is easily transmissible, and causes many physical and mental [7], social, spiritual, and economic losses. For health workers, COVID-19 has created psychological distress and challenges [29], where many feels exhausted as a result of caring for more and more patients at the expense of their own well-being and become infected. In society, there is anxiety and depression due to fear of infection, excessive media information, and panic buying necessities [30]. Economic actors have caused economic losses which led to mass layoffs.

The nature of the virus which is easily transmitted causes people to be suspicious and shut themselves off from the social environment. In addition, houses of worship were closed because it is thought to be a gathering area for many people who are at high risk of infection due to the proximity to one another where there is a possibility that there are positive sufferers of COVID-19 who are not aware of it.

Various countries have tried to make efforts to address the problems caused by COVID-19. To control the epidemic of this virus, the Chinese government on January 23, 2020, ordered the quarantine of the city of Wuhan, implementing an unprecedented intervention strategy [8], [21]. These policies include large-scale quarantine, strict control of travel, and extensive monitoring of suspected cases [21]. All cities in China are under quarantine including national school closures as an emergency measure to prevent the spread of infection, extended national holidays, restricting public activities, taking strict measures to restrict travel and public gatherings, closed public spaces, and strict temperature monitoring [21], [31].

Almost all countries have implemented quarantine policies to prevent the spread of COVID-19 by implementing mitigation measures, such as traffic restrictions, cancellation of social gatherings, and home quarantine [6]. Quarantine is associated with reduced transmission rates. Centralized patient quarantine and contacts appear to have been associated with reduced transmission in hospitals, households, and communities [6]. During this time, the international community has paid great attention to the effectiveness of quarantine [32]. Quarantine is expected to minimize transmission of COVID-19. The key factor in slowing transmission of the virus is "*social distancing*" by reducing human-to-human contact [2]. It should be emphasized that the importance of current surveillance efforts in countries around the world is done to ensure that the ongoing outbreak will not become a global pandemic [20].

Governments in various countries have started to carry out quarantine interventions both independently and in combination to prevent outbreaks, although it is not known whether community interventions can improve the control of the COVID-19 outbreak [6], and no studies have been found regarding its effectiveness quarantine against the spread of COVID-19. Therefore, it is necessary to carry out literature research to investigate quarantine interventions that are effective in reducing the spread of COVID-19 cases.

This research aimed to: (1) Investigate quarantine interventions that are effective in reducing the spread of COVID-19 carried out in the world between December 2019 and April 2020, and (2) analyzing the potential impact of the regulation of the COVID-19 outbreak in the world.

This research is useful to assist policymakers in making efforts to prevent and control the spread of disease due to COVID-19, as well as to collect and critically analyze the distribution of quarantine intervention programs in all countries affected by COVID-19.

Methods

In this systematic review, the researcher uses the guidelines from the Preferred Reporting Items for

Systematic Reviews and Meta-Analyzes [33] in this systematic review.

Study selection and eligibility

The inclusion criteria in these studies were as follows: (1) Published in peer-reviewed scientific journals; (2) focus on quarantine interventions to prevent the spread of COVID-19; (3) published between December 2019 and April 2020; (4) articles in English; (5) full text; (6) RCT, Quasi experiment, cohort study; and (7) involving human subjects (Table 1).

Data search strategy

Authors include RCT studies, quasi-experiments, and cohort studies examining quarantine interventions related to COVID-19. Sourcing through electronic literature databases (PubMed, Medline-EBSCO, ProQuest, Science Direct, CINAHL-EBSCO, Academic Search Complete-EBSCO, Springer Link, Sage Journal, Cambridge Core, Taylor and Francis Online, Clinical key, Willey Online Library, and Scopus) to search for articles related to quarantine interventions related to COVID-19 in 2019-2020. Search was carried out using medical subject headings and keyword such as intervention, COVID-19, coronavirus, quarantine using 13 databases using the same search strategy in 13 databases.

Study selection and data collection

Researchers identified and filtered abstracts of all English articles in the database. Quarantine data related to COVID-19 such as epidemiological reviews, conference proceedings, thesis reports, meta-analyzes, systematic reviews, comments, review literature, and editorial were not included in this study. Only studies related to COVID-19 quarantine in the form of RCTs, quasi-experiments, and cohort studies were included in this systematic review study. A total of 2210 studies were screened based on titles and abstracts, then released 1522 studies which were editorial research, commentary, literature review, thesis, conference proceedings, not related to quarantine-related interventions related to COVID-19, and not in English, leaving 688 articles. Furthermore, the researchers issued 661 studies because of duplication, were literature studies and were not quarantine interventions related to COVID-19 so that 27 studies had the potential to meet the requirements. Of the 27 articles, only six articles met the requirements. The study flow chart is presented in Figure 1. Representativeness, relevance, study design, clarity of objectives, and evidence of an ethical approach were considered among the quality criteria.

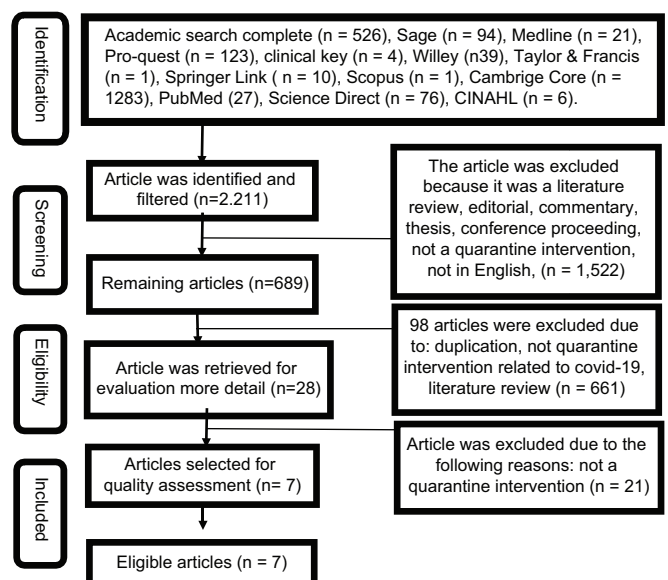Framework: The population, intervention, comparators and outcomes (PICO) (Table 1).

Figure 1. Summary of the research article selection process

After screening full-text articles and assessed for quality using a quality assessment tool, only six studies were identified as meeting the essential criteria. All articles identified as relevant to quarantine interventions related to COVID-19 by one of the authors were submitted for full text review and data extraction. The first and second authors reviewed all abstracts of the articles identified in the database. All data are obtained in electronic form. All four authors reviewed the full text of the screened articles for assessment and confirmed their eligibility. Each author filled out the study data extraction form for eligible articles. The article was selected to report results from the latest literature on quarantine related to COVID-19. The identified articles from the electronic database are transferred and stored in the EndNote software X5.01. A brief description of the selected studies is shown in Table 2. Every effort was made to reduce the risk of bias in this review by a panel of experts consisting of three academics who had been trained.

Table 1: Framework: The PICO

Population	Intervention	Comparison of	Outcomes
Community	A quarantine program with various methods related to the prevention of the spread of COVID-19, both social distancing methods, self-isolation, large-scale, and social restrictions.	Social distancing programs, self-isolation, large-scale social restrictions.	Reduced incidence of disease due to COVID-19.

PICO: Population, intervention, comparators, and outcomes

Data extraction

Reviewers extracted data by one reviewer and checked by another. All studies that met the inclusion criteria were assessed according to the JBI Critical Appraisal Checklist for RCT and *The Cochrane Collaboration's tool for assessing risk of bias in randomized trials* including: 1) Authors; 2) year of publication; 3) research title; 4) geographic area of research; 5) research objectives 6) study design; 7) samples and sampling techniques; 8) data analysis;

Table 2: Summarizing and reporting the results

Name and year	Objectives	Method	Sampling	Analysis	Treatment	Results	Conclusion
(Hou *et al*., 2020) Wuhan China	To explore the effectiveness of the Wuhan city quarantine against this epidemic, the dynamics of COVID-19 transmission	Well-mixed the "SEIR" combined compartmental model	Vulnerable populations, exposed populations, symptomatic infected populations, and recovered populations.	Software R (version 3.6.1)	Referring to SARS epidemic data, the level of contact of infected individuals after quarantine and isolation is regulated.	The mixed SEIR model matched the results based on the assumption of latent individual contact rates to be within 6–18, representing the possible impact of quarantine and isolation interventions on infectious disease, whereas other parameters were considered unchanged.	By reducing the level of latent individual contact, interventions such as quarantine and isolation could effectively reduce the potential peak number of COVID-19 AND infections delay the peak infection time.
(Koo *et al*., 2020) Singapore	To investigate early intervention in Singapore if the local detention (for example, prevent the spread of disease through tracing contact effort) is not work.	Influenza epidemic simulation mode of SARS-CoV-2 infection parameters	School community, home community, and work place Respondents are divided into 2: Intervention and control (baseline) group	Statistical software R (version 3.6.3) for plotting graphs and for all analyzes	In the intervention group there were four intervention scenarios: (1) Group quarantine: isolation of infected individuals and quarantine of their family members. (2) Quarantine plus (school): Direct school closure for 2 weeks of quarantine plus (workplace distancing): 50% of the workforce are encouraged to work from home for 2 weeks; (3) Combined intervention: immediate school closure, and workplace distancing. (4) In the baseline group: none of the interventions	The results of the study prove that in the intervention group there was a decrease in COVID cases compared to the baseline group. Compared with the baseline scenario, intervention the combine dis were most effective	Intervention combinations (combine quarantines, school closures, and workplace distancing) to prevent national epidemic at the level of for low infectivity and significantly reduced total number of infections at higher rates of infectivity.
(That *et al*., 2020) China	To demonstrate how AI control measures, impact epidemic containment.	Population migration data before and after January 23 and epidemiological data for the most updated COVID-19 into the SEIR AI approach	Population into four possible states: Vulnerable [S], Exposed or latent [E], Infectious [I] or Removed [R].		Methods Data source the most recent epidemiological data based on the daily number of COVID-19 outbreaks reported by the Chinese National Health Commission were taken. Migration index based on the daily number of events in and out by rail, air and traffic path, sourced from a web-based program. Epidemic data SARS 2003 between April and June 2003 across China taken from an archived news site (SOHU) used for AI training	It found that the Chinese epidemic will peak in late February, indicating a gradual decline in late April	Dynamic SEIR model is effective in predicting the peak and size of the COVID-19 epidemic. Implementation of control measures on 23 January 2020 is urgently needed to reduce the size of the COVID-19 epidemic
(Pan *et al*., 2020) Wuhan China	To evaluate the relationship between public health interventions and epidemiological features of the COVID-19 outbreak in Wuhan.	Kohort study	32583 confirmed cases of COVID-19 were reported between December 8, 2019 and March 8, 2020, extracted from the City's verifiable Disease Report System, including patient age, sex, location of residence, occupation, and severity classification.	Regression SAS statistical software version 9.3	Exposure Non-pharmaceutical public health interventions include cordon sanitation, traffic restrictions, social distancing, home isolation, centralized quarantine, and universal symptom surveys.	Results among 32 583 cases of COVID-19, the mean age of patients was 56.7 years, more women. The daily case rate peaked in the third period and decreased thereafter across Geographical regions and for sex and age groups, except for children and adolescents. The rate of daily cases throughout the period among local health care workers was higher than the general population. The proportion of severe and critical cases decreased from 53.1% to 10.3% over 5 periods. The risk of severity increases with age	A diverse range of public health interventions have been linked to improved control of the COVID-19 outbreak

(Contd...)

Table 2: *(Continued)*

Name and year	Objectives	Method	Sampling	Analysis	Treatment	Results	Conclusion
Lagie *et al.* 2020) Prance	To test expats for SARS-CoV-2 twice in order to reduce and decision makers	Researchers investigated the presence of SARS-CoV-19 by testing all discharged patients within the first 24 h of their arrival in France and on day 5. Viral RNA was extracted from nasal and oropharyngeal swab fluids or sputum in the absence of multiple real time RT-PCR tests.	The total sample of 337 consisted of 170 males (50.4%), mean age 31 years (range 0–75 years)	Samples were taken from 3 flights 178 (first), 124 (second) and 35 (third)	Researcher collected one nasal and one oropharyngeal swab and one sputum sample from each individual. For children under the age of three, a nasal rinse was performed. A team consisting of between two and seven infectious disease specialists was sent to the two quarantine bases to test asymptomatic persons.	Researcher tested 337 passengers at day 0 and day 5. All the tests for SARS-CoV2 were negative	The procedures reduce anxiety and reassures the population and decision makers
Rocklöv *et al.* (2020) Sweden	Estimating the baseline reproduction numbers from the initial outbreak period using the SEIR model	Calibrate the model with the transient event data response function. Estimating counterfactual scenarios in the absence of countermeasures, and establishing a grouped model by crew and guests to study the impact of differential levels of contact between groups. Also compares previous and later ship evacuation scenarios	The population was homogeneous (3700 individuals), and the population is stratified crew (1000 individuals) and guests (2700 individuals).	SEIR models	Researchers used 21 January 2020 as the first point in time, t=0, COVID-19 related to cruise ships derived using a compartment model that estimates the dynamics of the number of people who are susceptible (S), exposed (E), infected (I), and recovered (R), adapted but modified from a published COVID-19 study	The cumulative number of cases modeled on February 19, 2020, was 613 out of 3,700 people at risk, while the number of observed cases reported was 619.	The initial evacuation of all passengers on the cruise ship - a situation with limited space and high mixing - is recommended as soon as the COVID-19 outbreak is confirmed.
Telles *et al.* (2021) Brazil	To compare the outcomes of policies adopted by countries between January and April 2020	Testing the policies used as a preventive framework for virus community transmission in some countries and compared it to the policies adopted by China and South Korea	March 28–30 (n=56,337), April 11–13 (n=71,619), May 1–2 (n=60,807) consisted of 29 countries	Policies as a preventive framework	The first group implemented social distancing (1–2 m) only, and the second comprised China and South Korea, which implemented distancing with additional transmission/isolation measures using masks and city disinfection	Virus transmission was reduced due to policies affecting SARS-CoV-2 propagation over time	Social distancing by 1–2 m with mask use and city disinfection yields positive outcomes

SEIR: Susceptible exposed infectious recovered, AI: Artificial intelligence, RT: Reverse transcription

9) explanation of the intervention; 10) Main findings, and 11) conclusions. A narrative synthesis of evidence was performed for all studies.

Results

Study selection

Initial search for articles combining all keywords from the electronic literature database yielded 2210 titles. After removing duplication, articles editorial, conference proceedings, systematic review theses, non-English articles, not focusing on quarantine interventions to prevent the spread of COVID-19, seven articles are left that are eligible (Figure 1).

Study characteristics from eligible studies

Based on the research results, there were six articles that examine the effectiveness of quarantine to prevent the spread of the COVID-19 virus. From these articles, five articles explained that the quarantine program was carried out and the next was calculated using the SEIRS application, one article was conducted with a cohort shortcut, policies analysis, and one more article using the COVID-19 signs check method. In addition, policies affecting SARS-CoV-2 propagation influenced to prevent the spreading virus transmission [34]. There were several quarantine programs carried out to prevent and reduce the spread of COVID-19 which were divided into four types of programs, namely:

Quarantine program in China

In this quarantine program carried out by the Chinese government then estimation and analysis are carried out using the SEIRS application. The effectiveness of the quarantine program in the city of Wuhan was analyzed by Hou *et al.* (2020) in Wuhan City, China which aims to explore the effectiveness of the Wuhan city quarantine against this epidemic; the dynamics of COVID-19 transmission have been

estimated [8]. The results show that considering infected individuals as transmitters during the latency period, the mixed model SEIR results are based on the assumption that the latent individual contact rates are within 6–18. Thus, reducing the contact rate of latent individuals, interventions such as quarantine and isolation, could effectively reduce the potential peak number of COVID-19 infections and delay the peak infection time. Other studies using the SEIRS method have also revealed that the SEIRS model is effective in predicting COVID-19 in seeing the size and peak of the epidemic [21].

Quarantine program in Singapore

In this study, quarantine was divided into a control group (baseline) and an intervention group. In the baseline group, no intervention was carried out, while in the intervention group four intervention scenarios were carried out, namely: quarantine group, quarantine plus (school), quarantine plus (workplace distancing), and combination intervention. In the quarantine group, infected individuals are isolated and their family members are quarantined. Quarantine of infected individuals occurs 1 day after the onset of symptoms in a health-care facility and is fully equipped to handle full quarantine measures (i.e., negative pressure isolation rooms and full personal protective equipment used by staff) so that individuals cannot transmit SARS-CoV-2 to patients' other hospitalizations. At full hospitalization capacity, the remaining individuals are isolated at home after receiving treatment. Family members of the infected individual are quarantined at home for 14 days because transmission in the family is possible because of an isolated and infected individual.

In the quarantine plus group, direct school closures were carried out for 2 weeks. Workplace distancing was carried out: 50% of the workforce were encouraged to work from home for 2 weeks. In the combination intervention group, a combined intervention was carried out where the school was immediately closed and the workplace distancing. Four intervention scenarios are proposed to be implemented following failure of local containment, following the policy options currently being assessed by the Singapore Ministry of Health, as standard interventions for respiratory virus control.

Each of the 1000 epidemic simulations has a set of parameters and is run for the baseline and four control strategies. The median simulation was determined as the cumulative mean number of cases at day 80. The same set of parameters is used for every 1000 simulation sets for each value of R0. When analyzing differences across infectivity scenarios, we compared the outputs of each simulation, using the same parameters, not the median of each grouping.

We calculated IQR as simulated 25th and 75th in terms of the number of cumulative cases at 80 days. Researchers used statistical software R (version 3.6.3)

to plot charts and for all analyzes. We present intervention data for scenarios in which R0 is R0 1 5 (relatively mild outbreak), 2.0 (moderate outbreak), and R0 = 2.5 (severe outbreak). The results of the study proved that in the intervention group there was a decrease in COVID cases compared to the baseline group. Compared to the baseline scenario, combined interventions are the most effective [9].

Discussion

The results of this systematic review found five quarantine programs carried out to prevent the spread of COVID-19. These programs include quarantine in the city of China, quarantine in Singapore, quarantine in France, and quarantine in Sweden. These four countries showed that the quarantine program had a good impact on the program to prevent the spread of COVID-19. Meanwhile, a policy that implemented by the country also influenced will reduce transmission of the virus [34].

Quarantine program in China

There were three studies related to quarantine carried out in China [6], [8], [21]. From these three studies, it was revealed that quarantine and isolation could effectively reduce the potential peak number of COVID-19 infections and delay the peak infection time [8]. Besides, the SEIRS model was effective in predicting the peak and size of the COVID-19 epidemic [6], [21].

The COVID-19 pandemic was spreading so fast and causing a large number of morbidities followed by the number of deaths, so it required fast and precise efforts to predict the number of victims affected and an appropriate transmission prevention program. Thus, the spread of COVID-19 can be inhibited and can reduce the addition of new cases. The WHO has provided guidelines for preventing the spread of this disease. Every country must carry out a program to prevent the transmission of COVID-19. The SEIRS model was used to predict the onset of an epidemic of a disease, and the results of the review revealed that this model can predict the peak and size of the epidemic.

Quarantine program in Singapore

From the results of this review, it revealed that by mitigating this COVID-19 and in combination with other interventions (combining quarantine, school closings, and workplace distancing) can prevent national outbreaks at the level of combined interventions (combining quarantine, school closings, and workplace distancing) can prevent national outbreaks at low infectivity rates and reduce the total number of infections

significantly at higher infectivity rates [9]. From these findings, it shows that a combination of interventions can inhibit the spread of COVID-19.

The spread of COVID-19 can occur through coughing, sneezing, splashing saliva, when someone suffering from COVID-19 coughs or breathes, they release like droplets of liquid that also have the corona virus [5]. Therefore, this quarantine was needed to prevent the spread that was carried out in combination with other interventions. Mitigation will identify the potential hazards before this endemic COVID-19 event.

Quarantine program in Sweden

The quarantine program carried out in Sweden revealed that the initial evacuation of all passengers on a cruise ship, with conditions and situations with limited space and high mixing, it was recommended to immediately carry out quarantine after the COVID-19 outbreak was confirmed [25]. Consideration was carried out by quarantine based on the results of data analysis using the SEIRS model. This SEIRS model was widely used to predict the development of infectious diseases such as malaria [35].

Quarantine programs in France

From the results of the review, it was found that this laboratory-based quarantine program can reduce anxiety and reassure the population and decision makers [36]. The population examined in this incident were those who arrived from abroad and entered France. With this laboratory-based quarantine procedure, they were calmer and sure whether they were infected (positive COVID-19) or not infected. This was important for both the stolen group and the government to determine the policy to be taken next.

The COVID-19 examination consists of several stages starting from rapid testing or using PCR. This examination can confirm the presence of infection by COVID-19 so that if someone is clearly infected then automatic quarantine can be carried out properly so that it will not endanger him and or others. Likewise, for the government, the results of laboratory-based examinations will make it easier to issue appropriate policies.

Strengths and weaknesses

The strengths of this systematic review were that it revealed the quarantine intervention program to prevent or reduce the spread of COVID-19 which was a new case and there was no way to prevent it from spreading. In the table analysis, the program interventions and their revealed implementation were in detail, thus providing a clear picture for program users. While, the shortcomings of this systematic review were still limited to countries affected by COVID-19 which were very broad so that

they have not disclosed the prevention programs of the spread of COVID-19 in other countries.

Conclusion

Based on the results of the study, it can be concluded that the quarantine program has proven to be beneficial in preventing or reducing the spread of COVID-19. Suggestion: The government can use these programs to prevent and reduce the spread of disease caused by COVID-19.

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