

Futurology of Covid-19 in Nursing and Cardiovascular Complications

Futurología del Covid-19 en enfermería y complicaciones cardiovasculares

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Abstract

Introduction & Background: COVID-19 is a zoonotic disease that turned into a pandemic and claimed many lives. Futurology is a novel field that is necessary for global development and helps prevent surprises during crises. The aim of the present study was to comprehensively review the measures presented in the context of futures research in cardiovascular complications.

Methods: The present study is an integrated review of the articles related to futures studies in the post-COVID-19 era to garner relevant information in cardiovascular complications. In this study, the method proposed by Whittemore & Knafel was used, which consists of five steps: a) recognizing and specifying the goal, b) literature search, c) data evaluation, d) data analysis, and e) presenting the findings.

Results: At this stage, the search retrieved 1753 articles. After reviewing the titles and abstracts, a considerable number of irrelevant or duplicated articles were excluded, and, finally, 21 articles entered the study. The findings of these studies were categorized in seven dimensions: physical outcomes, educational organizations, human resources outcomes (nursing), outcomes for rehabilitation nurses, outcomes for pharmaceutical companies, drug outcomes, and outcomes of vaccine production.

Conclusion: According to this review, futures studies are scarce in the post-COVID-19 era; however, it is expected to draw a clear picture in the dimensions mentioned before we face and become surprised by future pandemics due to the lack of futurism and planning. In this way, countries can acquire necessary preparations to reduce death tolls caused by pandemics.

Keywords: COVID-19, Futures research, Nurse.

Resumen

Introducción y antecedentes. COVID-19 es una enfermedad zoonótica que se convirtió en pandemia y se cobró muchas vidas. La futurología es un campo novedoso que es necesario para el desarrollo global y ayuda a prevenir sorpresas durante las crisis. El objetivo del presente estudio fue revisar exhaustivamente las medidas presentadas en el contexto de futuras investigaciones en complicaciones cardiovasculares.

Métodos. El presente estudio es una revisión integrada de los artículos relacionados con estudios futuros en la era post-COVID-19 para recopilar información relevante en complicaciones cardiovasculares. En este estudio se utilizó el método propuesto por Whittemore & Knafel, el cual consta de cinco pasos: a) reconocer y especificar el objetivo, b) búsqueda bibliográfica, c) evaluación de datos, d) análisis de datos, y e) presentación de los hallazgos.

Resultados. En esta etapa, la búsqueda recuperó 1753 artículos. Luego de revisar los títulos y resúmenes, se excluyó un número considerable de artículos irrelevantes o duplicados y, finalmente, ingresaron al estudio 21 artículos. Los hallazgos de estos estudios se clasificaron en siete dimensiones: resultados físicos, organizaciones educativas, resultados de recursos humanos (enfermería), resultados para enfermeras de rehabilitación, resultados para compañías farmacéuticas, resultados de medicamentos y resultados de producción de vacunas.

Conclusión. Según esta revisión, los estudios de futuros son escasos en la era post-COVID-19; sin embargo, se espera que dibuje una imagen clara en las dimensiones mencionadas antes de que enfrentemos y nos sorprendamos con futuras pandemias debido a la falta

de futurismo y planificación. De esta manera, los países pueden adquirir los preparativos necesarios para reducir el número de muertos causados por las pandemias.

Palabras clave: COVID-19, Investigación de futuros, Enfermera.

COVID-19 is a zoonotic disease that turned into a pandemic¹. The causative virus of the COVID-19, which causes a serious respiratory illness, pneumonia, and pulmonary failure, was first reported in Wuhan, China, and spread throughout China and the globe within a few months of its first identification, becoming a pandemic², and a global health threat³. Preliminary genomic data of this virus did not match previous records, suggesting the emergence of a novel strain⁴. This global propagation of this viral infection urged the World Health Organization (WHO) to declare a public health emergency of international concern, causing the death of 26,495 people and contamination of over 570,000 worldwide up until March 28, 2020⁵. The symptoms of COVID-19 resemble those of influenza and infections by other coronaviruses (i.e., fever and cough)⁶. Although severe pulmonary damage has been described in all age groups, susceptible individuals, such as the elderly or those suffering from comorbidities, are more likely to develop severe interstitial pneumonia, acute respiratory distress syndrome (ARDS), and multi-organ failure, which is the main culprit of respiratory failure and death. Typically, affected individuals present varying degrees of dyspnea and radiological signs of pulmonary involvement⁷. Currently, there is no definite antiviral therapy for the COVID-19 infection, and the main focus in care centers is on alleviating symptoms and providing supportive care⁸. Therefore, to contain the propagation of COVID-19, governments started to impose restrictions on outdoor activities or enforce collective quarantine regulations. An important outcome of quarantine was changes in lifestyle, such as reducing physical activity and consuming unhealthy foods, highlighting the importance of implementing strategies to incentivize physical activity and adhering to healthy diets during quarantine^{9,10}. Some believe that the most effective way to entangle the COVID-19 pandemic is to quarantine suspected cases⁴. An experimental study in China showed that almost half of the respondents believed that COVID-19 could cause moderate to severe psychological problems, supported by the fact that one-third of infected individuals reported the symptoms of anxiety. In order to set priorities for public health policies and to implement health care interventions, it is required to promptly determine the prevalence of mental health symptoms and their associated risk factors during the COVID-19 outbreak¹¹. Mental health problems are repeatedly observed in university students. In a study, 27% of nursing students were found to suffer from mild to very severe depression. Another study reported a prevalence of 35.8% for depression among undergraduate nursing students¹².

The lung is the principal organ affected in the early stages of COVID-19. The virus utilizes the angiotensin-converting enzyme 2 (ACE2) receptor, abundant in the lower respiratory tract, for entry into the cells. Importantly, ACE2 is also expressed in the heart, intestinal epithelium, vascular endothelium, and the kidneys, making all of these organs potential targets. The exact pathogenesis of cardiac involvement is not entirely clear. Increased cardiac biomarkers, including troponin T, have been shown to be linearly correlated with inflammatory markers, indicating that myocardial injury is likely related to underlying inflammation. Several mechanisms of cardiac damage are likely at play, including direct myocardial damage by the virus itself, hypoxic injury mediated by respiratory failure, indirect injury mediated by cytokines secondary to systemic inflammatory response, myocardial infarction (MI) due to plaque rupture secondary to systemic inflammation, the prothrombotic state produced by severe systemic inflammation, and ischemia from myocardial supply-demand mismatch.

Long Covid is often a debilitating disease that occurs in at least 10% of the individuals contracting the severe acute respiratory syndrome covid (SARS-CoV-2) virus, which is associated with over 200 multisystem symptoms. It has been estimated that at least 65 million people worldwide suffer from long Covid, and this number is rising on a daily basis. Biomedical research has led to significant progress in identifying various pathophysiological changes and the risk factors associated with this condition¹³. The common signs and symptoms include dyspnea, fatigue, tachycardia, and memory and cognitive dysfunction even months after the infection, which often affect survivors' quality of life. Nevertheless, the exact prevalence and duration of these symptoms are hard to be determined due to the lack of standard research methodologies and limited patient follow-ups in clinical studies¹⁴. Regarding the above-mentioned and the high mortality rate of COVID-19, this study aimed to conduct a comprehensive review of the measures implemented with the approach of futurism. In social sciences, futures research refers to studying the current trends in order to predict future developments. While the theoretical aspects of futurism are traceable to science-fiction stories, its methodology was developed at the end of World War II and roots into disciplines such as mathematics, economics, computer science, etc¹⁵. A paper by Kovas-Heyout first introduced the concept of "existence and time" by raising several questions directly relevant to the post-treatment world, including questions about how we should think, speak, search, and write about revolution and change, bringing deeper ontological questions about the nature and meaning of time. He argues that "activist generations" have non-critically admitted the logic of Hegelian and consider time to be unidirectionally linear. According to Kovas-Heyout (2011), work of this kind divide time, assuming that it "moves in a straight line from a recognized origin toward an endpoint". At this point, "progress from the

past to the present and from the present to the future is considered natural and inevitable^{16,17}. Therefore, in the present study, the researcher aimed to explore the studies carried out with the futurism approach after the COVID-19 outbreak.

Objective

Evaluate the scientific evidence on Cardiovascular Complications in the futurism approach after the COVID-19 outbreak in nursing.

Materials and methods

The current study is an integrated review of the articles conducted with the futurism approach after the COVID-19 pandemic to gather relevant information in this field. In this study, we used the method proposed by Whittemore & Knafel, which includes five steps: a) identifying and specifying the goal, b) literature search, c) data assessment, d) data analysis, and e) presenting the findings. Using this method has been described to increase the rigor of the study¹⁸⁻²⁰.

PICO structure defining the Guiding Question for the present study was P = nurses, I = futurism approach in COVID-19, C = COVID-19 pandemic, and O = reduce death.

This questioning was then followed by publications search and selection in line with propositions from Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).

The first step

Based on the method proposed by Whittemore & Knafel, the following question was developed according to the objective of the study: What dimensions of futurism have come under focus in post-Covid era?

The second step

The studies included here were English language reviews, including systematic reviews and meta-analyses, conducted with the approach of futurism on COVID-19 and published from 2019 to 2023. Conference papers were also included. In the present study, the databases of PubMed, Cochrane library, Google Scholar, and other comprehensive databases and fully-accessible search engines providing links to the full-text of studies were searched with the keywords of Covid, futur*, and futurology. At this step, 1753 articles were identified after the primary literature search. After reading the titles and abstracts of the articles, irrelevant or duplicate items were removed (Table 1), and finally, 21 articles were included in the review.

The third step

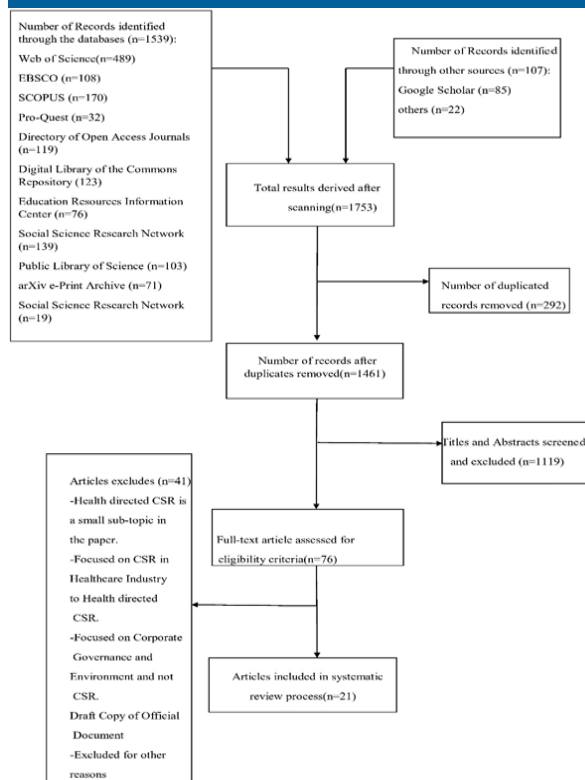
At this step, the content of the studies was assessed

in terms of quality using Bowling's Quality Assessment tool²¹. Two researchers independently performed this task, and then the results were compared. Finally, 21 articles were included in the study (Table 1). Bowling's tool consists of items that assess the methodology and results of studies on a three-point scale: yes, poor, and non-mentioned, through which studies with poor quality were removed.

The fourth step

Data analysis included the following steps: data reduction, data display, data comparison, conclusion drawing, and verification¹⁸. In this study, we tried to avoid bias by precisely defining a research framework (formulating the research question, literature search strategy, defining inclusion/exclusion criteria, and data extraction and data analysis methods) before starting to review the studies. We also tried to employ the terms used by the authors of the articles as much as possible without further interpretations. For categorizing the data, the first researcher initially extracted and categorized the data, and then a second researcher reviewed and re-assessed them.

Figure 1. The process of screening and selecting studies



Our findings are presented in Table 1.

Table 1. The feature of included studies.				
Author(s), Year of publication	Title	Concluding remarks	Main theme	Classification of outcomes
Raymond Pranata (2021) ²²	Diabetes and COVID-19: The past, the present, and the future	In the future, as the pandemic fades, we would expect a rise in the prevalence of non-communicable diseases due to lifestyle changes and medical issues/problems caused by the pandemic.	Outbreak of non-communicable diseases	Physical consequences
Joe Iwanaga (2021) ²³	A review of anatomy education during and after the COVID-19 pandemic: Revisiting traditional and modern methods to achieve future innovation	During the pandemic, students did not have access to cadavers, as the main method for learning anatomy since the 17 th century.	Learning anatomy practical courses	Impacts on educational organizations
John R Teijaro (2021) ²⁴	COVID-19 vaccines: modes of immune activation and future challenges	Changes in the formulation and delivery routes can optimize vaccines according to the immune status and age of recipients. The SARS-CoV-2 pandemic expedited the authorization of developing promising vaccine formulations, boosting our hopes for strengthening our immune system against emerging and future pandemics.	The future outcomes of protecting populations by Covid-19 vaccines	Vaccine outcomes
Hyacinth O Ukuhor (2021) ²⁵	The interrelationships between antimicrobial resistance, COVID-19, past, and future pandemics	The integration of complex interrelated factors and co-infections with antimicrobial-resistant agents amid the present and past epidemics increase the risk for the outbreak of antimicrobial-resistant agents in the future. Therefore, concerted and targeted global interventions at all levels of society are necessary to reduce the use/abuse of antimicrobial drugs and to tackle these multifaceted, interrelated and interdependent factors.	Coping with antimicrobial resistance in emerging and future pandemics	Drug outcomes
Justin A Chen (2020) ²⁶	COVID-19 and telepsychiatry: Early outpatient experiences and implications for the future	The noteworthy advantages of telepsychiatry include social distancing, reduced logistical barriers to caring for patients, and reduced absenteeism. A number of clinical suggestions have been offered to optimize telepsychiatry and to support the continuation of insurance restrictions and regulations affecting telepsychiatry, even after the end of this public health crisis.	Telepsychiatry	Technological outcomes
Ettore Beghi (2022) ²⁷	Acute and post-acute neurological manifestations of COVID-19: present findings, critical appraisal, and future directions	A specific phenotype defining a post-Covid neurological syndrome has not yet been identified.	Neurological outcomes of Covid-19	Physical consequences
John C Hayden (2020) ²⁸	The challenges of COVID-19 for community pharmacists and opportunities for the future	Pharmacists, like psychiatrists, have modified their practices amid the Covid-19 pandemic to ensure care and support for their patients. Pharmacists, providing a necessary and frontline health service, have to resolve a number of challenges to ensure continuity of patient care, including infection prevention assistance, supply chain management, preventing accumulation of drugs, and providing evidence-based medical information. However, crises like Covid-19 disproportionately affect poor and susceptible populations, and those with mental health conditions may be the most vulnerable. Pharmacists, at the levels of the health system and regulatory responses, have been looking for minimizing these impacts; nevertheless, this profession will be affected by prolonged impacts, either favorable or unfavorable.	Pharmacology challenges	Impacts on pharmaceutical companies
Michelle E Camicia (2021) ²⁹	COVID-19 and Inpatient Rehabilitation Nursing Care: Lessons Learned and Implications for the Future	Nurse leaders have an essential role in supporting their staff during the Covid-19 crisis through authentic presence and providing necessary resources and training. Rehabilitation nurses play a key role in helping patients and families manage post-Covid-19 complications and recover their optimal functioning.	Rehabilitation nurses	Manpower outcomes (nursing)

Shivaji Kashte (2021) ³⁰	COVID-19 vaccines: rapid development, implications, challenges and future prospects	Providing all people with an efficient and safe vaccine is the top priority of all countries in their fight against the Covid-19 pandemic. However, the current accelerated process of vaccine production for the Covid-19 leaves many unanswered questions.	Vaccine-related challenges	Impacts on vaccine producing companies
Asim Kichloo (2020) ³¹	Telemedicine, the current COVID-19 pandemic and the future: a narrative review and perspectives moving forward in the USA	The benefits of telemedicine include cost-effectiveness, expansion of access to specialized services, and tackling doctor shortages. On the other hand, disadvantages include technological shortages in some parts of the country, issues related to patient data security, and challenges in performing conventional clinical examinations.	Access to telemedicine services	Technological outcomes
Dimitrios G Chatzis (2022) ³²	COVID-19 and the cardiovascular system-current knowledge and future perspectives	More studies are required on novel drugs and treatments of Covid-19 and its cardiovascular complications.	Cardiovascular complications of the Covid-19	Physical consequences
Balasubramanian Ganesh (2021) ³³	Epidemiology and pathobiology of SARS-CoV-2 (COVID-19) in comparison with SARS, MERS: An updated overview of current knowledge and future perspectives	Regarding the future perspectives of Covid-19, it is required to prepare and implement appropriate strategies for the prevention, control, and treatment of infections to prevent similar disasters in the future.	Planning appropriate strategies for preventive, controlling, and therapeutic methods to prevent similar disasters in the near future.	Preventive and futures research implications
Matteo Cameli (2020) ³⁴	COVID-19 and Acute Coronary Syndromes: Current Data and Future Implications	In order to manage possible cardiac complications caused by the Covid-19, all efforts of doctors should be directed toward preventing late or incorrect diagnosis, reorganization of health care measures, and public education.	The impacts of the Covid-19 pandemic on the diagnosis and management of acute coronary syndrome	Physical consequences
Ettore Beghi (2020) ³⁵	COVID-19 Infection and Neurological Complications: Present Findings and Future Predictions	The public health system (mainly primary care) needs to be strengthened to ensure that research and development efforts are directed towards true requirements. In order to face the current pandemic, international organizations need to better cooperate with each other and be provided by more research funding and equipment to prevent, detect, and eradicate future epidemics.	Expanding research efforts towards needs	Research implications
Shiu-Wan Chan (2020) ³⁶	Current and Future Direct-Acting Antivirals Against COVID-19	When effective vaccines and treatments are unavailable, efforts continue to find specific antiviral drugs.	Future antiviral drugs	Impacts on pharmaceutical companies
Shuangyi Sun (2021) ³⁷	COVID-19 and healthcare system in China: challenges and progression for a sustainable future	The efficient use of fresh manpower helped China succeed in fighting against the Covid-19 virus. Strengthening of the global health care system with new forces is essential not only to tackle the Covid-19 but also unknown outbreaks in the future.	Efficient manpower	Manpower outcomes
Karthikeyan Iyengar (2020) ³⁸	Learning opportunities from COVID-19 and future effects on health care system	The Covid-19 pandemic created unique learning opportunities for the healthcare sector. Rationalizing and optimizing available resources along with resilience on the frontline of fighting the virus are among the most valued lessons learned during the crisis.	Unique learning opportunities for the future	Impacts on educational organizations
Leah V Estrada (2022) ³⁹	Structural Racism, Place, and COVID-19: A Narrative Review Describing How We Prepare for an Endemic COVID-19 Future	It is essential to know how racial disparities contribute to the increasing death toll of the Covid-19. Fighting structural and racial health inequalities through implementing anti-racist policies was employed in the United States to achieve health equity.	Health equality	Impacts on the health system
Rinette Badker (2021) ⁴⁰	Challenges in reported COVID-19 data: best practices and recommendations for future epidemics	Efforts for amending the global health data ecosystem must consider the following challenges: Best standard practices need to be developed and merged to achieve stronger, more transparent, and more communicable data. As no such standards yet exist, the key challenges of creating a comprehensive spatiotemporal view of disease outbreaks should be compiled from various resources.	The process of evaluating, integrating, validating, and interpreting data to identify and resolve the challenges related to the Covid-19 outbreak and its consequences.	Research implications

Herman Goossens (2022) ⁴¹	The European clinical research response to optimise treatment of patients with COVID-19: lessons learned, future perspective, and recommendations	The results of clinical research in the EU should be included in the global response during future outbreaks. Globally integrated clinical trial networks are necessary to respond more effectively to the outbreaks of infectious diseases in the future.	Clinical research at the global level, directing research and development efforts towards true needs	Research implications
G. Zakersalehi (2020) ⁴²	Futurology on the effects of the COVID-19 crisis on higher education	Higher education experts have admitted that the Covid-19 pandemic has profoundly affected the higher education system over a wide-range spectrum.	The impacts of the Covid-19 crisis on the higher education system	Impacts on educational organizations

The decisions made without foresight will culminate in surprises and managerial instability⁴³. In the present study, the researcher reviewed the studies concerning with futures research in the post-COVID-19 era to help identify and obviate challenges during future outbreaks. Scrutinizing the findings of 21 studies in this area, seven dimensions emerged, including physical outcomes, educational organizations, human resources outcomes (nursing), outcomes for rehabilitation nurses, outcomes for pharmaceutical companies, drug outcomes, and outcomes of vaccine production. In the future, as the pandemic disappears, outbreaks of non-communicable diseases are expected to emerge due to lifestyle changes and medical problems encountered during the COVID-19 pandemic²². Therefore, it is required to adopt appropriate policies with a futuristic approach.

Iwanaga et al., in their study, (2021) noted that during the Covid-19 pandemic, students studying medical sciences did not have access to cadavers, as the main way of learning anatomy since the 17th century. As predictions on acquiring access to cadavers in the future or participation in face-to-face classes are doomed, anatomy educators are obliged to review the applicability of alternative and innovative teaching methods²³. The results of the present study are in line with those of Kim et al.'s study in 2021⁴⁴. In this regard, it seems necessary to pay attention to futures research approaches to prevent the disruption of practical education in case of new pandemics.

Also, another finding of this study highlighted the importance of developing novel vaccines in fighting against the SARS-CoV-2 virus²⁴. Therefore, futures research enables us to sketch a picture on the horizon so that we do not witness this number of deaths in similar conditions in the future. Another study also noted that the past and ongoing pandemics could enhance the likelihood of the emergence of outbreaks by antimicrobial-resistant viruses in the future. Therefore, concerted and targeted global interventions at all levels of society are

necessary to reduce the inappropriate use of antimicrobial drugs and tackle the integration of these multifactorial, interrelated, and interdependent factors²⁵. This study's findings agree with those of Lai et al. (2021), asserting that we may face an increase in the outbreaks of antimicrobial-resistant agents in the future⁴⁵, demanding the implementation of policies with futures research approaches. In the study of Chen et al. (2020), it was suggested that remote psychiatry can contribute to the optimal use of psychological counseling services²⁶. Overall, our findings can be a basis for conducting futures research and policy research.

In a study by Mohammadi, et al., it was declared that although some biological mechanisms have been proposed to justify the complications of COVID-19 patients at discharge, there are no evidence-based data yet to clearly define these sequelae and their features and outcomes, especially among outpatients. In addition, there is paucity in the data coming from low- and middle-income countries, further intensifying uncertainties about COVID-19 -related neurological findings with regard to geographical, ethnical, socio-cultural, and health-related elements. As a result, there is currently no specific phenotype to define post-Covid (or long Covid) neurological syndrome²⁷, so more attention needs to be paid to this notion. Another study addressed the challenges faced by pharmacists during the COVID-19 pandemic²⁸. Therefore, the exploration of these challenges needs to conduct phenomenological studies to describe the lived experience of pharmacists and accordingly tailor policies based on futures research approaches.

Another study pointed out the need for implementing interventions to make patients and their families feel less isolated and to prepare the caregiver for the patient's discharge. Nursing leaders have an essential role in supporting staff during this crisis through providing resources and training. Rehabilitation nurses also play a key role in helping patients and their families to retain optimal functioning and managing post- COVID-19 complications²⁹. This study indicates the necessity of paying attention to patients by nurses during pandemics, especially in the rehabilitation dimension.

In a study by Kichloo et al. (2020), it was noted that during the current pandemic, Medicare and Medicaid telemedicine services were expanded. The benefits of

the expansion of remote medical services include cost-effectiveness, wider access to specialized services, and the potential to mitigating doctor shortages. The drawbacks of this strategy include the lack of access to technological resources in some parts of the country, the issues related to patient data security, and challenges in performing traditional clinical examinations. It is critical to implement structural modifications so that telemedicine services are completely integrated into the health system in order to prepare for future pandemics and to reap the benefits of these services in the future³¹. The findings of this research can draw a resource for adapting policies tailored to the futurism approach.

As well, the study of Sun et al. (2021) showed that the effective use of fresh manpower helped China succeed in the fight against the Covid-19 virus. Therefore, the global health care system must be enlivened by the integration of new human resources to help curb the COVID-19 pandemic and future unknown outbreaks³⁷. Also, Estrada et al. (2022) noted that in the US, structural and racial health disparities and inequalities were tried to be resolved through implementing anti-racist policies to achieve health equity³⁹, which requires paying attention to the futures research approach.

In the study of Bijani et al. (2020), it was also mentioned that there were no standards for the evaluation, integration, validation, and interpretation of data to identify and resolve data challenges⁴⁰, necessitating more efforts to culminate in this dimension. Goossens et al. (2022) asserted that integrated clinical trial networks at a global scale were necessary to effectively respond to future outbreaks of infectious diseases⁴¹. In addition, the findings of a study by Salehi et al. (2020) verified the fact that the COVID-19 crisis profoundly affected higher education, according to experts in this area⁴². Therefore, it seems necessary to conduct studies with a future research approach in this filed.

Conclusions

This research is among the few studies investigating futures research on COVID-19 in Iran. There are numerous justifications for paying attention to future research studies in the post-COVID-19 era. The findings of this study can help draw a small picture to develop effective strategies. In this study, we found that futures research studies after the COVID-19 pandemic are scarce. For future pandemics, we need to pay attention to and conduct futures research studies in at least seven dimensions, physical outcomes, educational organizations, human resources outcomes (nursing), outcomes for rehabilitation nurses, outcomes for pharmaceutical companies, drug outcomes, and outcomes of vaccine production to

avoid being surprised because of the lack of foresight and planning and to reduce the death toll caused by pandemics.

Study limitations

A significant limitation in this review is the lack of articles that answer the guiding question of the study. Nevertheless, the number of articles obtained was considered reasonable given the uniqueness and originality of the current situation.

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

MAM and QG designed the study. OF and EF conducted all the study and analyzed the data, and AB drafted the manuscript. All the authors reviewed the data, read and approved of the manuscript.

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