



Facebook user responses to COVID-19 vaccine posts: An exploration of COVID-19 vaccine hesitancy sentiments.



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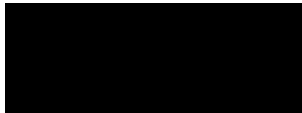
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ABSTRACT

The Coronavirus has evolved into a global pandemic, triggering an international effort to contain its dissemination. In response to mitigate the propagation of the Coronavirus, a vaccine has been developed with the intention of imparting a degree of immunity to the virus amongst the global populace. Despite the creation of a COVID-19 vaccine, a considerable segment of the population has exhibited reluctance in receiving it. Concurrently, the role of social media as a burgeoning platform for information acquisition and global news dissemination has expanded significantly. Nevertheless, amidst the profusion of available information, users are susceptible to encountering filter bubbles, echo chambers, and counterfeit news.

This qualitative, and exploratory investigation is centred upon discerning the responses of Facebook users to articles pertaining to COVID-19 vaccines and the ensuing sentiments of vaccine hesitancy that have emerged. The primary objective of this study is to acquire a more profound comprehension of how Facebook users react to news regarding COVID-19 vaccines and to identify any discernible patterns or trends. To fulfil this objective, a compilation of Facebook posts spanning from May 2019 to June 2022 was amassed. Employing a qualitative content analysis approach, specifically thematic analysis with both inductive and deductive coding, the findings reveal that Facebook users harbour preexisting ideologies and convictions concerning vaccines, which could potentially elucidate their hesitancy toward vaccination. Users articulated sentiments of remorse and scepticism regarding vaccination, attributing the vaccine to previously undiagnosed ailments, inexplicable sensations of persistent illness, and the untimely demise of individuals who had received vaccinations.

It is important to acknowledge a limitation of this study, as the underlying motivations behind these expressions of sentiment could not be definitively ascertained. Consequently, it is advisable that future investigations on the same phenomenon adopt in-depth interviews with Facebook users to elicit their perspectives regarding vaccine hesitancy.

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CHAPTER 1 INTRODUCTION AND ORIENTATION

1.1 INTRODUCTION

The omnipresence of social media platforms has significantly permeated human interaction and information consumption patterns in modern society. This phenomenon has not gone unnoticed, as Akram and Kumar (2017: 347) suggest that social media usage contributes to heightened social adeptness among individuals. Social media channels have emerged as prolific repositories of data and information pertaining to the COVID-19 virus (Buchanan, Aknin, Luton & Sandstorm, 2021: 1). Nevertheless, this informational landscape is marked by a duality in the veracity of content disseminated on social media platforms, encompassing both accurate and fallacious information related to the COVID-19 vaccination (Hou, Tong, Du, Lu, Zhao, Yu, Piatek, Larson, & Lin, 2021: 2). The ensuing impact of this informational dynamic is rendering a substantial segment of the population hesitant to partake in COVID-19 vaccination efforts (Hou, *et al.*, 2021: 2).

The influence of social media on individuals' information consumption behaviour is a subject of scholarly investigation, as evidenced by the research of Cinelli, Brugnoli, Schmidt, Zollo, Quattrociocchi, and Scala (2020: 2). Their work has demonstrated that exposure to identical content posted on Facebook can prompt individuals to adopt a more discerning stance in their approach to the material they encounter. However, this propensity for discernment exists in tandem with a persistent concern—namely, the absence of rigorous fact-checking and the predilection for selective information acquisition (Cinelli, *et al.*, 2020: 2). This latter trend has the potential to engender partial or biased perspectives on specific topics or subjects (Cinelli, *et al.*, 2020: 2).

The widespread dissemination of information concerning COVID-19 via social media platforms yields both constructive and deleterious consequences (Buchanan, *et al.*, 2021: 1). On one hand, these platforms offer a swift conduit for the propagation of vital information and guidelines germane to the COVID-19 pandemic, thus fostering enhanced public awareness (Buchanan, *et al.*, 2021: 1). Conversely, the same channels are beset by the dissemination of misinformation and disinformation regarding COVID-19 vaccines, instilling doubt and reluctance among many individuals with regard to receiving a vaccination (Hou, *et al.*, 2021: 2). This hesitancy poses a

formidable impediment to global endeavours aimed at curbing the transmission of the virus (Hou, et al., 2021: 2).

1.2 CONTEXT OF THE STUDY

1.2.1 Purpose of the study

The purpose of this research endeavour is to gain an in-depth understanding of how users of the social media platform Facebook respond to content, including posts and articles, pertaining to COVID-19 vaccines. The study endeavours to scrutinize the responses of Facebook users to narratives and postings concerning the COVID-19 vaccine, and to identify recurrent themes and prevailing perspectives that emerge within such discourse. Consequently, the study will undertake an analysis of the prevailing dialogues and arguments surrounding COVID-19 vaccinations, with a particular focus on comments reflecting vaccine hesitancy.

1.2.2 Background of the study

In January 2020, Wuhan, situated in Hubei Province, China, emerged as the epicentre of the initial identification of the seventh human coronavirus outbreak (Ciotti, Ciccozzi, Terrinoni, Jiang, Wang, & Bernardini, 2020: 365). This newly identified strain of the novel coronavirus, affiliated with the Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) family, was designated as "severe acute respiratory syndrome coronavirus 2" (SARS-CoV-2) and categorized as a beta coronavirus within the subgenus Sarbecovirus (Ciotti *et al.*, 2020: 365). Subsequently, on March 12, 2020, the World Health Organization (WHO) issued a declaration characterizing the COVID-19 coronavirus infection as a global public health emergency (Liu, 2022: 1).

The repercussions of COVID-19 have been profoundly felt worldwide, with numerous individuals being impacted by mandated lockdown measures and the direct consequences of the virus itself (Greyling, Rossouw & Adhikari, 2021: 1). In addition to the physical health implications, many have endured severe maltreatment, grappled with various mental health challenges, and experienced significant alterations in their daily routines because of the distress induced by the pandemic and its concomitant economic ramifications (Greyling, Rossouw & Adhikari, 2022: 1).

The global toll of fatalities attributed to the coronavirus stands at an estimated 6,960,783 deaths, as reported by covid19.who.int in 2023, with a corresponding total of 771,151,224 confirmed cases worldwide as of 4 October 2023, at 7:50pm CEST, according to the World Health Organization (WHO). The persistence of the pandemic, despite ongoing efforts, is attributed to the discovery of multiple novel mutations in the SARS-CoV-2 virus. These mutations have engendered surges or peaks in the likelihood of coronavirus disease transmission, thereby diminishing the prospect of an imminent conclusion to the pandemic (Lee, Jeon, Kang, Shin, Jung & Jung, 2022: 1; Lobinska, Pauzner, Traulsen, Pilpel & Nowak, 2022: 193).

In response to the pandemic, most nations have implemented a range of non-pharmaceutical interventions, including the use of disinfectants for non-healthcare surfaces, physical and social isolation measures, the mandatory use of face masks, and enforced quarantines (Walsh, Comar, Folan, Williams & Kola-Palmer, 2022: 1; World Health Organization, 2022). However, given the temporary and short-term nature of these interventions, vaccination campaigns have emerged as the singular global recourse to facilitate a return to a post-pandemic normalcy devoid of pharmaceutical interventions (Lobinska, *et al.*, 2022: 193; Walsh *et al.*, 2022: 1). The progress achieved through scientific research can be effectively translated into real-world protection against a disease that continues to be endemic across the globe, thanks to the implementation of efficient vaccination programs (Walsh, *et al.*, 2022: 1). It is imperative to underscore that the acceptance and uptake of vaccination play pivotal roles in the attainment of herd immunity and the reduction of ongoing new infections and reinfections (Walsh, *et al.*, 2022: 1).

As of 19 September 2023, the World Health Organization (WHO) reported a cumulative administration of 13,505,262,477 vaccine doses worldwide (WHO Coronavirus (COVID-19) Dashboard). Despite the noteworthy scale of vaccination efforts, empirical evidence underscores the imperative of achieving a substantial vaccination uptake to establish herd immunity, a prerequisite for preventing the resurgence of Mutant (MT) strains capable of generating widespread infections (Lobinska, *et al.*, 2022: 202). These MT strains, characterized by immunity to existing vaccines, pose a particular threat when they emerge in regions characterized by low or negligible vaccination rates (Lobinska *et al.*, 2022: 202).

Vaccination hesitancy, defined as the "delay in acceptance or refusal of immunization despite the availability of vaccination services," can be exacerbated by the sluggish deployment or absence of vaccination sites (MacDonald & the SAGE Working Group on Vaccine Hesitancy, 2015: 4163). Notably, the World Health Organization (WHO) has identified vaccine reluctance as one of the top 10 global health hazards (cited in Yu, Lam, Lam, Li, Chen, Lam & Yeung, 2022: 1). This underscores the significance of addressing and mitigating vaccination hesitancy as a crucial component of global public health efforts (Yu, *et al.*, 2022: 1).

The 13th Coronavirus Report issued by the World Health Organization (WHO) encompassed a spectrum of information, both accurate and deceptive, disseminated through online and offline channels (Liu, 2022: 1). The proliferation of information, coupled with its inherent shortcomings, rendered it challenging for the public to discern the veracity of information sources (Liu, 2022: 1). Within this context, the widespread dissemination of false information, often referred to as the "infodemic," encompassed erroneous news and unsubstantiated assertions regarding dubious remedies, inaccurate recommendations on preventive measures, and misunderstandings pertaining to COVID-19-related information (Liu, 2022: 1). Such dissemination of unverified claims and information concerning the coronavirus not only poses risks to individuals who place trust in them but also exacerbates the propagation of COVID-19 itself (Liu, 2022: 1).

Another contributing factor to the dissemination of misleading information and its consequent impact on public perception and behaviour is the pervasive use of social media platforms (Cascini, Pantovic, Al-Ajlouni, Failla, Puleo, Melnyk, Lontano, & Ricciardi, 2022: 2). These platforms have emerged as conduits for the dissemination of inaccurate information, thereby fostering a climate conducive to vaccine scepticism (Cascini, *et al.*, 2022: 2). This phenomenon underscores the need for a nuanced understanding of the role of social media in shaping public perceptions during health crises and the importance of effective information management in mitigating the potential consequences of false information dissemination (Cascini, *et al.*, 2022: 2).

The outbreak of the coronavirus has engendered a notable surge in the utilization of social media platforms as conduits for obtaining information and facilitating the exchange of opinions, thoughts, and personal experiences concerning the pandemic-

induced imperative of social distancing (Tsao, Chen, Tisseverasinghe, Yang, Li, & Butt, 2021: 175). Consequently, various stakeholders, including individuals, healthcare organizations, educational institutions, and governmental entities, have harnessed the communicative reach of social media to disseminate information related to COVID-19 and vaccination efforts (Tsao *et al.*, 2021: 175). The heightened reliance on social media by the general populace is chiefly attributed to the inherent ambiguity associated with COVID-19, which has instilled a pervasive need among users to seek clarification and augment their understanding of the pandemic (Elbarazi, Saddik, Grivna, Aziz, Elsori, Stip & Bendak, 2022: 290). However, this quest for knowledge in times of uncertainty has also engendered an inadvertent consequence—the proliferation of false and misleading information on the internet and social media platforms (Elbarazi *et al.*, 2022: 290).

The proliferation of disinformation, a deliberate endeavour aimed at sowing uncertainty and misinformation, has become a burgeoning concern in contemporary discourse (Ecker, Lewandowsky, Cook, Schmid, Fazio, Brashier, Kendeou, Vraga & Amazeen, 2022; Talwar, Dhir, Singh, Virk & Salo, 2020: 1). It is noteworthy that disinformation is not confined to conventional textual content but can manifest through various mediums and formats (Preston, Anderson, Robertson, Shephard & Huhe, 2021: 1). Instances of falsified information encompass doctored images and videos, as well as entirely fabricated narratives (Preston *et al.*, 2021: 1-2). Importantly, false information exhibits a propensity to propagate more rapidly than its verifiable counterpart, as it tends to seize the attention of a broader audience (Ecker *et al.*, 2022; Preston *et al.*, 2021: 2).

Social media communities tend to coalesce around individuals who share similar ideologies and beliefs, thereby fostering echo chambers that amplify and validate their existing viewpoints (Kitchens, Johnson & Gray, 2020: 1619). Within these echo chambers, group members actively disseminate information that serves to fortify and corroborate their collective perspectives (Kitchens, Johnson & Gray, 2020: 1619). Consequently, these self-reinforcing digital spaces can be construed as engendering a form of bias, where divergent viewpoints are marginalized or excluded (Kitchens, Johnson & Gray, 2020: 1619).

Users on social media platforms exhibit a proclivity for seeking out and engaging with online groups that align with their particular opinions and stances on specific subjects

and issues (Törnberg, 2018: 1). In this context, individuals on social media frequently display a preference for disregarding or actively avoiding information that contradicts their established ideologies and viewpoints, opting instead to consume content that aligns with their preexisting beliefs (Törnberg, 2018: 1).

1.2.3 Relevance and significance of the topic

Two fundamentally distinct “conceptualizations” encompass the belief in accurate and deceptive news including a focus on “truth discernment,” which pertains to the extent to which false information is believed when contrasted with accurate news (Pennycook & Rand, 2021: 388). Pennycook and Rand (2021) found that individuals who consume deceptive news or are exposed to diverse ideologies devoid of factual grounding may assimilate such information into their cognitive frameworks. The content individuals encounter on social media platforms, characterized by its propensity for homogeneity or the presence of divergent viewpoints, can exert a notable impact on users' cognitive processes (Pennycook & Rand, 2021: 395).

The phenomenon of selectivity has been notably influenced by the evolving news marketing strategies employed by media companies, particularly in their efforts to harness the potential of social media platforms to expand their reach within the online audience (Messing & Westwood, 2012: 2). Traditionally, individuals made deliberate choices regarding their sources of news content consumption, such as reading specific newspapers, watching particular news programs, or, in more recent times, perusing news websites (Messing & Westwood, 2012: 2). A person's news milieu was contingent upon their preferred sources, with occasional sharing of physical newspaper clippings or, in more contemporary contexts, email exchanges facilitating the dissemination of news articles (Messing & Westwood, 2012: 2).

In response to these transformative developments, news organizations undertook concerted efforts to promote their content, striving to establish and maintain a robust reputation (Messing & Westwood, 2012: 2). Critiques of news content were traditionally constrained to in-person interactions and, consequently, relegated to comments made on web pages (Messing & Westwood, 2012: 2).

Ultimately, the agency for determining the information to which users are exposed and its subsequent impact on their ideological stance and perspectives lies with the

individual user (Messing & Westwood, 2012: 2). It is the user who exercises discernment in assessing the veracity of news posts, thereby differentiating between authentic and spurious information (Messing & Westwood, 2012: 2).

Vaccination remains a cost-effective and reliable cornerstone in the interventions employed within global public health practices to manage the spread of infectious diseases (Li, Ju, & Sun, 2022: 2). Notwithstanding the established safety and efficacy of COVID-19 vaccines, a noteworthy segment of the population remains hesitant to partake in vaccination efforts, primarily due to the proliferation of misleading information regarding these vaccines (Li, Ju, & Sun, 2022: 2). This phenomenon of vaccine hesitancy is driven by multiple factors, including the dissemination of erroneous information, negative attitudes towards vaccination, barriers related to vaccine accessibility, and concerns regarding vaccine safety (Li, Ju, & Sun, 2022: 2). As a consequence, vaccine hesitancy has culminated in the delay or outright refusal of COVID-19 immunization, hence resulting in vaccination reluctance (Li, Ju, & Sun, 2022: 2).

The Strategic Advisory Group of Experts (SAGE) for the World Health Organization noted in 2012 that "despite the availability of vaccination services, the public continues to defer or reject immunization" (Li, Ju, & Sun, 2022: 2). This issue, identified as one of the top ten global health concerns, exerts a significant and inversely proportional influence on vaccination rates while also wielding a profound impact on public acceptance of vaccines (Li, Ju, & Sun, 2022: 2). Specifically, individuals harbouring reservations regarding the COVID-19 vaccine may exhibit hesitancy in accepting it (Fieselmann, Annac, Erdsiek, Yilmaz-Aslan & Brzoska, 2022: 1).

1.2.4 Relationship of the topic to the discipline of communication

In response to the COVID-19 outbreak and the imperative of social isolation, individuals increasingly turned to social media platforms to both acquire information about the coronavirus and disseminate their own perspectives, opinions, and personal experiences (Tsao, Chen, Tisseverasinghe, Yang, Li, & Butt, 2021: 175). Recognizing the expansive reach of social media, various stakeholders, including citizens, healthcare organizations, academic institutions, and governmental bodies, leveraged these platforms as channels for the dissemination of information pertaining to COVID-

19 and vaccination campaigns (Tsao, *et al.*, 2021: 175). Primarily motivated by a desire to access information, the general public frequently relies on social media platforms to satiate their informational needs, particularly during periods of uncertainty (Elbarazi, Saddik, Grivna, Aziz, Elson, Stip & Bendak, 2022: 290). However, this heightened quest for knowledge has also inadvertently fostered an environment conducive to the propagation of false information across the internet and social media platforms (Elbarazi, *et al.*, 2022: 290).

The dissemination of unfounded assertions and misinformation regarding the COVID-19 vaccine has the potential to instil scepticism or reduce individuals' inclination to use vaccination opportunities (Muric, Wu & Ferrara, 2021: 2). When individuals are exposed to false information through social media, and subsequently diverge from mainstream media guidance, actively dissuade others from receiving vaccinations, they may construct their own belief systems or perspectives. As a result, they may refrain from participating in or associating with individuals who choose to undergo vaccination (Muric, *et al.*, 2021: 2).

Social media serves as a potent platform for the dissemination of information, encompassing instances of misleading content (Muric, *et al.*, 2021: 2). Within this digital landscape, anti-vaccination activists have harnessed social media channels as conduits for articulating their rationales against vaccination (Muric, *et al.*, 2021: 2). Consequently, anti-vaccine campaigners have propagated their messaging extensively across diverse social media platforms and the broader expanse of the internet (Muric, *et al.*, 2021: 2). The inherent features of social media facilitate the rapid and widespread dissemination of anti-vaccine materials (Muric, *et al.*, 2021: 2). Users, in response to this information, often congregate into user groups, thereby amplifying the influence of this content and contributing to vaccine resistance (Muric, *et al.*, 2021: 2).

Immunization stands as a pivotal component within global health enhancement strategies, with a demonstrated impact on improving health outcomes worldwide (MacDonald, Butler, & Dubé, 2018: 218). Notwithstanding the significant health benefits associated with vaccinations, resistance to and hesitancy towards vaccines are prevalent phenomena that manifest when individuals are faced with the decision to receive vaccinations for themselves or their children (MacDonald, *et al.*, 2018: 218).

In recognition of this challenge, the World Health Organization and the United Nations Children's Fund, through their Joint Reporting Form, urged all Member States in 2014 to collaborate in efforts to augment vaccination coverage (MacDonald, *et al.*, 2018: 218). According to data from the United Nations Children's Fund Joint Reports Form, vaccine hesitancy emerges as a prominent determinant of immunization refusal (MacDonald, *et al.*, 2018: 218).

Despite some past unsuccessful attempts to mitigate vaccine hesitancy, it is imperative to gain a comprehensive understanding of the multifaceted factors contributing to this phenomenon (MacDonald, *et al.*, 2018: 218). Such comprehension is instrumental in addressing the underlying reasons that may deter individuals from embracing immunization (MacDonald, *et al.*, 2018: 218). Enhanced research endeavours aimed at unravelling the intricacies of these factors have the potential to inform strategies that can effectively address vaccination hesitancy, ultimately leading to increased immunization rates and the attendant health benefits, including enhanced life expectancy (MacDonald, *et al.*, 2018: 218).

Empirical investigations reveal that attempts to educate individuals who harbour vaccine scepticism regarding the advantages and safety of vaccinations have yielded limited success in altering their entrenched beliefs (Dubé, Gagnon, & Vivion, 2020: 48). Previous research underscores that the dissemination of strong messages advocating for vaccination may prove counterproductive among individuals who already harbour hesitations (Dubé, Gagnon, & Vivion, 2020: 48). Paradoxically, an excess of information may exacerbate reluctance to embrace vaccinations (Dubé, Gagnon, & Vivion, 2020: 48). Consequently, research has been conducted to identify the most effective communication methods and strategies aimed at mitigating this paradoxical outcome associated with diverse communication materials (Dubé, Gagnon, & Vivion, 2020: 48).

A matter of growing concern, both within the realm of public health and among professionals in the field, is the pervasive global decline in public trust and confidence in vaccines (Kumar, Chandra, Mathur, Samdariya, & Kapoor, 2016:1). This phenomenon is now commonly referred to as "vaccine hesitancy," a term that has supplanted earlier designations such as "vaccine opposition" or "vaccine resistance,"

which were originally employed by researchers to describe this phenomenon (Kumar, *et al.*, 2016: 1).

When there is a perception of low risk associated with diseases that are preventable through vaccination, coupled with a diminished sense of necessity for vaccination, a phenomenon known as vaccine complacency tends to emerge (Kumar, *et al.*, 2016: 2). Researchers have identified that resistance to vaccination is substantially influenced by factors such as uncertainty regarding the effectiveness and safety of immunization, as well as apprehensions concerning the competence and reliability of the healthcare system (Kumar, *et al.*, 2016: 2).

Given that vaccination constitutes an integral facet of the broader sociocultural milieu, and as the decision-making process surrounding vaccination is profoundly shaped by sociocultural factors, extant research underscores the necessity for a more comprehensive examination of vaccination decision-making within a sociocultural framework (Kumar, *et al.*, 2016: 2). This framework encompasses a diverse array of social dimensions, encompassing aspects such as interpersonal relationships with friends and family, issues related to personal autonomy, familial medical history, as well as prior encounters with healthcare services (Kumar, *et al.*, 2016: 2).

The decisions individuals make regarding vaccination are significantly influenced by local healthcare services, the vaccination context, and preventive measures. The prevailing local vaccination cultures are shaped by shared perceptions pertaining to the origins of diseases, the effectiveness and safety of contemporary medical interventions, including vaccines (Kumar, *et al.*, 2016: 2). Additionally, it has been observed that parental attitudes toward immunization can at times be influenced by concerns related to the nutritional and overall health status of their children (Kumar, *et al.*, 2016: 2).

In today's context, the credibility of science, the competence of healthcare professionals, and medical authority may occasionally be subject to questioning, thereby impacting the perceived value of immunization (Kumar, *et al.*, 2016: 2). The emergence of a 'consumerism' trend within healthcare, which encourages individuals to play an active role in their healthcare decision-making, may have contributed to a heightened emphasis on lifestyle modifications aimed at improving health and potentially fostered the growth of vaccine hesitancy (Kumar, *et al.*, 2016: 2).

The inclusion of patients who actively seek participation, as well as their families, in the decision-making process regarding healthcare is a practice that is increasingly gaining prominence (Kumar, *et al.*, 2016: 2). Historically, the responsibility for directing patient care exclusively rested with healthcare providers, with doctors serving as the primary decision-makers (Kumar, *et al.*, 2016: 2).

Social media's role in interpersonal communication is marked by three primary drawbacks, as elucidated by Subramanian (2017: 70, 74). Firstly, the use of social media for communication elevates an individual's propensity to place trust in their conversation partner, thereby fostering more direct and private interactions (Subramanian, 2017: 70). Secondly, users are less likely to forge deep, intimate relationships, as the social bonds formed on social media platforms tend to remain shallower compared to those nurtured through face-to-face interactions (Subramanian, 2017: 70). Thirdly, social media users exhibit a proclivity for engaging in conversations with individuals who share their beliefs, rather than those who hold divergent perspectives (Subramanian, 2017: 70).

1.3 CONCEPTUALISATION OF KEY TERMS

1.3.1 Social Media

Aichner, Grünfelder, Maurer, and Jegeni (2021: 216) state that social media platforms are not uniformly designed; rather, they vary in their intended purposes, with some primarily serving as information-sharing platforms, while others are expressly designed to facilitate user interaction and provide users with a degree of control over the platform. The landscape of online social media is increasingly shaped by internet communities (Aichner, *et al.*, 2021: 216). These platforms and online communities enable individuals to establish connections with fellow social media users, fostering a sense of community (Aichner, *et al.*, 2021: 216).

Social media platforms, alongside various other online avenues, offer an open forum for individuals desiring to disseminate information, articulate their viewpoints, or initiate discussions on pertinent subjects (Aichner, *et al.*, 2021: 216). Furthermore, social media facilitates the exchange of knowledge, insights, and even digital imagery, which can wield a transformative impact on individuals' lives (Aichner, *et al.*, 2021: 216).

Social media platforms employ strategies aimed at generating content that sustains users' interest and encourages their continued engagement (Rhodes, 2022: 1). These platforms recognize the presence of pre-existing beliefs among their visitors, which underscores the importance of offering content that is easily consumable and directs users' attention toward topics of their specific interest (Rhodes, 2022: 1). Consequently, users are more likely to encounter and interact with content that aligns with their preferences, thereby diminishing the likelihood of exposure to information deemed less engaging (Rhodes, 2022: 1).

1.3.2 Vaccine hesitancy

Considering that certain individuals may already hold pre-existing ideas and opinions regarding the vaccine, presenting them with accurate factual information can prove challenging (Hornsy, Harris & Fielding, 2018: 308). Even when factual data is made available, individuals may opt to rely on their preconceived notions rather than actively seeking out information that might impact their stance on the vaccine (Hornsy, Harris & Fielding, 2018: 308). Reiterating information is unlikely to sway a person's perspective; instead, it may foster resistance to considering alternative viewpoints regarding the vaccine, leading to a rejection of new information (Hornsy, Harris & Fielding, 2018: 308).

In addition to jeopardizing their own well-being and that of others, individuals who decline vaccination inadvertently contribute to the continued transmission of the virus (Mønsted & Lehmann, 2022: 2). Given the option to refuse immunization, some individuals may opt not to receive the vaccine at all (Mønsted & Lehmann, 2022: 2). Those who harbour uncertainty regarding the wisdom of receiving the vaccine seek access to factual information that can assist them in arriving at an informed decision (Mønsted & Lehmann, 2022: 2).

1.3.3 Echo chambers

The acquisition of knowledge and information has undergone a transformation with the advent of online media (Törnberg, 2018: 1). Online media's unregulated nature permits the dissemination of news and information without rigorous verification processes (Törnberg, 2018: 1). However, the internet and social media platforms have simplified the process of like-minded individuals coming together to lend support,

thereby reducing the inclination for individuals to openly express their opinions and ideologies concerning the content they encounter (Törnberg, 2018: 2). Rather than serving as a space for individuals with similar values and opinions to congregate, social media has facilitated connections, information acquisition, and engagement in debates with other users (Törnberg, 2018: 2). Consequently, it becomes challenging to introduce novel information or educate a group of individuals who share identical values and beliefs, particularly concerning alternative perspectives (Törnberg, 2018: 17).

Within an echo chamber, the proliferation of fear through social media or other public platforms can be more readily observed (Kitchens, Johnson & Gray, 2020: 1619). Membership in a community of individuals who share similar beliefs can foster the dissemination of misinformation and the propagation of fear (Kitchens, Johnson & Gray, 2020: 1619). Individuals may also circulate identical information within the group, subjecting members to repetitive content and shaping their perceptions of the information they are exposed to (Kitchens, Johnson & Gray, 2020: 1619).

1.3.4 Filter bubbles

The online accessibility of media has empowered individuals to access information promptly as per their needs (Spohr, 2017: 153). Users may opt to narrow down their search to specific content, creating a pattern in their search history that prompts social media platforms to present material resembling or mirroring their prior searches rather than exploring alternative information (Spohr, 2017: 153). This pattern results in the formation of a filter bubble wherein users are exposed to a news stream comprising predominantly akin content (Spohr, 2017: 153).

Utilizing search engines, social media streams, and filter bubbles, users are presented with content that aligns with their pre-established preferences and searches, consequently enticing them to engage with that particular information (Flaxman, Goel & Rao, 2016: 299). As a result, users find themselves within a filter bubble where predominantly similar or identical content is consistently fed to them (Flaxman, Goel & Rao, 2016: 299).

1.3.5 News Articles

Key attributes of news stories encompass the reader's capacity to stay informed about current events and the reliability and authenticity of news sources (Karlsen & Aalberg, 2021: 2). The degree of trust that an individual places in a news source plays a pivotal role in the source's efficacy in educating the public on contemporary developments (Karlsen & Aalberg, 2021: 2). The aspect of trust in news reporting can revolve around various facets, including the journalist's credibility, the accuracy of the article, the credibility of the news outlet, or the reputation of the news organization itself (Karlsen & Aalberg, 2021: 2). When news is disseminated via social media, evaluating the veracity of news items becomes a challenging task for individuals (Karlsen & Aalberg, 2021: 2). Individuals typically rely on their existing general knowledge (Karlsen & Aalberg, 2021: 2-3). Consequently, it is essential for individuals to recognize that relying solely on their personal understanding may not suffice when seeking information (Karlsen & Aalberg, 2021: 3). The study defines a news story as a specific passage of content necessitating reader engagement, often shared on social media platforms. According to the study, users tend to retain information sourced from news stories. The research specifically concentrates on news pieces concerning COVID-19 vaccinations shared on Facebook or articles pertaining to COVID-19 vaccinations posted on the Facebook platform.

1.4 TYPE OF STUDY

1.4.1 Interpretivist paradigm

A paradigm, as articulated by Junjie and Yingxin (2022: 10), serves as a comprehensive theoretical framework guiding philosophical assumptions and methodological approaches. Paradigms, as conceptual frameworks, provide researchers with the structure to shape their thoughts and actions (Babbie, 2014: 32). Within the interpretivist paradigm, the focus is on understanding how individuals personally interpret and derive meaning from the world (Okesina, 2020: 60). In the interpretive paradigm explanations are constructed based on values and subjective interpretations of reality (Junjie & Yingxin, 2022: 10).

Interpretivism is dedicated to unravelling the underlying motives and meanings individuals attribute to specific situations (Bonache & Festing, 2020: 104). This approach emphasizes the researcher's interpretive work, highlighting the pivotal role it plays in grasping a participant's life experiences (Bonache & Festing, 2020: 104). The interpretative phenomenological approach posits the existence of multiple social realities, each constructed based on distinct ideas and perceptions (Bonache & Festing, 2020: 104).

In the interpretivist paradigm, subjective data holds precedence over strict adherence to predefined methodologies during information gathering (Alharahsheh, 2019: 41-42). Acknowledging the inherent uniqueness of each person's reality, this paradigm recognizes that individuals may interpret social circumstances differently (Alharahsheh, 2019: 42).

The study's core objective is to scrutinize comments on Facebook news articles related to the COVID-19 vaccine. By analysing these comments, the research aims to gain insights into individuals' beliefs, ideologies, and perceptions. Furthermore, the examination seeks to uncover recurring patterns or trends in the diverse comments posted by individuals in response to COVID-19 vaccination information on Facebook.

Interpretive research, elucidated by Babbie (2014: 32) and Okesina (2020: 60), centres on individual-level examination of how people construe and perceive the world. This paradigm acknowledges the interplay of cultures, contextual circumstances, and historical epochs in constructing distinct social realities (Alharahsheh & Pius, 2020: 42). Researchers do not privilege any single interpretation when faced with multiple well-substantiated perspectives (Rehman & Alharthi, 2016: 55).

The study, delving into Facebook comments on COVID-19 vaccine news, seeks nuanced comprehension of sentiments and potential vaccine hesitancy. Inherent philosophical underpinnings, including ontology, epistemology, and axiology (Okesina, 2020: 58), are crucial in shaping the study's approach.

Ontologically, the study explores the essence of reality surrounding Coronavirus and vaccines through users' Facebook commentaries. Epistemologically, it focuses on how the researcher employs social artifacts to augment knowledge, aligning with the broader concept of rational discourse about knowledge (Farrow, *et al.*, 2020: 10).

Axiologically, the study values ethical standards in analysing Facebook comments objectively (Farrow, *et al.*, 2020: 12; Okesina, 2020: 59).

In terms of ontology, the examination of existence is pivotal, influencing worldviews and understanding (Farrow *et al.*, 2020: 9). Users' comments on Facebook reflect their subjective experiences, contributing to their unique reality.

Epistemologically, the study aligns with the concept of systematic knowledge, emphasizing rational discourse about knowledge (Farrow, *et al.*, 2020: 10). The comprehension of Facebook comments aids in advancing understanding of COVID-19 vaccination sentiments.

Axiologically, the study integrates rational discourse about values, ensuring ethical conduct in reporting findings about Facebook comments on the COVID-19 vaccine (Farrow, *et al.*, 2020: 11-12). Objectivity is paramount in upholding axiological principles.

Overall, the interpretive paradigm shapes the study's focus on individual interpretations, cultural nuances, and historical contexts, fostering a nuanced understanding of sentiments expressed in Facebook comments on COVID-19 vaccination.

1.4.2 Basic research

Specifically, the field of social sciences delves into how evolving social realities can be newly or distinctively interpreted (Jackson, Drummond & Camara, 2007: 21). Social scientists are engaged in the discourse on people's conceptions of life (Jackson, *et al.*, 2007: 21). It presupposes the existence of a methodical approach for assembling the key components of the predicaments affecting our social milieu (Jackson, *et al.*, 2007: 21). Even the most optimistic scholar acknowledges that only data available at the time of the study or in the preceding years can be examined (Jackson, *et al.*, 2007: 21).

1.4.3 Exploratory research

Exploratory research studies aim to investigate phenomena and issues characterized by a lack of well-defined boundaries (Stebbins, 2019: 2). At its broadest, exploration encompasses the examination, analysis, or research of a wide array of subjects. In a

more specific sense, it involves testing or experimenting with various aspects to gain familiarity with them (Stebbins, 2019: 2). This type of investigation is often associated with individuals in fields that value creativity, innovation, and invention (Stebbins, 2019: 2).

Another aspect of exploration pertains to spatial exploration, which entails traversing specific areas in pursuit of knowledge and adventure (Stebbins, 2019: 2). In contrast, the final interpretation of exploration involves a systematic search coupled with a close examination of a subject or concept to arrive at a diagnosis (Stebbins, 2019: 2). Under this perspective, explorers embark on methodical searches when they already possess a foundational understanding of what they are seeking, such as oil reserves, cancer cells, or toxins (Stebbins, 2019: 2). In its purest form, exploration serves as an encompassing term for the inquisitive processes of learning, questioning, and related endeavours (Stebbins, 2019: 2). While the category of investigative exploration broadly captures the activities of social science explorers, it provides only a general description of their pursuits (Stebbins, 2019: 2).

The second definition of exploration, while closer to the essence of social science research than the first, distinguishes itself by emphasizing that testing or experimentation is undertaken with the specific aim of achieving a particular impact or product (Stebbins, 2019: 3). This could manifest in various forms such as the creation of a new painting, culinary dish, a combination of musical sounds, the development of a technique, or a tool (Stebbins, 2019: 3). The essence of this creative exploration lies in its objective to acquire an in-depth understanding of the properties of substances and processes, enabling their modification to attain the desired outcome or product (Stebbins, 2019: 3).

A key differentiator between imaginative exploration and the third meaning of exploration, referred to as exploration for discovery, is the primary goal of the latter: to explore comprehensively and broadly for the sake of discovery (Stebbins, 2019: 3). In contrast, exploratory endeavours that result in innovation tend to be more focused and specific in their objectives (Stebbins, 2019: 3).

The fourth interpretation, sometimes denoted as limited exploration, is characterized by the explorer's deliberate search for a specific object or information (Stebbins, 2019: 3). In this context, innovation and extensive discovery often take a backseat because

the explorer already possesses a clear understanding of what they are seeking (Stebbins, 2019: 3).

Exploratory research is typically conducted when a researcher suspects that a particular group, method, activity, or scenario contains components worthy of investigation, yet there exists limited to no scientific knowledge on the subject (Stebbins, 2019: 5). To effectively explore such phenomena, researchers must adopt two distinct orientations: flexibility in their search for evidence and a willingness to consider various sources of information (Stebbins, 2019: 5).

The optimal approach involves diligently seeking out relevant knowledge from diverse sources, employing ethical methods as necessary (Stebbins, 2019: 5). The primary objective of exploratory research is to derive inductively formulated generalizations about the subject, process, effort, or event under scrutiny (Stebbins, 2019: 5).

Exploratory research is pertinent to this study as it aims to discern the nature of the research problem and its underlying causes. This approach can be effectively applied to the examination of comments posted on Facebook in relation to the Coronavirus vaccine. Employing this methodological framework is particularly valuable due to the scarcity of extensive research on this specific subject matter.

1.5 RESEARCH APPROACH

1.5.1 Qualitative research

Qualitative research, as outlined by Babbie (2014: 27), Punch (2013, as cited in Busetto, Wick & Gumbinger, 2020: 1), and Mohajan (2018: 2), takes a qualitative approach, prioritizing attributes over numerical quantification. It operates within the realm of social science, focusing on non-quantitative data collection and analysis to deepen our understanding of social phenomena. This methodology captures individuals' perceptions within natural contexts, exploring human relationships, signification, experiences, and societal patterns that may marginalize specific demographic groups.

Fundamentally concerned with how individuals construe and ascribe significance to their lived experiences, qualitative research employs diverse methodologies such as interviews, diaries, field notes, immersive engagements, observations, and content

analysis of both visual and textual resources (Mohajan, 2018: 2). It is exploratory in nature, aiming to unravel the "how" and "why" of behavioral dynamics within specific contextual confines, contributing to a comprehensive understanding of societal milieus and underlying causative factors.

This research paradigm, characterized by a commitment to discovery and close engagement with authentic occurrences (Williams, 2007: 67), is instrumental in generating novel theories. In contrast to quantitative research, it provides a structured narrative, embracing the nomenclature "qualitative" due to its potency as a model transpiring within authentic contexts.

The ongoing study adopts a qualitative research methodology to examine comments from Facebook users regarding the COVID-19 vaccine, emphasizing a comprehensive exploration and comprehension of the comments rather than quantifying participant contributions. Qualitative research involves a methodical, coherent, and systematic approach to yield pertinent findings within specific contexts (Mohajan, 2018: 1). It focuses on qualities, perspectives, appearances, and the qualitative aspects of a study, relying on words rather than numerical data (Busetto, Wick & Gumbinger, 2020: 1).

The study aims to gain deeper insights into the discourse found in comments on Facebook news articles related to COVID-19 vaccination, aligning with a qualitative research paradigm that prioritizes the exploration of meanings and perspectives within natural settings.

1.6 FORMULATION OF THE RESEARCH PROBLEM

1.6.1 The research problem

Social media serves as a preferred communication channel due to its ability to fulfil social obligations without necessitating in-person interactions (Subramanian, 2017: 70). However, the utilization of social media for interpersonal communication has given rise to three significant issues (Subramanian, 2017: 70, 74). Firstly, individuals connecting on social media are more inclined to place trust in their conversational partners, fostering more direct and private exchanges (Subramanian, 2017: 70). Secondly, the development of intimate relationships is hindered since social bonds on

social media do not deepen to the same extent as in face-to-face interactions (Subramanian, 2017: 70). Lastly, users exhibit a tendency to prefer conversing with others who share their beliefs, rather than engaging with those who hold opposing viewpoints (Subramanian, 2017: 70).

In addition to its growing significance in information dissemination, social media has also seen a surge in the spread of false information (Moravec, Minas & Dennis, 2018: 1). The rapid accessibility of online news and information has outpaced traditional news sources (Moravec, *et al.*, 2018: 1). Social media platforms employ algorithms to curate users' newsfeeds, amalgamating posts from friends and family with advertisements (Moravec, *et al.*, 2018: 1-2). Even when users are aware of the presence of false information on social media, they continue to encounter it, causing confusion among readers (Moravec, *et al.*, 2018: 2). Research indicates that users struggle to distinguish between authentic and fake news stories (Moravec, *et al.*, 2018: 2). Reporting false news stories has minimal impact on people's beliefs, as it often incites user comments on the bogus news, rather than prompting critical re-evaluation (Moravec, *et al.*, 2018: 2). Furthermore, individuals are more likely to believe comments that align with their existing beliefs, regardless of whether the information is factual or false (Moravec, *et al.*, 2018: 2).

The prevalence of incorrect information and misleading news about the COVID-19 vaccine on social media platforms has exacerbated vaccine hesitancy (Rhodes, 2022: 2). Anti-vaccine advocates inundate social media with posts, leaving individuals who are contemplating vaccination in a state of uncertainty (Muric, Wu & Ferrara, 2021: 2). This hesitancy stems from a desire for more information, concerns about safety, religious objections, ethical considerations, personal convictions, and various other underlying factors (Muric, Wu & Ferrara, 2021: 2).

Furthermore, the propagation of information within "echo chambers" increases the likelihood of individuals encountering incorrect information on social media (Rhodes, 2022: 2). Echo chambers are characterized by the repetition of information among individuals who share similar ideologies or attitudes, reinforcing pre-existing beliefs and viewpoints (Cinelli, Brugnoli, Schmidt, Zollo, Quattrociocchi & Scala, 2020: 2). This tendency is attributed to "selective exposure and confirmation bias," as individuals seek information that aligns with their existing beliefs to avoid cognitive

dissonance (Cinelli, *et al.*, 2021: 2). Consequently, users are constrained to reading news articles from sources that align with their worldviews, perpetuating confirmation bias (Flaxman, Goel & Rao, 2016: 299).

Despite the implementation of preventive measures such as social isolation and mask usage, the acquisition of the COVID-19 vaccine remains the sole long-term activity to combat the pandemic (Hou, Tong, Du, Lu, Zhao, Yu, Piatek, Larson & Lin, 2021: 2). As a result, even with declining coronavirus infections, cases persist (Hou, *et al.*, 2021: 2). The persistence of the virus and the decline in infections have led some individuals to lose confidence in vaccinations, resulting in vaccine hesitancy (Hou, *et al.*, 2021: 2).

The focal concern under examination pertains to vaccine hesitancy surrounding the COVID-19 vaccine, encompassing a comprehensive comprehension of the myriad factors influencing individuals as they seek information about the vaccine. This hesitation reflects the apprehension and reservations harboured by individuals with regard to the Coronavirus and its associated vaccines.

1.6.2 Research questions

Based on the research problem identified and described the following research questions were formulated.

Primary research questions:

What sentiments are reflected in Facebook users responses to and comments on COVID-19 related vaccine posts?

What are the emerging themes related to vaccine hesitancy in Facebook users' comments on COVID-19 related vaccine posts?

Secondary research question:

How are echo chambers (if any) reflected in dissenting comments regarding COVID-19 vaccine posts on Facebook?

1.7 RESEARCH METHODOLOGY AND METHODS

1.7.1 Data collection

In the realm of academic research, it is imperative to underscore the significance of discerning patterns within data and establishing categorical frameworks as fundamental procedural steps within the data collection process for qualitative content analysis, as expounded by Shava *et al.* (2021: 553). Qualitative content analysis method, in its essence, serves as a research approach that employs coding techniques to meticulously structure and systematize the amassed data, with the overarching goal of elucidating emergent themes and patterns residing within textual content (Shava *et al.*, 2021: 553).

One distinct advantage inherent in the utilization of qualitative content analysis pertains to its capacity to enable the researcher to interact with the data autonomously, regardless of the physical presence or involvement of study participants (Shava *et al.*, 2021: 553). In the forthcoming study, this methodological approach will be aptly applied to amass and dissect comments and posts derived from the Facebook platform concerning COVID-19 vaccines. The data collection phase for Facebook posts is slated to transpire within the temporal span extending from May 2019 through June 2022, with a firm commitment to adhering to stringent ethical guidelines that preclude the acquisition of users' private information. It is worth emphasizing that the qualitative data's intrinsic value lies primarily in its quality rather than its sheer volume or magnitude (Busetto, Wick & Gumbinger, 2020: 1).

The study focused on collecting comments from online articles posted by certain organizations on Facebook. All comments were used as they appeared, without changing any user information. To adhere to ethical guidelines, extra care was taken to remove user names and ensure privacy. These organizations were intentionally chosen because they were key sources of information during this period, influencing public discussions and awareness about vaccination initiatives.

1.7.2 Data analysis and interpretation

Within the realm of academic inquiry, the process of comprehending a phenomenon through the utilization of specific methodologies to dissect acquired data is commonly referred to as data analysis (Wong, 2008: 14). In the context of this study, the chosen method for data analysis is textual analysis.

Textual analysis, as a data analysis approach, involves the meticulous dissection of text-based information to segregate elements that depict tangible concepts and the subsequent establishment of relationships or contextual frameworks for classifying information that can elucidate or substantiate a particular phenomenon (Kleinheksel, Rockich-Winston, Tawfik & Wyatt, 2020: 127). This method places emphasis on the characterization and interpretation of meaning within recorded modes of interaction. Furthermore, it delves into the underlying philosophical and cultural dimensions inherent in text, necessitating a profound examination of the linguistic constructs and symbolic representations employed within the text (Arya, 2020: 173).

In the execution of textual analysis for content exploration, it is imperative for the researcher to judiciously account for various elements, including the participants, the contextual circumstances, the environment, and the overarching context, when clustering and categorizing the data (Kleinheksel, *et al.*, 2020: 128). This analytical technique is instrumental in the identification of patterns, connections, and shifts in the meaning encapsulated within the text (Kleinheksel, *et al.*, 2020: 128).

Furthermore, a crucial component of the data analysis process in the present investigation involves coding, a systematic procedure for detecting similarities or recurring patterns within the amassed data (Linneberg & Korsgaard, 2019: 6). Codes, which may manifest as specific words or phrases present within the data, are employed for data classification (Linneberg & Korsgaard, 2019: 6).

Thematic analysis is a prominent method for discerning patterns within qualitative data (Braun & Clarke, 2006; Kiger & Varpio, 2020: 2). This approach involves the selection of codes and the identification of overarching themes during the data examination process, shedding light on how the data is construed and comprehended (Braun & Clarke, 2006; Kiger & Varpio, 2020: 2). Thematic analysis enjoys wide recognition and applicability across diverse research contexts (Kiger & Varpio, 2020: 2).

Given that the primary data source for this study comprises Facebook comments pertaining to COVID-19 vaccination, which are presented in textual format, the chosen approach for data analysis is textual or content analysis. Specifically, thematic analysis will be employed to scrutinize the data and unearth prevailing patterns and general trends.

1.8 FEASIBILITY OF THE STUDY

1.8.1 Trustworthiness

Trustworthiness refers to the systematic assessment of a qualitative study's integrity and the reliability of its gathered information, as elucidated by Stahl and King (2020: 26). This evaluative construct can be further delineated into four distinct facets: credibility, transferability, dependability, and confirmability, as expounded by the same authors (Stahl & King, 2020: 26).

1.8.1.1 Credibility

Credibility denotes the extent of a researcher's confidence in the accuracy and authenticity of a study's outcomes, as asserted by Stahl and King (2020: 26). It prompts an inquiry into whether the researcher possesses conviction regarding the trustworthiness and truthfulness of the findings (Stahl & King, 2020: 26).

1.8.1.2 Transferability

Transferability is aimed at establishing the extent to which the study's findings can be extrapolated and applied to alternative contexts (Stahl & King, 2020: 27). To augment the credibility of this transferability, qualitative researchers may furnish additional contextual information, elucidating how the outcomes of their study possess relevance and applicability across a spectrum of divergent situations, locales, and conditions (Stahl & King, 2020: 27).

1.8.1.3 Dependability

Dependability, as a vital facet in the evaluation of research quality, pertains to the extent to which a study can be replicated by other researchers, with the expectation

that the findings will exhibit consistency and robustness (Stahl & King, 2020: 27). Researchers from diverse domains may seek to draw upon the data derived from prior studies with the objective of deriving analogous conclusions from the present study (Stahl & King, 2020: 27). Researchers may employ triangulation to substantiate the dependability of their findings (Stahl & King, 2020: 26). Triangulation, as a research practice, involves examining a single subject from diverse and distinct methodological vantage points (Stahl & King, 2020: 26).

1.8.1.4 Confirmability

Confirmability, a pivotal criterion within research assessment (Stahl & King, 2020: 28), is indicative of the extent to which the conclusions of a research study maintain objectivity. This attribute signifies that the foundation of these conclusions' rests upon the responses of participants, rather than being susceptible to potential researcher biases or personal proclivities (Stahl & King, 2020: 28). It necessitates vigilant measures to prevent researcher bias or the imposition of skewed data interpretations, thereby ensuring that the selection of participants does not lead to a preordained validation of the researcher's objectives (Stahl & King, 2020: 28).

In qualitative research an exhaustive audit trail encompassing all techniques employed for data analysis may be provided to increase the confirmability of a study (Stahl & King, 2020: 28). This comprehensive documentation not only bolsters the confirmability of the study but also serves to demonstrate that conclusions were reached through a systematic and logically defensible process (Stahl & King, 2020: 28).

To ensure the study's trustworthiness, it is imperative that the research process remains free from any deliberate imposition of preconceived outcomes. This necessitates the meticulous gathering and preservation of all data without any endeavour to manipulate it to align with the researcher's predetermined objectives. The comprehensive documentation of the study's research methodology and the meticulous delineation of the author's rationale in reaching the study's conclusions are fundamental aspects of this validation process. Furthermore, a commitment to transparency entails making each discrete piece of data publicly accessible, thereby elucidating the precise methodologies employed in its acquisition by the researcher.

1.9 ETHICAL CONSIDERATIONS

Ethical dimensions within a research investigation encompass the delineation of principles that govern the appropriate application of ethical norms and an acknowledgment of the variables that may exert influence upon the study's ethical landscape (Burles & Bally, 2018: 3). It is essential to recognize that the specific ethical considerations germane to a study will invariably vary contingent upon the unique nature and context of the research being undertaken (Burles & Bally, 2018: 3). Additionally, the clear and comprehensive explication of research methodologies, both in their correct and erroneous manifestations, is imperative for a researcher (Babbie, 2014: 62).

In adherence to ethical protocols, ethical clearance has been diligently procured from the ethics committee of the Research and Postgraduate department of the IIE. To safeguard the confidentiality of participants, the research endeavour will abstain from extracting any sensitive personal data from the provided artefacts. Furthermore, the identities of Facebook users will be safeguarded through an appropriate the deidentification process. The research process will strictly refrain from any form of editing or manipulation of the original Facebook posts and user comments, adhering to a principle of recording and utilizing only unaltered content.

1.10 SUMMARY AND CONCLUSION

In conjunction with the burgeoning significance of social media as a conduit for information dissemination, there has been a concomitant escalation in the proliferation of spurious news content (Moravec, Minas & Dennis, 2018: 1). The swiftness of information retrieval has been notably expedited through the prevalence of online news sources, eclipsing the comparatively languid pace associated with traditional news outlets (Moravec, *et al.*, 2018: 1). Notably, Facebook employs algorithms that amalgamate user-generated content from friends and family with paid promotional material, thereby shaping the composition of individual users' newsfeeds (Moravec, *et al.*, 2018: 1-2). Intriguingly, individuals occasionally disseminate inaccurate information on social media platforms, even when cognizant of its fallacious nature, thereby confounding the comprehension of those exposed to such content (Moravec, *et al.*, 2018: 2).

The principal objective of this study is to delve deeper into the phenomenon of COVID-19 vaccine hesitancy. It aims to facilitate an enhanced comprehension of consumer sentiment and opinions surrounding the COVID-19 vaccination. The collected data will be meticulously analysed to provide a more nuanced insight into how individuals are responding to the COVID-19 vaccine within the online sphere, as well as the potential nexus between vaccine hesitancy and the ongoing pandemic.

In the pursuit of this research, a steadfast commitment to ethical standards is paramount, and strict adherence to ethical considerations is imperative throughout the research process (Burles & Bally, 2018: 3; Babbie, 2014: 62). It is imperative to acknowledge that the specific ethical framework to be observed may vary contingent upon the nature and design of the study (Burles & Bally, 2018: 3). A comprehensive understanding of both the correct and incorrect research conduct is essential for the researcher's ethical diligence (Babbie, 2014: 62).

1.11 EXPOSITION OF THE STUDY

In Chapter 1, the study's contextual background and overarching aims and purpose were systematically delineated, providing readers with a comprehensive understanding of the study's foundation and objectives. This chapter serves as the entry point, establishing the groundwork for the subsequent exploration.

Moving on to Chapter 2, the narrative transitions into a critical examination of existing knowledge, encapsulated in the literature review. Additionally, the theoretical framework that will underpin the research is introduced. This chapter not only synthesizes relevant scholarly works but also positions the study within the existing body of knowledge, laying the theoretical groundwork for the research endeavours that follow.

Chapter 3 details the research design and methodology. This section outlines the specific methods employed for data collection, analysis, and interpretation. By providing a clear roadmap, this chapter ensures transparency in the research process and helps readers grasp the systematic approach applied to address the study's research questions.

As the research progresses into Chapter 4, the focus intensifies on the practical implementation of the methodology. This phase involves the actual gathering of data and the subsequent interpretation of that data. A paramount consideration in this chapter is the unwavering commitment to ethical standards, ensuring the integrity and reliability of the research process.

The concluding chapter, Chapter 5, serves as the culmination of the research journey. Here, the findings derived from the data are presented in a structured manner. Moreover, this chapter provides a synthesis of the study's outcomes and draws conclusions based on the research objectives. It offers insights, implications, and potentially avenues for future research, thus completing the narrative loop initiated in Chapter 1. In essence, Chapter 5 represents the capstone of the study, encapsulating the research's essence and its contribution to the academic discourse.

CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 INTRODUCTION

Chapter 2 encompasses an in-depth examination of pertinent literature, accompanied by the formulation of a theoretical framework. The purpose of the literature review is to provide a comprehensive portrayal of the subject matter by elucidating the topic, elucidating how previous scholars have undertaken analogous or akin research within the same domain. The amalgamation of a diverse array of articles authored by multiple scholars serves to enrich the researcher's conclusions, while concurrently accentuating pivotal themes and concepts germane to the study's focus. This critical survey of existing literature further aids the researcher in the identification and selection of pertinent concepts and constructs, which subsequently find application in the empirical facet of the research.

2.2 LITERATURE REVIEW

Scholarly literature reviews are characterized by their meticulous, evidence-based examinations of the subject matter (Winchester & Salji, 2016: 308). The length and style of such reviews are contingent upon a multitude of factors, but fundamentally, a literature review serves as a comprehensive assessment of the prevailing state of knowledge within the field at the time of its composition (Winchester & Salji, 2016: 308). Moreover, the process of uncovering antecedent research endeavours through a literature review affords the researcher the opportunity to elaborate on theories and concepts germane to a particular phenomenon (Winchester & Salji, 2016: 308). This, in turn, facilitates a more nuanced exploration, either substantiating the subject of interest or shedding light on research findings that deviate from the trajectory of the ongoing study (Winchester & Salji, 2016: 308).

2.2.1 Online communities

In the realm of social media, users can identify and engage with communities or organizations that share congruent beliefs or interests on specific topics or concerns, fostering communicative interactions among members (Dover & Kelman, 2018: 1). The vitality and longevity of online communities are often contingent upon the size of their membership and the frequency of interactions within, serving as mechanisms to ensure the group's sustained activity and the retention of its members, preventing attrition or dissolution (Dover & Kelman, 2018: 1). Notably, online communities characterized by shared ideals or opinions tend to experience reduced instances of intra-member conflicts (Dover & Kelman, 2018: 1).

In the pursuit of online community engagement, users actively seek out like-minded individuals who share analogous viewpoints, beliefs, or objectives, thereby cultivating meaningful relationships within these virtual social networks (Akar & Mardikyan, 2018: 1). The commonality of interests among community members serves as a cohesive force, unifying individuals across diverse pursuits, goals, lifestyles, or geographic locations (Akar & Mardikyan, 2018: 1). Furthermore, adherence to a set of community-established guidelines is incumbent upon all participants, and active participation is a cornerstone principle once one becomes a member or joins an existing online community (Akar & Mardikyan, 2018: 1). Lastly, fostering a sense of belonging and inclusion among participants within the online community is of paramount importance (Akar & Mardikyan, 2018: 1).

To sustain the vibrancy and expansion of online communities, user engagement and information exchange are vital practices, although the specific demands and objectives of various online communities may diverge markedly (Akar & Mardikyan, 2018: 1). There exists a recurring three-regime pattern governing the relationship between activity levels and community size, a trend observed across platforms and over time, with a few noteworthy exceptions (Dover & Kelman, 2018: 13).

Scholarly investigations into online communities encompass a multifaceted array of dimensions, including examinations of community structure, commitment levels, intentions for participation, knowledge sharing behaviours, motivational factors driving contributions, identity dynamics, usability assessments, determinants of community success, the influence of word-of-mouth marketing, and role identification within

psychological and social contexts (Akar & Mardikyan, 2018: 2). The study of online communities also encompasses the identification of diverse user typologies within these virtual groups, a facet elucidated by prior research (Akar & Mardikyan, 2018: 2).

Furthermore, in the context of vaccine hesitancy, it is likely that individuals who harbour reservations about vaccination may actively seek out and affiliate with online communities that share similar perspectives, beliefs, or hesitations regarding vaccine acceptance, thereby fostering a sense of solidarity and reinforcement of their viewpoints within these digital social spheres.

2.2.2 Credibility of online news

In the context of social media, it is noteworthy that the veracity of news content tends to be accepted at face value by readers, often without diligent fact-checking, a phenomenon documented by Kim, Xiong, Lee, and Han (2021: 2). This propensity is compounded by the facile dissemination capabilities that social media platforms afford, where virtually anyone with access can instantaneously propagate news, including fake or inaccurate information (Kim, *et al.*, 2021: 2). The dissemination of such misleading news on social media carries significant consequences, particularly when it is perceived as reliable information, thus potentially precipitating adverse effects (Kim, *et al.*, 2021: 2).

Importantly, individuals are inclined to accord credibility to fake news that aligns with their preexisting thoughts or beliefs, even in the presence of evident contradictions or disconfirming evidence (Kim, *et al.*, 2021: 2). Moreover, the demarcation between those who disseminate misleading information and those who originate it can often be blurred, making it challenging to distinguish their roles within the ecosystem of misinformation (Kim, *et al.*, 2021: 2). Furthermore, an intriguing and disconcerting phenomenon in this context is the potential for individuals who consume fake news to transition unwittingly into roles of information propagation, and conversely, those who engage in spreading disinformation to also become consumers of the same (Kim, *et al.*, 2021: 2).

It is salient to acknowledge that cognitive biases wield a substantial influence in both the production and consumption of erroneous information within the realm of social media (Kim, *et al.*, 2021: 2). The propagation of fake news across social media

platforms can engender vaccine hesitancy among readers, as encounters with such misleading content may instil doubts and reservations about vaccine acceptance (Kim, *et al.*, 2021: 2).

2.2.3 Reinforcing attitude-consistent information

Within the realm of information consumption, users exhibit a proclivity for selectively engaging with content that corroborates their existing beliefs, while consciously avoiding information that runs contrary to their convictions, as elucidated by Metzger, Hartsell, and Flanagan (2020: 3). This selective exposure phenomenon manifests as individuals actively seeking and encountering content that aligns with their personal ideologies and opinions (Metzger, *et al.*, 2020: 4). Although numerous digital and internet-based news providers are accessible, the ease of access to news has conferred upon users an elevated degree of discretion in curating the information to which they are exposed (Metzger, *et al.*, 2020: 4).

When confronted with information that challenges their entrenched attitudes, individuals often resort to strategies such as avoidance or selective engagement, either bypassing the information altogether or taking measures to shield themselves from its influence in future encounters (Metzger, *et al.*, 2020: 4). This predilection to engage primarily with information that bolsters preconceived notions while dismissing contradictory perspectives can, in turn, constrain an individual's capacity to apprehend the informational content objectively (Metzger, *et al.*, 2020: 4).

Although the utilization of independent news sources could potentially enable a more balanced information diet, such equilibrium is contingent upon individuals taking the initiative to diversify their information sources, an endeavour that, regrettably, many do not actively pursue (Metzger, *et al.*, 2020: 4).

Furthermore, individuals who consume news exhibit a propensity to disseminate information that harmonizes with their preexisting opinions and ideologies (Metzger, *et al.*, 2020: 4). In this context, the alignment between a news article's headline and the reader's ideological stance amplifies the likelihood of them engaging with the content, and it may even lead to an exclusive reliance on attitude-consistent news sources (Metzger, *et al.*, 2020: 4). This inclination for attitudinal consistency and the

desire to avert cognitive dissonance, as posited by Festinger (1957, cited in Metzger, *et al.*, 2020: 4), underscores the preference for congruence between attitudes and behaviour. Nevertheless, it is pertinent to note that although consumers may prefer information that reinforces their existing attitudes, there exists no empirical substantiation of a direct link between attitude-challenging information and psychological discomfort (Metzger, *et al.*, 2020: 4).

Indeed, the notion that individuals actively avoid knowledge that induces discomfort lacks empirical validation (Metzger, *et al.*, 2020: 4). Beyond these perspectives, several theoretical frameworks, including the "information processing theory, social identity theory, the theory of motivated reasoning, mood and emotion, and information quality or credibility," have been posited to elucidate the phenomenon of selectivity in information seeking (Metzger, *et al.*, 2020: 4).

Users who exhibit selectivity in their information consumption patterns have also demonstrated a tendency to prematurely discontinue engagement with information and dismiss its credibility if they harbour doubts about its veracity, rather than embarking on independent fact-checking endeavours, as observed in the research of Metzger, Hartsell, and Flanagin (2020: 5). Even when encountering content that may be misleading or factually incorrect, individuals may embrace it, driven by the inclination to fortify their preexisting values. This is partly attributable to a cognitive bias wherein individuals perceive articles that align with their convictions as authentic and truthful (Metzger, *et al.*, 2020: 5).

Historically, early analyses of the selective exposure phenomenon yielded inconclusive findings, with some research indicating a preference for information congruent with one's attitudes, while others failed to establish a consistent pattern of avoidance or pursuit of attitude-consistent sources (Metzger, *et al.*, 2020: 5). However, it is crucial to contextualize these earlier investigations within a media landscape characterized by fewer information sources and a more prevalent presence of impartial news coverage (Metzger, *et al.*, 2020: 5). Recent studies, in contrast, have discerned a consistent preference for partisan selective exposure among news consumers (Metzger, *et al.*, 2020: 5).

The discernible prevalence of the selective exposure phenomenon in online environments can be attributed to users' augmented control over the sources and content to which they are exposed, coupled with the proclivity of many online political media platforms to align themselves with specific ideological orientations to maintain readership (Metzger, *et al.*, 2020: 6). This empirical reality lends support to the existence of political selective exposure, a phenomenon substantiated by empirical data, particularly within the context of blogging (Metzger, *et al.*, 2020: 6). The selective exposure theory posits that blog readers tend to gravitate toward blogs that align with their political proclivities while eschewing those that do not (Metzger, *et al.*, 2020: 6). Moreover, it is noteworthy that such effects are not confined solely to the realm of blogs, as recent years have witnessed evidence of selective exposure to affirmative political messages across diverse online media platforms (Metzger, *et al.*, 2020: 6).

Additionally, research pertaining to selective exposure illuminates the operation of selection mechanisms within online news consumption, both at the source and message levels (Metzger, *et al.*, 2020: 6). Individuals appear to be influenced by their political predispositions when deciding which news sources to consult and the extent of time they allocate to perusing story content online, operating at both the source and narrative dimensions (Metzger, *et al.*, 2020: 6). When presented with the choice between attitude-consistent and attitude-challenging news stories, individuals demonstrate a proclivity to opt for the former, spending a greater duration reading attitude-consistent narratives (Metzger, *et al.*, 2020: 6). Furthermore, the likelihood of seeking out information is heightened when websites exhibit a consistent ideological tone and are curated by individuals who ardently espouse particular beliefs (Metzger, *et al.*, 2020: 6).

However, despite the empirical substantiation of the selective exposure phenomena, its theoretical underpinnings and mechanisms have not received commensurate attention within research endeavours (Metzger, *et al.*, 2020: 6). Few studies have delved deeply into the causal drivers of selective exposure, despite its pervasiveness in the context of internet news consumption (Metzger, *et al.*, 2020: 6).

The concept of "cognitive dissonance" pertains to the discomfort individuals experience when confronted with inconsistencies between their attitudes and

behaviours or between disparate attitudes they hold (Metzger, *et al.*, 2020: 6). Festinger (cited in Metzger, *et al.*, 2020: 6) expounds upon how individuals are inherently motivated to mitigate or avert cognitive dissonance, a feat that can be achieved through rationalization of beliefs or behaviours, the attenuation of their significance, or the circumscription of information seeking to content that bolsters existing actions or viewpoints.

The nexus between cognitive dissonance and selective exposure has been a longstanding focus of inquiry in both psychological and communication literature, with a particular emphasis on the dynamic wherein individuals gravitate toward information sources that align with their beliefs to evade dissonance (Metzger, *et al.*, 2020: 6-7). Supporting sources that champion opposing ideologies can indeed induce dissonance in one's actions (Metzger, *et al.*, 2020: 6). Furthermore, exposure to information that contradicts one's beliefs, especially when derived from sources or statistics favouring opposing viewpoints, can precipitate cognitive dissonance (Metzger, *et al.*, 2020: 7).

Selective exposure, in this context, functions as a mechanism to alleviate dissonance by enabling individuals to circumvent the discomfort associated with endorsing an attitude-challenging news source or confronting opposing evidence or viewpoints (Metzger, *et al.*, 2020: 7).

The proliferation of articles reinforcing vaccine hesitancy among users may be exacerbated when individuals selectively expose themselves to information that aligns with their preexisting sentiments and ideologies regarding vaccines. This inclination toward vaccine hesitancy may further be amplified by individuals actively seeking out articles that substantiate and validate their reservations concerning vaccination.

2.2.4 Influence of social media

Individuals have the capacity to establish social networks and cultivate social connections with fellow users on the platform commonly referred to as social media (Akram & Kumar, 2017: 347). It is noteworthy that social media exerts a discernible influence, whether consciously or subconsciously, over an individual's daily routines and activities, thereby shaping their behavioural patterns (Akram & Kumar, 2017: 347).

One of the most pervasive effects of social media pertains to the realm of communication, as it has fundamentally transformed the manner in which individuals engage in interpersonal exchanges (Akram & Kumar, 2017: 347). Over the passage of time, there has been an observable trend wherein individuals increasingly rely on social media and mobile communication for their communicative needs, engendering a growing dependence on these platforms (Akram & Kumar, 2017: 347).

In response to this evolving landscape, businesses have actively embraced social media as a means to enhance their performance, leveraging the efficiency gains in communication afforded by social networking (Akram & Kumar, 2017: 347). The advent of social media platforms has ushered in an era where individuals are no longer constrained to a solitary source for news acquisition; instead, they can access a wealth of local and global news through these social media channels (Akram & Kumar, 2017: 347).

However, as people continue to integrate social media and mobile communication into their daily lives, there has been a noticeable increase in addiction to these digital devices, which, paradoxically, has the potential to make life more convenient yet simultaneously more complex (Subramanian, 2017: 70). In the contemporary landscape, communication predominantly transpires through mobile contacts or electronic media platforms, emphasizing the pivotal role played by these technological advancements (Subramanian, 2017: 70).

The proliferation of various digital devices has empowered individuals to keep tabs on the activities and updates of their friends and family across various social media platforms (Akram & Kumar, 2017: 347). This technological progress has necessitated an adaptation to an evolving lifestyle paradigm (Akram & Kumar, 2017: 347).

However, the increasing prevalence of user interaction on social media and through mobile communication channels has, in some instances, led individuals to shy away from face-to-face interactions (Subramanian, 2017: 70). A growing segment of the population appears to find solace in the realm of social media and mobile communication, often opting for these digital avenues over in-person interactions (Subramanian, 2017: 70).

This digital reliance has contributed to a notable decline in interpersonal communication skills, as individuals who are addicted to social media have demonstrated a preference for digital interactions over face-to-face engagements (Akram & Kumar, 2018: 347; Subramanian, 2017: 70). Consequently, society is witnessing a gradual erosion of the aptitude and confidence required for effective face-to-face interactions (Akram & Kumar, 2017: 347; Subramanian, 2017: 70).

The pervasive use of social media has engendered a paradigm shift in daily interactions, leading users to display a reluctance to resort to alternative modes of communication (Subramanian, 2017: 70). The unique dynamics of social media communication have fostered an atmosphere of trust among users, despite the absence of face-to-face encounters, wherein individuals feel free to engage in open and judgment-free dialogue (Subramanian, 2017: 70). This heightened trust in online interactions may be attributed to the inherent uncertainty surrounding the veracity of information exchanged with individuals whom users may never meet in person, making it challenging to discern fact from fiction (Subramanian, 2017: 70).

However, it is important to note that relationships cultivated through social media often lack the robustness and enduring quality characteristic of face-to-face interactions (Subramanian, 2017: 70). Users may perceive these online relationships as requiring less effort and maintenance, potentially contributing to their transient nature (Subramanian, 2017: 70).

The accessibility and ease of use of social media technology have converted users into advocates for the platform, actively promoting its adoption and concurrently diminishing the utilization of alternative communication methods (Akram & Kumar, 2017: 347; Subramanian, 2017: 70). Users commonly perceive social media communication as expedient and convenient, leading them to embrace the concept to avoid isolation and to remain interconnected with others (Akram & Kumar, 2017: 347; Subramanian, 2017: 70).

The influence of social media can extend to shaping individuals' attitudes and behaviours, potentially fostering vaccine hesitancy as users are exposed to prevailing trends and instances of vaccine hesitancy within their social media networks.

2.2.5 Fake news on social media

The phenomenon of fake news and conspiracy theories predates the advent of the Internet (Aldwairi & Alwahedi, 2018: 215). However, in the contemporary digital landscape, an increasing number of individuals are favouring social media as their primary source of information over traditional media channels (Aldwairi & Alwahedi, 2017: 215).

With the expansion of social media user bases, there has been a parallel proliferation of websites disseminating false and misleading information (Aldwairi & Alwahedi, 2017: 215). In the nascent stages of social media, the prevalence of fake news was relatively low, primarily due to the limited number of individuals using these platforms as news sources (Aldwairi & Alwahedi, 2017: 215). However, as the popularity of social media surged, so did the prevalence of fake news, as more users turned to these platforms for real-time information (Aldwairi & Alwahedi, 2017: 215).

Social media platforms have encountered significant challenges in devising effective mechanisms to curtail the spread of fake news within their ecosystems (Aldwairi & Alwahedi, 2017: 216). These platforms grapple with the task of mitigating user engagement with fake news posts, as individuals who interact with such content often harbour genuine interest in the information being conveyed (Aldwairi & Alwahedi, 2017: 216). As the proliferation of fake news intensified, the concept of clickbait emerged as a strategy to capture users' attention and entice them to click on fake news articles (Aldwairi & Alwahedi, 2017: 216).

Technology companies have made efforts to address user concerns related to fake news, but these endeavours have not yielded substantial success (Aldwairi & Alwahedi, 2017: 216). On websites containing false information, the share button facilitates user dissemination of content, with the intention of increasing click-through rates (Aldwairi & Alwahedi, 2017: 216). This widespread sharing of content not only exposes more users to fake news but also harnesses the network effect to propagate such information on behalf of the company (Aldwairi & Alwahedi, 2017: 216). While social media platforms have expressed a commitment to curbing the spread of false

information, challenges persist in effectively addressing this issue (Aldwairi & Alwahedi, 2017: 216).

The prevalence of vaccine hesitancy among social media users may indeed be influenced by the exposure to misleading and counterfeit information, exacerbating their reservations about receiving the vaccine.

2.2.6 COVID-19 Vaccine hesitancy

Due to the rapid proliferation of the COVID-19 virus, the development of a vaccine was initiated as a crucial public health defines measure (El-Elimat, AbuAISamen, Almomani, Al-Sawalha & Alail, 2021: 2). A vaccine serves the purpose of fortifying the body's immune system in its response to the virus, should an individual contract the virus or come into contact with an infected person. However, it is important to note that a vaccine does not serve as a remedy for those already afflicted with the virus, nor does it function as a preventive measure against initial infection (Muric, Wu, & Ferrara, 2021: 2).

With the advent of the COVID-19 vaccine, a plethora of information and discussions regarding its various aspects have been disseminated (Lyu, Han & Luli, 2021: 1). These conversations have played a pivotal role in influencing individuals' decisions regarding whether to accept the vaccine (Lyu, *et al.*, 2021: 1).

On social media platforms, all users are exposed to a mix of both accurate and false information pertaining to the COVID-19 vaccine, granting them the option to either engage in a thorough perusal of the information or merely skim its surface (Pierri, Perry, DeVerna, Yang, Filammini, Menczer & Bryden, 2022: 1).

The formulation of users' perspectives on the COVID-19 vaccine hinges heavily upon their consumption of the abundant information available (Lyu, *et al.*, 2021: 1). It is worth noting that exposure to this information has resulted in a significant number of individuals expressing reservations about receiving the COVID-19 vaccine (Lyu, *et al.*, 2021: 1). As the COVID-19 vaccine became accessible worldwide as part of the global effort to combat the pandemic, a substantial portion of the public exhibited

apprehension regarding the vaccine's potential effects and its constituent components (El-Elimat, *et al.*, 2021: 2).

Interestingly, numerous individuals who have encountered information, whether accurate or not, related to the COVID-19 vaccine online have nonetheless harboured hesitations about personally receiving the vaccination (Pierri, *et al.*, 2021: 1). Those who have undergone the vaccination process and reported less-than-optimal experiences may have shared their negative sentiments on social media, thereby influencing other users' reluctance to undergo vaccination (Lyu, *et al.*, 2021: 2). In such cases, individuals are more inclined to hesitate regarding the COVID-19 vaccine when exposed to an abundance of negative information as opposed to positive information (Muric, *et al.*, 2021: 2).

Individuals who harbour reservations about receiving the COVID-19 vaccine may elect to share the articles they have read on social media platforms, thereby setting off a chain reaction (Muric, *et al.*, 2021: 2). Furthermore, these individuals may advocate against vaccination, potentially swaying others away from receiving the vaccine (Muric, Wu, & Ferrara, 2021: 2). Such influential figures may leverage their social media presence to voice unfavourable opinions about the vaccine, which could dissuade others from pursuing vaccination (Pierri, *et al.*, 2022: 1).

Many individuals find it challenging to navigate the vast volume of information surrounding the COVID-19 vaccine available on social media, leading to a sense of overwhelm and information overload (Muric, *et al.*, 2021: 2). According to social media users, the continuous influx of new information supersedes prior content over time (Lyu, *et al.*, 2021: 2). Users may either forget or never encounter previously presented information, making it increasingly difficult for them to discern the veracity of COVID-19 vaccine-related information encountered on social media. The ever-evolving nature of information on social media perpetuates this challenge (Muric, *et al.*, 2021: 2; Lyu, *et al.*, 2021: 2).

The presence of conflicting information on social media platforms may further contribute to vaccine hesitancy, as users grapple with the question of why discrepant information is being disseminated (Pierri, *et al.*, 2021: 1). Given the diversity of

viewpoints and information encountered by social media users, individuals have had to independently formulate conclusions regarding the COVID-19 vaccine in the absence of a centralized narrative (Pierri, *et al.*, 2021: 1).

The endeavour to facilitate individuals' access to sufficient information for making informed decisions about vaccination is a challenge that health professionals are actively addressing (Hornsy, Harris & Fielding, 2018: 307). Research has demonstrated the presence of a considerable number of individuals who possess misinformation concerning vaccines, information that has not been disseminated by healthcare authorities (Hornsy, *et al.*, 2018: 307). The coexistence of this misinformation alongside accurate information often leaves individuals in a state of hesitancy, ascertaining which information source is authoritative and reliable (Hornsy, *et al.*, 2018: 307).

Online media platforms and interest-based groups have established channels for individuals to share information discouraging vaccine acceptance, rooted in personal convictions against vaccination practices (Mønsted & Lehmann, 2022: 2). These disseminators of information may propagate content that encompasses fake news, asserting their possession of the 'truth' while implicating healthcare professionals as purveyors of misinformation (Mønsted & Lehmann, 2022: 2). The reception of such information can result in confusion as individuals grapple with distinguishing between accurate and false claims (Mønsted & Lehmann, 2022: 2). Publicly accessible platforms may become inundated with information circulated from other sources, engendering a climate of uncertainty and vaccine hesitancy (Mønsted & Lehmann, 2022: 2).

The swift development of the COVID-19 vaccine may induce hesitancy among individuals (Hornsy, Harris & Fielding, 2018: 307). Vaccine hesitancy, when expressed on social media platforms like Facebook, provides a forum for users to discover that their concerns are shared by others and that such concerns are valid (Hornsy, *et al.*, 2018: 307). However, if the information being disseminated is erroneous, users may experience discomfort stemming from the profusion of misleading content encountered on social media platforms (Hornsy, *et al.*, 2018: 307).

The rapid development of the vaccine may instigate hesitancy among individuals. This vaccine hesitancy, as expressed on social media platforms such as Facebook, provides a forum for users to recognize that their concerns are shared by others and validates their reservations towards vaccine acceptance. However, in cases where the information being disseminated is inaccurate, users may experience discomfort due to the inundation of misleading content within the social media environment. Facebook serves as an illustrative example of a platform where users enjoy the liberty to freely post content, thereby wielding influence over public perceptions through their shared postings.

2.2.7 Echo chambers

The gaining of acquiring knowledge and information has experienced a transformation with the advent of online media, as highlighted by Törnberg (2018: 1). Online media platforms, characterized by a lower degree of organization, may allow the dissemination of information and news without stringent verification (Törnberg, 2018: 1). Paradoxically, the digital realm, including social media, has resulted in a diminished sharing of diverse opinions and ideologies among individuals, giving rise to ideological echo chambers where like-minded individuals gather and reinforce their existing beliefs (Törnberg, 2018: 1). Despite the initial aim of social media to facilitate connections, the consequence has often been the clustering of individuals who share similar ideologies and beliefs, potentially leading to a lack of exposure to new information and diverse perspectives (Törnberg, 2018: 1).

Furthermore, social media platforms possess the potential to magnify the spread of fear within the public sphere, with individuals in echo chambers contributing to the amplification of this fear (Kitchens, Johnson & Gray, 2020: 1619). Shared ideologies within these groups can further propagate fear and misinformation (Kitchens, Johnson & Gray, 2020: 1619). Moreover, the repetition of information within these ideologically aligned clusters has the effect of solidifying and strengthening individuals' attitudes toward the shared information (Kitchens, Johnson & Gray, 2020: 1619).

Participating in an ideological echo chamber has the potential to heighten individuals' apprehension and reluctance to accept the vaccine. Those immersed in such echo

chambers may be particularly susceptible to the collective influence of the group, contributing to their vaccine hesitancy.

2.2.8 Filter bubbles

The digital landscape, characterized by online media, facilitates expedited information retrieval for users (Spohr, 2017: 153). Consequently, users often gravitate towards selectively acquiring information aligned with their preferences, inadvertently establishing a pattern within their search history. This pattern results in social media platforms consistently exposing users to content resembling their previous choices, giving rise to what is commonly referred to as a "filter bubble" (Spohr, 2017: 153).

These filter bubbles are perpetuated through the use of algorithms in search engines and social media streams, suggesting content that aligns with the user's past search history and exposure (Flaxman, Goel & Rao, 2016: 299). In essence, users find themselves enclosed within a filter bubble, continually exposed to content that mirrors their established preferences and choices (Flaxman, Goel & Rao, 2016: 299).

As the utilization of social media as a primary source of news and information continues to surge, the manifestations of ideological polarization in information consumption are becoming increasingly conspicuous (Spohr, 2017: 150). This trend is closely intertwined with the emergence of "filter bubbles" and the pressing issue of fake news within contemporary social networks (Spohr, 2017: 150).

Regarding the origins of this escalating ideological polarization in online media consumption, diverse hypotheses have been advanced (Spohr, 2017: 150). One such hypothesis posits that algorithmic curation, which effectively tailors our online interactions, has the effect of confining individuals within echo chambers that reinforce their existing beliefs. This phenomenon plays a pivotal role in propagating fake news and is a principal driver of polarization (Spohr, 2017: 150).

Conversely, the roots of another polarizing factor, which has persisted over time, can be traced back to the domains of psychology and behavioural economics (Spohr, 2017: 150). According to this perspective, behaviours such as selective exposure, confirmation bias, and availability bias contribute significantly to individuals' proclivity

to engage with information that validates their preconceived notions. These cognitive biases are regarded as the primary catalysts for ideological polarization, both in offline and online contexts (Spohr, 2017: 150).

In light of the overwhelming volume of information available, platforms such as Facebook have been intentionally or inadvertently engineered to "enable users' selective attention to information" (Spohr, 2017: 152). Of the two predominant theories, one ascribes culpability to the algorithms employed for curating online experiences (Spohr, 2017: 152). This inclination toward polarization within social networking platforms like Facebook is encapsulated by the concept known as the "filter bubble" (Spohr, 2017: 152).

In this context, a user's online experience operates in a manner that isolates them, presenting content that aligns with their previous online behaviour (Spohr, 2017: 152). The debate surrounding news consumption via social media and the existence of ideological echo chambers pivots on the contention that algorithms are effectively "dictating" the content individuals are exposed to (Spohr, 2017: 152).

Filter bubbles can exacerbate vaccine hesitancy by narrowing an individual's exposure to information, potentially hindering their ability to make an informed decision about vaccination. Engaging in information-seeking within such filter bubbles may further amplify hesitancy without providing the comprehensive information necessary for a well-founded decision.

2.2.9 Perceived threat and coping responses

The cornerstone of public health is vaccination, a practice that has undeniably preserved countless lives (Morstead, Zheng, Sin, & DeLongis, 2022: 1). Nonetheless, despite its vital importance and general societal acceptance, individuals who remain unvaccinated continue to represent a significant threat to public health, as acknowledged by scientists and healthcare experts (Morstead, *et al.*, 2022: 1). The umbrella term encompassing the underlying attitudes and beliefs contributing to individuals' hesitation to receive vaccinations or outright refusal of immunization is referred to as vaccine hesitancy (Morstead, *et al.*, 2022: 1). While not a novel

phenomenon, the COVID-19 pandemic has brought into sharp focus the consequences of vaccine scepticism, emphasizing the critical need to identify key risk factors (Morstead, *et al.*, 2022: 1).

When individuals exhibit vaccine hesitancy, they often perceive the risk of disease as minimal, driven by these risk factors (Morstead, *et al.*, 2022: 1). However, it is essential to explore the role of coping mechanisms that define various responses to the anticipated threat of illness (Morstead, *et al.*, 2022: 1). By examining both the perceived risks, one can gain a deeper understanding of COVID-19 and how individuals cognitively and behaviourally respond to it, thereby shedding light on the intricate interplay between vaccine hesitancy and cognition and behaviour (Morstead, *et al.*, 2022: 1). The perception of risks, including the decision to get vaccinated, is a pivotal component of disease prevention (Morstead, *et al.*, 2022: 1).

Historically, parents have exhibited vaccine hesitancy in large part due to their lack of awareness regarding the potential dangers posed by preventable diseases through vaccination (Morstead, *et al.*, 2022: 1). The perception of a COVID-19 pandemic-related threat to one's own health and the well-being of loved ones has been associated with an increased motivation to seek vaccination (Morstead, *et al.*, 2022: 1). This aligns with previous research conducted during prior epidemics of infectious diseases, such as H1N1, Ebola, and SARS (Morstead, *et al.*, 2022: 1).

This finding is in harmony with two prominent models of health behaviour, namely, the Health Belief Model and the Protective Motive Theory, which suggest that experiencing illness typically heightens one's inclination to take preventive measures (Morstead, *et al.*, 2022: 1). These models take into account threat perception as conveyed through threat appraisal, especially as an iterative process running in parallel with coping mechanisms when a perceived threat influences future behaviour (Morstead, *et al.*, 2022: 2). Therefore, the role of coping mechanisms should also be considered when analysing the influence of threat perception on vaccine hesitancy (Morstead, *et al.*, 2022: 2). The predominant paradigm frequently applies when contemplating their role in addressing health-related beliefs and behaviours during coping responses to threat awareness and what diverts one's attention elsewhere (Morstead, *et al.*, 2022: 2).

This differentiation between approach coping and avoidance coping aligns with the fundamental motives believed to underlie various responses and behaviours (Morstead, *et al.*, 2022: 2). Approach coping involves taking actions to mitigate the impact of perceived threats, which may encompass information-seeking behaviours and help-seeking responses (Morstead, *et al.*, 2022: 2). Conversely, avoidance coping entails efforts to suppress or disregard the existence of a specific threat (Morstead, *et al.*, 2022: 2). Coping strategies, in the absence of coping mechanisms, can be either adaptive or maladaptive, with coping mechanisms often associated with enhanced psychological adjustment and better overall health, especially in the face of persistent threats (Morstead, *et al.*, 2022: 2). While avoidance coping techniques may offer temporary stress relief, they are frequently linked to long-term adverse health consequences and reduced engagement in health-promoting behaviours (Morstead, *et al.*, 2022: 2).

In the context of a persistent threat like the possibility of disease during a pandemic, avoidance behaviours can become maladaptive and hinder efforts to implement preventive measures (Morstead, *et al.*, 2022: 2). Previous research conducted during past infectious disease outbreaks supports this notion. For instance, a study conducted during the 2003 SARS epidemic revealed a higher prevalence of avoidance coping, which was associated with maladaptive behavioural responses rather than adaptive health behaviours (Morstead, *et al.*, 2022: 2). Similarly, coping through avoidance was linked to reduced adherence to recommended preventive measures during the 2009 H1N1 pandemic (Morstead, *et al.*, 2022: 2).

The COVID-19 Pandemic Measures have illuminated a connection between avoidance coping and reduced engagement in healthcare practices (Morstead, *et al.*, 2022: 2). For instance, a study identified a correlation between the adherence to social distancing recommendations and reduced compliance (Morstead, *et al.*, 2022: 2). Conversely, another study demonstrated that the adoption of COVID-19 preventive measures was negatively associated with coping strategies but positively associated with avoidance strategies (Morstead, *et al.*, 2022: 2). Investigations conducted during the H1N1 pandemic found that individuals who predominantly employed avoidance coping strategies in response to concerns about the disease were less inclined to

report having received a vaccination, whereas those who relied more on approach coping mechanisms expressed greater intentions to do so (Morstead, *et al.*, 2022: 2).

Parents can play a role in instilling vaccine hesitancy in their children. There have been numerous instances of vaccine hesitancy during pandemics or disease epidemics, with hesitancy often resulting in avoidance behaviours.

2.2.10 Social media and online communication

"Interactive computer intermediary technology that facilitates the generation of information, ideas, career interests, and various forms of representation through virtual communities and networks" is the encompassing definition of social media (Wong, Ho, Olusanya, Antonini, & Lyness, 2021: 255). This comprehensive concept includes well-known platforms such as Twitter, Facebook, Instagram, LinkedIn, blogs, WeChat, and WhatsApp (Wong, *et al.*, 2021: 255). The integration of social media into our daily lives has profoundly influenced our communication patterns (Wong, *et al.*, 2021: 255).

While there has been ongoing debate regarding its use in medical education, social media initially emerged in the medical field as a platform for information exchange and professional networking (Wong, *et al.*, 2021: 255). The emergence of the novel Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) and its resulting pandemic, known as coronavirus disease-2019 (COVID-19), led to a global health crisis characterized by viral respiratory failure (Wong, *et al.*, 2021: 255). Many nations have implemented "physical distancing" measures to mitigate the spread of the pandemic, often involving limitations on in-person interactions to essential daily activities (Wong, *et al.*, 2021: 255). Consequently, there has been a heightened reliance on social media platforms for work, education, and social interactions. Platforms like Zoom and Microsoft Teams have experienced an exponential increase in user engagement during this period (Wong, *et al.*, 2021: 255).

There exists no infallible mechanism for governing the dissemination and circulation of information on social media platforms (Wong, *et al.*, 2021: 257). In an ideal scenario, all users would employ ethical principles when sharing information (Wong, *et al.*, 2021: 257). However, the reality often diverges from this ideal, especially in times of crisis

(Wong, *et al.*, 2021: 257). The responsibility remains with the users as evaluating the veracity of content before taking action can be a challenging task (Wong, *et al.*, 2021: 257).

This suggests that individuals who do not thoroughly consume the entirety of information presented on social media might make decisions without a comprehensive understanding of the content. This phenomenon is associated with the vaccine hesitancy observed in many individuals due to the information they encounter on social media platforms. Users' decisions regarding vaccination may be swayed by the posts they come across, particularly those shared by close friends and family members.

2.2.11 Buffering effect of social media

The COVID-19 pandemic of 2020 has emerged as a significant global health event, often referred to as the coronavirus pandemic, underscoring the existential risk it poses due to the considerable loss of lives attributed to a longstanding shortage of vaccinations and an initially ineffective global response (Marzouki, Aldossari, & Veltri, 2021: 2). This situation underscores the imperative for an alignment that transcends previous global and intergenerational efforts, necessitating a departure from the trial-and-error phase (Marzouki, *et al.*, 2021: 2). There will not be a second chance, and institutions must be established to ensure future preparedness and avoid the recurrence of such catastrophic events (Ord, 2020, cited in Marzouki, *et al.*, 2021: 2).

The implementation of quarantine measures to curb the virus's spread, while effective in some respects, also has its drawbacks (Marzouki, *et al.*, 2021: 2). Research conducted by the World Health Organization and Qui *et al.* (cited in Marzouki, *et al.*, 2021: 2) has identified various psychological distress factors associated with rigorous quarantine measures, such as panic disorder, anxiety, and depression, particularly in the case of China's stringent protocols (Marzouki, *et al.*, 2021: 2). Brooks *et al.* (cited in Marzouki, *et al.*, 2021: 2) conducted an extensive meta-analysis of the adverse effects of quarantine, including symptoms of post-traumatic stress disorder, confusion, and anger (Marzouki, *et al.*, 2021: 2). Strategies for mitigating these adverse impacts are also discussed (Marzouki, *et al.*, 2021: 2).

Effective recommendations have helped the public comprehend the benefits of altruistic quarantine and provided them with clear, persuasive information to support its ongoing necessity (Marzouki, *et al.*, 2021: 2). Lockdown measures during epidemics have varied in form and intensity worldwide, leading to an unprecedented surge in internet and social media usage compared to the pre-pandemic era (Marzouki, *et al.*, 2021: 2). These impacts have undoubtedly had a psychological impact (Marzouki, *et al.*, 2021: 2).

Social media can play a significant and positive role in this context by providing individuals with a platform to express their thoughts and ideas and engage in more than mere reporting on the issue (Marzouki, *et al.*, 2021: 2). Understanding the buffering effect of social media on individuals' resilience to existential risks or threats is a concept that has not been systematically studied but merits exploration (Marzouki, *et al.*, 2021: 2). Positive perceptions of stress and resilience contribute to this buffering mechanism (Marzouki, *et al.*, 2021: 2).

In the context of COVID-19, a unique psychological paradigm has emerged, with the fear of death and contagion as key elements driving "corona phobia" (Marzouki, *et al.*, 2021: 2). This associated fear represents an impending threat perceived by individuals as the stimulus source draws closer to or moves further from life (Marzouki, *et al.*, 2021: 2). Humans possess an inherent ability to anticipate this threat as they become aware of its proximity or distance, resulting in heightened fear reactions as the threat becomes more immediate (Marzouki, *et al.*, 2021: 2). Such circumstances generate intense anxiety and hinder individuals' ability to construct coherent interpretations of information, often leading to inaccuracies and incompleteness (Marzouki, *et al.*, 2021: 2).

The unpredictability of the COVID-19 pandemic and the associated uncertainty have compounded the challenges people face in making decisions (Marzouki, *et al.*, 2021: 2). The distinction between perceived knowledge and actual knowledge, which has been established in cognitive psychology studies before the advent of social media, remains relevant in situations like existential risks such as the COVID-19 pandemic, where social media usage and real-time knowledge dissemination are expected to grow rapidly (Marzouki, *et al.*, 2021: 2).

The Looming Vulnerability Model (LVM) posits that people's understanding of the proximity of risks and their perceptual dynamics takes the form of probabilistic decisions (Marzouki, *et al.*, 2021: 2). When individuals believe that their distance from a potential threat keeps them safe from negative consequences, their fears and anxieties are expected to diminish rationally (Marzouki, *et al.*, 2021: 2). Understanding this concept is crucial in the context of the COVID-19 pandemic, as it plays a critical role in how individuals perceive and respond to the threat. Social media can serve as a valuable tool for disseminating pertinent information about the pandemic in an accessible manner (Marzouki, *et al.*, 2021: 2).

The Fear Hypothesis suggests that exposure to unknown threats through social media may shift individuals from helplessness to resilience (Marzouki, *et al.*, 2021: 2). Awareness of impending vulnerability, often translated as a "subjective knowledge" of being at the mercy of dynamic threats without adequate protection, may psychologically lead individuals to recognize their limitations (Marzouki, *et al.*, 2021: 2). Increased social and emotional support is typically mobilized by individuals with higher levels of social contact and membership in larger, more complex social networks (Marzouki, *et al.*, 2021: 2). A similar level of support may also be prevalent in virtual environments due to the proliferation of social media platforms (Marzouki, *et al.*, 2021: 2).

The Stress Buffer Model encompasses several functions that can be applied to any online platform, including social media (Marzouki, *et al.*, 2021: 2). It includes pillars such as self-esteem support, information support, diffusion support, sense-based support, support for social group membership, and concrete assistance for disaster victims (Marzouki, *et al.*, 2021: 2). This model posits that individuals' stress levels increase, and their ability to respond appropriately to stressors decreases as they perceive a situation as more severe (Marzouki, *et al.*, 2021: 2). This results in feelings of helplessness and low self-esteem (Marzouki, *et al.*, 2021: 2). However, if the situation is deemed a threat and cannot be completely avoided, it still allows for the implementation of helpful coping mechanisms (Marzouki, *et al.*, 2021: 3).

During a pandemic, individuals may encounter challenges in adapting to and managing the circumstances, characterized by heightened stress levels. This stressful situation may evoke a range of emotional responses, including vaccine hesitancy.

2.2.12 Anti-vaccination infodemic on social media

Vaccination stands as one of the paramount medical breakthroughs of the 20th century, playing a pivotal role in reducing disease incidence and mortality within communities (Germani & Biller-Andorno, 2021: 1). Despite the unequivocal facts and scientific consensus affirming the necessity and safety of vaccines, there has been a decline in immunization coverage, potentially reviving the threat of diseases such as measles (Germani & Biller-Andorno, 2021: 1).

In the contemporary postmodern era, characterized by contentious debates over medical knowledge, the influence of the anti-vaccination movement on the general populace gains particular significance. This is especially pertinent during the global battle against a pandemic, where the development of a dependable vaccine is crucial (Germani & Biller-Andorno, 2021: 2). In managing the COVID-19 pandemic and the associated proliferation of misinformation, the dissemination of accurate information about vaccinations assumes paramount importance (Germani & Biller-Andorno, 2021: 2).

Efforts to comprehend the success of anti-vaccination movements must delve into various contributing factors. Thus far, studies have identified belief in alternative medicine, endorsement of conspiracy theories, moral and religious convictions, personal worldviews, emotional resonance, and distrust in authorities as key determinants shaping the proclivities and engagement levels of individuals with respect to vaccination-related discourse (Germani & Biller-Andorno, 2021: 2).

The digital landscape, particularly the roles and functionalities of social media and the internet, constitutes a focal point of concern in many investigations (Germani & Biller-Andorno, 2021: 2). Anti-vaccination sentiments have found a fertile breeding ground, notably on platforms such as Facebook and Twitter, where sensitive scientific and

medical information with the potential to reach a vast audience is readily available (Germani & Biller-Andorno, 2021: 2).

For instance, in the case of parents who opt against vaccinating their children, a noteworthy pattern emerges (Germani & Biller-Andorno, 2021: 2). Following online research and interactions primarily with sources lacking credible authority, individuals tend to formulate their own opinions (Germani & Biller-Andorno, 2021: 2). In the realm of online discourse surrounding vaccination, a distinct contrast becomes apparent between pro-vaccination groups and agencies, which often draw upon expert opinions and scholarly research in their online communications, and anti-vaccine profiles and online communities that predominantly generate content rooted in personal experiences and beliefs (Germani & Biller-Andorno, 2021: 2).

Consequently, various factors influencing the efficacy of the anti-vaccination movement on the internet come into play, including the adopted rhetoric, frequency of social media engagement, content typology, and emotional resonance (Germani & Biller-Andorno, 2021: 2). Moreover, recent research indicates that Twitter data analysis can serve as a valuable tool for gauging public sentiments related to public health and vaccine resistance (Germani & Biller-Andorno, 2021: 2).

Individuals who hold anti-vaccine views often wield a notable degree of influence on social media platforms, capable of persuading a substantial number of users to disseminate the information they acquire. This propagation of misinformation can substantially contribute to vaccine hesitancy among individuals. In certain cases, parents may opt against vaccinating their children, leading to a shared reluctance toward immunization within the parent-child dyad.

2.2.13 Facebook and anti-vaxxers

According to recent reports, Facebook reportedly performed its own internal investigation to comprehend the growth of vaccine-sceptical content on its site (Center for Countering Digital Hate, 2021:8). These stories claim that Facebook's data scientists found that only 10 out of 638 fifty percent of the information on vaccine reluctance on the population segments platform (Center for Countering Digital Hate,

2021:8). These groups represented various user, group, and page categories that each might contain at least 3 million individuals (Center for Countering Digital Hate, 2021:8).

Facebook also discovered that only 111 unique users contributed half of all vaccine-hesitant content in the population category with the highest vaccine hesitation (Center for Countering Digital Hate, 2021:8). These results support the research that only a small group of committed individuals, the majority of the anti-vaccine propaganda on Facebook is created by anti-vaxxers, although Facebook is probably understating the severity of the issue (Center for Countering Digital Hate, 2021:8).

The internal research conducted by Facebook does not appear to look at the root cause of "vaccine hesitant content" on its site (Center for Countering Digital Hate, 2021:8). This means that posts that share another user's vaccine-related content are credited to the user who shared it rather than the primary source (Center for Countering Digital Hate, 2021:8). Facebook would assign 12,000 shares of an article in this scenario as those individuals who posted an anti-vaccine article from Joseph Mercola's website, rather than Mercola himself (Center for Countering Digital Hate, 2021:8).

This strategy is also consistent with Facebook's failure to perceive the actual relationships between accounts, as seen by the deplatforming of several anti-vaxxers' Instagram profiles while maintaining their Facebook and organisation accounts (Center for Countering Digital Hate, 2021:8).

In a recent analysis titled Malgorithm, the Centre for Countering Digital Hate demonstrated that Instagram's algorithm did not always recognise posts containing content concerning vaccines, and that many of these images did not have such labelled as intended (Center for Countering Digital Hate, 2021:8). Facebook conducted this internal study utilising comparable "Software algorithms," implying that it might have missed a sizable portion of the vaccine unwilling content (Center for Countering Digital Hate, 2021:8). Additionally, it greatly reduces the likelihood that Facebook has created algorithmic ways for separating personal vaccine reluctance

sentiments from the report of organised misinformation about vaccines (Center for Countering Digital Hate, 2021: 8).

2.2.14 Trust, Conspiracy Beliefs, and social media

The rapid and successful mobilization of COVID-19 vaccinations by governments hinges on effective public acceptance. However, factors such as distrust, complacency, and the spread of misinformation have all contributed to vaccine resistance (Jennings, Stoker, Bunting, Valgarsson, Gaskell, Devine, McKay, & Mills, 2021: 1). Trust is paramount in sustaining compliance with public health measures. Regrettably, governments and experts have at times conveyed ambiguous or contradictory advice, eroding public confidence (Jennings, *et al.*, 2021: 1). COVID-19, in addition to being a pandemic, has led to an "infodemic" characterized by a deluge of complex and ever-evolving information, encompassing both facts and falsehoods (Jennings, *et al.*, 2021: 1). The World Health Organization (WHO) has identified vaccination delays as one of the top 10 global health threats of 2019 (cited in Jennings, *et al.*, 2021: 1).

The question of who among the public places their trust in information sources, and whether this trust is influenced by the sources they consult, remains an open inquiry (Jennings *et al.*, 2021). Approximately 72% of Americans and 83% of Europeans rely on the Internet for health information, a trend significantly shaped by the expansion, utilization, and credibility of social media platforms such as YouTube, Facebook, Twitter, and TikTok (Jennings, *et al.*, 2021: 1). Notably, belief in conspiracy theories, anti-vaccination notions, and low confidence in institutions are associated with a higher reliance on social media for health information, though research in this domain has largely depended on small, non-representative samples until now (Jennings, *et al.*, 2021: 1).

Maintaining trust in scientific and healthcare institutions is crucial (Jennings, *et al.*, 2021: 10). Trust in COVID-19 vaccination and perceived personal threats are correlated with increased readiness for state pandemic responses (Jennings *et al.*, 2021: 10). It has been observed that increased vaccine hesitancy is linked to the use of social media platforms, among other factors (Jennings, *et al.*, 2021: 10). This

underscores the potential consequences of vaccine misinformation spread via decentralized platforms with relatively lenient regulation (Jennings, *et al.*, 2021: 10). Among all demographic variables, age and education exhibited the strongest association with vaccine readiness (Jennings, *et al.*, 2021: 10). When there is a lack of trust in the political system, media outlets, and authoritative figures, the proliferation of false information becomes more likely (Jennings, *et al.*, 2021: 10).

The influence of social media on its users is closely associated with vaccine hesitancy. The propagation of inaccurate information through online platforms empowers individuals to question the efficacy and safety of vaccines, thus fostering reluctance to receive vaccination.

2.2.15 Construction and dissemination of information

The sharing of information on social media during crisis situations holds significant importance for both first responders, as it enhances situational awareness, and the general populace, as it facilitates a unified and consistent response to events, as documented in the crisis management literature (Bubendorff, Rizza, & Prieur, 2020: 204). Nonetheless, social media platforms are also recognized as potential breeding grounds for "noise" and the dissemination of false news (Bubendorff, Rizza, & Prieur, 2020: 204).

Considerable research has been conducted on the activity and content shared on social media during crises (Bubendorff, Rizza, & Prieur, 2020: 205). It has been established that social media can significantly aid in fostering accurate situational awareness and facilitating a coordinated, collective response to the crisis (Bubendorff, Rizza, & Prieur, 2020: 205). Despite its extensive exploration in the literature over an extended period, both authorities and users continue to grapple with the authenticity of information disseminated through social media channels (Bubendorff, Rizza, & Prieur, 2020: 205).

The term "social software" encompasses activities such as information sharing and dissemination, connection management, communication, and self-expression, all of

which are facilitated by Web 2.0-based applications designed to harness various forms of interaction and communication processes (Bubendorff, Rizza, & Prieur, 2020: 205).

In times of crisis, the primary function of social media has consistently revolved around the sharing and acquisition of factual information (Bubendorff, Rizza, & Prieur, 2020: 205). Citizens engage in information exchange via social media during crises, while authorities utilize these platforms for official communication, including warnings and public information dissemination (Bubendorff, Rizza, & Prieur, 2020: 205). Furthermore, it has been suggested that utilizing social media as a means to "develop, renovate, or assist in construction" as part of an authority's crisis management strategy can enhance the establishment of trust relationships with the public (Bubendorff, Rizza, & Prieur, 2020: 205).

The information shared on social media during crises is of paramount importance to emergency services, as it enhances situational awareness and enables a unified and coherent response (Bubendorff, Rizza, & Prieur, 2020: 205). Some scholars have introduced the concept of "resilience," defined as "the ability of social groups and communities to recover" from a catastrophe or effectively respond to a crisis in a constructive manner. This concept is considered a crucial factor in achieving social resilience (Bubendorff, Rizza, & Prieur, 2020: 205).

Moreover, social media platforms often serve as vigilant channels for monitoring breaking news events (Bubendorff, Rizza, & Prieur, 2020: 205-206). Notably, the emphasis shifts towards user trajectories and contributor posts during significant events, highlighting the momentum generated by these events compared to typical non-current articles. This shift is characterized by a faster pace of editing and correction and a concentrated focus within a short timeframe (Bubendorff, Rizza, & Prieur, 2020: 206). Additionally, during major crises, new contributors emerge to complement existing sources and disseminate information obtained from alternative sources such as traditional media (Bubendorff, Rizza, & Prieur, 2020: 206).

In various literary and media outlets, user-generated content on social topics is considered a valuable source of information, particularly (Bubendorff, Rizza, & Prieur, 2020: 206). This phenomenon has given rise to the term "citizen journalism," which

encompasses participatory journalism—described as the "active engagement of informed citizens" in the processes of gathering, reporting, analyzing, and disseminating news and information (Bubendorff, Rizza, & Prieur, 2020: 206). However, it is essential to note that this form of journalism tends to emerge predominantly during times of crisis when temporal constraints leave limited space for civic or practical journalism (Bubendorff, Rizza, & Prieur, 2020: 206).

In practice, both traditional media and citizen-generated content on social media mobilize supplementary sources of information during significant events (Bubendorff, Rizza, & Prieur, 2020: 206). They integrate such content into their respective operations to convey comprehensive knowledge about these events (Bubendorff, Rizza, & Prieur, 2020: 206).

Social media platforms have the capacity to disseminate false information, thereby generating what Bubendorff, Rizza, and Prieur (2020: 206) refer to as "noise." This phenomenon is exemplified by Alexander's examination of instances where post-disaster media channels propagated misleading information. Starbird has coined the term "alternative narrative man-made hazard" to describe this effect (Bubendorff, Rizza, & Prieur, 2020: 206). It is evident that individuals tend to view information obtained from social media with scepticism due to its perceived unreliability (Bubendorff, Rizza, & Prieur, 2020: 206). Surveys have revealed a lack of trust in social media platforms among the majority of the population in the UK, particularly when it comes to sources of information, often seen as unreliable, especially during critical moments when rumours and fake news proliferate on social media (Bubendorff, Rizza, & Prieur, 2020: 206).

Studies and case analyses demonstrate the structural processes or assurance systems implemented by social media users to validate the accuracy of the information they disseminate (Bubendorff, Rizza, & Prieur, 2020: 206).

The role of social media as a primary source for staying informed about the latest news and events may contribute to vaccine hesitancy. Misinformation disseminated through social media and online platforms can lead to doubts and reluctance among

individuals. Members of the public may turn to social media as a means to gather additional information about vaccines.

2.2.16 Online Social Endorsement and Covid-19 Vaccine Hesitancy

While vaccine hesitancy has been a persistent issue, it has gained paramount significance in the context of the current Covid-19 pandemic (Chadwick, Kaiser, Vaccari, Freeman, Lambe, Loe, Vanderslott, Lewandowsky, Conroy, Ross, Innocenti, Pollard, Waite, Larkin, Rosebrock, Jenner, McShane, Giubilini, Petit, & Yu, 2021: 2). The gravity of this problem is exacerbated by the extensive loss of life and economic ramifications resulting from the ongoing Covid-19 outbreak (Chadwick, *et al.*, 2021: 2). Pervading disillusionment in the British public's institutions has also led to heightened anxiety (Chadwick, *et al.*, 2021: 2). Vaccine hesitancy predominantly revolves around the vaccination of children, notwithstanding the surge in "anti-vax" movements (Chadwick, *et al.*, 2021: 2).

Distinctive features of Covid-19 vaccine hesitancy, including the rapid transmission rate, relatively high SARS-CoV-2 mortality, diverse symptomatology and infection outcomes, emergence of new virus variants, varying global political responses, and swift vaccine development, necessitate novel public health communication strategies (Chadwick, *et al.*, 2021: 2). In response to the pandemic's early stages, governments and health authorities enacted new regulations and launched public relations campaigns aimed at promoting social distancing (Chadwick, *et al.*, 2021: 2). The second phase, which commenced in December 2020 with the issuance of emergency licenses for the first vaccines, prioritized behaviour modification to curb the spread of the virus among high-risk populations (Chadwick, *et al.*, 2021: 2). Furthermore, long-term immunization success hinges on behaviour modification (Chadwick, *et al.*, 2021: 2).

During the early stages of the pandemic, a vast array of misinformation and conspiracy theories proliferated widely through online platforms and personal messaging systems, which, to some extent, undermined adherence to social distancing regulations (Chadwick, *et al.*, 2021: 2). Furthermore, government-related factors such as confusion, delays, and inconsistent messaging have contributed to this issue. The

vaccination rollout, up to mid-2020, exhibited a similar pattern (Chadwick, *et al.*, 2021: 2).

For example, false claims about the demise of a participant in an early vaccine trial, disseminated online and subsequently debunked by organizations like Full Fact and BBC News, proved entirely unfounded (Chadwick, *et al.*, 2021: 2). The influence of a minor political movement known as "COVID denial" has extended to right-wing populists, climate science deniers, and protests outside of healthcare facilities, indirectly affecting mainstream media reporting and social media platforms (Chadwick, *et al.*, 2021: 2). The persisting crisis and its unpredictability may impede efforts to dispel myths surrounding the safety and efficacy of Covid-19 vaccines, potentially jeopardizing long-term population-level immunity objectives (Chadwick, *et al.*, 2021: 2).

Vaccine hesitancy is a manifestation of the broader social information challenge (Chadwick, *et al.*, 2021: 2). The overall success of vaccination programs hinges on the dissemination of information regarding vaccine safety and efficacy, as well as the relationships cultivated with the general public (Chadwick, *et al.*, 2021: 2). The landscape of information production, distribution, and consumption has undergone significant transformations due to advancements in media systems (Chadwick, *et al.*, 2021: 3). There is increased competition for audience attention (Chadwick, *et al.*, 2021: 3), and the control over the news agenda by traditional elites is diminishing (Chadwick, *et al.*, 2021: 3).

Social media platforms are routinely utilized by political activists, prominent and less-known individuals, "soft news" outlets, fact-checking organizations, social media influencers, and occasionally engaged citizens to exchange ideas, amplify news, and express opinions. These platforms also serve as whistleblowing channels and platforms for establishing codes of conduct (Chadwick, *et al.*, 2021: 3). Concurrently, professional journalists incorporate the content generated by these diverse actors into their routine reporting (Chadwick, *et al.*, 2021: 3).

To comprehend how individuals encounter and react to information from civil society, it is essential to explore online social interactions (Chadwick, *et al.*, 2021: 3). People's

attitudes toward previous vaccines can often be discerned through their endorsements or discouragements shared on social media, influencing the decisions of others (Chadwick, *et al.*, 2021: 3).

Access to reliable, authoritative, and responsible sources of scientific knowledge for the public is contingent upon the media landscape (Chadwick, *et al.*, 2021: 3). Media literacy holds particular importance because individuals employ media as a tool for persuasion when utilizing social media, thereby influencing online discourse and social perceptions (Chadwick, *et al.*, 2021: 3). Public health communication strategies must grapple with the decentralization of media systems, which have become increasingly competitive and influential compared to a decade ago (Chadwick, *et al.*, 2021: 3). Fewer individuals now rely on traditional news outlets and PR campaigns for information on healthcare (Chadwick, *et al.*, 2021: 3-4).

The influence of media extends to shaping public service regulations in the United Kingdom, particularly concerning broadcast content and information quality (Chadwick, *et al.*, 2021: 4). Private mainstream media and the press continue to exert a significant influence in areas where regulations pertaining to criminal and illegal speech are currently absent. However, the regulatory framework for these entities has considerably weakened, while social media platforms and private messaging services have become prominent (Chadwick, *et al.*, 2021: 4). Information flow is not solely determined by individual actions but also by corporate terms of service, "community standards," and proprietary algorithms (Chadwick, *et al.*, 2021: 4). Personal chat applications, which are largely encrypted, fall outside the purview of regulation unless structural changes are implemented (Chadwick, *et al.*, 2021: 4).

The proliferation of information from non-scientific or health authorities is facilitated by personal messaging systems and social media, leading to the rapid dissemination of such information (Chadwick, *et al.*, 2021: 4). Notably, previous studies have identified Facebook and Twitter as prominent platforms for the anti-vaccination movement (Chadwick, *et al.*, 2021: 4). This movement has subsequently expanded its presence to encompass YouTube, Instagram, and private messaging applications like WhatsApp (Chadwick, *et al.*, 2021: 4). The COVID-19 pandemic has further accelerated the growth of the anti-vaccination movement (Chadwick, *et al.*, 2021: 4).

Nevertheless, a significant portion of the population still relies on specialized news sources through radio and television news outlets (Chadwick, *et al.*, 2021: 4). During the early stages of the pandemic, residents of the United Kingdom turned to established information sources, with the national broadcaster BBC being the most widely consumed (Chadwick, *et al.*, 2021: 4). However, access to mainstream news declined in 2020 as social media usage increased (Chadwick, *et al.*, 2021: 4). By the end of 2020, nearly 49% of the general population reported using social media as a source of news and information about COVID-19 (Chadwick, *et al.*, 2021: 4). This underscores the diverse role that various media platforms play in delivering a wide array of online content to individuals (Chadwick, *et al.*, 2021: 4).

The demarcation between "social media" and "mainstream media" oversimplifies the complexity of contemporary media consumption patterns among audiences (Chadwick, *et al.*, 2021: 4). There exists a recursive loop in which misinformation about vaccines spreads on social media and subsequently garners media coverage (Chadwick, *et al.*, 2021: 4). While much of the health information disseminated on social media originates from the top-down flow initiated by professional media outlets, horizontal networks of human interactions have the capacity to reach a broader audience (Chadwick, *et al.*, 2021: 4).

Notably, reputable media previously featured unethical research that erroneously linked the MMR vaccine to autism, which significantly contributed to vaccine hesitancy, despite this being ultimately debunked as a scientific falsehood (Chadwick, *et al.*, 2021: 4). However, social media has played a pivotal role in sustaining the public infrastructure for the dissemination of misleading anti-vaccine narratives (Chadwick, *et al.*, 2021: 4). A news article's visibility and user endorsement can be greatly influenced by the enthusiastic reception it receives from social media users (Chadwick, *et al.*, 2021: 4).

Many individuals perceive the number of likes, comments, and the frequency of article sharing as more indicative of credibility than the editorial decisions made by news outlets (Chadwick, *et al.*, 2021: 4). Negative tweets about articles can diminish both their legitimacy and their perceived significance in comparison to news headlines (Chadwick, *et al.*, 2021: 4). Due to vaccination regulations, parents who hold negative

views within their social network may face obstacles in vaccinating their children in a timely manner (Chadwick, *et al.*, 2021: 4). Consequently, social support topics hold prominence in individuals' online media feeds (Chadwick, *et al.*, 2021: 4).

Online exposure to support is more prominently available on social media and within private messaging platforms; however, these channels are also inundated with a substantial volume of false information and conspiracy theories, highlighting the possibility of varying media diets exposing individuals to diverse combinations of vaccine-related information (Chadwick, *et al.*, 2021: 4).

Over the past decade, attitudes toward news consumption have evolved, moving away from the era of predominantly popular radio and print with relatively uniform audiences (Chadwick, *et al.*, 2021: 4). The advent of social media and the "news finds me" approach have led many individuals to prioritize their online social networks of friends and acquaintances over actively monitoring traditional news sources (Chadwick, *et al.*, 2021: 4). This shift reflects a certain degree of political disengagement (Chadwick, *et al.*, 2021: 4), which is associated with decreased vigilance in information scrutiny, potentially rendering individuals more susceptible to false information and reducing their willingness to receive vaccinations (Chadwick, *et al.*, 2021: 4).

Within the framework of the media diet, an individual's stance on and support for vaccination may be influenced by the news finding them rather than them actively seeking out news (Chadwick, *et al.*, 2021: 4). Consequently, individuals who passively seek accurate information may be more likely to encounter baseless rumours from their online acquaintances' network than to access reports from reputable sources, engage in discussions surrounding these rumours, and seek guidance from their peers (Chadwick, *et al.*, 2021: 5).

Low-status beliefs and perceptions of potential status threats exhibit an association with the widespread propagation of conspiracy theories (Chadwick, *et al.*, 2021: 5). This phenomenon is further correlated with a sense of powerlessness in influencing societal and political events, although such feelings of powerlessness do not extend to one's personal life or interpersonal relationships (Chadwick, *et al.*, 2021: 5).

While it is not unusual for individuals to hold certain conspiracy theories related to COVID-19, it is essential to gain insight into the underlying sentiments of mistrust toward public institutions and the perplexing behaviour exhibited by governments during the crisis (Chadwick, *et al.*, 2021: 5). These sentiments may also contribute to individuals' advocacy for and dissemination of conspiracy theories (Chadwick, *et al.*, 2021: 5).

A prevailing notion in some circles suggests that the pandemic resulted from a "covert conspiracy" orchestrated by influential groups. This misleading narrative promotes the false belief that "unsafe" or "unnecessary" vaccines were deliberately introduced to manipulate the landscape of interpersonal communication, necessity, and political objectives (Chadwick, *et al.*, 2021: 5).

An individual's media consumption patterns exert a considerable influence on the information they assimilate. Exposure to a higher volume of anti-vaccine messages or affiliations may prompt a user to confront conflicts or amend their preexisting beliefs, potentially fostering vaccine hesitancy. Furthermore, individuals who adopt a passive stance, believing that pertinent information will naturally reach them, are susceptible to encountering false information under the presumption that they were intended to be informed. Moreover, when users participate across multiple social media platforms, they become exposed to a diverse array of information, encompassing both divergent and congruent perspectives. This amalgamation of knowledge could engender reluctance toward vaccination, as individuals may encounter contradictory or misleading information amidst their diverse online interactions.

2.2.17 Vaccine Hesitancy, Confidence, and Public Engagement

WHO reported on 27 September 2023 that there have been 770,875,433 confirmed cases of COVID-19, including 6,959,316 deaths and a total of 13,505,262,477 vaccine doses have been administered. Effective containment measures, such as mask-wearing and social distancing, have contributed to managing the pandemic. However, the linchpin for long-term pandemic prevention and control lies in widespread vaccination efforts (Hou, *et al.*, 2021: 2).

The COVID-19 pandemic has triggered substantial responses worldwide, significantly influencing vaccine development (Hou, *et al.*, 2021: 2). By mid-2020, multiple vaccine candidates, including those from Oxford/AstraZeneca, Sinopharm, Sinovac, BioNTech/Pfizer, and Moderna, had progressed to Phase III clinical trials, with some completing these trials by the end of 2020 (Hou, *et al.*, 2021: 2).

Partial vaccine utilization was authorized in China, England, and the United States until December 2020 (Hou, *et al.*, 2021: 2). To ensure comprehensive immunization coverage, governments must undertake efforts to bolster public confidence, address vaccine hesitancy, and implement community engagement initiatives in the deployment of COVID-19 vaccines (Hou, *et al.*, 2021: 2).

Despite the undeniable effectiveness of vaccines in reducing the global disease burden and mortality rates, various concerns have significantly eroded public confidence in vaccination efforts (Hou, *et al.*, 2021: 2). The erosion of trust in vaccines and the prevalence of uncertainty can have adverse consequences, including delays, refusals, interruptions in research and distribution programs, and, at times, resurgences of disease outbreaks (Hou, *et al.*, 2021: 2).

In recognition of the escalating issue of delayed vaccination, the World Health Organization (WHO) designated it as one of the top 10 threats to global health in 2019, a trend that has been on the rise over the past decades (Hou, *et al.*, 2021: 2). Reasons behind vaccine hesitancy are multifaceted and encompass emotional, cultural, social, spiritual, and political dimensions, with variations observed from one nation to another (Hou, *et al.*, 2021: 2).

Reports indicate that a notable percentage of caregivers exhibit reluctance to vaccinate their children, with figures such as 45.8% in France (2016), 31.8% in the USA (2014), 24.6% in Italy (2017), and 23% in Brazil (2016) (Hou, *et al.*, 2021: 2). Furthermore, the extent of vaccine hesitancy among healthcare professionals varies by country, spanning from 2% to 16.5% (Hou, *et al.*, 2021: 2). The rapid development of COVID-19 vaccines has given rise to additional public concerns regarding their efficacy and safety (Hou, *et al.*, 2021: 2).

Much like other circumstances, scepticism surrounds the COVID-19 vaccination due to several factors, including the novelty of the disease, the politicization of vaccines, mistrust of experts and government institutions (Hou, *et al.*, 2021: 2). In preparation for the introduction of a COVID-19 vaccine, public assessment becomes imperative to instil trust and ensure widespread acceptance (Hou, *et al.*, 2021: 2).

The sentiments of the public regarding the COVID-19 vaccine are rapidly evolving, offering opportunities to propagate health communication and wellness promotion messages via social media. The wealth of real-time data available on social media platforms can be harnessed for this purpose (Hou, *et al.*, 2021: 2). Contrasting with conventional surveys, social media listening not only tracks public sentiments in real-time but also examines how these sentiments are disseminated and covered by the media (Hou, *et al.*, 2021: 2).

Given the increased use of social media for personal communication, public engagement provides insight into the presentation of various messages, including those concerning COVID-19 vaccination (Hou, *et al.*, 2021: 2). While previous research employed surveys to gauge the universal acceptance of the COVID-19 vaccine, it remains unclear how these viewpoints reached the broader public (Hou, *et al.*, 2021: 2).

Generally, social media users residing in high-level metropolitan areas experiencing the stresses of the COVID-19 pandemic have exhibited relatively elevated levels of vaccine hesitancy (Hou, *et al.*, 2021: 8). Specifically, only 36% to 50% of Twitter users, predominantly located in New York and London, have expressed willingness to accept the COVID-19 vaccination, in stark contrast to the over 80% acceptance rate observed in non-metropolitan regions (Hou, *et al.*, 2021: 8).

The behaviour of social media users on these platforms appears to correlate with their reservations regarding vaccination. Those who consume more information are more likely to express hesitancy than their counterparts with lower information consumption. This hesitancy is often attributed to the recent development of the COVID-19 vaccine, which tends to increase individuals' reluctance when compared to other established vaccines.

2.2.18 Media usage and social media use during COVID-19

Public health interventions implemented in response to the COVID-19 pandemic and aimed at mitigating its severe repercussions have incurred substantial costs (Allington, McAndrew, Moxham-Hall, & Duffy, 2021: 2595). In addition to the loss of life, a significant portion of the population has also suffered economic hardships, and a notable deterioration in mental health has been observed (Allington, *et al.*, 2021: 2595). A pivotal component of the global strategy to combat the pandemic is the mass immunization campaign against the causative virus, SARS-CoV-2 (Allington, *et al.*, 2021: 2595).

However, achieving substantial immunization coverage is imperative before population-level benefits can be realized (Allington, *et al.*, 2021: 2595). Consequently, vaccine acceptance plays a crucial role since it directly impacts the future utilization of the SARS-CoV-2 vaccine (Allington, *et al.*, 2021: 2595). It has been discerned that the prevalence of COVID-19 misinformation, particularly online, has given rise to an "infodemic" that hinders efforts to combat the pandemic (Allington, *et al.*, 2021: 2595).

Online platforms have witnessed the dissemination of conspiracy theories and false information about COVID-19 at an alarming rate of 27.5%. The most viewed YouTube videos on this subject have garnered a staggering 60 million views (Allington, *et al.*, 2021: 2595). Furthermore, a significant portion of the most popular COVID-19 videos on YouTube has been found to contain inaccurate information, despite their popularity. This highlights that politically manipulated COVID-19 videos generate more engagement on YouTube compared to other video-sharing platforms (Allington, *et al.*, 2021: 2595).

Research has been conducted concerning the proliferation of deceptive COVID-19 videos on platforms like YouTube, prompting Facebook to introduce alerts to users when sharing such content on its site. YouTube has also grappled with the issue of these misleading videos, albeit less frequently (Allington, *et al.*, 2021: 2595). This problem is not novel; even before the onset of the COVID-19 pandemic, similar misleading information was prevalent. In 2017, a study indicated that 65% of college-aged individuals who viewed YouTube videos related to vaccinations expressed

opposition to them. Our research findings indicated that posts expressing anti-vaccination sentiments were more likely to be shared on Twitter, thereby attracting a larger audience (Allington, *et al.*, 2021: 2595-2596).

Nevertheless, the global crisis prompted by COVID-19 has sparked discussions about the roles and responsibilities of the public within the news ecosystem of social media (as cited in Carlson, Allington, *et al.*, 2021: 2596). A content analysis spanning the last five years has revealed that, despite reporting exhibiting more neutral or positive tones, a staggering 75% of newspaper stories disseminated via traditional media on social media platforms conveyed unfavourable messages about vaccines. Furthermore, 83% of these stories contained erroneous information (Allington, *et al.*, 2021: 2596).

Extensive media coverage of COVID-19 was significantly driven by social media, as evidenced by Kaya (2020: 5). Social media platforms have become increasingly popular venues for user interaction, providing a fertile ground for encountering COVID-19-related information that piqued their curiosity (Kaya, 2020: 5). Previous research has also indicated that users' moods and emotional states are often reflected on social media, suggesting that these platforms offer opportunities for online healthcare support and the receipt of social support from one's social network (Kaya, & Bicen, as cited in Kaya, 2020: 3). To anticipate user behaviour and mitigate panic-related incidents, health organizations utilize tools like Google Trends to identify COVID-19-related keywords that users are most likely to search for (Kaya, 2020: 3).

According to Kaya (2020: 4), a critical skill for future leaders will be their ability to effectively navigate and lead through digital platforms. Having a comprehensive understanding of the mechanisms behind the dissemination of misinformation, particularly fake news, can empower leaders to mitigate its impact and limit its reach (Kaya, 2020: 4). Leveraging digital platforms to minimize the likelihood of public concern and anxiety has proven to be an effective strategy in both pandemic and epidemic scenarios (Kaya, 2020: 5). Furthermore, Kaya (2020: 5) suggests that providing support through social media and ensuring the dissemination of reliable, credible information can be instrumental in addressing the physiological effects of COVID-19.

The literature review not only highlights the communicative potential of social media but also underscores its potential influence on users' well-being (Kaya, 2020: 3). As Kaya (2020: 4) discovered, social media activity during the COVID-19 pandemic has had a significant impact on decision-making by authorities and has contributed to heightened public awareness.

Consumers increasingly relied on social media as their primary source of COVID-19 information. However, individuals' platform choices for daily use significantly influenced their perceptions. The extent to which they were exposed to news played a crucial role in shaping their vaccination decisions. Simultaneously, both accurate and misinformation circulated on social media platforms. Exposure to this diverse array of content could potentially lead individuals to adopt new beliefs, possibly resulting in vaccine hesitancy.

Regrettably, the veracity of information circulated on social media is not always guaranteed, with a substantial amount of false content disseminated across online platforms. This pervasive presence of misinformation in digital forums poses a particular challenge, as individuals who have yet to decide whether to receive the vaccine may find themselves increasingly apprehensive due to the abundance of misleading material they encounter.

2.3 THEORETICAL FRAMEWORK

A theoretical framework can be defined as a set of concepts or theories that a researcher establishes and employs in their study, serving as the fundamental underpinning for their research (Varpio, Paradis, Uijtdehaage & Young, 2020: 990). The study in question will incorporate and draw upon the Confirmation Bias Theory, Cultivation Theory, and Selective Process Theory as integral components of its theoretical framework.

2.3.1 Confirmation bias theory

The Confirmation Bias Theory was formulated by Wason (Hallihan & Shu, 2013: 20). In 1960, Wason (1960: 129). undertook an experiment to elucidate that individuals

tend to seek out information that confirms their existing beliefs or preconceptions, as well as information that might disconfirm those beliefs, with the aim of reaching a conclusion based on the entirety of available information. The presence of evidence, whether supportive or contradictory to an individual's preconceived notions, exerts a significant influence on how that individual formulates conclusions based on the information presented (Wason, 1960: 129). Wason's research findings suggested that having evidence or information alone holds limited value for individuals (Wason, 1960: 129). In his research, Wason (1960: 129) investigated how individuals arrive at conclusions when presented with various factors that could potentially influence them, thereby testing the extent to which the accuracy or irrelevance of information impacts their ability to draw conclusions.

Confirmation bias can be defined as the cognitive tendency for individuals to actively seek out information that aligns with and reinforces their pre-existing ideologies or beliefs, while simultaneously downplaying or dismissing information that contradicts or challenges those beliefs or hypotheses (Peters, 2020: 1351). Individuals exhibiting confirmation bias exhibit a propensity to selectively choose information that bolsters their existing mental frameworks and convictions (Peters, 2020: 1351). They may invest considerable effort in actively seeking out information that aligns with their mindset and beliefs (Peters, 2020: 1351).

It is noteworthy that individuals influenced by confirmation bias may expend substantial time and energy in their quest for selective information, yet their efforts may yield limited amounts of corroborative evidence (Peters, 2020: 1352). In such instances, individuals may regard the scant information they have gathered as sufficient evidence to substantiate their beliefs, even when there may be a preponderance of evidence counter to their convictions (Peters, 2020: 1352). The presence of confirmation bias can result in overconfidence, hinder the correction of erroneous mindsets or beliefs, and obstruct the adoption of well-founded convictions (Peters, 2020: 1352).

When an individual encounters information that corroborates their pre-existing ideologies or beliefs, it often leads to a heightened sense of self-assurance (Peters, 2020: 1352). Such individuals tend to engage in a selective and biased approach to

processing information, which can be characterized as incomplete (Peters, 2020: 1352). This cognitive phenomenon known as confirmation bias is marked by a strong inclination to interpret information in a manner that aligns with one's established viewpoints and theories, thereby reinforcing preconceived notions (Peters, 2020: 1352).

Confirmation bias can be understood as a cognitive mechanism through which an individual's ideologies and beliefs shape their information selection, acquisition, and evaluation processes (Peters, 2020: 1353). This cognitive bias can be further categorized into two distinct forms: motivated confirmation bias and unmotivated confirmation bias (Peters, 2020: 1353).

Motivated confirmation bias involves a deliberate and conscious bias in processing information to bolster a viewpoint that the individual desires to be accurate, often resulting in incomplete or selective information processing (Peters, 2020: 1353). Unmotivated confirmation bias, conversely, pertains to a situation in which incomplete or selective information is encountered, affirming pre-existing beliefs or ideologies without the individual actively seeking out such information (Peters, 2020: 1353).

Individuals tend to exhibit a propensity, whether consciously or subconsciously, to actively seek out information that aligns with and validates their pre-existing beliefs and ideologies (Peters, 2020: 1353-1354). In the realm of social media, users are often observed to dismiss or overlook any information that contradicts their firmly held beliefs (Peters, 2020: 1354).

The existence and implications of confirmation bias have sparked debates among scholars and individuals alike. Some firmly assert the reality of confirmation bias, contending that individuals have a predisposition to steadfastly adhere to their beliefs and ideologies, resistant to change even in the face of compelling evidence (Peters, 2020: 1354). Conversely, there are those who argue that confirmation bias may not be an inherent cognitive phenomenon for all individuals, asserting that with the presentation of sufficient evidence and a well-structured explanation, individuals can be swayed to alter their opinions (Peters, 2020: 1354).

Individual responses to information and evidence are varied. Some individuals exhibit a steadfast commitment to their beliefs and ideologies, even in the absence of concrete evidence to support them. Others may be more open to altering their perspectives if they are presented with reasonable and compelling evidence (Peters, 2020: 1354).

Interestingly, research suggests that individuals are often less inclined to challenge their own perceptions and beliefs but are more willing to engage in debates or arguments when confronted with opposing viewpoints held by others (Peters, 2020: 1355). This tendency leads individuals to vehemently contest ideologies and beliefs that diverge from their own, often asserting the superiority of their own viewpoints when presented with alternative perspectives (Peters, 2020: 1355).

Assessing whether individuals in the research study are exhibiting confirmation bias is crucial for gaining a deeper insight into how Facebook users engage with and respond to news posts related to the COVID-19 vaccine. The study aims to discern the specific manifestations of confirmation bias preferred by users. Individuals who hold strong convictions regarding their own beliefs and ideologies are more likely to engage in debates with those who hold differing viewpoints and may seek to influence others with their own ideologies.

If an individual is unwilling to consider information that contradicts their existing perspective, the quantity of information presented becomes inconsequential, as they will continue to disregard it. For individuals who harbour hesitancy towards receiving the COVID-19 vaccine, the information they encounter may either reinforce their favourable inclinations towards vaccination or further solidify their reservations. Consequently, individuals may feel compelled to participate in discussions on Facebook's COVID-19 vaccine posts, aligning their comments with their deeply held beliefs and ideologies. This dynamic highlights the presence of confirmation bias in their interactions with such content.

2.3.2 Cultivation theory

The Cultivation Theory, originally formulated by Gerbner (cited in Mosharafa, 2015: 23), was further developed in collaboration with Gross in 1976 (Gerbner & Gross, 1976: 173). It underscores the significant role played by an individual's environment in the process of learning and assimilating information (Gerbner & Gross, 1976: 173). Various forms of symbols, images, symbols, and characters are employed to aid individuals in their comprehension and meaning-making endeavours (Gerbner & Gross, 1976: 173). The advent of new technology has greatly facilitated the dissemination and utilization of information (Gerbner & Gross, 1976: 173).

Television serves as a prime example of mass-produced message dissemination and information generation (Gerbner & Gross, 1976: 173). Research endeavours have been undertaken to explore how the content displayed on television, which individuals consume, impacts their perceptions and understanding of the information presented (Gerbner & Gross, 1976: 174). These studies have revealed that the act of watching television exerts a discernible influence on individuals, with potential outcomes ranging from positive to negative effects (Gerbner & Gross, 1976: 174).

The Cultivation Theory posits that the more time individuals spend immersed in the media environment, the more inclined they are to internalize the social reality as portrayed by the media (Shrum, 2017: 2). In essence, this suggests that individuals who dedicate substantial time to consuming media content may be more inclined to accept the information presented by the media without critically assessing its accuracy or honesty (Shrum, 2017: 2). This theoretical framework implies that prolonged exposure to media may lead to a certain level of dependence, with individuals seeking satisfaction through the consumption of information provided by the media (Shrum, 2017: 2).

The influence exerted by the media is substantial, leading individuals to gradually alter their worldviews and perceptions in alignment with the content they are exposed to (Shrum, 2017: 2). The repetition of certain messages in the media further reinforces their impact on readers or viewers, increasing the likelihood of individuals internalizing and believing the information being disseminated (Shrum, 2017: 2). According to the

Cultivation Theory, the extent of media influence is directly proportional to the amount of time an individual dedicates to consuming media content; those who spend less time on media are less likely to be influenced or may remain unaffected by media messages altogether (Shrum, 2017: 2).

Therefore, the media possesses the capacity to shape and direct individuals' beliefs and ideas, particularly when individuals willingly allow themselves to be influenced by the media. Users who are more receptive to media influence are prone to accepting and adopting the perspectives and ideas conveyed through media channels (Shrum, 2017: 2).

Individuals may develop a routine of consuming the same media sources repeatedly, thereby limiting their exploration of new or diverse media outlets (Shrum, 2017: 3). Media entities strive to cater to the specific interests of their users in order to retain their attention and engagement (Shrum, 2017: 3). Technological advancements have significantly expanded the array of media options available to individuals, but this abundance can also lead to selectivity in media consumption (Shrum, 2017: 4).

The act of consuming media content can have various effects on individuals (Shrum, 2017: 6). Exposure to specific media content has the potential to evoke memories or recollections of personal experiences (Shrum, 2017: 7). Consequently, individuals may choose to consume media content that is predominantly positive or uplifting to avoid triggering any unpleasant memories (Shrum, 2017: 7). Memory-based processing refers to an individual's ability to recollect information that has been stored in their memory (Shrum, 2017: 8). As individuals consume media content, it may prompt the retrieval of stored information, influencing their perceptions and reactions (Shrum, 2017: 8).

On the other hand, online processing entails the real-time analysis and engagement with information while it is being consumed (Shrum, 2017: 9). It involves actively interpreting and processing the information presented in the media as individuals engage with it (Shrum, 2017: 9). This process of active engagement can lead to the formation of new ideologies or the incorporation of additional information into existing cognitive frameworks (Shrum, 2017: 9).

The cultivation theory bears relevance to this study in the context that individuals who are influenced by media sources may exhibit selectivity in their engagement with information pertaining to COVID-19 vaccines. These individuals, under media influence, might undergo shifts in their perceptions and beliefs concerning COVID-19 vaccines, subsequently opting to exclusively engage with content that aligns with their pre-established viewpoints. Repetitive exposure to specific messages regarding COVID-19 vaccines through the media can reinforce this selectivity, prompting individuals to seek out and prioritize content that mirrors their existing beliefs while disregarding alternative perspectives.

Furthermore, individuals who are heavily engaged with media may adopt a passive approach, relying on media outlets to provide them with updates and information about COVID-19 vaccines instead of actively seeking out diverse sources of information. Increased media exposure tends to accentuate selectivity, whereby individuals may limit their information intake to align with the particular narratives they have been exposed to. Consequently, they may become highly discerning regarding the COVID-19 vaccine-related information they choose to consume.

Some individuals might opt to follow prevailing trends and viral discussions related to COVID-19 vaccines, while dismissing posts or content that do not appear to be in line with these trending topics. This selective approach may be driven by the desire to remain informed about the most current developments in the context of COVID-19 vaccines, as influenced by media exposure.

2.3.3 Selective process theory

Cognitive dissonance, as posited by Festinger in 1957, provides insight into the intricate relationship between situational factors and information that shape individuals' cognitive frameworks (Festinger, 1957: 1). People may hold certain beliefs or opinions on a particular subject, yet their cognitive dissonance theory suggests that their actions may deviate from these beliefs to alleviate internal discomfort (Festinger, 1957: 1). This inconsistency between beliefs and actions can be unsettling, drawing attention to the otherwise consistent pattern of behaviour (Festinger, 1957: 2). Some individuals persist in actions or behaviours despite being aware of potential

consequences or punishment, offering a striking example of the complexity of cognitive dissonance (Festinger, 1957: 2).

Notably, individuals do not always succeed in rationalizing or explaining contradictions to themselves, leading to unresolved inconsistencies (Festinger, 1957: 2). Such unresolved contradictions can induce physical discomfort, motivating individuals to seek harmony and reduce psychological dissonance (Festinger, 1957: 2). When confronted with dissonance, individuals actively strive to diminish it and may avoid situations and information that exacerbate this internal conflict (Festinger, 1957: 3).

In contemporary society, where individuals tend to seek out information that reinforces their pre-existing beliefs while avoiding contrasting viewpoints, the prospects for conscious democracy are bleak (Camaj, 2019: 8). The current media landscape offers opportunities for selective exposure, which in turn fosters the creation of ideological echo chambers that pose significant challenges to conscious democratic discourse (Camaj, 2019: 8). News consumers often opt for media outlets that align with their established opinions and preferences, both in online and broadcast formats (Camaj, 2019: 8). Selective exposure continues to influence decision-making even after initial exposure, as long as the audience remains engaged with the information (Camaj, 2019: 8).

To gain a comprehensive understanding of selectivity in information engagement, it is essential to comprehend the underlying processes that drive selective exposure and information processing (Camaj, 2019: 8). The phenomenon of selective exposure involves a systematic bias in the selection of information that deviates from the broader spectrum of readily available information and news (Camaj, 2019: 8). Media consumers frequently gravitate toward media products that align with their existing attitudes and beliefs (Camaj, 2019: 8).

Individuals tend to gravitate toward information that aligns with their pre-existing beliefs while actively avoiding contradictory information that may cause cognitive dissonance or discomfort (Camaj, 2019: 9). This behavioural tendency encourages individuals to seek confirming evidence, reduce cognitive dissonance, and shield themselves from opposing viewpoints (Camaj, 2019: 9). The Adversarial Media Bias

Hypothesis sheds light on why partisans frequently perceive media coverage in a negative light and may lose trust in mainstream media sources (Camaj, 2019: 9). Trust in mainstream media significantly influences individuals' media choices, shaping their exposure to information (Camaj, 2019: 9). These conceptual underpinnings delineate the initial stages of conscious media engagement, framing media as a tool with a specific purpose for information acquisition and consumption (Camaj, 2019: 9).

Contrary to the widespread belief that individuals' opinions are becoming increasingly entrenched, scholarly literature suggests that people prefer to acquire political knowledge to inform public opinion without systematically avoiding opposing perspectives (Camaj, 2019: 9). The Selective Exposure Phenomenon encompasses two components: exploration and avoidance of challenging viewpoints (Camaj, 2019: 9). Most consumers maintain a diverse media diet, consuming content from both supportive and oppositional sources in limited quantities (Camaj, 2019: 9). Individuals who are politically partisan and motivated tend to exhibit a heightened interest in political content across various media platforms (Camaj, 2019: 9). In real-life scenarios, individuals' media consumption patterns exhibit significant diversity, and self-reported assessments may overstate ideological exposure, potentially leading to the isolation within echo chambers (Camaj, 2019: 9).

Selective exposure can be comprehended through the lens of the motivated reasoning theory (Camaj, 2019: 9). This theory posits the existence of two distinct types of goals that drive individuals in their pursuit of objectives (Camaj, 2019: 9). Truth-directed goals compel individuals to seek accuracy and attain objective conclusions (Camaj, 2019: 9). These individuals prioritize obtaining reliable conclusions through exposure to information from diverse media sources (Camaj, 2019: 9). Conversely, directionally motivated goals prompt individuals to focus on political cues and heuristics, such as party affiliation and personal preferences, to select information that leads to conclusions they perceive as justified (Camaj, 2019: 9). Individuals with directional goals actively seek information that aligns with their pre-existing attitudes (Camaj, 2019: 9).

Research suggests that individuals with the most extreme political opinions are particularly susceptible to news content from both network and cable television,

highlighting that media influence is largely a product of biased information processing (Camaj, 2019: 9). Motivated reasoning serves as a psychological mechanism that guides the search and selection of messages, as well as the subsequent pattern of information processing following initial exposure. This framework not only elucidates information-seeking patterns but also sheds light on how individuals evaluate evidence and its relationship to their existing attitudes, contingent upon their motivation for knowledge (Camaj, 2019: 9).

Individuals who are driven by the pursuit of correctness tend to engage in more objective and thorough information assessment (Camaj, 2019: 9). Consequently, individuals with directional goals, who scrutinize information more critically, give greater consideration to material that contradicts their beliefs and aligns with them (Camaj, 2019: 9). Driven by directional goals, individuals are motivated to focus on political cues and heuristics, processing and selectively discarding information that contradicts their partisan or biased perspectives (Camaj, 2019: 9).

This perspective underscores the notion that enduring political identities are activated and guided by content, shaping discussions related to denial and information accountability in an automated and frictionless manner (Camaj, 2019: 10). Information processing strategies can be either conscious or unconscious (Taber & Lodge, 2012, as cited in Camaj, 2019: 10). Recognizing and addressing objections and counterarguments demands cognitive effort (Camaj, 2019: 10). When confronted with opposing viewpoints, individuals often prioritize their pre-existing attitudes, and redirecting them from their informed stance frequently necessitates a significant and deliberate intervention (Taber & Lodge, 2012, as cited in Camaj, 2019: 10). Numerous motivational factors and interactions can contribute to distorted information processing (Camaj, 2019: 10).

2.4 CONCLUSION

In the chapter dedicated to the literature review and theoretical framework, emphasis was placed on the significance of establishing a solid foundation capable of providing elucidation and guidance for the research endeavour. Furthermore, the utility of the

literature review and theoretical framework in aiding the research process was elucidated.

Within the theoretical framework segment, a thorough examination and explication of three pertinent theories were undertaken. These theories are poised to play a pivotal role in clarifying the significance of specific aspects, while the constituent elements of the theoretical foundation are poised to enrich the elucidation, explication, and interpretation of data.

Chapter 3 of this work will comprehensively expound upon the intricacies of the chosen research design and methodology. In this section, the rationale behind the selection of the specific research design and the detailed approach taken in the methodology will be thoroughly elucidated and examined. This chapter aims to provide a clear and comprehensive understanding of the framework that guides the study, offering insights into the methodologies employed and their relevance to the research questions.

CHAPTER 3 RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

In chapter 3 it is crucial to understand the research design and methodology section within the study being conducted. Comprehending research design and methodology holds paramount importance in the realm of scholarly inquiry. It serves as the bedrock for the cultivation of rigorous and methodologically sound research endeavours, thereby underpinning the assurance of findings' trustworthiness. Furthermore, a grasp of research design and methodology promote the seamless dissemination and practical implementation of research outcomes.

Chapter 3 will be discussing the research design, unit of analysis, population and sampling, data collection, analysis and interpretation methods, trustworthiness, and ethical considerations. Subsequent to the exposition of the aforementioned themes in Chapter 3, Chapter 4 shall ensue with a comprehensive exploration of data collection, analysis, and interpretation methods.

3.2 RESEARCH DESIGN

The objective of a research design is to delimit the study's scope while delineating explicit concepts, methodologies, and operational procedures. It commences with a primary focus, idea, or theoretical conjecture (Babbie, 2014: 121). The process of designing a study entail making determining the subject of investigation, the demographic under examination, the employed research instruments, and the underlying rationale (Babbie, 2014: 117; Creswell, 2019: 32; Creswell & Poth, 2018: 40). These facets are meticulously premeditated within comprehensive research blueprints and protocols, encompassing all facets from overarching hypotheses to meticulous strategies for data collection and analysis (Alharahsheh & Pius, 2020: 40; Babbie, 2014: 121; Creswell, 2019: 32; Creswell & Poth, 2018: 40).

3.3 METHODOLOGY

Research can be conceptualized as a trajectory of inquiry aimed at addressing prospective issues (Alem, 202: 1). In vernacular discourse, the term "research"

denotes the process of acquiring knowledge (Alem, 202: 1). It can further be characterized as a meticulous and scientific quest for pertinent information concerning a particular subject (Alem, 202: 1). Research, in essence, constitutes a comprehensive investigation or exploration, particularly entailing the pursuit of novel insights within any domain of expertise (Alem, 202: 1). The acquisition of pertinent data for the study and its judicious utilization assumes pivotal importance (Alem, 202: 1).

Within the broader context of a research endeavour, the overarching research blueprint or methodology delineates its execution and, notably, prescribes the methodologies to be employed (Alharahsheh & Pius, 2020: 40). The methodological directives therein explicate how data shall be procured and the manner in which researchers shall derive their conclusions (Alharahsheh & Pius, 2020: 40). Of paramount significance is the selection of the unit of analysis, as it dictates the methodologies to be employed for data collection, analysis, and interpretation (Kumar, 2019: 71).

3.2.1 Unit of analysis

The unit of analysis, as elucidated by Kumar (2019: 70), represents the entity or entity from which a researcher gathers empirical data. It serves as the definitive response to the "what" or "who" dimensions within the scope of the inquiry, thereby encompassing the entire entity under investigation (Kumar, 2019: 71). The ambit of the target population in a research inquiry extends to encompass individuals, as well as groups thereof, organized entities, nations, technologies, and objects (Kumar, 2019: 71). Paradoxically, despite its ostensibly straightforward nature, the selection of the unit of analysis often encounters oversight in research endeavours (Kumar, 2019: 71). A lack of clarity pertaining to the unit of analysis hampers the researcher's ability to effectively demarcate the research problem (Kumar, 2019: 71).

It is worth noting that beyond individuals, who constitute conventional units capable of providing pertinent insights across a spectrum of research inquiries, an array of potential units of analysis exists (Kumar, 2019: 72). Social artefacts are human-made items that serve to achieve a certain expression, interpretation, objective, or desired goals. They might be in the form of objects, representations, assemblages, institutions, knowledge, or conceptual frameworks (Babbie, 2014: 121; Kumar, 2019: 74). Books, newspapers, ads, websites, technological innovations, movies, images, paintings,

outfits, jokes, justifications for students to be late for class, furniture, machines, structures, and other human-made things may all be regarded as social artefacts (Babbie, 2014: 121; Kumar, 2019: 74;).

In the domain of social sciences, the term "cultural artefact" finds frequent application to denote any creation originating from human agency, which serves as a conduit for the manifestation of cultural cognition. This usage is particularly salient within the disciplines of anthropology, ethnology, and sociology (Kumar, 2019: 74).

During the timeframe spanning from May 2019 to June 2022, the investigator systematically collected Facebook content pertaining to the Coronavirus vaccine. This collection process involved capturing screenshots of both the original posts and the ensuing comments on the respective Facebook posts. Subsequently, these captured images were archived within a designated file repository and preserved for future data analysis purposes.

The unit of analysis in this study is the comments on COVID-19 vaccine posts on Facebook, which are classified as social artefacts. Facebook posts are categorized as social artefacts due to their capacity to serve as a robust data repository conducive to the comprehensive comprehension of human behavioural paradigms, social exchange dynamics, cultural intricacies, and communicative trends within the contemporary digital milieu.

3.2.2 Population and sampling

Sampling constitutes an imperative prerequisite in the realm of qualitative research, invariably necessitating deliberations concerning both sample dimensions and sampling configurations (Omona, 2013: 169). These considerations bear significance as they empower qualitative researchers to judiciously discern sample sizes and sampling frameworks congruent with the fundamental objectives of their inquiries (Omona, 2013: 169). Notably, the concept of sampling transcends the boundaries of both general and specialized research paradigms (Omona, 2013: 169).

In instances where the entirety of the population remains either enigmatic or inaccessible, or when research objectives entail the focalization of specific facets germane to a particular research domain, qualitative research resorts to the application of non-probability sampling techniques (Lopez, & Whitehead, 2013: 123).

The population, as defined by Babbie (2014: 116) and Shukla (2020: 2), constitutes the comprehensive ensemble of individuals or social artefacts that forms the subject of scrutiny within a study, with the overarching objective of addressing research inquiries and deriving substantiated conclusions. Consequently, the explication of the problem under investigation necessitates the articulation of a precise delineation of this population (Shukla, 2020: 2).

In the context of the present study, the target population encompasses all remarks and posts pertaining to Covid-19 vaccines disseminated on the Facebook platform during the temporal span of May 2019 to June 2022.

A sample, as per the assertions of Pascoe (2021) and Turner (2019), constitutes a subset derived from the delineated population, thoughtfully selected by the researcher to serve the dual purposes of enhancing data manageability and mirroring the salient attributes characterizing the phenomenon under examination.

The population parameters in this study pertain specifically to two organisations comments posted on Facebook in response to vaccine-related content. The sample size, which consists of 15 Facebook posts from two organisations related to Covid-19 vaccines, will encompass the entire spectrum of user comments associated with these posts. Nonetheless, it is noteworthy that the study will not be contingent upon the presence of an extensive volume of comments within each post. Rather, the researcher intends to scrutinize and analyse these comments comprehensively. Subsequently, the selection process will prioritize those comments that have garnered the highest levels of engagement, as evidenced by responses, or likes.

3.2.3 Sampling method

Purposive sampling, alternatively recognized as purposeful sampling, is a non-probability sampling approach employed with the specific intent of discerning and selecting the most pertinent data elements for a research endeavour, as substantiated by the works of Palinkas, Horwitz, Green, Wisdom, Duan, and Hoagwood (2015: 534) and Pascoe (2021). In the pursuit of this objective, the researcher must purposefully select social artefacts that contain in-depth and intricate insights into the subject matter under scrutiny (Edwards & l'Anson, 2020).

Given that participants occupy pivotal roles marked by their substantial expertise, experiential acumen, or specialized knowledge, purposeful sampling, also recognized as judgment sampling, endeavours to afford data instances that are notably information-laden, thereby facilitating in-depth investigative pursuits (Lopez & Whitehead, 2013: 125). In the application of purposive sampling, the emphasis may be directed towards individuals, specific historical epochs, or delineated geographical locales (Lopez & Whitehead, 2013: 125).

In this study, purposive sampling will be employed to meticulously choose all Facebook posts related to COVID-19 vaccines, generated by the National Department of Health (South Africa) and the World Health Organization (WHO), that have garnered the highest levels of user engagement, as evidenced by the accumulation of likes and comments, spanning the duration of 37 months encompassing the data collection period.

3.3 RESEARCH METHODS

Research constitutes a form of systematic inquiry directed towards the revelation of noteworthy or innovative insights, with the methodologies and procedures employed for research purposes collectively referred to as research methods (Walliman, 2011: 1). As with any undertaking, the degree of meticulousness applied to this endeavour directly shapes the calibre of the outcomes yielded (Walliman, 2011: 1).

Qualitative techniques, anchored in the quest for information quality, are intrinsically designed to probe the underlying rationales and incentives governing human conduct, in addition to elucidating the way individuals construe their encounters and their perceptual lens through which they view the world (MacDonald & Headlam, 2011: 8). Through the exposition of contextual insights, qualitative approaches engender the formulation of concepts germane to the situation under scrutiny (MacDonald & Headlam, 2011: 8).

3.3.1 Data collection, analysis, and interpretation

Qualitative data encompasses descriptive, non-numerical information that defies expression in numerical terms. Predominantly unstructured in nature, this form of data serves as a linchpin for addressing the "how" and "why" inquiries inherent in research

investigations, with data collection methods such as interviews being quintessential examples (Taherdoost, 2021: 11). Researchers employ a gamut of techniques for acquiring qualitative data, including but not limited to audiotapes, sketches, notes, and photographs (Taherdoost, 2021: 11).

Notably, while qualitative data can prove instrumental in eliciting supplementary insights, unravelling new program effects and consequences within research, and ultimately enhancing the quality of quantitative outcomes, its application necessitates a substantial allocation of financial resources, time, and a significant commitment of human resources. Furthermore, it is important to acknowledge that the conclusions drawn from qualitative data may not be readily transferable across different contexts (Taherdoost, 2021: 11).

3.3.1.1 Data collection

The process of gathering information pertinent to a particular study, with the aim of subsequently utilizing this data in the analysis phase to discern the study's findings and address its research inquiries, encompasses various methodologies collectively termed as data collection (Taherdoost, 2021: 10-11).

The data collection phase within the realm of research studies assumes paramount importance as it significantly mitigates the likelihood of subsequent errors in the procedural trajectory, thereby exerting a profound influence on the resultant data quality (Taherdoost, 2021: 11). The significance of this phase is underscored by the inherent challenge of ensuring the accuracy of conclusions when dealing with data that is both limited and marred by deficiencies. Consequently, substantial time and diligence must be invested in securing data outcomes, in conjunction with the development of a robust study design (Taherdoost, 2021: 11).

It is important to note, however, that while a well-conceived data collection strategy undoubtedly aids in research planning, it does not invariably guarantee the overarching success of the research project (Taherdoost, 2021: 11). Therefore, the selection of a data collection method should be preceded by a meticulous determination of the specific data typology requisite for the project's objectives (Taherdoost, 2021: 11). This study will adopt a qualitative content analysis approach for data collection, characterized by the process of discerning prevalent themes within

the amassed data (Shava, Hleza, Tlou, Shonhiwa & Mathonsi, 2021: 553). Qualitative content analysis entails the accumulation of written or spoken materials followed by their categorization predicated on discerned common patterns (Shava, *et al.*, 2021: 553). In essence, this research technique employs a coding mechanism to systematize the collected data and unveil prevailing themes or patterns inherent in textual content (Shava, *et al.*, 2021: 553).

Employing qualitative content analysis offers the distinct advantage of enabling the researcher to engage with the data irrespective of the presence of participants (Shava, *et al.*, 2021: 553). This methodology will be employed to collate Facebook comments and posts concerning COVID-19 vaccines, with the data collection period spanning from May 2019 to June 2022. It is noteworthy that no personal user data will be aggregated. When harnessing qualitative data, the primary emphasis centres on the quality of the data rather than its sheer quantity or voluminous scale (Busetto, Wick & Gumbinger, 2020: 1).

The focus of the data collection was on the comments people made in response to articles posted by specific organizations on Facebook. The researcher ensured to attribute each comment to its respective user without making any changes. To comply with ethical guideline, careful steps were implemented to deidentify users' names, prioritizing ethical considerations and data privacy.

The selection of these organizations was purposeful, driven by their key roles as primary sources of information about vaccines during the specified timeframe. This recognition was based on their significant influence in shaping public discussions and awareness regarding vaccination initiatives.

3.3.1.3 Data analysis and interpretation

Data analysis constitutes the application of methodologies to process the accrued data, thereby engendering an enhanced comprehension of a given phenomenon (Wong, 2008, 14). In the context of this study, the selected data analysis technique is thematic analysis, a variant of textual analysis.

The raw data acquired undergo a transformation during the data analysis phase, metamorphosing into pertinent knowledge and concepts amenable to either qualitative or quantitative interpretation (Alem, 2020: 1). This process necessitates the

deconstruction of intricate components into more manageable constituent parts, followed by their innovative reassembly with the ultimate objective of facilitating interpretation (Alem, 2020: 1).

The term "textual analysis" pertains to the process of characterizing and deciphering meaning within recorded modes of interaction. It involves the separation of information that delineates discernible concepts and subsequently establishing connections or generating context to classify the information, which may then be employed to define or substantiate a given reality (Kleinheksel, Rockich-Winston, Tawfik & Wyatt, 2020: 127).

Textual analysis places emphasis on delving into the underlying philosophical and cultural significance embedded within a text (Arya, 2020: 173). This approach involves a thorough understanding of the language and symbols employed within the text, constituting an integral facet of the textual analysis process that serves to facilitate a more comprehensive apprehension of the text's inherent meaning (Arya, 2020: 173).

Within the realm of textual analysis, the researcher will engage in a meticulous examination of the language employed by Facebook users, with the aim of discerning patterns, associations, and shifts in the textual meaning (This analytical process involves the grouping of data into cohesive clusters to elucidate prevailing trends and developments (Kleinheksel, et al., 2020: 128).

3.3.1.4 Thematic analysis

Thematic analysis represents a qualitative data analysis technique designed to uncover recurring patterns (Kiger & Varpio, 2020: 2). This approach involves the selection of codes and the identification of themes to both depict the data and elucidate the interpretive process (Kiger & Varpio, 2020: 2). Renowned for its adaptability within the context of a study, thematic analysis places a significant reliance on the researcher's ability to discern prevailing trends, noteworthy concepts, and codes within the dataset (Kiger & Varpio, 2020: 2).

Given that the comments within this study are presented in text format, the application of textual or content analysis will aid the researcher in interpreting the data and detecting underlying patterns or recurring trends (Kiger & Varpio, 2020: 2).

Furthermore, this study will employ coding, which entails the process of identifying patterns or recurrent trends within the gathered data by utilizing codes composed of specific words or phrases discernible within the dataset (Linneberg & Korsgaard, 2019: 6).

The study in progress will employ inductive and deductive coding. In qualitative research, there exists a robust tradition of constructing "direct" codes derived directly from the data corpus (Linneberg, & Korsgaard, 2019: 12). Researchers, in this context, formulate codes by drawing from the expressions and terminology employed by the study participants themselves, eschewing the utilization of the researcher's theoretical lexicon (Linneberg, & Korsgaard, 2019: 12).

Reflexive thematic analysis and other methods give tools and strategies that are either non-theoretical or flexible in terms of theory (Braun, & Clarke, 2020: 38). They pick up theoretical presumptions throughout time when used in a specific study (Braun, & Clarke, 2020: 38). Even though methodological writers do not require it, theory must be made explicit for quality practise (Braun, & Clarke, 2020: 38).

The approaches to thematic analysis often allow the possibility of inductive (data-driven) and deductive (theory-driven) coding orientations, capturing both explicit and latent (implicit, underlying; perhaps unconscious) coding schemes and meanings and theme creation, as well as the possibility of some flexibility centred on the theory that underlies the study being conducted (Braun, & Clarke, 2020: 39).

Thematic analysis is frequently considered to be a part of the phenomenological or experiential qualitative research tradition, which is prevalent in research on counselling and psychotherapy (Morrow, 2007, cited in Braun, & Clarke, 2020: 39). This custom focuses on investigating the subjective experiences and sense-making of individuals (Braun & Clarke, 2013; Willig, 2013, cited in Braun, & Clarke, 2020: 39).

A structured codebook is frequently used in coding reliability approaches, which emphasise the measurement of accuracy or reliability while coding data (Byrne, 2021: 1392; Braun, & Clarke, 2020: 39). Themes often emerge relatively early in the analytical process when using a coding reliability approach. Prior to collecting data, themes can be hypothesised based on theory; following data collection, evidence supporting these assumptions can be acquired derived from the data as codes (Byrne, 2021: 1392).

Alternatively, after becoming somewhat familiar with the data, themes can be hypothesised (Terry, *et al.*, 2017, cited in Byrne, 2021: 1392). Themes are frequently mentioned as existing within the data in a positivistic meaning and are typically believed to provide "domain summaries," or "summaries of what participants said in relation to a particular topic or data collection question" (Braun, *et al.*, 2019: 5, cited in Byrne, 2021: 1392- 1393).

It is possible to think of codebook approaches as a kind of middle ground between reflexive and coding reliability approaches (Braun, & Clarke, 2020: 39; Byrne, 2021: 1393). The approaches to coding reliability, codebook approaches make use of a structured codebook and discuss how themes are conceptualised as domain summaries (Braun, & Clarke, 2020: 39; Byrne, 2021: 1393). However, in terms of prioritising a qualitative coding philosophy, codebook systems resemble the reflective approach more. Supporters of codebook methods would tend to reject positivistic notions of coding reliability and instead acknowledge the interpretive data coding is a feature (Braun, *et al.*, 2019, cited in Byrne, 2021: 1393).

The reflexive method of TA emphasises the researcher's active participation in knowledge creation (Braun, & Clarke, 2019, cited in Byrne, 2021: 1393). It is believed that codes convey the researcher's interpretations of the meaning patterns found in the dataset. Reflexive thematic analysis is thought to represent the researcher's interpretation of the data performed at junction of (1) the dataset, (2) the analysis's underlying assumptions, and; (3) The researcher's analytical capabilities and resources (Braun, & Clarke, 2019, cited in Byrne, 2021: 1393).

The data in the study being conducted will be interpreted in a Thematic Analysis approach. Thematic Analysis is a qualitative research method that involves identifying, analysing, and reporting patterns or themes within the data. Thematic Analysis allows researchers to explore the rich, nuanced aspects of qualitative data and gain insights into participants' perspectives. It's a flexible approach that can be adapted to various research questions and contexts.

Data will be collected from Facebook posts on Coronavirus vaccines. The data collected will be sorted into groups that other users have commented or responded more to. Comments will be broken down into relevant and irrelevant data that can contribute to the research findings. Reading the comments made by the Facebook

users, the researcher will determine patterns and themes that are relevant to the research and collect the data.

3.6 CONCLUSION

Methodology refers to the comprehensive research approach employed for conducting a study, encompassing the specific procedures to be followed to align with the designated research plan (Alharahsheh, & Pius, 2020: 40).

The methods elucidated within the methodology section provide clarity regarding the types of data collection approaches to be employed (Alharahsheh, & Pius, 2020: 40). Methodology underscores the nature of the techniques utilized to fulfil the study's objectives, prioritizing this aspect over prescribing a particular method to be adopted (Alharahsheh, & Pius, 2020: 40). Furthermore, it centres on the process of designing the research endeavour rather than specifying the instruments or procedures for executing tasks (Alharahsheh, & Pius, 2020: 40).

The essence and methodology of qualitative research may not readily lend themselves to quantitative analysis (Alharahsheh, & Pius, 2020: 40). Qualitative research endeavours to provide a nuanced comprehension of a phenomenon grounded in the firsthand experiences of individuals, often with a narrower scope (Alharahsheh, & Pius, 2020: 40). Additionally, qualitative research strives for a comprehensive understanding of a specific context through in-depth exploratory investigations, facilitating the discovery of rich insights throughout the research process (Alharahsheh, & Pius, 2020: 40).

Interpretivism places a premium on thorough analysis, acknowledging contextual factors when distinguishing between human experiences and physical phenomena. This approach recognizes that contextual nuances contribute to deeper understandings and underscores that the examination of human experiences differs fundamentally from the study of physical phenomena (Alharahsheh, & Pius, 2020: 41).

Chapter 3 of the study emphasises the critical importance of understanding the research design and methodology section. It serves as the foundation for conducting rigorous and methodologically sound research, ensuring the validity and reliability of findings. A deep understanding of research design and methodology also facilitates the effective dissemination and practical application of research results.

This chapter delves into various essential topics, including research design, unit of analysis, population and sampling, and research methods. Chapter 4 will subsequently explore data collection, analysis, and interpretation methodologies in greater detail.

CHAPTER 4 DATA COLLECTION, ANALYSIS AND INTERPRETATION

4.1. INTRODUCTION

In the previous chapter the data collection, analysis and interpretation methods were identified and described, and were cast against the context of the research design and methodology.

Data collection, analysis, and interpretation play pivotal roles, as they allow the researcher as the research instrument to interpret and give meaning to raw data in the process of creating knowledge. This triad of processes empowers researchers to make judicious decisions, assess the validity of hypotheses, address tangible real-world challenges, and augment the corpus of scientific comprehension across diverse academic disciplines.

In this chapter, the focus is on elucidating the methodologies employed in the actualization of data collection, analysis, and interpretation. Furthermore, the application of the conceptual framework depicted in Figure 4.1 throughout the data coding process, leading to the identification and subsequent delineation of various themes and sub-themes are explained.

4.2 DATA COLLECTION

Fifteen Facebook posts pertaining to the Coronavirus and the COVID-19 vaccine, disseminated between the data collection period spanning from May 2019 to June 2022, were methodically acquired and archived for reference (See Addendum 1 for details). These posts predominantly emanated from the World Health Organisation (WHO) and the National Department of Health (South Africa), the two principal entities maintaining Facebook presence.

The primary focus of data collection was directed toward the commentary generated in response to the online articles posted by these organizations on Facebook. All comments procured from these news posts were ascribed to their respective users without any modifications. In accordance with ethical guidelines expounded upon in

Chapter 3, measures were diligently undertaken to ensure the deidentification of users' names for ethical compliance and data privacy considerations.

The rationale behind the deliberate selection of these organizations within the specified timeframe can be attributed to the peak period in which widespread access to vaccination sites, organized and facilitated by the South African government, was extended to various age groups across South Africa. This initiative was notably augmented by health organizations such as Discovery Health, Clicks, and private health clinics, with concerted efforts being made to encourage public engagement in the vaccination process.

The purposive selection of these organizations was underpinned by their pivotal roles as primary disseminators of vaccine-related information during the stipulated timeframe. This designation was made in recognition of their prominence in shaping public discourse and awareness regarding vaccination initiatives during the specified period.

No personal user data was collected. During the data collection process, an emphasis was placed on the quality of data rather than its quantity or volume, as advocated by Busetto, Wick, and Gumbinger (2020: 1) and Babbie (2014: 28). Additionally, the rationale that qualitative data is intertwined with idiomatic justifications, as per Babbie (2014: 28), was taken into account throughout the data collection phase.

4.3 DATA ANALYSIS AND INTERPRETATION

In the realm of social sciences, investigations commonly portray the aggregate conduct of diverse populations (Babbie, 2014: 13). Frequently, social scientists delve into the determinants influencing human actions, yet they tend to allocate limited recognition to individual actors (Babbie, 2014: 13). Within this context, social scientists are primarily engaged in the construction and interpretation of meanings concerning the patterns within datasets, as opposed to the scrutiny of individual life narratives (Babbie, 2014: 13). The core objective of social scientists resides in comprehending the underlying mechanisms governing human behaviour, rather than providing elucidations of human behaviour to external audiences (Babbie, 2014: 13).

The process of employing various techniques to analyse acquired data with the aim of comprehending a particular phenomenon is formally referred to as data analysis

(Wong, 2008, 14). In the context of this study, textual analysis served as the designated method for data analysis. Textual analysis involves the identification of discernible concepts and their contextual connections, thereby characterizing and elucidating the meanings embedded within documented modes of interaction. This categorization of information serves the purpose of defining or substantiating the outcomes associated with a given phenomenon (Kleinheksel, Rockich-Winston, Tawfik & Wyatt, 2020: 127). Furthermore, textual analysis encompasses an exploration of the underlying philosophical and cultural significance inherent in the text (Arya, 2020: 173). This approach involves a detailed examination of the language and symbols employed within the text, thereby facilitating a more comprehensive comprehension of its intended meaning (Arya, 2020: 173).

The process of identifying recurrent themes within collected data entails the assembly of written or verbal material and subsequent categorization based on shared patterns (Shava, Hleza, Tlou, Shonhiwa & Mathonsi, 2021: 553). Qualitative content analysis, as a research methodology, involves the examination of textual content to discern underlying themes or patterns and the utilization of coding techniques to systematize the amassed data (Shava, *et al.*, 2021: 553).

An advantageous aspect of employing qualitative content analysis is that it permits researchers to engage with the data, irrespective of the physical presence of participants (Shava, *et al.*, 2021: 553; Babbie, 2014: 28). It is imperative to recognize that in qualitative research, the researcher effectively becomes the research instrument, with data collection, analysis, and interpretation processes often interwoven and interdependent (Nowell, Norris, White & Moules, 2017).

The analytical approach employed in this study is textual analysis (Kleinheksel, Rockich-Winston, Tawfik & Wyatt, 2020: 127). Textual analysis constitutes a methodical process aimed at characterizing and unravelling the meaning within recorded text by discerning discernible concepts used to elucidate or substantiate a given phenomenon (Kleinheksel, Rockich-Winston, Tawfik & Wyatt, 2020: 127). This method serves the purpose of identifying trends, connections, and shifts that manifest within the text's meaning (Kleinheksel, *et al.*, 2020: 128). Notably, textual analysis delves into the underlying philosophical and cultural connotations embedded within the text (Arya, 2020: 173). An integral aspect of textual analysis is the comprehension

of the language and symbols present in the text, which facilitates a more comprehensive understanding of its intended significance (Arya, 2020: 173). Furthermore, during the process of categorizing the data for analysis, the researcher must take into consideration the contextual circumstances, the environment, and the historical background (Arya, 2020: 173).

Thematic analysis, categorized as a variant of textual analysis, represents a methodological approach employed to discern patterns within qualitative data (Braun & Clarke, 2006; Kiger & Varpio, 2020: 2). During this process, the researcher engages in the identification of codes and themes while elucidating both the data itself and the manner in which it has been construed (Kiger & Varpio, 2020: 2). This method's flexibility hinges on the researcher's ability to pinpoint emerging trends, pivotal concepts, and relevant codes within the dataset (Kiger & Varpio, 2020: 2).

4.3.1 The process of thematic analysis

Braun and Clarke (2006: 87), leading authors on the processes of thematic analysis, suggest that the researcher follows the steps and phases listed below:

Familiarisation with data: This initial step involves “transcribing data” with deep reading and taking notes or memoing while being immersed in the data.

Generation of initial codes: In this step, the researcher conducts open coding systematically and sorts the data into categories.

Searching for themes: During this step, codes are classified into potential themes.

Reviewing themes: In the step, the process involves a reviewing of categorization across all categories.

Defining and naming themes: This step involves the reconsideration and “refining” of the labelling of code categories.

Producing the report: In this step, the researcher identifies examples that illustrates the various code categories and sub-categories.

These steps were used in the coding, analysis, and interpretation of the data. Coding was used to find patterns or a common tendency in the data. The data was classified using codes, which can be either a word or a phrase that can be identified within the

data (Linneberg & Korsgaard, 2019: 6). The comments in the Facebook posts were in text format, which meant that no transcribing of data was necessary, and it allowed the researcher to immediately code, analyse and interpret by finding patterns or common trends within the data. A conceptual framework was used to identify codes and themes.

4.3.2 Conceptual framework

The culmination of integrating multiple interconnected concepts yields a conceptual framework, employed to elucidate and offer a more holistic depiction of the subject under examination (Shikalepo, 2020: 2). In essence, a conceptual framework serves as a synthesis of various findings derived from the literature sources that have been reviewed, and it is crafted to enhance the understanding of the study's nature (Shikalepo, 2020: 2). This process imparts insight by providing an inquiry with a structured framework that organizes prevailing ideas, thus imparting emphasis and direction (Shikalepo, 2020: 2).

The orchestration of pivotal concepts and central theories, alongside noteworthy findings extracted from research endeavours, is steered by insights gleaned from studies, policy directives, and the expertise of others (Shikalepo, 2020: 2). The conceptual framework serves as a structural scaffold that organizes the principal elements of a study, thereby delineating its focus and trajectory. These primary notions are derived through an extensive review of pertinent terminology and concepts within the literature, as well as through the examination of existing theories and their associated empirical findings (Shikalepo, 2020: 2).

The ensuing regulations have been established subsequent to a comprehensive and meticulous review of pertinent scholarly works, with the aim of formulating a theoretical framework. Beyond offering guidance concerning the development of research inquiries, the structuring of research methodologies, and the ongoing exploration of pertinent literature, this framework serves the additional purpose of reminding the investigator about the focal points and limitations of the research endeavour (Shikalepo, 2020: 2-3). Moreover, a conceptual framework imparts a sense of coherence to the investigator's thought process, facilitating the clear elucidation of the reasons and mechanisms underlying the pertinence of the researcher's ideas within the context of the extant body of knowledge within the research domain, as well as in

relation to the contributions and experiences of fellow scholars in the same field (Shikalepo, 2020: 3).

The formulation of the ensuing guidelines is the culmination of a meticulous and extensive examination of the pertinent literature, undertaken with the intention of establishing a conceptual framework. These guidelines are multifaceted in their utility: firstly, they offer valuable direction for shaping research inquiries, designing the study, and conducting a comprehensive review of the pertinent literature (Shikalepo, 2020: 2-3). Secondly, they serve as a constant reminder to the researcher regarding the focal points and constraints of the research project.

Furthermore, a conceptual framework bestows a sense of coherence upon the researcher's thought process (Shikalepo, 2020: 3). It simplifies the articulation of the rationale behind the researcher's ideas and underscores their significance (Shikalepo, 2020: 3). This is not only in comparison to other prevailing bodies of thought within the research domain but also in relation to the extensive body of work and experiences contributed by fellow scholars within the discipline (Shikalepo, 2020: 3).

A conceptual framework, represented in Figure 4.1 below, is employed to guide the analysis and interpretation of data by utilizing codes and phrases that facilitate a deeper understanding of the essence of a phenomenon (Grant & Osanloo, 2014).

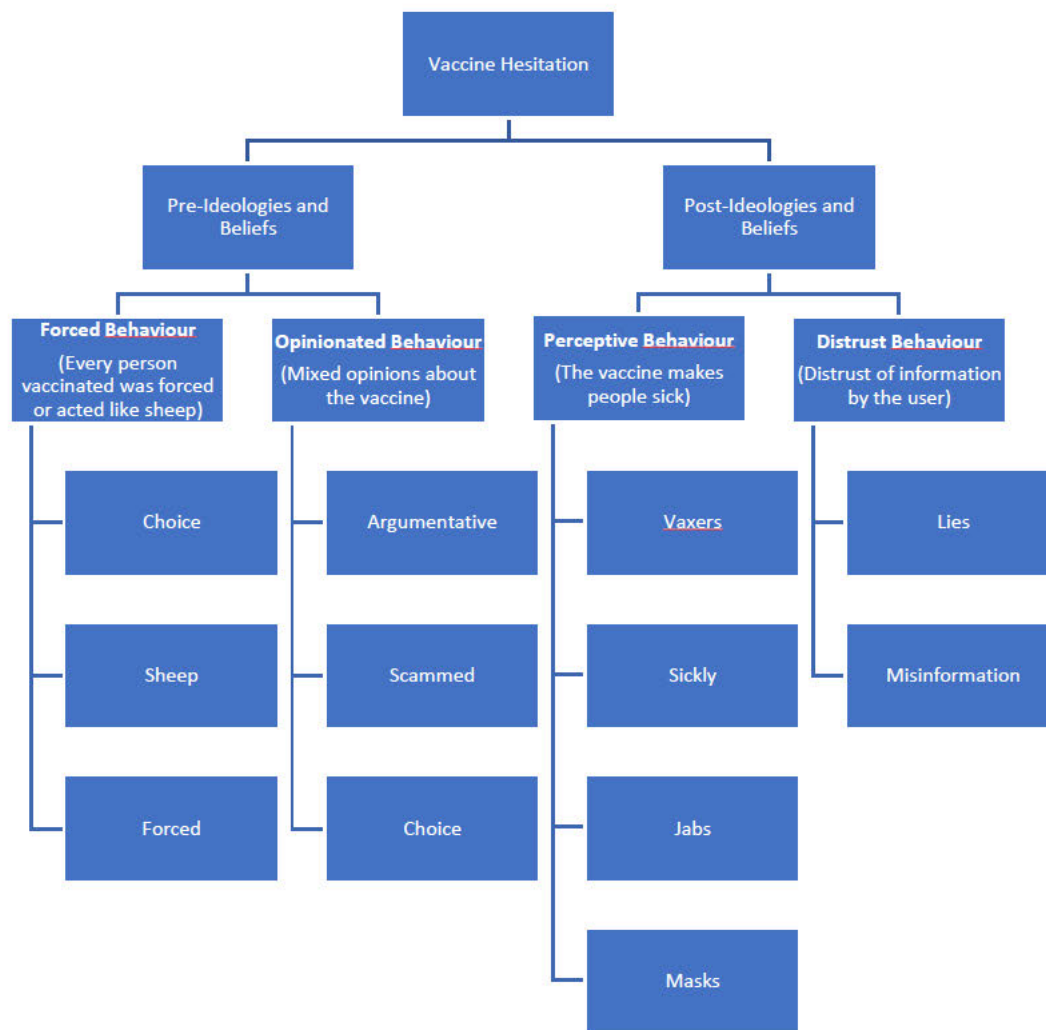


Fig. 4.1 Conceptual framework

4.3.3 Coding: Codes and themes

The coding process entails the identification (perception) of pivotal moments, followed by their transformation into codes (conceptualization), preceding the subsequent interpretation phase (Fereday & Muir-Cochrane, 2006: 83). An "exemplary code" effectively captures the qualitative nuances of the phenomenon, contributing to the organization of data for the eventual development of thematic patterns (Fereday & Muir-Cochrane, 2006: 83). A "theme" is defined as a discernible pattern within the information, serving to both characterize and structure the observed phenomena, and at a deeper level, analyse specific facets of the event (Fereday & Muir-Cochrane, 2006: 83).

To facilitate the organization of textual data for subsequent interpretation, a template comprising codes extracted from a codebook (or conceptual map) is implemented (Fereday & Muir-Cochrane, 2006: 83). Typically, researchers develop this template (or codebook) prior to conducting an in-depth study, customizing it to suit the specific research focus (Fereday & Muir-Cochrane, 2006: 83). However, in the context of this particular study, the template was pre-established to align with both the theoretical framework and the subject matter of the research. Conventionally, the construction of the codebook ensues after an initial examination of the textual material (Fereday & Muir-Cochrane, 2006: 83).

Two distinct coding techniques were employed in this study. The first technique, known as inductive coding, involves the examination, analysis, and subsequent interpretation of data without the utilization of preconceived or a priori codes (Bingham & Witkowsky, 2022; Chandra & Shang, 2019: 91). Conversely, deductive coding, the second technique, relies on predefined codes derived from a literature review and the theoretical framework, necessitating a priori analysis (see Figure 4.1).

The initial step in inductive coding entails a meticulous examination of the text, considering the various interpretations it already conveys (Thomas, 2006: 4). When a meaningful unit is identified within a segment of text, the researcher promptly allocates it to a new category and assigns an appropriate label (Thomas, 2006: 4). Additional text passages are incorporated into the category as needed (Thomas, 2006: 4).

It is pertinent to note that at some point, an explanatory comment pertaining to the category, encompassing associations, connections, and implications, may be documented by the researcher (Thomas, 2006: 5). Furthermore, the researcher may establish an initial definition to elucidate the meaning of the category (Thomas, 2006: 5). Additionally, the category may be interconnected with other categories through diverse structures, including networks, category hierarchies, and causal chains (Thomas, 2006: 5).

The concluding phase of the analysis entails the validation of the theoretical model, utilizing the themes derived from the coded data, against both previously gathered and new data sources (Jnanathapaswi, 2021: 3). This cyclic process involves the generation of inductive themes grounded in the data, followed by an evaluation of the relevance of the most recent data through deductive or inferential application (Jnanathapaswi, 2021: 3).

During the inductive cycle, open coding was employed, while selective coding was implemented in the subsequent deductive coding phases.

The diverse codes that exhibited consistent identification across the dataset encompassed:

- Vaxers
- Forced
- Lies
- Misinformation
- Sickly
- Jabs
- Sheep
- Scammed
- Argue
- Masks
- Choice

Subsequently, these codes underwent categorization, leading to the assignment of themes to each code.

Table 4.1 Code categories and themes

Vaccine Hesitation	
Pre-Ideologies and Beliefs	Post-Ideologies and Beliefs
Forced Behaviour (Every person vaccinated was forced or acted like sheep) • Sheep • Forced	Perceptive Behaviour (The vaccine makes people sick) • Vaxers • Sickly • Jabs • Masks
Opinionated Behaviour (Mixed opinions about the vaccine) • Argumentative • Scammed • Choice	Distrustful Behaviour (Distrust of information by the user) • Lies • Misinformation

4.3.3.1 Theme 1: Pre-ideologies and beliefs: Forced behaviour

In all fifteen posts that were collected users had mixed response with regards to liking the post, by laughing, and placing a heart or angry face emoji in the post's reaction section.

The following Facebook post was collected and the comments made by users on Facebook.



Fig. 4.2 National Department of Health (South Africa) Facebook post, posted on 30 June 2022.

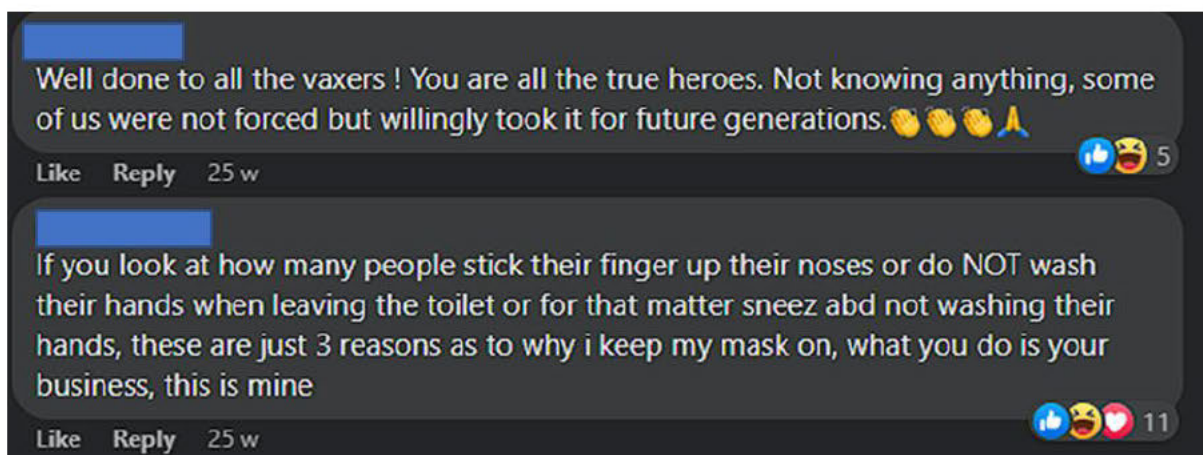


Fig. 4.2.1 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 30 June 2022.

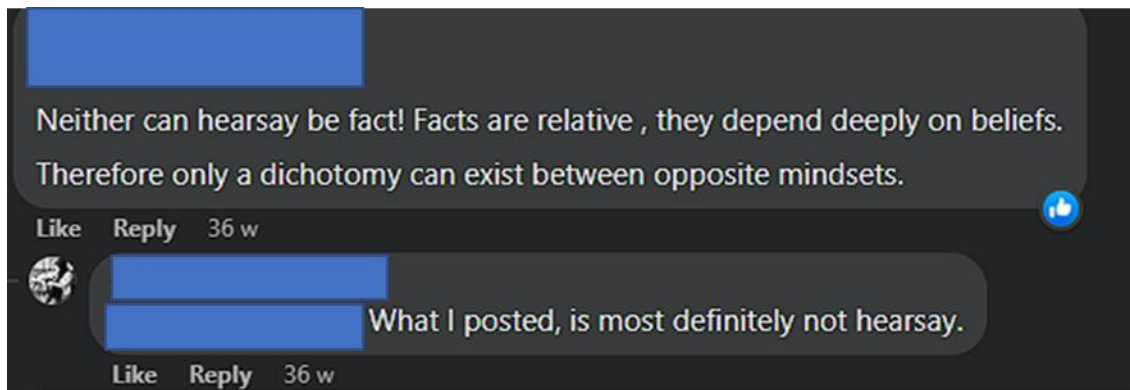


Fig. 4.2.2 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 30 June 2022.

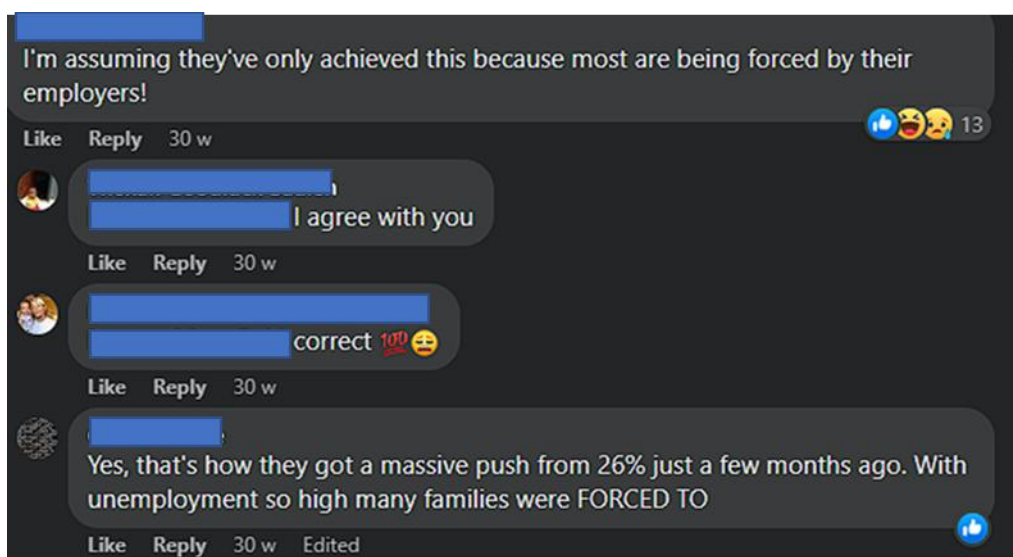


Fig. 4.2.3 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 30 June 2022.

The majority negative statements and responses by users concur with Metzger *et al* (2020: 4) in that information reinforces beliefs about a matter or issue and by choosing to ignore the contradicting information little to nothing is gained.

4.3.3.1.1 Sub-theme: Negativity and regret

There were negative comments about avoiding the vaccine and several people who posted that they regret receiving the vaccine or that they were forced by their job requirements to obtain the vaccine.



Fig. 4.3 National Department of Health (South Africa) Facebook post, posted on 27 May 2022.

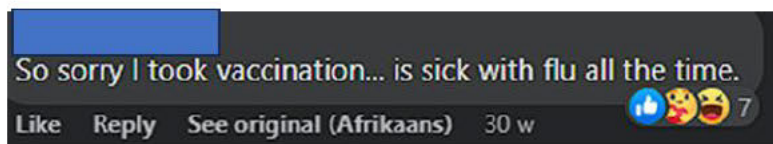


Fig. 4.3.1 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 27 May 2022.

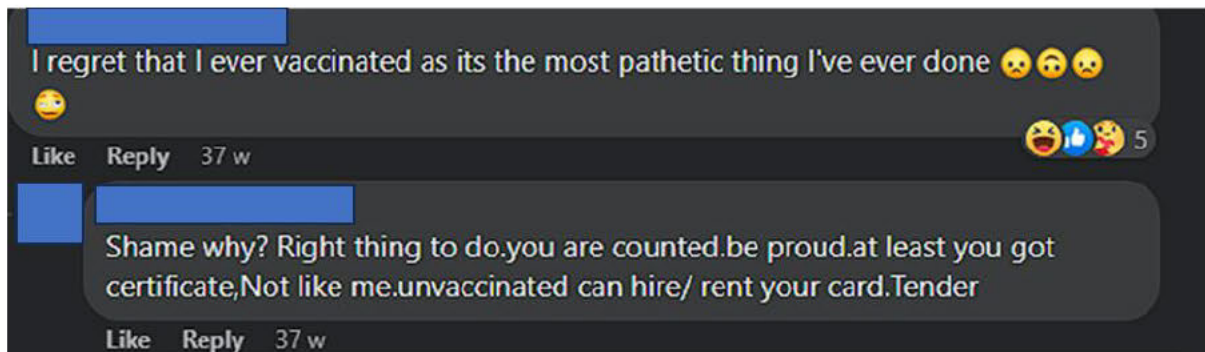


Fig. 4.3.2 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 27 May 2022.

Regret about receiving the vaccine posted on Facebook may contribute to vaccine hesitancy since Wong, Wong, Huang, Cheung, Law, Chong, Ng, Lai, Boon, Lau, *et al.*, (2021 cited in Lyu, *et al.*, 2021: 2) and Muric, *et al.* (2021: 2) found that unpleasant experiences and viewpoints shared on social media may lead to hesitancy in receiving the vaccine by those users who read the posts. Additionally, the more negative

information about the COVID-19 vaccine users read, the more likely they will be to hesitate to receive the vaccine than those social media users exposed to more positive information about the vaccine. It thus confirms the notion that online communities with similar thinking possesses or having ideologies that are the same, users who are vaccine hesitant will try and find online communities that are also hesitant in receiving the vaccine.

Negative comments include references to the ineffectiveness of the vaccines, illnesses that those vaccinated may develop and that they contracted the disease even after being vaccinated. Users also referred to religion and felt it was their right to make comments on their own beliefs and ideologies. There were mixed responses to the people who commented with their religion to a post, other users would either agree with them or comment that what they believe in is not realistic. If a person felt they had a strong opinion or ideology they would comment on the comments that other users have made. This would sometimes become a dispute between the person who originally posted the comment and the person who commented on their comment. Expressing polarised ideologies is confirmed by statements by Dylko, *et al.* and Stroud and Pariser, (cited in Spohr, 2017: 150) that the impact of ideological polarisation may become more obvious as social media due to the development of "filter bubbles".



Fig. 4.4 World Health Organization (WHO) Facebook post, posted on 1 May 2022.

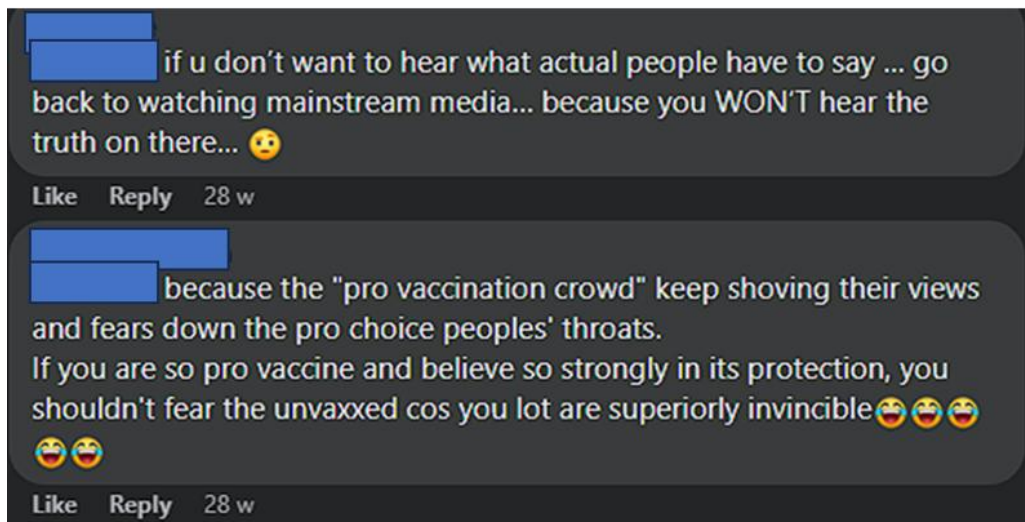


Fig. 4.4.1 Comments made by Facebook users on World Health Organization (WHO) Facebook post, posted on 1 May 2022.

These shared sentiments concur with statements by Zhang, Ackerman & Adamic, (2007); Kozinets, (2002); González-Bailón, Borge-Holthoefer, Rivero & Moreno (2011) and Grabowicz, Ramasco, Moro, Pujol & Eguiluz (2012 cited in Dover & Kelman, 2018: 1) that social media users find groups or communities that share the same ideologies or interest.



Fig. 4.5 World Health Organization (WHO) Facebook post, posted on 30 April 2022.

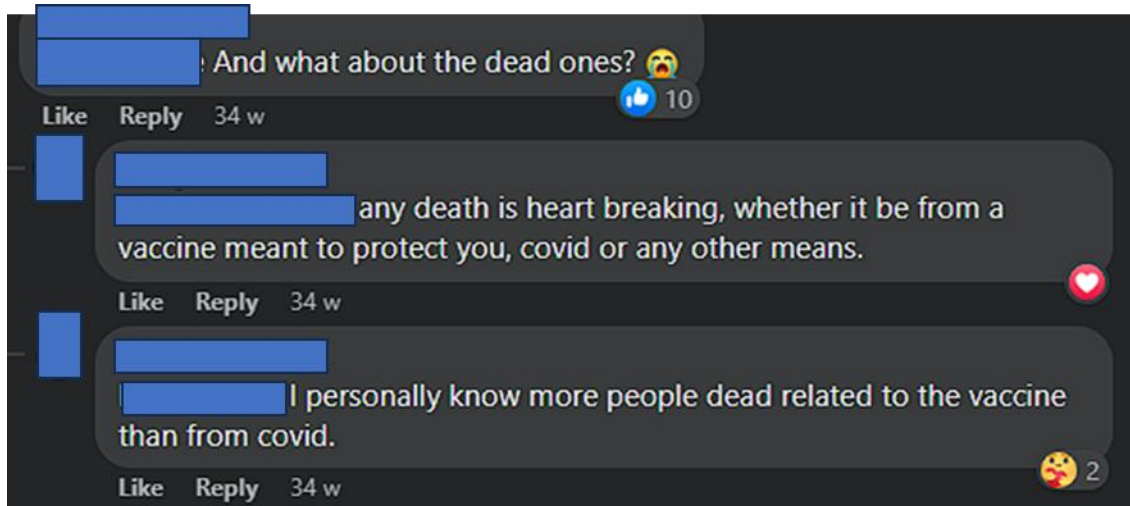


Fig. 4.5.1 Comments made by Facebook users on World Health Organization (WHO) Facebook post, posted on 30 April 2022.

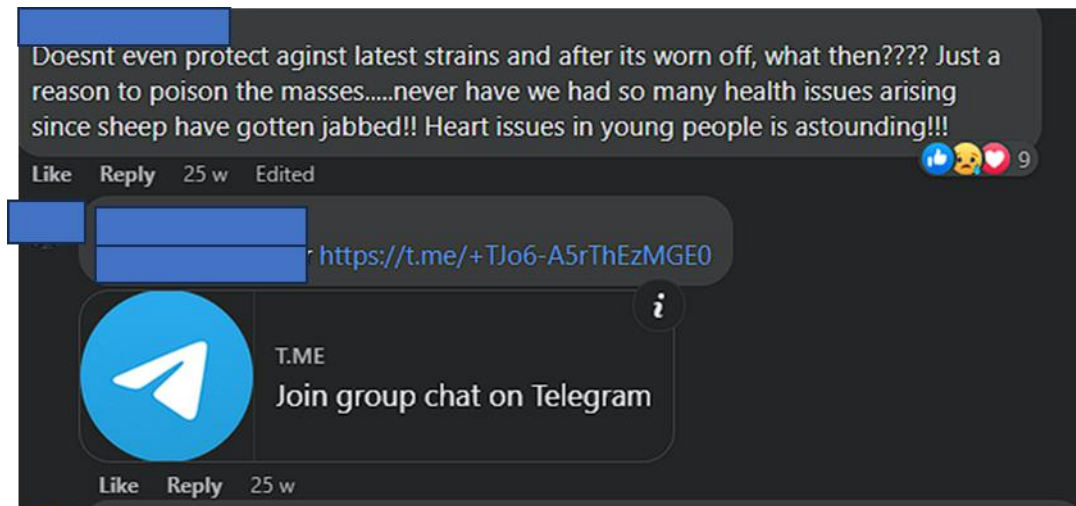


Fig. 4.5.2 Comments made by Facebook users on World Health Organization (WHO) Facebook post, posted on 30 April 2022.

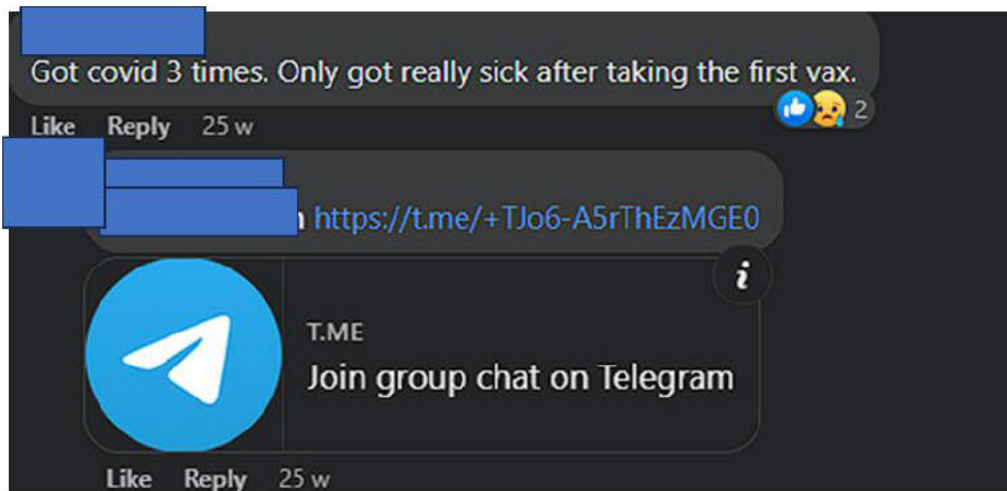


Fig. 4.5.3 Comments made by Facebook users on World Health Organization (WHO) Facebook post, posted on 30 April 2022.

4.3.3.1.2 Sub-theme: Acting sheeplike

A common code used throughout the comment was 'sheep'. It is assumed that the users who made comments about the term 'sheep' were implying that the people who were receiving the vaccine were sharing the same characteristics as a sheep, hence following someone blindly. This can refer to a person who would follow what the majority is doing or what is being told to them that they must do. A person who received the vaccine was commented on by others with just the word sheep or told that they were behaving like sheep.



Fig. 4.6 National Department of Health (South Africa) Facebook post, posted on 27 May 2022.

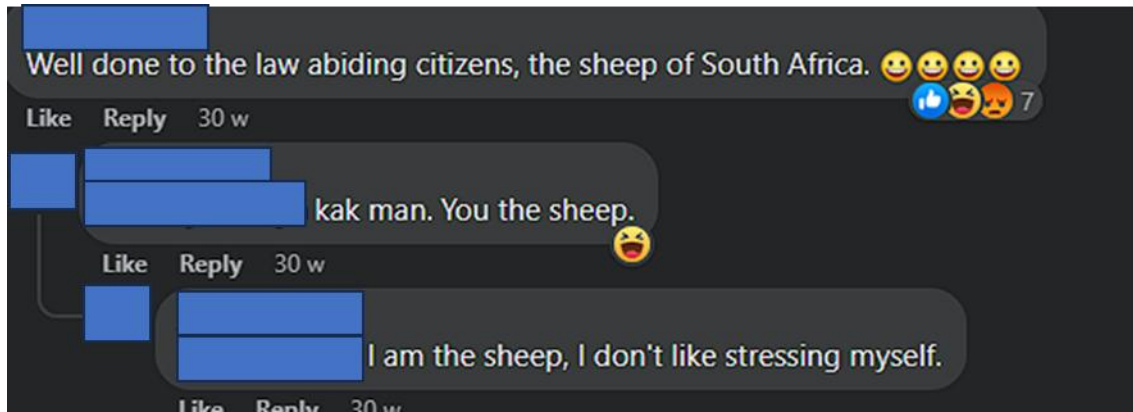


Fig. 4.6.1 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 27 May 2022.

4.3.3.2 Theme 2: Pre-Ideologies and Beliefs: Opinionated behaviour and slurs

Any person who commented on the Facebook post either received comments from other users or their comment was either liked or laughed at when responding with emojis on the comment. People appear to be influenced by political prejudice when choosing a news source to view, as well as how long they spend seeing the story content online, both at the source level and narrative level (Metzger, *et al.*, 2020: 6).



Fig. 4.7 National Department of Health (South Africa) Facebook post, posted on 27 May 2022.

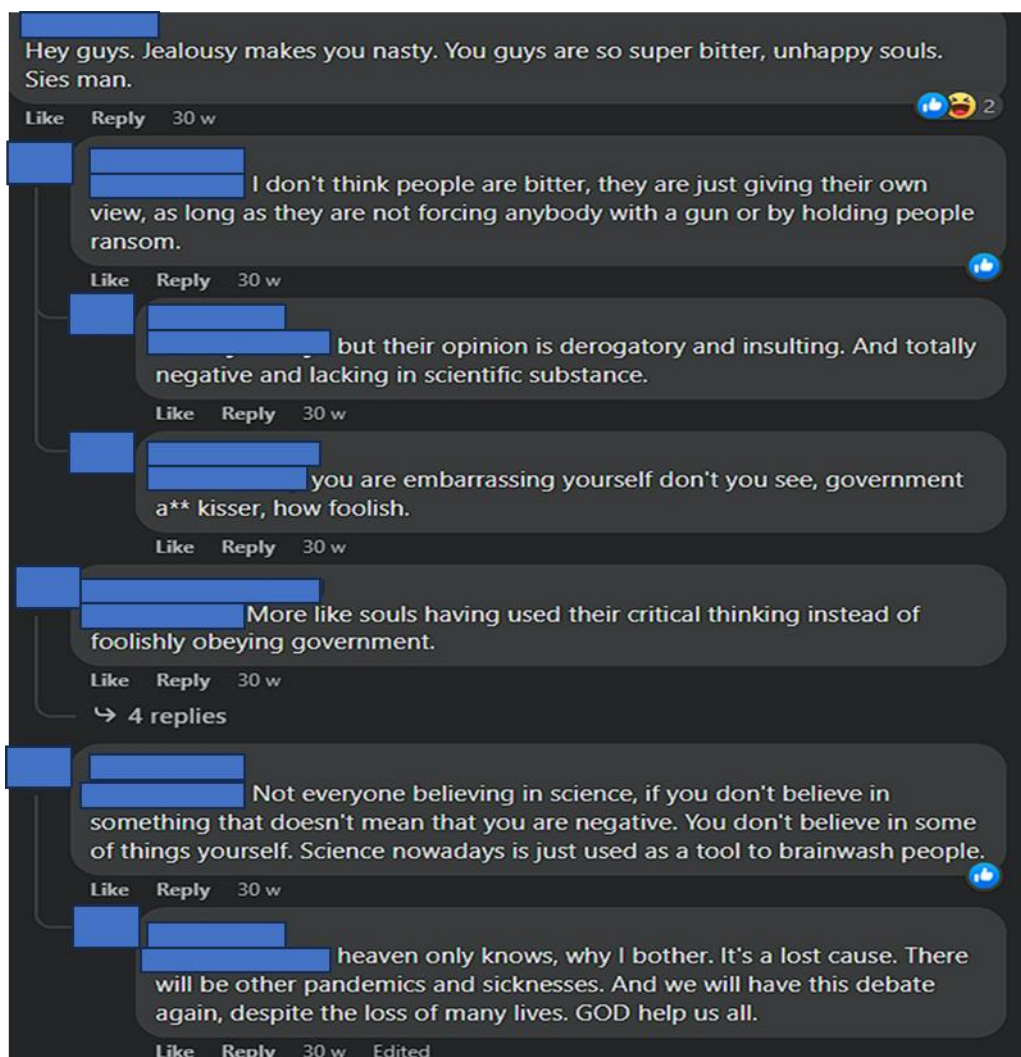


Fig. 4.7.1 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 27 May 2022.

4.3.3.3 Theme 3: Post-ideologies and beliefs: Perceptive behaviour

A person can change their beliefs and ideologies based on what they are reading or being exposed to (Metzger, *et al.*, 2020: 6). The user on Facebook may read comments that other users have posted and become influenced by what they are reading. The people may see the comments as being correct as others have stated their beliefs and change the way in which they believe on a certain matter (Metzger, *et al.*, 2020: 6).

4.3.3.3.1 Sub-theme: Adverse effects

The users on Facebook are sharing their views on the Corona virus and how they have been impacted by the information that has been given to them (Metzger, *et al.*,

2020: 6). The users turn to social media to share their experience, ideas and beliefs about COVID-19 (Metzger, *et al.*, 2020: 6).



Fig. 4.8 World Health Organization (WHO) Facebook post, posted on 30 April 2022.

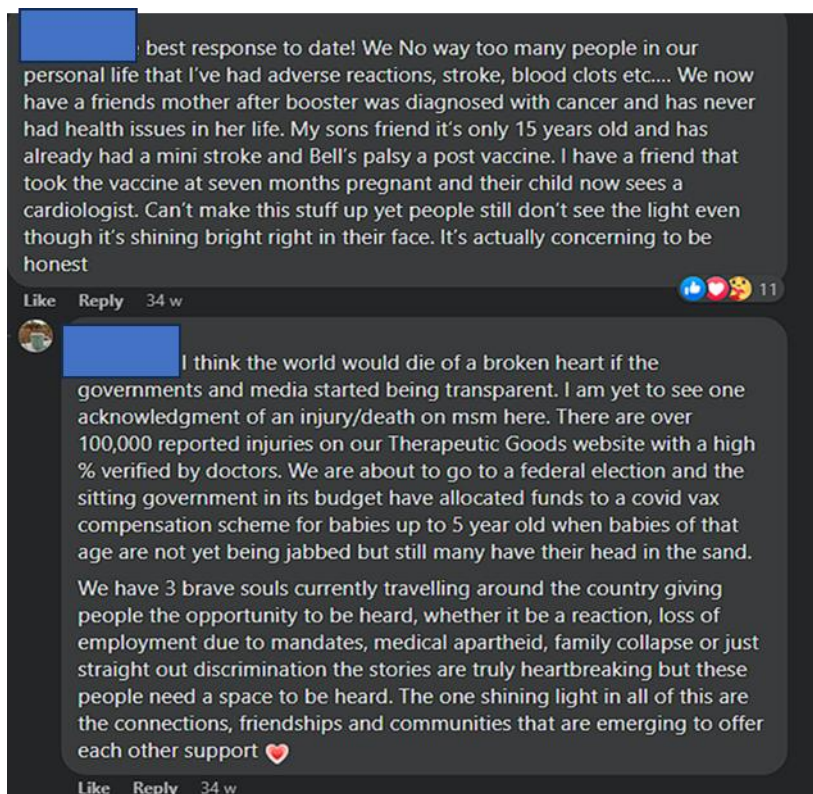


Fig. 4.8.1 Comments made by Facebook users on World Health Organization (WHO) Facebook post, posted on 30 April 2022.

4.3.3.4 Theme 4: Post-ideologies and beliefs: Distrustful behaviour

The user who is reading the comments on Facebook may not want to believe what every other person is posting about (Metzger, *et al.*, 2020: 6). The individuals may

question what they are reading and feel that they need to do more research before they believe what they are being exposed to (Metzger, *et al.*, 2020: 6).

4.3.3.1.1 Sub-theme: Deceit and misinformation

People are being cautious as to what they are reading and believing (Metzger, *et al.*, 2020: 6). They have strong opinions as to what they believe and any other information that they come across is incorrect (Metzger, *et al.*, 2020: 6). The misinformation that they are being exposed to, the users are calling out the post and stating that it is incorrect (Metzger, *et al.*, 2020: 6).

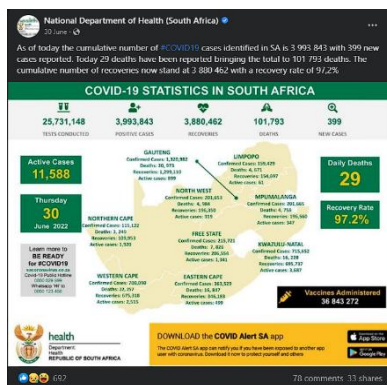


Fig. 4.9 National Department of Health (South Africa) Facebook post, posted on 30 June 2022.

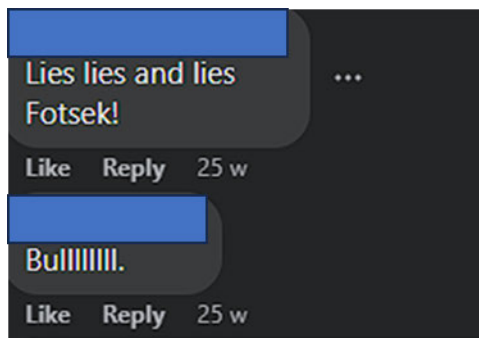


Fig. 4.9.1 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 30 June 2022.

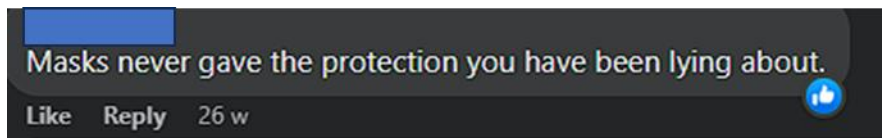


Fig. 4.9.2 Comments made by Facebook users on the National Department of Health (South Africa) Facebook post, posted on 30 June 2022.

In every fifteen posts on Facebook by the two different organisations chosen in this study, there are more than fifty comments and reactions on posts that were posted relating to the coronavirus. This shows that the users on Facebook have an interaction with the organisation and want their opinions or ideologies to be shared on the subject matter that is being discussed in the post that they have either read, looked at the headline of the post, or skimmed through the article.

The majority of the comments are negative towards the vaccine. Either being side effects, hearing stories, or stating their own beliefs. Some users believe that the coronavirus is a lie and a conspiracy theory. Other users add links or attach articles to prove what they are posting as being factual and the truth. Many users other people as references when posting their comments. There is the majority of people encourage other users to not receive the vaccine.

Text has shown a mixed response toward the COVID-19 vaccine. Many comments were that the people do not trust the vaccine and regret receiving the vaccine if they have already done so. Users who posted positive feedback about the vaccine were targeted and told that they are being brainwashed and had made the wrong decision. It can be concluded that there are more negative comments about the COVID-19 vaccine, as opposed to positive comments on Facebook vaccine posts. There are a few reasons why a person is not obtaining the vaccine, however, the more common reason is that the person does not wish to do what the government is telling them to do and makes them seem like a 'sheep'. The hesitation is also influenced by what the person has seen or heard about people who have already obtained the vaccine. Others are posting on Facebook vaccine posts to warn people about their own personal experiences when they received the vaccine.

It is assumed that the main cause of vaccine hesitation is that the person would want to have their own choice in the matter and does not want to be told what they need to do when making an important decision. A person who was forced or feels forced to

obtain the vaccine has more of a negative attitude toward the vaccine. However, there are few people who are positive about receiving the vaccine and want to share their positive experience with other users but are responded to by others who are against the vaccine, giving that person comments negative feedback and criticism. When looking at Facebook posts about the COVID-19 vaccine more negative comments and antivaccine comments are posted and appears on the top of the comment section, exposing the user to all the negative comments first.

4.3 TRUSTWORTHINESS

Trustworthiness has four divisions: credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985 cited in Stahl & King, 2020: 26).

Credibility pertains to the researcher's confidence in the authenticity of the research study's outcomes (Stahl & King, 2020: 26). This involves an inquiry into whether the researcher perceives the findings as both truthful and precise (Stahl & King, 2020: 26). In the realm of qualitative research, researchers often employ triangulation as a means to establish the credibility of their research findings (Stahl & King, 2020: 26). Triangulation entails the application and amalgamation of various research methods in the examination of the same phenomenon (Stahl & King, 2020: 26). In this context, the researcher fortified the study's foundation by incorporating multiple theories and drawing from a variety of scholarly articles to establish a robust theoretical framework.

Transferability in qualitative research refers to the demonstration of how the findings of the research study can be applicable to different contexts (Lincoln & Guba, 1985 cited in Stahl & King, 2020: 27). Qualitative researchers achieve this by providing detailed descriptions that illustrate how the research findings can be relevant to various contexts, circumstances, and situations (Stahl & King, 2020: 27). In this study, the researcher elucidated the research methods comprehensively, enabling other researchers to potentially apply similar methods in comparable contexts.

Dependability, within the context of research, refers to the extent to which the study can be replicated by other researchers, and whether the conclusions align with findings obtained by these other researchers (Lincoln & Guba, 1985 cited in Stahl & King, 2020: 27). Other researchers often draw upon information derived from previously conducted studies (Stahl & King, 2020: 27). Therefore, it is crucial that the

researcher can arrive at similar conclusions when replicating the study (Stahl & King, 2020: 27). To facilitate this, the research design and methodology were meticulously described, allowing other researchers to emulate the study's procedures.

Confirmability, as a vital facet of research, pertains to the degree of impartiality inherent in the research study's findings (Bogdan & Biklen, 2003 cited in Stahl & King, 2020: 28). This entails that the findings are rooted in the text and remain free from any potential bias or personal motivations of the researcher (Stahl & King, 2020: 28). To ensure the researcher does not introduce personal bias or skew data interpretation by selectively choosing participants to align with preconceived notions (Stahl & King, 2020: 28).

In the quest for confirmability, qualitative research endeavours can furnish an audit trail detailing every step of the data analysis process, thereby providing a transparent account of the reasoned decisions undertaken (Stahl & King, 2020: 28). This was achieved by refraining from any efforts to coerce the data into aligning with the researcher's desired outcome. All data were meticulously collected without any manipulation to achieve a specific researcher-driven result. The research methods were comprehensively described and explained, elucidating how the findings within the study were derived.

4.4 CONCLUSION

In academic research, the processes of data collection, analysis, and interpretation are of paramount importance. They serve as the means through which raw information is transformed into meaningful knowledge. These processes enable researchers to make informed decisions, test hypotheses, address real-world problems, and contribute to the advancement of scientific understanding across various fields.

Chapter 4 of this study concentrated on the meticulous exploration of data collection, analysis, and the subsequent interpretation of the amassed data. In this chapter, the researcher furnished a comprehensive account of the research's procedural aspects, including the employed methodologies, data collection procedures, and the analytical and interpretative processes. The chapter encompassed detailed explanations of how codes and themes were methodically developed throughout the study. An emphasis

was placed on the rigorous pursuit of trustworthiness, ensuring that all prerequisites were diligently adhered to, thereby minimizing potential biases in the research.

Chapter 5 will be a comprehensive and reflective section, encapsulating the essence of the study. Focusing on the findings, limitations and recommendations and the conclusion of the study will also be provided.

CHAPTER 5 FINDINGS, LIMITATIONS, AND RECOMMENDATIONS

5.1 INTRODUCTION

Findings, limitations, and recommendations constitute essential constituents of research, as they collectively offer a comprehensive perspective on the study's outcomes, their contextual significance, and potential ramifications. These components serve to bolster the research's credibility, foster the expansion of scholarly knowledge, and illuminate the path for forthcoming research endeavours and initiatives, all grounded in empirical evidence and discerning insights.

In the preceding chapter, it was elaborated on the process of data collection, analysis, and interpretation. Specifically, the detailed the acquisition of social artefacts from Facebook posts and comments, emphasizing the importance of de-identifying data to safeguard privacy and adhere to ethical standards.

Chapter 5 will be dedicated to an in-depth discussion of our research findings, encompassing a thorough exploration of any limitations encountered during the study. Additionally, it will propose recommendations for further research endeavours. In the final section of the chapter, will provide an overarching conclusion, encapsulating the key insights gleaned from the study, followed by concluding remarks that summarize the significance of our research.

5.2 FINDINGS

The study's outcomes will be presented by addressing both the primary and secondary research inquiries. Each question will be explicitly formulated, followed by responses that derive from the comprehensive analysis and interpretation of the collected data.

Primary questions

How do Facebook users respond to COVID-19 related vaccine posts?

Users demonstrate robust pre-existing ideologies and convictions, rendering them resistant to influence by the content they encounter on Facebook (Metzger, Hartsell & Flanagin, 2020: 3). The Facebook posts they opt to interact with often lack seriousness

and frequently feature derogatory language and humour directed at vaccine-related information (Metzger, Hartsell & Flanagin, 2020: 3).

Users employed various labels to characterize their responses to the information presented, but the predominant trend in most posts was one of negativity, featuring derogatory comments and expressions of scepticism regarding the credibility of both COVID-19 and the vaccine (Akram & Kumar, 2017: 347). These comments frequently centered on adverse vaccine effects, such as premature deaths among young individuals and the sudden onset of illnesses in previously healthy relatives (Akram & Kumar, 2017: 347). Furthermore, some users openly conveyed regret regarding their vaccination experience (Akram & Kumar, 2017: 347).

Participating in Facebook posts served as a platform for users to articulate their viewpoints and share their perspectives on the subject matter (Akram & Kumar, 2017: 347). Users utilized this medium to express their emotions and thoughts pertaining to the COVID-19 vaccine (Akram & Kumar, 2017: 347). The resultant mixed reactions observed in response to these Facebook posts can wield both positive and negative influences on individuals encountering them (Akram & Kumar, 2017: 347).

If the comments manifest a positive stance and the post conveys a favourable outlook on COVID-19 vaccines, it may engender a positive disposition in the individual, potentially fostering a willingness to receive the vaccine (Akram & Kumar, 2017: 347). Conversely, if negative comments outweigh the positive ones, the user may experience ambivalence and hesitancy toward the COVID-19 vaccine (Akram & Kumar, 2017: 347). For individuals already harbouring reservations about the vaccine, perusing the comment section may take precedence over the post itself, with the intent of seeking out negative vaccine-related experiences shared by others (Akram & Kumar, 2017: 347). Should the user encounter an abundance of negative comments relative to positive ones, it could intensify their hesitancy toward the vaccine (Akram & Kumar, 2017: 347).

What are the emerging themes related to vaccine hesitancy in Facebook users' comments on COVID-19 related vaccine posts?

Evidently, users attributed job losses and feelings of vaccination compulsion to government responses during the pandemic (Kim, Xiong, Lee & Han, 2021: 2).

Moreover, they perceived mandatory vaccination as a violation of their personal autonomy (Kim, Xiong, Lee & Han, 2021: 2).

Most comments on the Facebook posts conveyed a negative sentiment. Users characterized the articles related to Coronavirus on Facebook as baseless and disseminators of false information (Kim, Xiong, Lee & Han, 2021: 2). Individuals who had been compelled to receive the vaccine expressed regret over their decision. Others shared observations of adverse outcomes from the vaccine and expressed reluctance to undergo vaccination (Kim, Xiong, Lee & Han, 2021: 2). Additional comments on the post involved users engaging in confrontations with one another, disputing the accuracy of information and advocating against vaccination (Kim, Xiong, Lee & Han, 2021: 2).

Positive comments from users were notably scarce, and they often faced negative responses (Metzger, Hartsell & Flanagin, 2020: 3). The limited positive comments cantered on individuals expressing gratitude for having received the vaccine, endorsed mask-wearing, and attributed their sense of safety to their religious beliefs (Metzger, Hartsell & Flanagin, 2020: 3). However, even these positive remarks were not immune to criticism, as some respondents likened those who received the vaccine to compliant individuals following instructions blindly (Metzger, Hartsell & Flanagin, 2020: 3).

Some comments contested the content as misinformation and fake news, sparking debates among users. This contentious discourse was sometimes underscored by the use of laughing emojis, suggesting that some participants found the discussions amusing (Metzger, Hartsell & Flanagin, 2020: 3). Notably, users did not apply filters to their comments, reflecting their unfiltered and unedited expressions. Furthermore, they employed language and emojis that resonated with their personal preferences and were most fitting for the messages they sought to convey (Metzger, Hartsell & Flanagin, 2020: 3).

Secondary question

How are echo chambers (if any) reflected in dissenting comments regarding COVID-19 vaccine posts on Facebook?

A substantial number of users engaged in debates with individuals expressing divergent viewpoints, often resorting to derogatory remarks. Additionally, certain posts

garnered reactions in the form of likes, laughing emojis, and angry face emojis (Akram & Kumar, 2017: 347). These reactions suggest a mixed response among Facebook users regarding their sentiments about the post (Akram & Kumar, 2017: 347).

The likes may signify that some users found the post valuable or aligned with their preferences and the content presented therein. Conversely, the use of laughing emojis and angry face emojis could indicate that users either perceived the shared content as amusing or as in discordance with their personal beliefs and opinions (Akram & Kumar, 2017: 347).

5.3 LIMITATIONS AND RECOMMENDATIONS FOR FURTHER STUDY

A notable limitation of this study is the incomplete capture and utilization of comments for analysis. A more comprehensive examination of all comments within a Facebook post could provide a more holistic perspective of the overall sentiment conveyed by the post.

Furthermore, it is challenging to anticipate the degree of hesitation expressed in comments on COVID-19-related Facebook posts. Understanding the emotional nuances of the individuals behind these comments is inherently challenging, as it primarily depends on whether the comment explicitly conveys hesitancy or not.

Facebook users are constrained by the platform's comment sections, preventing them from engaging in open-ended conversations. Consequently, while users may endeavour to convey their thoughts comprehensively, the absence of facial expressions and vocal tones hampers the complete transmission of their intended messages.

The limitations of the platform also restrict the researcher's ability to pose in-depth questions to users commenting on COVID-19 vaccine-related posts. If the participants were available in person, the researcher could have considered additional variables such as age and gender, which might influence an individual's hesitancy towards receiving the COVID-19 vaccine.

Collecting data from social artefacts, such as Facebook comments, imposes constraints on the researcher's ability to solicit further insights through direct

questioning. The researcher must rely solely on the information at hand, without the opportunity to probe for additional context. Therefore, it is advisable for future studies to incorporate in-depth interviews with Facebook users to supplement the findings.

5.5 CONCLUDING REMARKS

The primary enduring strategy to mitigate the ongoing pandemic, notwithstanding the comprehensive implementation of precautionary measures such as social distancing and mask adherence, is the administration of COVID-19 vaccinations (Hou *et al.*, 2021: 2). Consequently, even though COVID-19 incidence rates may exhibit a decline, they endure (Hou *et al.*, 2021: 2). This persistent persistence of the virus, amid the diminishing infection rates, has engendered vaccine hesitancy among segments of the population, who harbour uncertainties regarding the imperative of immunization (Hou *et al.*, 2021: 2).

The research revealed that individuals harbour deeply entrenched preconceptions and convictions concerning the COVID-19 vaccine. Furthermore, users on the Facebook platform demonstrate a willingness to openly express their personal viewpoints through comments, both on their own posts and in response to others' comments. It is noteworthy that the volume of negative comments pertaining to the COVID-19 vaccine substantially eclipsed the limited number of positive comments in the discussions.

The study's conclusions were derived through the application of qualitative research methodologies, which facilitated a more profound comprehension of the responses of Facebook users to a highly contentious and presently contentious practice, namely vaccination. These responses may be indicative of a proclivity towards vaccine hesitancy.

The study also offered suggestions for future investigations and acknowledged certain constraints within the research. It is advisable to conduct additional research on this subject to further enhance our comprehension of vaccine hesitancy, particularly concerning the COVID-19 vaccine.

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ADDENDUM 1: Ethical clearance letter

Data Classification – Business General





Our Ref: M. 461222
Enquiries: research@iie.ac.za

06 December 2022

Outcome of Ethics Clearance Application for Master of Philosophy in Arts

Student name: Veronica Mae Esterhuizen
Student number: [REDACTED]
Brand and campus: IIE MSA

Dear Veronica,

Thank you for submitting the ethics clearance application for the study:

Facebook user responses to COVID-19 vaccine posts: An exploration of COVID-19 vaccine hesitancy sentiments

We are pleased to inform you that the Higher Degrees Committee considered and granted ethics clearance. This means that you may proceed with data collection. Kindly ensure that all ethical considerations are duly applied whilst collecting, analysing and interpreting the data for the completion of your research. The committee noted and approved the change in title of the study from the initial proposal approval.

If you have any questions, please feel free to contact your programme team or supervisor directly.

All the best with your research.

[REDACTED]

Dr WH Engelbrecht
Chair: Higher Degrees Committee



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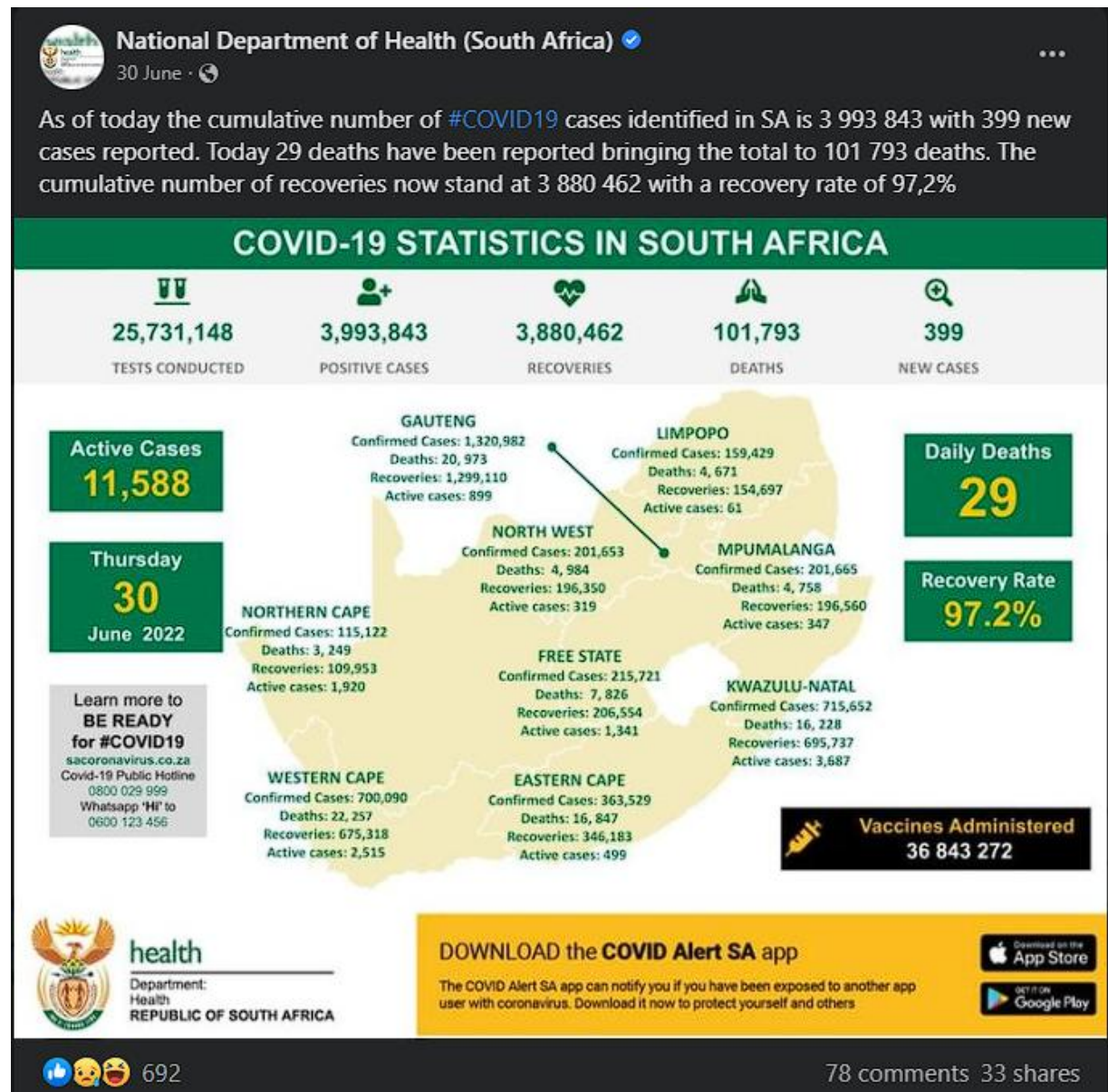
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ADDENDUM 2: Facebook posts





National Department of Health (South Africa) ✓

27 May · 🌐



Well done South Africa. As of today 50% of South Africans are vaccinated [#COVID19](#)
[#VaccinateToSaveSouthAfrica](#)

50% OF ADULTS IN SA ARE VACCINATED

WELL DONE!

**"IT ALWAYS SEEMS IMPOSSIBLE
UNTIL IT'S DONE"**
- Nelson Mandela

Call 0600 029 999 for more information - it's free or email info@vaccinesupport.org.za

health
Department of Health
REPUBLIC OF SOUTH AFRICA

**I CHOOSE
Vaccine Nation**

**STAY
SAFE**
VACCINATE TO SAVE SOUTH AFRICA
TOGETHER WE CAN BEAT COVID-19

**2030
NDP**

👍👎❤️ 554

76 comments 16 shares

👍 Like

💬 Comment

➦ Share



World Health Organization (WHO) ✓

1 May · 🌐



Getting vaccinated is a safer way for you to develop immunity against COVID-19 than getting infected and sick.

COVID-19 Vaccines

**Getting vaccinated is
a safer way for you to develop
immunity against COVID-19
than getting infected and sick.**

COVID-19 is a life-threatening disease.
Don't risk your health.
Get vaccinated as soon as it's your turn.



30/03/2022



425K

64K comments 10K shares



World Health Organization (WHO) ✓

30 April · 🌐



Vaccines give everyone the opportunity to reach their full potential and pursue a life well lived. Ultimately, vaccines provide hope for all of us to enjoy a healthy, more fulfilling life – and that's something we should all be fighting for.

**VACCINES
WORK.**

WORK.

#LongLifeForAll



World Health
Organization

👍 🥰 ❤️ 10K

2.6K comments 822 shares