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STRENGTHENING DISEASE SURVEILLANCE AND RESPONSE SYSTEMS IN THE FEDERAL REPUBLIC OF NIGERIA - LESSONS LEARNED FROM THE COVID-19 PANDEMIC: A SYSTEMATIC REVIEW

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Abstract

This systematic review focuses on the disease surveillance and response systems of Nigeria during the COVID-19 pandemic, the strategies adopted, challenges, and achievements, as well as lessons to be learned to enhance epidemic preparedness in the future. The research article was guided by the PRISMA principle, as it involved search of five databases. Eighteen articles were included in the study, including seventeen qualitative and one mixed-method design. The Joanna Briggs Institute (JBI, 2020) checklists were used to critically appraise the papers. Findings were thematically analyzed using the MAXQDA software. The results showed three overarching themes (1) adopted strategies on managing COVID-19, (2) lessons learned regarding future preparedness in case of a pandemic, and (3) the success of strategies implemented. The containment strategies that were adopted by Nigeria comprised lockdown, travel bans, wearing of masks, and health education of the population. These were accompanied with digital innovations, community engagements, and presidential task force support. Nonetheless, poor infrastructure, poor coordination low testing capacity, and socioeconomic differences affected the efficacy of interventions. There is need of the multi-sectoral coordination, technology integration, and socioeconomic resilience in future preparedness actions. The study also highlighted the importance of institutional co-existence, the constant training of health workers and investment in health infrastructure to make sure future outbreaks are detected and mitigated on time. However, continued difficulties, such as misinformation, failure to enforce, and premature relaxation of lockdowns, restricted total effect. The review recognizes some vital lessons to the response to COVID-19 in Nigeria that can be used to improve the empowerment of disease surveillance and response systems. The priorities are to enhance data systems, community trust, emergency preparedness and interagency coordination to increase resilience to future outbreaks of public health.

Keywords: *COVID-19, Nigeria, Disease Surveillance, Response Systems, Pandemic Preparedness, Public Health.*

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Introduction

Disease surveillance and response systems play a significant role in the monitoring, detection and response to a public health threat e.g. infectious disease in timely and a proficient manner. Nigeria has a big population, a diverse geography, and high burden of diseases, and this is why disease surveillance and response systems should be emboldened. Nigeria has a very diverse range of health problems, including infectious diseases, including malaria, tuberculosis, HIV/AIDS, and emerging outbreaks, including Ebola and Lassa fever (Adedokun et al., 2018; Umeokonkwo et al., 2020). The most recent in the country is the COVID-19 epidemic that has impacted the socioeconomic and health of the country to a significant extent. The existing literature and reports indicate that the Nigerian disease surveillance and response have been facing significant challenges that have slowed in the early detection and control of the disease outbreaks. As Adokiya et al. (2014) and Umeokonkwo et al. (2020) observed, these challenges are the lack of infrastructure, lack of funding, poor data management systems, insufficient training of healthcare professionals, and a lack of coordination in the many stakeholders in disease monitoring. Efforts aimed at enhancing the monitoring and response systems related to the diseases in Nigeria have been initiated on a national and international level recognizing the importance of addressing these concerns (National Primary Health Care Development Agency, 2018; World Health Organization, 2020).

Disease surveillance is an important aspect of the administrative framework of health, which entails the process of accumulating, analyzing, interpreting, and sharing information about health as part of tracking the incidence and transmission of diseases and responding to them. Disease surveillance, as defined by the World Health Organization (WHO), refers to the continuous monitoring of different indicators, such as mortality, morbidity, and risk factors, to identify patterns, trends, and possible outbreaks to implement early interventions to address the population in terms of public health (WHO, 2021). To give a detailed view of the trends and patterns of diseases, surveillance systems will gather information through several data sources including healthcare institutions, labs, and community reports. The analysis of these data is performed to identify the patterns, unusual events, and the effect of diseases on a population. The data collected through surveillance can be used to track disease occurrence, prevalence, and distribution and outline the risk factors and the populations at risk (WHO, 2021). Surveillance data analysis allows professionals working in the field of health promotion to identify and control the outbreak of disease in a timely manner. Surveillance will help to detect a change or a surge in disease prevalence by keeping the eye on key indicators and providing baseline data which will enable early detection and quick response. This early-warning system assists the public health authorities to control the disease by taking the correct steps to prevent further transmission of the disease by taking suitable control measures, including specific interventions, contact tracing, and vaccinations (WHO, 2021). Along with identifying outbreaks, disease surveillance has become a very important aspect in terms of checking the effectiveness and measuring the programme of the population's health. Surveillance systems collect information continuously and analyze it thus providing a valuable base on the effect of interventions, which can be used to determine the effectiveness and efficiency of control measures. This feedback loop allows the public health authorities to make rational choices, modify strategies, and distribute resources in the most effective way (WHO, 2021). Surveillance of disease is done at several levels including global and local. In the local levels, the local healthcare facilities and communities have surveillance systems that identify and report cases to the local health authorities. Such data are aggregated and analyzed regionally and nationally to derive general patterns of disease and make policy decisions. Organizations like the WHO coordinate surveillance activities, share data, and offer technical assistance globally in order to enhance national systems of surveillance (WHO, 2021).

Response mechanisms are essential to reducing the effect of epidemics and other health crises of the population. They include various actions and strategies that aim at minimizing the impact of such incidents on the target populations. The World Health Organization (WHO) defines response systems as the coordination and mobilization of resources, administering interventions, investigative efforts, and ensuring that the affected populations receive healthcare services promptly and sufficiently (WHO, 2021). When there is an emergency in public health, response systems are put into operation to enhance a coordinated and effective response. Such systems entail the coordination of different stakeholders such as government agencies, health care providers, community organizations and international partners. To make sure the required supplies, staff, and infrastructure are in place to handle the emergency, resources coordination and mobilization play an essential role (WHO, 2021). Response systems are the major elements that entail interactions and include various activities to control and manage the spread of the disease. Such interventions can involve the following public health interventions: quarantine, isolation, contact tracing, and social distancing. It can also be implemented by having medical teams, treatment center's, and vaccines and therapeutics be distributed to the affected areas (WHO, 2021). Response work investigation is an essential component of the response system, the purpose of which is to learn the nature of the disease and its mechanisms

of spread, as well as the quality of the applied control. This involves the epidemiological research, laboratory testing and surveillance to collect information and make strategic decisions. In conducting evidence-based strategies, research and data collection during an emergency response assist in guiding the implementation (WHO, 2021). The provision of healthcare services in a proper and timely manner is a very crucial constituent of response systems. It is all about making sure that the affected persons receive the required healthcare services, which can be diagnosis, treatment, and supportive care. The response systems are aimed at reinforcing the healthcare infrastructure, training the healthcare workers, and creating systems of rapid response and delivery of services to meet the unique needs of the affected population (WHO, 2021).

Disease surveillance and response have become a matter of concern to most countries around the world, particularly during the current day COVID-19 pandemic and generally in the context of new infectious diseases. This has forced international organizations such as the World Health organization (WHO) and the Centres of Disease Control and Prevention (CDC) to emphasize the need to have robust and effective surveillance systems aimed at detecting and combating potential health risks (World Health organization, 2021; Centres for Disease Control and Prevention, 2022). There exist special challenges as well as opportunities in Nigeria in order to improve the disease surveillance and response systems. The country has a complex disease surveillance as it comprises of over 200 million people who have diverse geographical locations. In Nigeria, the federal system also implies the cooperation and integration of the national, state, and local units of the healthcare system in order to have efficient surveillance and response (Adokiya et al., 2014; Umeokonkwo et al., 2020).

The COVID-19 Strategic Preparedness and Response Plan (SPRP) 2021 was created to renew the global strategic objectives and direct the health response to the COVID-19 in case the global epidemiological situation evolved and knowledge on COVID-19 extended. The acute phase of the pandemic will be eliminated and future preparedness and resilience will be facilitated by SPRP 2021. The SPRP 2021 consists of 6 strategic goals, such as to suppress transmission, reduce exposure, fight against false information and disinformation, protect the vulnerable, decrease disease and death and hasten equal access to new tools (World Health organization, 2021). The SPRP 2021 is a preparation and response comprising of eleven pillars (see Figure 1).

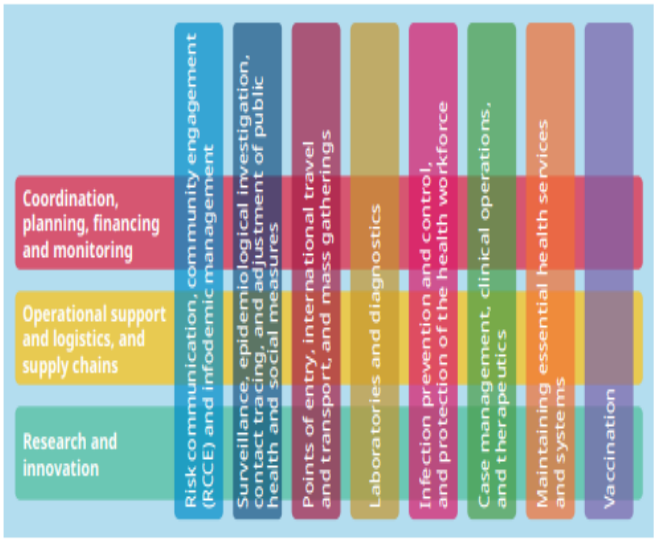

Figure 1: Eleven pillars underpinning the national, regional and global COVID 19 response.

The M&E Framework is an open-source project, which involves an integrated set of key performance indicators and narrative case studies to supplement the financial monitoring and stakeholder coordination and feedback systems. Together, these constitute the operational intelligence required to track the progress against the SPRP 2021 and make strategic thinking (Figure 2). These ten SPRP pillars which do not involve research and innovation are the ones that build the M&E Framework because it is the full and fundamental pillars that contribute towards the national, regional and global public health and social measures, the SPRP 2021 strategic objectives.

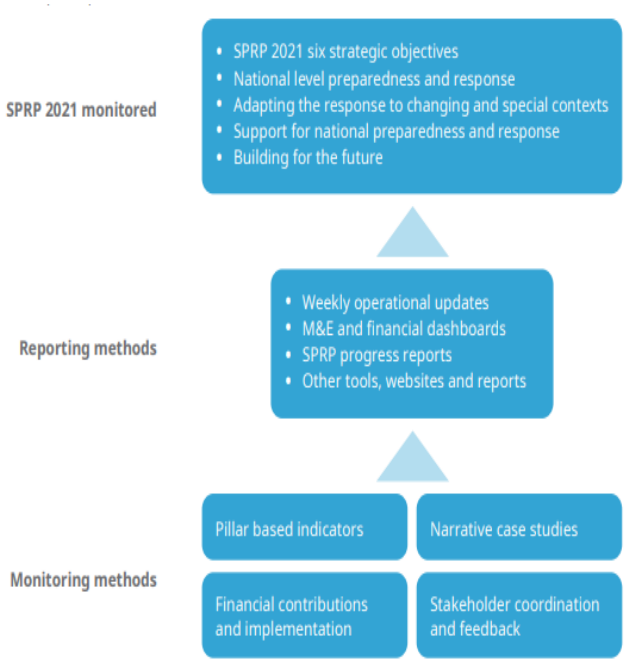

Figure 2: Methods for monitoring and reporting operational intelligence against the COVID 19 Strategic preparedness and response plan 2021.

The issue being discussed is the necessity to enforce the disease surveillance and response systems in the Federal Republic of Nigeria to eliminate the gaps that exist and enhance the possibility of the state to detect, respond to, and control the diseases. The existing disease surveillance situation in Nigeria is typified by poor infrastructure, resources, ineffective data management, lack of training of health workers, and lack of coordination among the stakeholders (Umeokonkwo et al., 2020). COVID-19 has brought a lot of challenges to the disease surveillance and response systems in the Federal Republic of Nigeria. Nigeria has been impacted by the COVID-19 pandemic to a significant level in the morbidity, mortality and economic cost. In June 2023, the COVID-19 positive cases in Nigeria were over 3 million, and the death toll had exceeded 50 000 (Nigeria Centre for Disease Control, 2023). The pandemic has introduced mind-blowing cases and mortality rates throughout the globe. According to the World Health Organization (WHO), more than 200 million confirmed cases and an excess of 4 million fatalities of the COVID-19 pandemic, as of June 2023 (WHO, 2023). The case is no exception in Nigeria as regionally, the country is feeling the impact just like the rest of the world since Africa is considerably struggling to contain the spread of COVID-19 at its side (Africa CDC, 2023).

The consequences of the COVID-19 pandemic on health are not limited to the economic aspects, but there are health implications that are independent of the disease. Healthcare is one of the sectors where the pandemic has imposed a burden on the healthcare systems, and, therefore, caused the reduction of access to the required healthcare services (WHO, 2020). Besides, the mental health and psychosocial well-being have been adversely affected by the introduction of the public health practices, e.g., lockdowns and travel bans (Holmes et al., 2020). Moreover, the pandemic can give way to the increasing risk of vaccine-preventable diseases due to the disrupted immunization programmes (WHO, 2021). Similarly, the impact of the COVID-19 pandemic on the environment is complicated. On the one hand, the containment practices, such as reduced economic activity as well as movement, have caused short-term air quality improvement and reduction of greenhouse gases (Le Quere et al., 2020). However, improper disposal of personal protective equipment (PPE) and, accordingly, the generation of additional medical waste has raised the issue of environmental pollution (Carrington, 2020).

A report that was released during the lockdown periods indicated that Nigeria lost its GDP by 34.1 percent to the COVID-19 with over 2-3rd of the losses incurred by the services sector, and 13.1 percent of the losses were incurred by the agricultural sector (Andam et a, 2020). Equally, households experienced a loss of average 33 percent of their income with the greatest impact being experienced by rural non-farm and urban households. Moreover, the economic consequences of COVID-19 are a 14-percentage-point temporary rise in the poverty headcount rate of Nigeria, meaning that 27 million more individuals slipped below the poverty threshold due to the lockdown (Andam et al., 2020). These issues are of concern and have a higher probability of reoccurrence unless appropriate actions are implemented to enhance disease surveillance and response mechanisms in the country, hence the need to review them to assess the surveillance and response procedure in the COVID-19 pandemic.

The paper addressed the following: What can be learnt through the control and management of the COVID-19 pandemic, and how can it be applied to strengthen disease surveillance and response systems in the Federal Republic of Nigeria? The targeted objectives are as follows: (1) To test the disease surveillance system in Nigeria in the context of the COVID-19 pandemic. (2) to examine the response mechanism involved in controlling and managing the pandemic (3) to find out the issues experienced by the government and the medical practitioners in the control and management of the pandemic. (4) To revisit the lessons gained during the pandemic and how they can be applied to enhance successive eruption of the same in Nigeria. Therefore, the outcome variables were the appropriateness of the case definition, detection, and reporting, the scope of emergency preparedness and response, and the control and management of the cases. These outcomes are key factors to consider the effectiveness of a disease surveillance and response system in dealing with the COVID-19 pandemic.

Methodology

Design: The systematic review is based on PRISMA guideline. In April 2024, an extensive search was conducted in five bibliographic databases. The study adopted a systematic review because it would offer a rigorous and structured methodology of synthesizing a broad scope of available information about the strategies implemented to deal with the COVID-19 pandemic in Nigeria, the effectiveness of the strategies and learnings on future pandemic improvement. It guarantees a systematic, impartial and evidence-based review of this multifaceted and multicoloured issue and provides useful information to decision-makers in the sphere.

Search Strategy

Electronic databases were searched (PubMed, Google Scholar, Scopus, Web of Science, Embase; Medline, Cochrane Library, and AJOL). The search strategy involved free-text terms as well as controlled-vocabulary terms, which catered to any gaps in the indexing of some databases. To get the greatest number of relevant research, the recognition of the multi/related terms that identify the strategies adopted to handle the COVID-19 pandemic in Nigeria, its level of success and lessons to be learnt to enhance future pandemics were considered.

As illustrated by Kolaski et al., (2023) pilot searches were developed, tested, and revised using similar indexing phrases peculiar to a particular database. Making sure that the search method developed naturally took time as it was constantly enhanced by new iterations. The search approach was made more exhaustive and complete using the citation monitoring and expert consultation to enhance its application empirically (Bakkalbasi et al., 2006). The fact that the moderate level of information fitting into the topic of this research (between 2020 and 2024) is frequently imprecise and imbalanced in the allocation of various research subjects led to a decision to cite all the relevant items. Pilot search, revealed that the terms containment strategies and pandemic response were used interchangeably to mean the same thing in relation to the control of the Covid-19 pandemic (Chen, 2021). In this regard, the incorporation of such concepts into the search strategy as prevention, control, and mitigation, could be useful to find the studies that concentrate on the efficacy of the intervention. To maintain the focus on the containment and mitigation actions, the term "pandemic response" was accorded precedence over others. By ensuring that the search strategy was based on keywords such as community intervention, preventative action and the management of pandemic, it became easy to focus on research studies that specifically dealt with the management techniques of the pandemic. The final search option was to use keywords which were borrowed through the PICO framework, as indicated in Table 1.

Eligibility Criteria and Study Selection

The PICO framework was used to develop the inclusion and exclusion criteria attentively as emphasized by Hiebel et al., (2021; Table 1). The inclusion criteria were used to gain the greatest explanatory power instead of merely compiling similar concepts (Dekkers et al., 2022). Both conceptual relevance and methodological rigour were considered in the study selection process. The assessors used full-text articles that satisfied the initial criteria or required further assessments to qualify. The last filtering consisted of secondary research studies and peer-reviewed articles in English, but not conference abstracts, opinion pieces, editorials, and another non-peer-reviewed documents.

Table 1: PICO-based criteria. Adapted from Hiebel et al. (2021).

Criteria	Inclusion Criteria	Exclusion Criteria
Population	Individuals residing in Nigeria during the COVID-19 pandemic	Individual residing outside Nigeria during the COVID-19 pandemic
Intervention	Strategies implemented to manage the COVID-19 pandemic in Nigeria.	Studies that do not address COVID-19 pandemic.
Comparison Outcome	No inclusion criteria. Effectiveness of COVID-19 management strategies in Nigeria.	No exclusion criteria. Studies with no information on the outcomes of implemented measures.
Study Type	Peer-reviewed articles, conference journals, and dissertations.	Grey literature, non-peer-reviewed sources, opinion pieces.
Language	Studies published in English	Studies published in languages other than English
Geographical Location	Studies conducted in Nigeria	Studies conducted in other countries or not specifying the location.

Data Extraction

A data extraction sheet was used to take vital data of each of the selected studies. As shown by Hiebel et al., (2021), the retrieved data included relevant information such as authors, years of publication, place of publication, and design of the study. Additionally, the literature regarding different interventions concerning the enhancement of preparedness and response to COVID-19 pandemic and information about the demographic characteristics of the target population (Nigerian healthcare workers) was accessed.

Critical Appraisal

The quality of the evidence was determined by critical appraisal (Mhaskar et al., 2009). The papers were appraised based on Joanna Briggs Institute (JBI, 2020) critical appraisal checklist. This checklist (JBI 2020) was used to assess numerous study designs (Aveyard, 2019). This approach allowed making the relative assessment of the merits of different articles. The checklists were also helpful in critically evaluating the literature and made one think about the ethical consequences of the study retrieved. To conduct this assessment, no formal ethical permission was needed since all the publications included were in the public domain and recognized accordingly.

Data Analysis

A thematic analysis was performed with the aim of identifying trends, understanding the situation, and interpreting data. This gave a deeper understanding of what determines the mitigation measures of the COVID-19 pandemic in Nigeria. The entire screening of the texts revealed 3 main issues, namely, the lessons to be learned during future pandemic preparedness, the success of implementation, and the techniques of dealing with COVID-19. In the second section of this review, the latter section includes a detailed discussion of identified themes.

Results

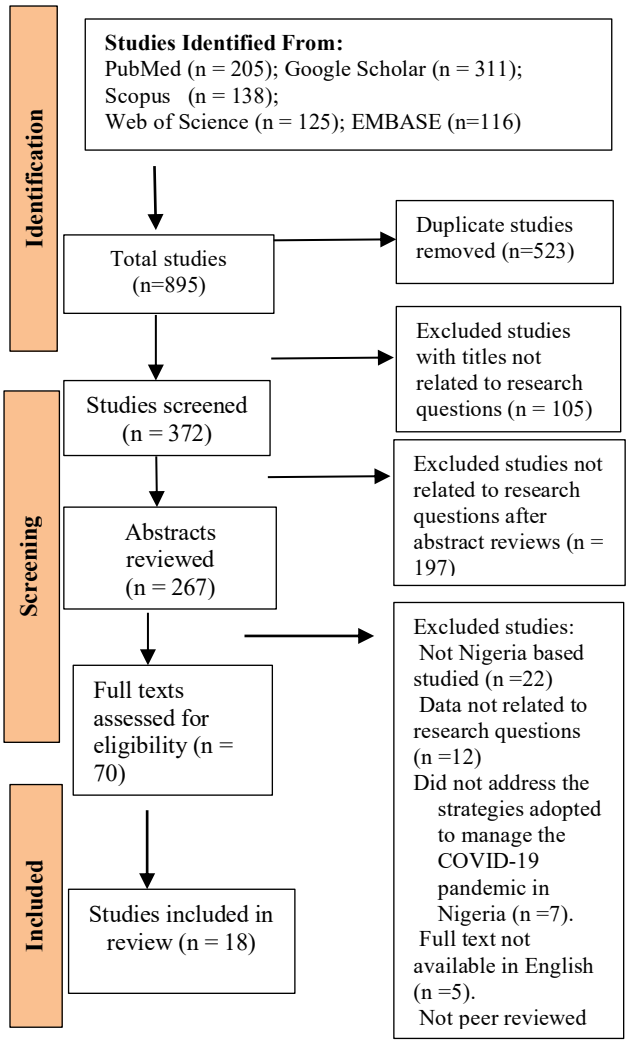

Figure 3: PRISMA flowchart (Source: Moher et al., 2009)

Study search and selection

The search of the databases resulted in 895, and then was narrowed down to 523 studies, after duplicates were removed. 105 articles were removed as they did not mention the strategies employed in Nigeria to curb the COVID-19 pandemic and the lessons that could be learned in order to manage such outbreaks in the future. Another 197 of 267 remaining abstracts were not connected with the strategies applied in order to reduce the COVID-19 epidemic in Nigeria. This resulted in 70 eligibility papers in full-text, out of which important 17 qualitative studies and 1 mixed research passed the inclusion criteria (Figure 1).

Characteristics of Included Studies

One of the 18 papers reviewed (Table 2) took a mixed-method study design and the remaining seventeen articles relied on qualitative designs. The methods of research employed by these articles varied as well: some used the analysis of secondary data (Chinnah and Amabibi 2020), literature review (Madubuike et al., 2020), questionnaire (Oni 2020), survey (Iroeze and Iroeze 2021), and in-depth interviews (Ugochukwu et al., 2023). The research was conducted in 2020-2024 in Nigeria and produced the results indicating the scope of impacts of COVID-19 and the efficiency of mitigation measures in Nigeria.

The reviewed 18 studies were primarily dedicated to the strategies that were employed to deal with COVID-19 in Nigeria, although 14 of them (77.78 percent) provide a profound insight into what can be learned in the event of the outbreak. Two articles (2.11) out of the reviewed articles highlighted the success of the implemented strategies. The 18 publications combined demonstrated that there are many problems and results of tackling the COVID-19 epidemic in Nigeria. They point to logistical complications, medical danger, and socioeconomic inequality and underline that there is a necessity to react to the virus and its consequences to the society with coordinated and flexible responses.

Thematic Analysis

It was observed that three key perspective themes were identified: the use of adopted techniques in coping with the pandemic, the lessons that will be learned in the future pandemic preparedness and the success of the strategies implemented.

Authors	Themes		
	Adopted strategies for COVID-19 management	Lessons learned for future pandemic preparedness	Success of implemented strategies
Chinnah & Amabibi (2020)	✓		
Etteh et al., (2020)	✓	✓	
Madubuike et al., (2020)	✓	✓	
Oni (2020).	✓	✓	
Ugwu et al., (2020)		✓	
Enesi, & Ibrahim (2021).	✓	✓	
Iroegbu et al., (2021)	✓	✓	
Iroeze & Iroeze (2021).	✓	✓	
Ogunyemi et al., (2021)	✓	✓	
Okaisabor, (2021)	✓	✓	
Williams & Justina, (2021)	✓	✓	
Chinyere et al., (2022).	✓	✓	
Gideon et al., (2022).	✓		✓
Jacobs & Okeke, (2022)	✓		✓
Okoro, & Mary-Callistus (2022).	✓		
Shittu et al., (2022)	✓	✓	
Ugochukwu et al., (2023)	✓	✓	
Salisu et al., (2024)	✓	✓	

Theme 1: Adopted Strategies for COVID-19 Management

To demonstrate such examples, Chinnah and Amabibi (2020), Etteh et al. (2020), Madubuike et al. (2020), and Oni (2020) all dwell upon such preventative strategies that were introduced to the country and which included lockdowns, the importance of people wearing face masks, and the closing of markets and borders. The aims of these measures were to decrease the spread of the virus, yet they also influenced the negative aspect of the situation like the rising of prices on offered products and services, the loss of jobs, and the decline of the religious life. Similarly, Oni (2020), Ugwu et al. (2020), and Iroeze and Iroenze (2021) emphasize the necessity of the general population adhering to such mitigation measures as social distance and hand washing. Nonetheless, they indicate that some barriers such as population resistance and inconvenience make it hard to attain total compliance. Instead, Enesi and Ibrahim (2021) and Iroegbu et al. (2021) focus on the impact of COVID-19 to the small and medium-sized businesses (SMEs) and local churches, respectively. The scholars highlight the financial challenges that these sectors are facing, including lost wages and staff, and they point to the need of special interventions like systematized care of the palliative patient, and using technology to reach them. Iroeze and Iroeze (2021) spoke about methods of academic libraries, the importance of the use of social media, social distance, remote working organization, and good cleaning. Nevertheless, Jacobs and Okeke (2022) offer a critical view of how Nigeria responded to the initial wave of the COVID-19 and identify such problems as a lack of testing capacity and early decisions to relax lockdown rules. Similarly, Salisu et al. (2024) have provided an in-depth analysis of the socioeconomic impacts of COVID-19 that has been noted to require a balanced policy response to reduce the adverse consequences of the disease on economies and the health of people. Some of the measures that were implemented included interstate travel restrictions, hand washing, social distance and self-isolation. Moreover, Okaisabor (2021) and Ogunyemi et al. (2021) evaluate the effectiveness of the governmental policies and containment. They highlight such issues as the need of continuous investment in healthcare infrastructure and the lag in change implementation. Williams and Justina (2021) emphasize that in their discussion about the mitigation strategy resistance, people should pay attention to the role of education in improving comprehension and increasing compliance with mitigation strategies in the context of public health education. Chinyere et al. (2022) and Gideon et al. (2022) in their turn, concentrated on the PR actions and health system reactions respectively on the importance of coordinated actions and effective communication in terms of management of the pandemic.

As the analysis revealed, despite the overall focus on the significance of the multidisciplinary approach to COVID-19 management, the studies also attract the focus to the long-lasting implementation-related issues, including the presence of socioeconomic disparities, enforcement challenges, and the need to constantly adapt to the evolving conditions. The second theme discovered will now be discussed.

Theme 2: Lessons Learned for Future Pandemic Preparedness

Among the 18 reviews analyzed 14 (Etteh et al., 2020; Madubuike et al., 2020; Oni, 2020; Ugwu et al., 2020; Enesi, and Ibrahim, 2021; Iroeze, and Iroeze, 2021; Ogunyemi et al., 2021; Okaisabor, 2021; Williams and Justina, 2021; Chinyere et al This leads to the significance of institutional cooperation in the combat of pandemics. Additionally, Oni (2020), Ugwu et al (2020), Williams and Justina (2021) and Shittu et al. (2022) underline the crucial importance of the community participation and the commitment towards the preventive measures in holding down the transmission of the virus. Nevertheless, Enesi and Ibrahim (2021), Chinyere et al., (2022) and Ogunyemi et al., (2021) reported socioeconomic consequences of the pandemic, especially among the disadvantaged individuals and small businesses, which should be supported in the future preparedness efforts. In their turn, Salisu et al. (2024), analyze some of the policy reactions and their outcomes on the economy and the apparent impossibility to find a balance between the efforts of the public health and economic matters. Besides, Ugochukwu et al. (2023) emphasized the challenges in the execution of the COVID-19 principles and suggest strengthening the institutional capability and tracking systems. Additionally, Iroeze and Iroeze (2021), Iroegbu et al., (2021) and Okaisabor (2021) discuss the role of technology in preventing pandemics and indicate that the digital solutions can be introduced into the future preparedness activities. Put collectively, such studies underscore the heterogeneity of the concept of pandemic preparedness and the need to employ comprehensive plans that comprise technological advancements, socioeconomic support, community involvement, legislation, and enforcement.

Theme 3: Success of Implemented Strategies

Two of eighteen research Gideon et al., (2022) and Jacobs & Okeke (2022) were devoted to the efficiency of implemented solutions. As an illustration, Gideon et al., (2022) focus on the PR tactics employed by the Anambra State Government, with the accentuation on the application of the social media interaction, press releases, and special broadcasts. As it was demonstrated, these strategies proved useful in dealing with the COVID-19-related situations, implying that communication and information distribution were a

reasonable approach. In the same manner, Jacobs and Okeke (2022) also talk about the containment and mitigation strategies that have been adopted in Nigeria by using social separation, contact tracing, and travel bans. The researchers mentioned that this kind of behavior had been claimed to have contributed to the relatively average performance of COVID-19 in Nigeria compared to the situation in the whole world. Nevertheless, such shortcomings as insufficient testing capacity and untimely lifting of lockdown measures were noted, which implies that the Nigeria response plan can be enhanced. Based on the discussion, effective communication and containment measures were necessary to control the COVID-19 situation in the state of Anambra as well as the entire Nigeria.

Table 2: Characteristics of Included Studies

Author/ Year/ State	Type of Study	Study Aim	Main Findings	Critical Appraisal (JBI 2020)
Chinnah & Amabibi (2020). Rivers State.	Qualitative research	To assess the implications and impact of COVID-19 preventive measures in Nigeria.	The study highlights the preventive measures adopted by the Rivers State government, including lockdowns, compulsory wearing of face masks, closure of borders, markets, and educational institutions, social distancing measures, and sensitization campaigns. However, these measures led to increased prices of goods and services, unemployment, poverty, and a decline in religious activities. The distribution of government palliatives faced challenges, and there was an increase in crime and anti-social behavior.	The study provides valuable insights into the impact of COVID-19 preventive measures in Nigeria. However, it could benefit from more comprehensive data collection methods and analysis to address potential biases and limitations.
Etteh et al., (2020)	Qualitative research	To evaluate the health system preparedness and lessons for future epidemics in Africa based on Nigeria's COVID-19 response.	The study highlights the multi-sectoral response coordinated by the Nigeria Center for Disease Control (NCDC) and Presidential Task Force (PTF) on COVID-19, including the establishment of daily situation reports, development of guidelines, provision of resources, and engagement with faith-based organizations and other stakeholders. Challenges such as socioeconomic factors, large population, and density of living conditions pose obstacles to implementing preventive measures effectively.	The study provides a comprehensive overview of Nigeria's COVID-19 response and offers valuable lessons for future epidemic preparedness. However, it could include more empirical data to support its findings and recommendations.
Enesi, & Ibrahim (2021). Abuja-FCT	Qualitative research	To understand the effect of COVID-19 on the performance of SMEs in Abuja and provide mitigation strategy.	Mitigation strategies included lockdown measures and ban on social gathering. Effects of the pandemic on SMEs included loss of competent staff, reduced revenue, lack of patronage, and government insincerity in addressing the pandemic. Challenges faced by SMEs included inability to pay salaries and loans. Recommendations included structured palliatives, poverty alleviation programs, reduced interest rates, and tax deferments.	The study provides practical insights into the impact of COVID-19 on SMEs but may be limited by the small sample size and the focus on a specific geographic area.
Iroegbu et al., (2021)	Qualitative study	To explore the impact of COVID-19 on local churches in Nigeria and recommend strategies for mitigation and continuation of worship.	Findings revealed that, mitigation strategy employed includes, suspension of corporate worship, sacramental activities, crowd events, and rural evangelism, resulting to reduced church income. Recommendations included adoption of ICT facilities for outreach, diversification of revenue sources, and government distribution of palliatives through churches.	The study provides insights into the challenges faced by local churches during COVID-19 but may lack depth due to reliance on secondary data and potential bias from selected sources.
Iroeze & Iroeze (2021). South Eastern State.	Mixed method research	To identify strategies for academic libraries to curb the spread of COVID-19 and remain relevant post-pandemic.	Strategies identified included creation of functional library websites, use of social media, social distancing, remote working management, and hygiene promotion. Challenges included inadequate funding, poor technological infrastructure, and lack of skilled personnel.	The study offers practical recommendations for academic libraries but may be limited by the focus on a specific region and potential bias from the survey approach.
Madubuike et al., (2020)	Qualitative research	To assess Nigeria's readiness and recommend strategies for controlling COVID-19.	Nigeria's healthcare system faced challenges due to neglect and corruption, making it vulnerable to COVID-19. Socioeconomic factors and population density pose additional challenges. The effectiveness of measures like social distancing was limited due to population density and displacement. Implementation of lockdowns was hindered by logistical and socio-economic factors.	The study provides valuable insights into Nigeria's preparedness and response to COVID-19. However, it could include more recent data and empirical evidence to support its analysis and recommendations.

Oni (2020). Ogun State.	Descriptive cross-sectional study	To assess the perception of mitigating strategies and challenges regarding COVID-19 among residents in Ogun State.	The most common mitigation strategies adopted were avoidance of social gatherings, use of face masks, and hand hygiene, although full adherence was low. Challenges included inconvenience of wearing face masks, restrictions on social gatherings, and religious practices. Recommendations included provision of medical supplies and palliatives, health education, enforcement of preventive measures, and free testing and treatment.	The study provides valuable insights into public perceptions and challenges related to COVID-19 mitigation strategies, but the reliance on self-reporting may introduce bias, and the assessment of adherence could be subjective.
Ugwu et al., (2020)	Qualitative research	To propose strategies for building resilient communities in Nigeria during the COVID-19 pandemic.	Strategies proposed included wearing face masks, physical distancing, hand hygiene, quarantine for travelers, and avoiding congregating. The pandemic caused economic, health, and educational disruptions, necessitating resilience-building efforts such as supporting small and medium businesses, job creation, youth capacity building, health education, and bridging the digital divide in schools.	The study offers comprehensive strategies for community resilience but lacks empirical data to validate the effectiveness of the proposed measures.
Ogunyemi et al., (2021)	Qualitative study	To analyze mitigation strategies in the early phase of the COVID-19 pandemic and recovery potential in Nigeria	Findings revealed that Nigeria experienced delayed implementation of containment strategies such as travel restrictions, mass gathering bans, and lockdowns. Food supply during lockdowns was inconsistent, and financial incentive packages lacked specificity. Vulnerable populations were not adequately addressed in mitigation efforts, potentially hindering recovery.	The study provides valuable insights into the timing and effectiveness of mitigation strategies but may be limited by the availability and completeness of secondary data.
Okaisabor, (2021)	Qualitative study	To examine public policies against the COVID-19 pandemic in Nigeria, their challenges, effects, and perceptions.	The study identified government policies and restrictions, challenges in healthcare infrastructure, and socioeconomic impacts of lockdowns implemented to mitigate Covid-19. It highlighted the need for sustained investment in healthcare infrastructure and improved coordination in distributing palliatives.	Reliance on secondary sources may limit the depth and accuracy of data. However, cross-checking biases with other sources enhances the credibility of findings.
Williams & Justina, (2021)	Review.	To assess awareness and mitigation efforts against various waves and variants of COVID-19 in Nigeria.	The study revealed resistance to mitigation measures due to conspiracy theories and socio-cultural factors. It highlighted coercive measures to enforce vaccination, lock down, the use of face mask, and social distancing and emphasized the importance of sustained public health education.	The review provides valuable insights into awareness and mitigation efforts but may lack primary data and depth in analyzing the effectiveness of interventions.
Ugochukwu et al., (2023) Enugu State	Qualitative study	To investigate adherence to COVID-19 mitigation guidelines among itinerary traders and their role in the spread of the virus.	The study found that control measures such as adherence to lockdown orders, social distancing, and bans on interstate movements were undermined by itinerary traders driven by economic gains. This compromised efforts to curb the spread of the virus, indicating a weak link in containment efforts. The study recommends strengthening institutional capacity for detection and control, providing critical infrastructural facilities for intensified surveillance, and implementing economic incentives and effective monitoring of protocol enforcers.	The study offers valuable insights into the challenges of enforcing COVID-19 guidelines among itinerary traders in Enugu State, Nigeria. However, it could benefit from a larger sample size and further exploration of potential solutions to address the identified weaknesses in containment efforts.
Salisu et al., (2024)	Qualitative analysis	To examine the political economy of the COVID-19 pandemic, its impact on socio-economic development in Nigeria and mitigation measures.	The study revealed that COVID-19 significantly impacted Nigeria's economy, diaspora remittance, and health status due to factors such as falling oil prices, business shutdowns, and inflation of goods and services. Measures such as social distancing, hand washing, self-isolation, and interstate travel restrictions were implemented, but they	The study provides a comprehensive analysis of the socio-economic impact of COVID-19 on Nigeria. However, it could benefit from a more detailed exploration of specific policy responses

			also had consequential effects on the economy by reducing economic activity.	and their effectiveness in mitigating the pandemic's impact.
Okoro, & Mary-Callistus (2022).	Qualitative study	To identify measures to mitigate the impact of COVID-19 in Nigeria through an innovative advancement approach.	The study identified mitigation measures such as economic stimulus bills, cash transfers, Central Bank of Nigeria stimulus packages, and food assistance. However, challenges such as inadequate coverage of vulnerable populations, lack of awareness, and distribution issues were noted.	The study offers insights into innovative approaches to mitigating the impact of COVID-19 in Nigeria. However, it could benefit from further exploration of the effectiveness of these measures and strategies to address identified challenges.
Shittu et al., (2022)	Qualitative Cross-sectional study	To explore the influence of psychosocial factors on community mitigation practices and their implications for COVID-19 pandemic mitigation policy.	The study found that various socioeconomic indicators influence health-seeking non-pharmaceutical intervention (NPI) behaviors differently. Factors such as social awareness of the pandemic's incidence and mortality rates, age, sex, education, household size, and access to palliatives were observed to significantly impact community mitigation practices. Women were more likely to engage in NPIs such as mask wearing, hand washing, and the use of hand sanitizers. Regular awareness about the pandemic combined with economic palliative measures can enhance the adoption of community mitigation practices.	The study provides valuable insights into the influence of psychosocial factors on community mitigation practices related to COVID-19 in Nigeria. However, it may benefit from further exploration of specific socioeconomic indicators and their detailed effects on mitigation behaviors.
Chinyere et al., (2022). Lagos and Enugu.	Review.	To assess Nigeria's health system response to COVID-19 at national and sub-national levels.	Interventions included technical support for health workers, upgrading laboratories, provision of protective materials, and strengthening health information systems. Political will and multi-sectoral response facilitated these interventions.	The study offers insights into health system responses but may be limited by reliance on published and grey literature, potentially overlooking real-time data and experiences.
Gideon et al., (2022). Anambra State	Qualitative research study	To evaluate the use of public relations strategies in managing COVID-19 pandemic-related crises by the Anambra State Government.	The study identified several public relations strategies employed by the Anambra State Government, including press releases, special broadcasts, press conferences, announcements, town hall meetings, distribution of palliatives, use of social media, and health worker training. These strategies contributed to effectively managing COVID-19 related crises in the state.	The study effectively examines the public relations strategies used by the Anambra State Government, providing valuable insights into their effectiveness in managing the COVID-19 pandemic.
Jacobs & Okeke, (2022)	Qualitative research study	To critically evaluate Nigeria's response to mitigate the first wave of COVID-19.	Nigeria implemented containment and mitigation measures, including travel restrictions, social distancing, contact tracing, and clinical interventions. These measures may have contributed to the mild COVID-19 outcome in Nigeria compared to the global trend. However, challenges such as inadequate testing capacity, suboptimal utilization of epidemic metrics, and premature easing of lockdown measures were identified.	The study provides a comprehensive analysis of Nigeria's response to the first wave of COVID-19, utilizing data from the Nigeria Centre for Disease Control. However, it may benefit from further exploration of the challenges identified and their implications for future pandemic responses.

Discussion

The paper critically analyzes the approaches to the COVID-19 pandemic in Nigeria and throws some light on the obstacles that the response efforts faced as well as the achievements they made. The examination has revealed the different strategies that have been implemented by Nigeria to restrict the spread of the virus, such as lockdowns (Chinnah & Amabibi, 2020), face mask usage was made compulsory (Etteh et al., 2020), the borders and the market were closed (Madubuike et al., 2020), and the large-scale public health campaigns were introduced (Gideon et al., 2022). The aforementioned steps, which are aimed at mitigating the spread of the virus in the community and curb the outbreaks of the virus, prove that the Nigerian government is making proactive steps to control the spread of the virus and limit its negative effects on the health of the populations. Although such measures have been put in place, compliance and effectiveness are still a problem. Full compliance and preventive measures were not reached due to socioeconomic disparities (Enesi and Ibrahim 2021), enforcement challenges (Jacobs & Okeke 2022) and resistance to the measures by the population (Salisu et al., 2024). Additionally, to promote the overall performance of response activities, Iroeze and Iroeze, (2021) and Ugwu et al., (2020) clarify the necessity to solve the logistical and infrastructural issues, such as poor healthcare infrastructure and deficient technologies.

This review is based on what was learned during the efforts to manage the COVID-19 in Nigeria and has some significant considerations regarding the future pandemic preparedness. As was mentioned previously, institutional cooperation and coordination play a vital role in many areas, such as finance, education, and health (Etteh et al., 2020; Ugwu et al., 2020). Chinyere et al., (2022) also emphasize the role of the community in influencing people to follow preventative actions and trust the government in working. Furthermore, specialized support to high-risk groups, including small and medium-sized businesses (SMEs) and local churches, is required to reduce the socioeconomic impact of the pandemic and ensure equal distribution of the resources (Enesi & Ibrahim, 2021; Iroegbu et al., 2021). As noted in the review by Ogunyemi et al., (2021) and Salisu et al., (2024) the review also highlights that detailed policy interventions and enforcement strategies are very essential in order to regulate the adverse impact on health and the economy. This involves proactive distribution of palliative care (Oni 2020), regular investment in healthcare infrastructure (Okaisabor, 2021) and development of digital solutions (Iroegbu et al., 2021) to enhance monitoring and surveillance capabilities.

The analysis of the success of the strategies implemented into practice has shown that, despite most studies being conducted about the strategies implemented to reduce the virus, few studies focus on the effectiveness of those that are implemented into practice especially in the fields of containment and PR (Gideon et al., 2022; Jacobs & Okeke, 2022). Effective communication is a major ingredient of managing the COVID-19 situation in Anambra State (Gideon et al., 2022). Although the mitigating measures, such as therapeutic treatments, social distance, contact tracking, and travel restrictions among others, allowed the COVID-19 outcome in Nigeria to be less severe than the global one (Jacobs & Okeke, 2022).

The achievement of the review result was the result of close selection based on the predetermined eligibility criteria and strict evaluation with the help of the Joanna Briggs Institute (JBI 2020). As it was already mentioned, the authenticity and dependability of the findings were ensured by the use of peer-reviewed literature. Nevertheless, it has a number of limitations which could influence generalizability, i.e., use of secondary data and potential bias of self-reporting. The theme analysis made it possible to synthesize the information provided by numerous sources, thus allowing comprehensive research of the measures, the accomplishments, challenges and lessons learned. By identifying common trends in studies, this study produced valuable information on the crisis management of COVID-19 in Nigeria and its implication of future preparedness activities.

Conclusion and Recommendation

Even with government interventions to control the management of COVID-19, there are still some challenges that impede complete compliance and performance, such as socioeconomic inequalities, difficulties in enforcement, and opposing the population. It is disclosed that the present state of the disease surveillance in Nigeria is linked with the inappropriate infrastructural support, the lack of the sufficient funding, the inefficient data management equipment, the insufficient training of the medical personnel, and the lack of the stakeholder's cooperation. To bring together the future response, these problems reveal that there is need to strengthen the governance, coordination and capacity building efforts. The analysis provides good information concerning what needs to be prepared in advance of future pandemics, institutional coordination, community engagement, specific support of vulnerable individuals, comprehensive policy intervention, and investment in healthcare infrastructure.Moreover, the analysis provides the instrumental role of effective communication, containment strategies, and PR strategies on the crisis management process. In certain aspects, such as in the case of effective communication in the state of Anambra, the applied strategies have been effective. Nevertheless, other aspects that can be improved include the testing capacity and the premature

relaxation of lockdown. These issues have brought forth a number of recommendations on further research and practice that may be applied in the future to counter any future outbreak of the virus.

The recommendations are as follows: (1) To reduce the spread of COVID-19 and enhance preparedness to new outbreaks, Gideon et al. (2022) suggested that the NCDC relies on a simplified mode of communication and PR. Etteh et al., (2020) suggested strengthened organizational synergy motivated by COVID-19 Presidential Task Force and NCDC, as a way to create a more unified pandemic response. (3) Enesi and Ibrahim (2021) suggested that vulnerable groups, including small and medium-sized enterprises (SMEs), local churches, and the disadvantaged communities, should be provided with specific assistance. The vulnerability of communities can be reduced and the total effect of the pandemic decreased through addressing the specific needs of such groups, which are financial assistance, social support, and access to healthcare. (4) The establishment of comprehensive policy mechanisms guaranteeing the peaceful coexistence of the objectives of population health and economic reality, as suggested by Salisu et al., (2024) could play an important role in halting the diffusion of COVID-19 and strengthening against the upcoming epidemic incidences. Timely provision of palliative services, continued infrastructure development of the healthcare sector, as well as targeted economic stimulus packages to support the affected groups of people may be all such interventions. (5) Iroegbu et al. (2021) suggested that the Nigerian government ought to utilize digital technologies in communication, monitoring, and surveillance. The overall effect of the pandemic response capability is enhanced due to the ability of the digital technologies to distribute information swiftly, encourage access to healthcare services, and enhance the coordination of stakeholders.

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Competing Interest

The authors declare there is no conflict of interests.

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