The Impact of Misinformation on Public Health Initiatives and Perceptions

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Abstract:

The COVID-19 pandemic represents both a major global health crisis and an infodemic. The pandemic was characterized by large amounts of misinformation, mostly propagated through social media. This study aimed at investigating the impact of misinformation on public health initiatives and perceptions during the pandemic. The study showed that vaccination was a major public health initiative to manage the pandemic, and the spread of misinformation was associated with increased vaccine hesitancy and lower vaccine uptake. The study also found evidence of socioeconomic and racial differences in the impact of misinformation on vaccine hesitancy. Misinformation was also associated with reduced public trust in either government or public health experts, and this relationship was mediated by political polarization and the politicization of the pandemic. Misinformation about the COVID-19 pandemic also had negative implications on the economy, which could potentially reduce the availability of public health funding. Lastly, misinformation had a significant negative impact on the public perception of public health guidelines, which resulted in reduced compliance with them.

Keywords: *COVID-19, Misinformation, Public Health, Public Perception, Public Trust, Vaccine Hesitancy*

Introduction

The COVID-19 pandemic is one of the most important global health challenges in recent times. The pandemic was a major cause of significant distress and decline in the quality of life due to its impact on physical and mental health and its contribution to a deterioration in financial security and social well-being (Mohapatra et al., 2022). The pandemic also resulted in unprecedented societal changes such as social distancing, lockdowns, and mandatory stay-at-home orders, which led to increased uncertainty and a fear of unknown. The impact of COVID-19 on individuals and communities across the world cannot be understated. In addition to these obvious outcomes, the pandemic also had significant effects on public health systems. According to Filip et al. (2022), COVID-19 was a critical public health stressor which exposed systemic weaknesses in public health systems, highlighted shortcomings in global medical

care infrastructure, and presented challenges for government and health officials in controlling and managing the disease. Overall, the COVID-19 pandemic was a significant health challenge that resulted in adverse outcomes on multiple aspects and can provide lessons on how to manage future pandemics.

Public health efforts such as those targeted at managing the COVID-19 pandemics can be affected by misinformation. Kozyreva et al. (2023) identified misinformation as a global problem mostly fueled by the rising popularity of digital media. Misinformation impacts public health by posing a policy problem, eroding trust in democratic institutions, and encouraging people to adopt false beliefs and take ill-informed action. Misinformation posed a significant challenge in the management of the COVID-19 pandemic. Nelson et al. (2020) noted that COVID-19 was a unique pandemic as it occurred in the age of modern technology, where constant media coverage and social media positioned misinformation as a powerful destructive force threatening individuals and health professionals tasked with managing the crisis. Supporting this view, the director-general of the World Health Organization (WHO) labelled the pandemic as an infodemic, which is characterized by skyrocketing fake news, misinformation, and conspiracy theories that tend to undermine trust in health institutions and public health programs (García-Saisó et al., 2021). Therefore, the COVID-19 pandemic was a unique health crisis accompanied with the high proliferation of misinformation and its prevalent impacts.

In researching the impact of misinformation during the pandemic, it is important to provide a consistent and coherent definition of this concept. According to Vraga and Bode (2020), misinformation occurs when people hold inaccurate beliefs and do so confidently, which indicates that they are not ignorant or lack knowledge but instead are confident of the inaccurate knowledge they have. In such a case, beliefs are considered inaccurate when they do not focus on factual matters and are not supported by clear evidence and expert opinion. In the health domain, expert opinion and clear evidence are important considerations to avoid misinformation and determine whether information is accurate or not. To further support this definition, Southwell et al. (2022) provided a consistent definition of scientific misinformation as publicly available information that is deceptive or misleading when compared to the best available scientific evidence and that is contrary to the statements or positions held by actors or institutions that adhere to specific scientific principles. Overall, misinformation can be defined as publicly available inaccurate information that is misleading and deceptive and not supported by clear scientific evidence or expert opinion.

As identified, misinformation has potential implications for public health initiatives and policies. The COVID-19 pandemic represents a unique public health challenge due to its scale and overwhelming adverse effects on health, finance, and social well-being. Occurring in the era of technological advancement, the pandemic was susceptible to misinformation from different sources. Considering the vast nature of misinformation surrounding COVID-19, it is essential to investigate the impact it had on initiatives targeting the pandemic and the public perceptions of these initiatives. The main research question in this study is "What are the impacts of misinformation on public health initiatives and perceptions during the COVID-19 pandemic?" This research is important in understanding how misinformation may have shaped the public understanding of the pandemic and the subsequent response to health-related policies and initiatives. By answering these research questions, the study will help in identifying the extent to which misinformation hampered public health initiatives and funding aimed at managing the pandemic. The research is essential in assessing the potential impact of misinformation on public health funding.

Literature Review

Different studies focus on misinformation and help to provide a good understanding of this problem and the challenges it poses. A study by Southwell et al. (2019) identifies misinformation as a significant yet misunderstood challenge to public health, which is especially prevalent in the United States due to the presence of a complex health information system. According to this study, there is a need to refrain from an understanding of misinformation as malicious acts aimed at transmitting false information but instead consider it as a set of core systemic challenges that public health and medical professionals face in their attempt to communicate and disseminate accurate information. Therefore, misinformation is not a uniform threat; rather, it represents a category of symptoms which have varying consequences for public health behaviors and outcomes. Misinformation and related problems arise from systemic challenges that should be considered and addressed to mitigate their potential impact on the health and policy landscapes.

Different factors can help in explaining the spread and significance of health-related misinformation. According to Chou et al. (2018), the ubiquitous nature of the social media landscape has created a vast information ecosystem that supports the dissemination of health-related misinformation. Additionally, the curation of social media feeds to fit personal beliefs, biases, and identity creates information silos and echo chamber effects, which potentially increases misinformation within specific closed networks.

A study by Wang et al. (2019) offers similar sentiment and identifies the important role of social media in the spread of health-related misinformation. The authors show that social media online platforms mostly lack filtering and fact-checking mechanisms, which results in an ecosystem where false individual beliefs can accumulate and give rise to larger social movements, such as an anti-vaccination movement, which have adverse consequences for public health. The study further shows that misinformation in these platforms mostly concerns infectious diseases and vaccines against them. Suarez-Lledo and Alvarez-Galvez (2021) also explored the important role of social media in health misinformation and went ahead to identify the most prevalent health misinformation topics on different social media platforms. According to this study, the highest amount of misinformation is spread in Twitter, where major public health issues such as pandemics, diseases, and vaccines represent the most common misinformation topics. Overall, social media represents a significant avenue through which health-related misinformation, especially about infectious diseases such as COVID-19 and vaccines against them, is spread.

The literature also identifies some factors that explain differences in the risk of health misinformation. A study by Chou et al. (2018) indicates that receptivity to health misinformation can greatly vary depending on factors such as the motivation of the information source and the recipient's social network, emotions, sociocultural identity, level of trust, and social media use patterns. The authors note the importance of understanding the context of misinformation exchange and any underlying intrapersonal and interpersonal dynamics, which can help in understanding the problem and possible remedies. Chou et al. (2020) also identified different psychological factors such as identity, cognitive biases, and emotions, such as fear and anxiety, as important drivers of health misinformation in social media. A clearer understanding of psychological drivers can help explain differences in receptivity to misinformation and be vital in designing successful interventions. A study by Nan et al. (2022) also provides some insight on who is at risk of health misinformation and how individual differences increase susceptibility to this public health threat. The study identified different psychological factors that act as predictors of health misinformation susceptibility, which include individual's knowledge and cognitive skills, intuitive thinking style (as opposed to analytical thinking), conspiracy thinking, trust in social media, friends and family, group identity, and political and personal values. These studies emphasize the importance of understanding the potential drivers of misinformation, which can help in the implementation of effective mitigation strategies to minimize the impact of misinformation on health-related initiatives and outcomes.

The literature also provides some insight on the impact of health-related misinformation. A study by Nelson et al. (2020) highlights the negative impacts of misinformation during the COVID-19 crisis. According to this research, one effect of misinformation was the transformation of the pandemic into a backdrop for political battle, with partisan leaders pitting against each other over public policy related to health (Nelson et al., 2020). This transformation of COVID-19 into partisan politics was detrimental and drew attention away from the significance of the pandemic and its impact on public health. This article further notes that misinformation worsened an already complex emotional situation, which affected the mental health of the public and that of healthcare providers, which affected their ability to navigate the challenges posed by COVID-19 (Nelson et al., 2020). Furthermore, misinformation posed a threat to public health, limiting trust in the available medical literature and thus affecting health professionals' ability to deliver care and manage the pandemic. Silva et al. (2022) showed that misinformation and fake news are a public problem that have an impact on public policies. This study indicates that misinformation affects public decisions, adherence to policies, the perception of reality, credibility of institutions, and public health initiatives. The authors noted that the impact of misinformation is mostly observed in four distinct areas, which are impacts on state actors, impact on societal actors, impacts on state dynamics, and impacts on societal dynamics (Silva et al., 2022). Overall, these studies present evidence proving the negative effects of misinformation on public policies and the mitigation of public health crises such as the COVID-19 pandemic.

The reviewed literature captures the concept of misinformation and the problem it poses, especially in the public health and policy fields. The literature warns against conceptualizing misinformation as a uniform threat and calls for identifying it as a complex problem that arises from different systemic challenges. The literature also shows that social media provides the best medium for the spread of health-related misinformation, especially about vaccination and infectious diseases such as COVID-19. The literature further demonstrates that misinformation does not spread uniformly across the population and presents some factors that explain differences in susceptibility to health misinformation. Understanding of these factors and different drivers of misinformation can help in devising strategies to mitigate this problem. Lastly, the literature shows the impact of health-related misinformation during health crises such as the COVID-19 pandemic on policies targeting different public problems such as public health. The study identified a literature a gap as there seems to be limited research providing a comprehensive assessment

of the impact that misinformation had on public perceptions and public health initiatives during the COVID-19 pandemic. In addition, the literature does not adequately capture how misinformation may affect health funding for programs such as those targeting COVID-19 management. Hence, it is necessary to review and synthesize research to fill this research gap.

Methodology

Theoretical Perspective

Research methodology is usually guided by a specific philosophical or theoretical perspective. One such theoretical worldview is symbolic interactionism, which mostly focuses on explaining how people in society use symbols and language to create meaning and interact with others (Cohen et al., 2018). One postulate in this theory holds that human beings act towards things on the basis of the meaning that they have for them. This meaning is subjective and arises from one's interaction with symbols and language present in their world. From the literature review, misinformation is not an objective truth, but rather a complex issue attributed to different systemic challenges. Additionally, misinformation arises from a belief in language or symbols such as conspiracy theories, which are inaccurate and not supported by evidence or expert opinion. Considering the nature of misinformation, symbolic interactionism provides a good theoretical perspective that allows to investigate how people derive meaning from misinformation and what impact this potentially has on societal structures such as public health funding and initiatives to manage pandemics. The second assumption in the theory is that the attribution of meaning to symbols is a continuous process, which is always subject to change (Cohen et al., 2018). This view is important when investigating misinformation, which is also dynamic and susceptible to change. Amidst health crises such as the COVID-19 pandemic, new facts constantly emerge, which are interpreted differently by individuals, resulting in either fueling or curbing of misinformation. The last postulate is that the process of making meaning occurs in a social context, where individuals are likely to align their actions to those of others (Cohen et al., 2018). The literature shows that misinformation is mostly spread through social media and specific social groups, which is consistent with the attribution of meaning suggested by symbolic interactionism.

This research aims to investigate the potential implications that misinformation had on public health initiatives and policies, including funding, during the COVID-19 pandemic. These implications are likely to arise from how people make meaning of the information available to them and their social networks, as suggested by the symbolic interactionism theory. The research aim and objectives are therefore consistent with the assumptions of the chosen theoretical perspective. A systematic review provides an appropriate research approach that will allow the collection and synthesis of mostly subjective qualitative data, which will provide insights on how people derived meaning from information available to them during the pandemic and how it affected public health initiatives aimed at managing the health crisis. The methodology is consistent with the theoretical framework and can effectively answer the set research questions.

Data Selection and Analysis

The data selection and analysis method used in this study will be a systematic literature review. This approach is a secondary research design that is used to synthesize and summarize a body of primary research studies. Systematic reviews use the highest level of evidence when answering specific research questions and are mostly considered a qualitative research method when meta-analysis is not included. By using explicit and systematic methods and well-defined selection criteria, the study is able to minimize bias and provide objective and replicable findings. This systematic review will seek to answer the research questions by identifying and synthesizing available knowledge or evidence to derive insightful conclusions. The methodology is appropriate as it will allow to synthesize draw studies investigated the impact of COVID-19 misinformation and identify areas of congruence among these studies to highlight the main impacts of this misinformation that are consistent across different countries.

Using the systematic review, suitable studies to be included in the study were identified through a comprehensive search across three databases, which are PubMed, Scopus, and Google Scholar. An additional search through the Google search engine was also conducted to aid in identifying potentially appropriate articles missed during the database search. In conducting an extensive database search, different search terms were used alone or in combination. The key search terms used in the study included *COVID-19, misinformation, disinformation, infodemic, public health, public health policy, public health initiatives, public health funding, public perception,* and *public trust*. The inclusion criteria were original peer-reviewed research studies focusing on misinformation about the COVID-19 pandemic that were published in the English language since the year 2020. Any article that did not meet these inclusion criteria was excluded.

The initial search yielded 4,845 records. After accounting

for duplicates, 3,432 records were excluded. The titles and language of the remaining 1,413 articles were screened, which resulted in the exclusion of 1,316 records. The review of the abstracts of the remaining 97 articles led to the exclusion of 53 more articles. Then, the full text of 44 articles was reviewed, after which 26 articles were excluded, reducing the sample to 18 articles. A Google engine search revealed additional 5 sources. Hence, a total of 23 articles relevant for the study and consistent with the research goals were included in this systematic review for in-depth analysis and synthesis. References for the articles included in the study are provided in Appendix 1. Figure 1 presents the search strategy and the study selection diagram.
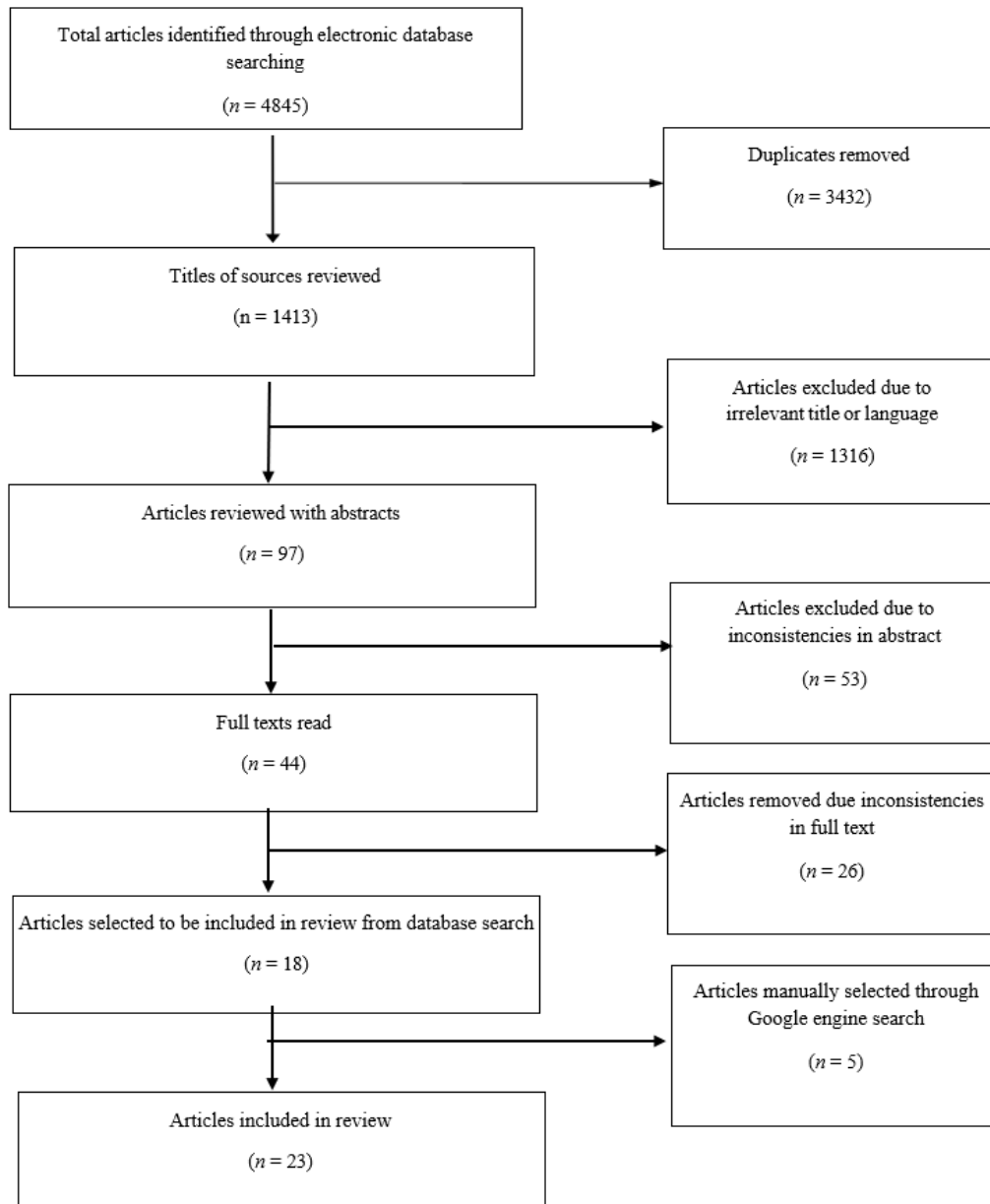

Figure 1: Search Strategy and Study Selection Diagram

The data analysis used in the review was guided by the grounded theory. The grounded theory is considered a qualitative research methodology that supports the systematic selection and analysis of data to generate a theory or draw conclusions (Tie et al., 2019). The methodology is especially appropriate when little is known about a specific phenomenon as it helps in constructing a theory or providing an explanation that is effective in uncovering processes inherent to the issue being studied (Tie et al., 2019). This consideration makes the grounded theory an

appropriate data analysis methodology for this study as the research with systematically select and analyze data on a recent phenomenon that is not fully or well-studied. The grounded theory consists of three stages of data analysis, which will be utilized in this systematic review. The first stage is open coding, where key concepts and phrases are identified and grouped into categories (Noble & Mitchell, 2016). This step helps make sense of the data by breaking it down into different categories that represent conceptual components relevant to the issue being investigated. In this case, this first step was to identify categories characterizing the areas impacted by COVID-19 misinformation. These included broad categories such vaccine hesitancy, politics, public trust, and public health policies. The second stage is axial coding, which entails identifying the relationships or connections between the categories or conceptual components identified in the first step. In this case, the politicization of COVID-19 and the polarization of politics were found to be connected to public distrust associated with COVID-19 misinformation. The last stage is selective coding, where the main category is identified and methodically linked to other categories. This integration helps in formulating a theory that can facilitate answering the research question. This step resulted in the identification of four main themes, which are discussed in the research findings and discussion section.

Research Findings and Discussion

A total of 23 studies were identified and included in the review. All the studies focused on COVID-19 misinformation, disinformation, or conspiracy theories. The reviewed studies considered participants from different countries, including South Korea, Nigeria, the United States, Hong Kong, Singapore, Japan, the United Kingdom, Ireland, Spain, Mexico, the Czech Republic, Hungary, Poland, Serbia, Belgium, Bangladesh, and Finland. The studies had varying sample sizes, with the lowest being 7 participants in an exploratory study using qualitative interviews and the largest being 8,001 respondents in a pre-post exposure study design using questionnaires administered to representative samples in the UK and the USA.

Misinformation and Vaccine Hesitancy

One of the major themes observed in the available data is the impact of misinformation on vaccine hesitancy. Vaccines are an important public health strategy to curb the spread of infectious diseases such as COVID-19. A study by Loomba et al. (2021) found that the development of COVID-19 vaccines was a major public health initiative targeted at fighting the disease and that a novel vaccine would need a 55% to 85% acceptance by the population

in order to provide herd immunity. The authors noted that such an acceptance rate would represent a public health success, but its attainment is likely to be affected by online and offline misinformation about the importance, safety, and effectiveness of COVID-19 vaccines. By using representative samples of the UK and USA populations and a pre-post exposure study design, the study showed that exposure to online misinformation on COVID-19 and vaccines impacted the intent to accept vaccination, resulting in the lower percentage of the population accepting the vaccine than the threshold required to attain herd immunity. Pierri et al. (2022) provided supporting evidence and showed that online misinformation was associated with hesitancy and refusal of early COVID-19 vaccination in the first six months of the vaccination public health program in the US. The study provides evidence of directionality, with online misinformation showing a negative correlation with vaccine uptake rates and a positive correlation with vaccine hesitancy rates; in turn, the reduced uptake of vaccines may limit the ability to achieve herd immunity. A cross-national study by Chen et al. (2022) across Asian and Western jurisdictions shows that the massive infodemic and misinformation about the COVID-19 pandemic was associated with reduced vaccine willingness and uptake. The authors, however, argue that infodemic may have a positive impact on vaccination, showing that the perceived information overload concerning COVID-19 vaccines was associated with increased vaccine willingness and uptake. Lastly, Kricorian et al. (2021) also showed that misinformation that negatively affects the perception of vaccine safety is associated with increased unwillingness to receive COVID-19 vaccine among Americans. Overall, the available evidence demonstrates that misinformation negatively impacted vaccine uptake and increased vaccine hesitancy, which can affect the public health goal of attaining herd immunity through vaccination and immunization programs.

The systematic review also revealed some socioeconomic and racial differences in the impact of misinformation on vaccine hesitancy. Kricorian et al. (2021) found that some demographics in the US were more prone to the impact of misinformation on the perception of vaccine safety. These included females, Black Americans, and populations that have lower educational attainment, lower income, and reside in rural areas. This disparity is disturbing as these demographics had a higher risk of COVID-19 and its consequences but also showed higher vaccine hesitancy due to misinformation. A study by Lockyer et al. (2021) found high COVID-19 misinformation and vaccine hesitancy in the population of Bradford, the UK and showed that it was mostly associated with three main factors, which are safety concerns, negative stories, and personal

knowledge. The authors made an important observation by showing that Bradford is a multi-ethnic and low socio-economic area, which was disproportionately impacted by COVID-19, and that the risk of the disease is the area was less likely to be mitigated by a widespread vaccine program due to high misinformation and its impact on vaccine hesitancy. Pierri et al. (2022) found that vaccine hesitancy rates due to online misinformation are higher in Democratic states when compared to Republican ones. They also noted that the vaccine hesitancy rate is higher in states with a high percentage of Black residents or a high percentage of residents below the poverty line. A study by Yao et al. (2023) also shows socioeconomic disparities in exposure to and endorsement of COVID-19 misinformation and its association with vaccine hesitancy. The study shows that participants with lower socioeconomic status had higher vaccine hesitancy and lower vaccination uptake due to exposure to misinformation. The authors made an interesting observation that although these individuals have low exposure to misinformation, they show a higher level of endorsing and accepting this misinformation. Lastly, Hussain et al. (2022) found that vaccine hesitancy was more common among ethnic minority groups in the UK, and this trend was driven by misinformation and different structural and systemic inequities. Overall, evidence from the reviewed literature indicates that misinformation and its impact on vaccine hesitancy and uptake is higher in lower socioeconomic groups and ethnic minorities such as Black Americans.

Misinformation and Public Perception and Trust

Another major theme observed in the literature is the impact that misinformation on public perception and trust during the COVID-19 pandemic. Public trust in institutions and systems such as the healthcare system and the government are important in ensuring the success of public health initiatives aimed at managing uncertain health crises such as the COVID-19 pandemic. A study by Lee et al. (2023) focused on assessing how COVID-19 preventive behaviors and trust in institutions such as government entities, local governments, hospitals, scientists, and medical and pharmaceutical companies were impacted by misinformation. The study showed that COVID-19 misinformation led to a significant increase in the avoidance of preventive behaviors, but this relationship was not observed when accounting for public trust in institutions. The implication of this finding is that the role of misinformation in the avoidance of COVID-19 preventive behaviors is negligible and only becomes significant when mediated through trust in institutions. Therefore, misinfor-

mation that reduced trust in institutions led to the avoidance of recommended COVID-19 preventive behaviors. A study by Kim et al. (2023) also showed that the proliferation of COVID-19 misinformation was a significant challenge to public health efforts to manage the pandemic, and this trend was linked to a lower trust in public health experts. By considering a nationally representative sample of US adults, the study showed that exposure to COVID-19 misinformation was associated with lower trust in public health experts and thus lower compliance with public health guidelines. A study by Mihelj et al. (2022) provides a unique perspective on the topic and shows that increasing distrust of public health experts not only hampers the implementation of public health policies but also increases the risk of exposure to online misinformation. When public trust in public health experts and mainstream media is low, the populace resorts to seeking information online and on social media, which increases the risk of encountering misinformation. The literature successfully captures the impact of misinformation on public trust and perception of public health experts, which, in turn, affects adherence to public health initiatives and recommended preventive behaviors.

The literature also reveals the potential role of politics in mediating public trust due to misinformation. A study by Amara et al. (2022) notes that the COVID-19 pandemic in the US occurred at a time characterized by high political polarization and a low level of trust in the government. During this period, the US President's Office provided statements that contraindicated guidance from the top public health officials. For instance, President Trump spread misinformation such as the possibility to inject disinfectants to treat the virus and undermined the severity of the disease and the importance of social distancing protocols and containment measures that had been proposed to curb the spread of the infection (Hartley & Khuong, 2020). Such politicization of the pandemic resulted in the polarization of the issue, where certain groups of the population were likely to lose trust in either the government or public health experts. For example, Kim et al. (2023) showed that misinformation had a differential impact in the US, where it decreased trust in public health experts and increased trust in the government, which resulted in the lower perceived severity of COVID-19 and lower compliance with public health guidelines. To exemplify this political polarization, Amara et al. (2022) showed partisan differences between Democrats (liberals) and Republicans (conservatives) on the appropriate policy response to the pandemic, with the Republicans leaning towards misinformation and mirroring the position of the President and the Republican leadership, which downplayed the need for government interventions in controlling the virus and its

spread. Bates et al. (2023) also found that the bi-partisan structure of the US and the fact that people received information from polarizing and biased informational sources while having minimal cross-partisan information sharing and social interactions resulted in the political polarization of the pandemic. The media sources in the country had a different portrayal of COVID-19 and provided varying recommendations by public health authorities, with some politically charged media sources leaning towards negative reporting, which could negatively impact adherence to public health initiatives. In further showing how politics coupled with misinformation impacted public trust, a study by Wonodi et al. (2022) revealed that in Nigeria, misinformation framed the pandemic as a hoax perpetuated by Nigerian government officials and politicians so as to misuse response funds. The study further showed that this distrust and the ensuing vaccine hesitancy was higher in Southeast Nigeria, which was in conflict with the federal government due to the separatist movement and intentions. From these findings, it is clear that misinformation contributed to political polarization, which caused differential impacts on public trust in the government or public health initiatives aimed at controlling the pandemic.

Misinformation and Economic Implications

The literature captures some negative impacts of COVID-19 misinformation on economic performance. The performance of the economy is an important metric to consider as it may impact public health policies by affecting the government's or taxpayers' ability to fund such policy programs. A study by Olakoyenikan (2024) assesses the economic implications of misinformation during the COVID-19 pandemic by considering the impact of fake news on stock market volatility. This study shows that misinformation related to vaccines or containment measures such as lockdowns had an impact on the stock market, which manifested in increased market volatility, panic selling, increased trading volumes, and shifts in investor behavior. Similarly, a study by Hong et al. (2023) shows how misinformation and fake news during the pandemic lead to extreme stock market risks, highlighting that this impact is especially significant in developed countries such as the US. The impact of misinformation on the stock market resulted in increased financial losses by investors. Banerjee et al. (2024) also considered the impact of misinformation such as fake and media-hype news on commodity future prices, which is an important indicator for traders. The article shows that this metric was susceptible to misinformation and presented different challenges and risks to participants in the market. Lastly, a study by Balcaen et al. (2023) focused on the impact of misinformation on consumer confidence, which is an important metric of economic performance. The authors demonstrated the in-

terdependency between public health and the state of the economy and proved that health-related misinformation affects factors such as the perception of vaccine effectiveness, which, in turn, spills over to the economic domain, impacting on consumer confidence. Moreover, this study provides evidence of how anxiety about health due to misinformation worsens economic expectations and outlook, ultimately affecting consumer decision-making processes and the economy. Overall, these studies provide evidence that COVID-19 misinformation had negative implications for the economy, highlighting the relationship between public health and economic performance during health crises such as the COVID-19 pandemic.

Misinformation and Compliance with Public Health Guidelines

The literature captures the negative impact of COVID-19 misinformation on individuals' compliance with public health guidelines. A study by Barua et al. (2020) shows that misinformation had an adverse effect on individual responses and thus led to negative health outcomes amid health disasters such as the COVID-19 pandemic. The authors further noted that an opportunity to evaluate the credibility of information can provide a resilience strategy, which has a positive effect on individual responses to COVID-19. Roozenbeek et al. (2020) also showed that increased susceptibility to misinformation is associated with reduced self-reported compliance with public health guidelines on COVID-19 management. Individuals susceptible to misinformation not only fail to comply with the public health guidelines but also refuse to receive vaccines and even recommend the same to vulnerable friends and family. Soveri et al. (2021) also noted that misinformation and conspiracy theories have a negative impact on individual's response to official public health recommendations during the pandemic. The response to these official guidelines is mostly mediated by the degree of trust they feel in the information sources. Freeman et al. (2022) showed that COVID-19 misinformation and conspiracy beliefs were associated with a strong skepticism and low adherence to government guidelines and recommended public health strategies such as vaccinations or diagnostic and antibody tests. Lastly, Romer and Jamieson (2020) identified misinformation and conspiracy theories as major barriers to controlling the spread of COVID-19 in the US. The study notes that misinformation is associated with perceptions that pose a continuing challenge to the control of the coronavirus pandemic due to their link with non-acceptance of recommended actions such as mask-wearing or vaccination. The literature provides clear evidence linking misinformation to increased reluctance

to comply with public health guidelines that are effective in managing the COVID-19 pandemic.

Conclusion

Based on the findings presented above, the following conclusions were drawn that can help in answering the research questions. During the pandemic, the development and roll-out of novel COVID-19 vaccines represented an important public health initiative aimed at managing the health crisis. The findings from this study show that misinformation led to significant vaccine hesitancy among the public and reduced vaccination uptake. The negative perception of vaccines had an adverse impact on vaccine acceptance and uptake, which threatened the success of vaccination programs by increasing the risk of not attaining herd immunity. However, the findings also show that information overload about vaccines can increase public willingness to accept COVID-19 vaccination. An important implication from these findings is that the roll-out of vaccination programs should be accompanied by massive dissemination of information on the vaccine, which can counter the existing misinformation and improve public perception and acceptance of vaccines. The findings also show that more vulnerable populations such as ethnic minorities and people with a low socioeconomic status are more susceptible to misinformation and its impact on vaccine hesitancy. These groups experience different health disparities, and public health initiatives during health crises such as the pandemic must give special attention to these vulnerable populations to mitigate the impact of misinformation and protect them from being further disadvantaged.

The findings also show that misinformation had a significant impact on reducing public perception and trust during the pandemic. The reduced public trust in health experts poses significant challenges to public health efforts to manage the pandemic and increases the risk of exposure to online misinformation. Public mistrust and negative perception of health experts play an important role in mediating increased nonadherence to or noncompliance with public health initiatives and guidelines. Therefore, misinformation and the ensuing reduction in public trust can explain increased noncompliance with public health guidelines that are otherwise effective in managing the pandemic. The evidence also shows that political polarization and the politicization of the pandemic can lead to mistrust in the government or public health experts. It can further the misinformation agenda and lower the perceived severity of the pandemic, which, in turn, can result in lower compliance with public health guidelines. Lastly, evidence shows that misinformation about the COVID-19 pandemic had some negative economic implications. While not explicitly stated, one can deduce that reduced economic performance due to misinformation can limit the governments and taxpayers' ability to fund public health programs aimed at managing the pandemic.

This study makes some important contribution to the field. First, it adds to the existing body of literature by providing a better understanding of how misinformation impacted vaccine uptake and compliance with public health initiatives and recommendations. By systematically reviewing studies from different countries and geographic locations across the world, the study provides a comprehensive understanding of the impact of misinformation on a global scale, which is more reflective of the widespread nature of the pandemic globally. Second, the study makes a contribution by comprehensively highlighting the impact of COVID-19 misinformation on the public perception and public trust and shows how it can cause the politicization of the pandemic and political polarization, which can affect public perception and trust. Overall, the study improves an understanding of how misinformation may have shaped public trust and perception of the COVID-19 pandemic and how it impacted on compliance with public health initiatives and recommendations.

This research reveals some gaps and potential pathways for future research. The study aimed to identify the potential impact of COVID-19 misinformation on public health funding. However, the literature search did not reveal any study that explicitly investigates the misinformation and its impact on health funding. From the findings of this study, one can argue that reduced public trust and the political polarization arising from COVID-19 misinformation may limit support for funding public health initiatives. Nevertheless, there is a need for more comprehensive future research that clearly shows the link between misinformation and public health funding.

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