Effectivity Strategy Screening Covid-19 : Systematic Review

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A B S T R A C T

Asymptomatic transmission of the virus through asymptomatic carriers causes the spread of Covid-19 to become more widespread and dangerous. The purpose of this review is to find out how effective screening is in identifying COVID-19 patients. This research is a systematic review with The article database consists of CINAHL, ProQuest, PubMed, Springer Link, and ELSEVIER. There were 7 articles obtained according to the criteria and analyzed descriptively narrative and had met the quality of the study according to the criteria in Joanna Briggs' Critical Assessment Methodology guidelines. Based on the results of the extraction and synthesis analysis of seven articles, it shows that COVID-19 screening can identify asymptomatic individuals, especially in patients who are admitted to health facilities and in the community. Screening is effective for the control and spread of SARS-CoV-2 in the community and prevention of nosocomial infections in health facilities. Rapid identification of the patient, the asymptomatic carrier, and the mode of transmission of a particular pathogen are the main objectives of the pandemic response, which can then be incorporated into a larger set of medical measures. Antibody-based rapid testing and fever screening for screening should not be used to avoid low sensitivity.

INTRODUCTION

The new coronavirus disease, spread globally in December 2019. SARS-CoV-2 is a group of patients with pneumonia of unknown cause. SARS-CoV-2 was first discovered at the local South Chinese huanan seafood market in Wuhan, Hubei province, China. Characterized by acute fever, which develops into acute respiratory distress syndrome (ARDS).The World Health Organization (WHO) has named the disease COVID-19. WHO declared it a public health emergency of international concern (PHEI) on January 30, 2020 and declared a pandemic on April 11, 2020, (Khan et al., 2020). As of April 3, 2021, COVID-19 was diagnosed with 129,902,402 confirmed cases, including 2,831,815 deaths reported by the WHO, (WHO, 2021).

Most of the SARS-CoV-2 infected people had only mild to moderate symptoms similar to other flu infections, which had no obvious symptoms. So it is difficult for us to identify people who are infected with SARS-CoV-2, (Döhla et al., 2020). Asymptomatic people are contributing to the widespread spread of SARS-CoV-2, the United States has the highest incidence of COVID-19 reporting of people without symptoms being in a health facility showing a significant percentage. The asymptomatic population's positivity to the virus reaches> 50%. Hospitalized SARS-CoV-2 could be prevented by population screening, (Sastry, 2020).

This systematic review provides an overview of COVID-19 screening. The purpose of writing this systematic review is to find out how effective screening is in identifying COVID-19 patients.

METHOD

Study Design

This writing is in the form of a systemic review by analyzing some of the main findings from research articles that discuss Covid-19 screening. Writing this systematic review is based on the PRISMA diagram guidelines as a standard in reviewing and selecting research articles, the PRISMA guideline is a form of instrument that aims to assist writers in improving the quality of the selection of research articles in a systematic way. Writing a review consists of four stages.

Selection Criteria

The standard in conducting a study or analysis of this systematic review uses the SPIDER Formulating which consists of Sample group, Phenomenom of interest, Design, Evaluation and Research Type. SPIDER was used by researchers in determining inclusion and exclusion criteria in this systematic review. The inclusion criteria include; (1) research focuses on COVID-19 screening in health and community facilities, (2) articles in journal form, (3) Quantitative, Qualitative, case studies (4) publication of articles for 2020-2021, (6) full text, (7) in English . While the exclusion criteria included; (1) screening, (2) not focusing on covid-19 screening, (3) articles in the form of systematic reviews, literature reviews, (4) articles published before 2020, (5) articles not in English.

Instrument

Assessment of the quality of the systematic review research methodology uses the JBI Critical Appraisal Checklist guidelines. JBI is an instrument used to assess the methodological quality of a study and to determine the extent to which a study has addressed possible biases in its design, intervention, and analysis, (The Joanna Briggs Institute, 2017). The JBI Critical Assessment Instrument is tailored to the type of research used, for qualitative research using the Qualitative Research Checklist, as well as for quantitative using a quantitative checklist.

JBI uses 10 predefined checklist items. The criteria assessment is given a score of 'Yes', 'No', 'Unclear', 'Not Applicable', and each criterion with a score of 'Yes' is given 1 point and the others are given a score of 0, then each score is calculated and added up, then assessed based on percentage. Studies where a percentage (80-100%) of the 10 criteria is considered "good quality", a percentage (50-79%) is considered "sufficiently qualified", and a percentage (<50%) is considered "poor quality". From the results of the assessment of the quality of research articles, the risk of bias that occurs from writing this systematic review can be minimized.

Procedure

In a systematic review of article searches using an international electronic database consisting of CINAHL, ProQuest, PubMed, Springer Link, and ELSEVIER with a research article publication period from 2020 to 2021. The search strategy in the systematic review uses several keywords used in the search on the database used. . The keywords used are adjusted to the topic and research title using the Boolean operator and the MeSH Browser standard. Keywords used include "Effectivity" OR "Evaluation" AND "Strategy" OR "Test taking" AND "screening" OR "Screening" AND "COVID-19" OR "SARS-CoV-2".

Data Analysis

Compiling and writing this systematic review, data extraction is designed to provide information from records tailored to the purpose of the study. The systematic review guide is the Selected Reporting Item for Systematic Review and Meta-Analysis (PRISMA) and as the standard for reviewing and selecting articles. Specific information was extracted such as author, year of publication, name of journal, study design, type of intervention, and results.

RESULTS AND DISCUSSION

Based on the article search flow chart or PRISMA diagram of the identification stage, 202 articles were obtained from several databases used with details of articles CINAHL 0, ProQuest 103, PubMed 87, Springer Link 10, and ELSEVIER 2. At the screening stage there was a reduction in the number of articles due to articles that were published. as many as 8 articles, so that at the screening stage there were 196 articles that would be selected based on article titles and abstracts. After selection, 166 articles released at this stage did not fit the inclusion criteria. At the feasibility stage, there are 30 articles that will be selected in full text. At this stage 23 articles were published because they had nothing to do with COVID-19 screening in health or community facilities, research did not use English, research was published before 2020. In the final stage 7 articles were obtained based on selections made according to inclusion criteria.
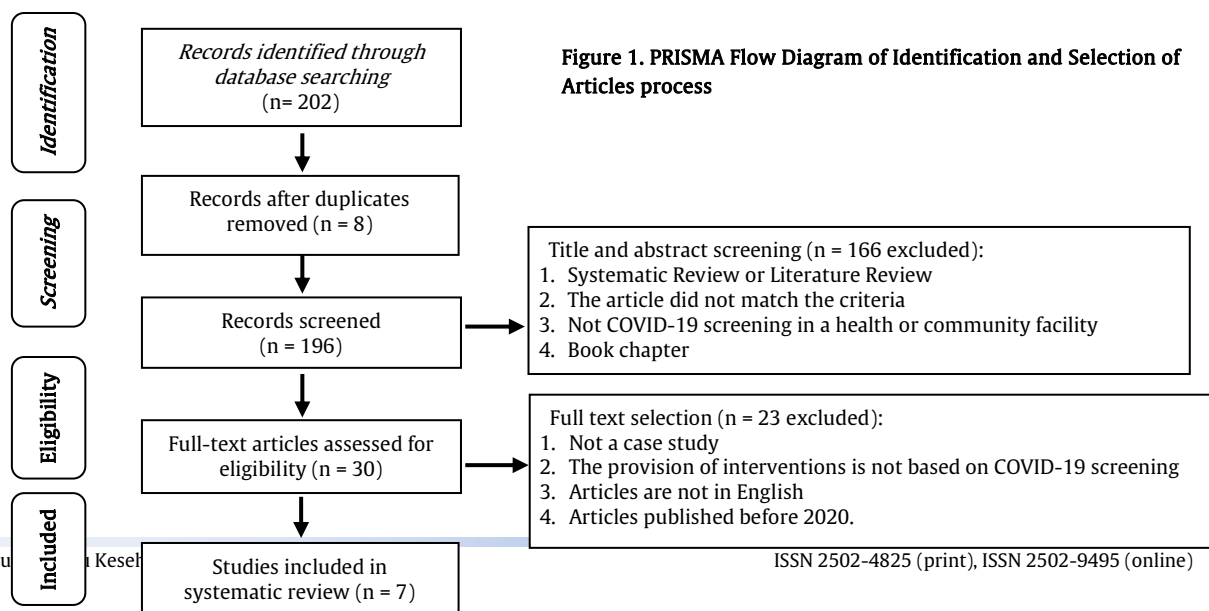

Figure 1. PRISMA Flow Diagram of Identification and Selection of Articles process

Table.1 Effectivity Strategy Screening Covid-19

No.	Author, Year, Journal, Country	Title	Study Design	Result
1.	(Chang et al., 2020) Multidisciplinary Digital Publishing Institute (MDPI) Journal Healthcare South Korea	Analysis of SARS-CoV-2 Screening Clinic (Including Drive-through System) Data at a Single University Hospital in South Korea from 27 January 2020 to 31 March 2020 During the COVID-19 Outbreak	Qualitative	Testing Drive-through screening systems (DT) collect more specimens than conventional screening systems. With 6,211 people screened, 142 tested positive for SARS-CoV-2 out of 3,368 people who were symptomatic or had a history of contact with COVID-19 patients and as many as 75 tested positive for SARS-CoV-2 out of 2,843 people asymptomatic and had no history of contact with patients COVID-19.
2.	(Black et al., 2020) The Lancet Journal England	COVID-19: the case for health-care worker screening to prevent hospital transmission	Case Study	The number of asymptomatic cases of COVID-19 is significant. In studies of symptomatic and asymptomatic infection of COVID-19, transmission before the onset of symptoms has been reported and may have contributed to its widespread spread. In addition, evidence from the modeled COVID-19 transmission profile suggests that 44% of secondary cases were infected during the symptom phase of the disease of the index cases, and it is likely that individual COVID-19 symptoms are uncommon and universal testing is proposed based on symptoms.
3.	(Krüger et al., 2021) Wiley Journal of Medical Virologi Germany	Performance and feasibility of universal PCR admission screening for SARS-CoV-2 in a German tertiary care hospital	Retrospective Cohort study	The PCR test was 99.9% effective for identifying cases of COVID-19. this was indicated by 27 positive cases with other tests and 7 positive cases who were asymptomatic and had no positive contact history, but were identified by positive PCR test. 425 in the first wave of the epidemic, 1218 in the low incidence phase is the number needed to identify asymptomatic patients, the specificity of the method was above 99.9%.
4.	(Kirshblum et al., 2020) Wiley Journal PM&R USA	Screening Testing for SARS-CoV-2 upon Admission to Rehabilitation Hospitals in a High COVID-19 Prevalence Community	Quantitative	Seven asymptomatic people without clinical symptoms of COVID-19 tested positive on admission. Of these, five had symptoms of COVID-19, with an average range of 2-5 days. Five additional patients became symptomatic and tested positive in 3 to 10 days. Overall had a positive test within 14 days of admission.
5.	(Sastry, 2020) PMC USA	Universal screening for the SARS-CoV-2 virus on hospital admission in an area with low COVID-19 prevalence	Quantitative	1,811 SARS-CoV-2 tests were performed on nasopharyngeal specimens: 1,335 were asymptomatic, 420 were symptomatic, 56 were not ordered correctly. Of the 1,755 tests in this analysis, 79 were positive for SAR-CoV-2. 12 were asymptomatic and 67 were asymptomatic.
6.	(Gostic et al., 2020) eLife Journal	Estimated effectiveness of symptom and risk screening to prevent the spread of COVID-19	Case study	Describing the factors that contribute to the success and failure rates of screening, shows that the majority of cases missed by screening are basically undetectable, because they are asymptomatic and unaware that they are exposed.
7.	(Döhla et al., 2020) Elsevier Journal Public Health Germany	Rapid point-of-care testing for SARS-CoV-2 in a community screening setting shows low sensitivity	Quantitative	The rapid test detected only eight of them who tested positive (sensitivity: 36.4%). Of the 27 qPCR-negative individuals, 24 were correctly detected (specificity: 88.9%). In contrast, of the 49 people, 22 tested positive with repeated PCR.

DISCUSSION

To deal with the COVID-19 pandemic, what matters most is diagnostic accuracy and efficiency, time to make a diagnosis and the number of tests performed.Rapid diagnosis and adequate testing capacity are essential for the management of COVID-19, as SARS-CoV-2 is highly contagious, (Chang et al., 2020).The application of the SARS-CoV-2 universal test proved effective in identifying infections that were not detected in patients at the inpatient level. Therefore, to reduce the risk of transmission between patients and healthcare workers. The most important thing to detect COVID-19 infection upon admission is to interview all patients for signs / symptoms and contact with COVID-19 cases. Through clinical triage and targeted testing, a theoretical 67% of cases could be detected. During the first three weeks, by asking about symptoms and previous contact with confirmed COVID-19 patients, 90% of new COVID-19 patients could be identified, (Krüger et al., 2021).

SARS-CoV-2 screening tends to increase with the increase in the incidence of COVID-19.For health workers, this could increase labor shortages by eliminating the need for quarantine, reduce transmission in asymptomatic cases, prevent the virus in health care, and protect hospital staff

from infection. In the community, identifying asymptomatic cases and helping to get rid of the SARS-CoV-2 virus can be done by testing. However, in carrying out universal screening there are obstacles, (Sastry, 2020).

In carrying out screening measures, it is strongly discouraged to use fever screening even though fever is reported as a common clinical finding in COVID-19, which has prompted extensive temperature screening in various places, such as offices, airports and hospitals.In an Australian study, fever was rare in hospital patients who tested positive for SARS-CoV-2. Fever has a low sensitivity to SARS-CoV-2, raising questions about the usefulness of temperature testing widely. The sensitivity of fever is lower in the early stages of disease examination than after the course of the disease on the ward. Additionally, using fever as a screening tool for COVID-19 cannot detect SARS-CoV-2.The opinion finding previously published that the role of fever screening at airports was also questioned, with entry or exit checks with thermal scanners deemed ineffective at detecting SARS-CoV-2.General public measures taken, such as self-isolation during illness, physical distancing and contact tracing, are more effective than temperature checks, (Mitra et al., 2020).

In another study, there were informal reports of people taking antipyretics to reduce fever, ultimately reducing the effectiveness of this method. The rapid PCR test will also be useful for identification of cases on arrival and help resolve problems with false positive detection through screening. Thus, to test suspected cases based on questionnaire answers, travel origin, or symptoms, at least one PCR test for SARS-CoV-2 that took less than one hour could be ascertained. However, this procedure can prove very costly if done on a large scale, (Gostic et al., 2020).

Likewise, the opening of a university requires an effective and safe SARS-CoV-2 monitoring strategy for students. In another study, very specific screening tests could easily be administered to each student, every one to seven days and could report results quickly enough for newly detected and isolated cases within a few hours to be more effective at preventing further transmission and control of infection . Thus, routine check-ups every two or three days of all students with low sensitivity, high sensitivity testing will control the outbreak by utilizing manageable isolation dormitories at a low cost. That way, the College can be safely reopened but its success depends on ongoing, routine and uncompromising screening for prevention and transmission,(Paltiel et al., 2020)

CONCLUSIONS AND RECOMMENDATION

Screening is effective for the control and spread of SARS-CoV-2 in the community and prevention of nosocomial infections in health facilities. Rapid identification of the patient, the asymptomatic carrier, and the mode of transmission of a particular pathogen are the main objectives of the pandemic response, which can then be incorporated into a larger set of medical measures. To avoid low sensitivity, it is best not to rely on antibody-based rapid tests and fever screening for screening.

Conflict of Interest Statement

There are no conflicts of interest to declare.

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