Online Information Review

Social media, misinformation and fake news in the pandemic: the dominant gaps and future research avenues

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Abstract

Purpose – Social networking sites have become breeding grounds for the spread of fake news and misinformation. At the height of the Covid-19 pandemic, the spread of fake news intensified, causing complications for health communicators by drowning authentic information from verifiable official sources. Looking at the impact of this growing phenomenon on people's attitudes and behaviour during the pandemic, research in the area must be populated to help governments, supranational organisations, non-governmental organisations as well as civil society organisations to formulate policies to curb the menace. This study was therefore undertaken to unravel current gaps and future research avenues to empower academia in achieving the desired scholarly impact.

Design/methodology/approach – The study adopted the systematic review approach, relying on 56 peer-reviewed articles on social media, fake news and misinformation in the Covid-19 pandemic.

Findings – The study found that the use of social media during the height of the pandemic led to unhelpful information creation and sharing behaviours such that people's self-awareness reduced drastically, thereby impeding the fight against the pandemic. The study also established that Entertainment motives, Ignorance and Altruism motives were the dominant factors that influenced the spread of fake news. There was evidence of the marginalization of research on the subject matter from contexts such as Africa, South America and Oceania.

Originality/value – This study has established existing gaps in issues and evidence, methodology, theory and context and consequently discussed future research avenues for social media use and the spread of fake news. The study has also provided practical implications for both governmental and non-governmental organisations in curbing the phenomenon of fake news and misinformation.

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Keywords Fake news, Misinformation, Covid-19, Social media, Pandemic, Systematic review

Paper type Research paper

1. Introduction

The efficiency of the modes of communication during pandemic situations has developed tremendously from what it used to be in the past (Adekoya and Fasae, 2021). For instance, during the 1918 Influenza pandemic, governments, citizens and other entities heavily relied on emails, telephones and interpersonal dialogue to circulate information (Merchant and Lurie, 2020). Today's technological transition has reshaped the narrative. The emergence of social media has ensured a rapid interconnection among its users in the dissemination and accessibility of information in different kinds, such as texts, images and audio (Adekoya and Fasae, 2021; Choi and Kim, 2021).

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Brooks (2015) contends that social media users visit their platforms to gratify their information needs at different times. In the case of the Covid-19 pandemic, people needed information and guidance from their community authorities on accessing relevant resources (Choi and Kim, 2021). Thus, social media was heavily utilised. Other users used the platforms to gather information on the precautionary measures to fight the pandemic (Brindha *et al.*, 2020). In essence, health authorities and institutions also used the platforms to create health awareness (Batool *et al.*, 2021).

However, all these information-seeking and sharing behaviours were stimulated by the psychological consequences of the high daily infection and mortality rates of the Covid-19 pandemic (Bradbury-Jones and Isham, 2020). People became anxious, afraid, uncertain and stressed and needed information to satisfy these psychological needs (Naeem, 2020). As such, a novel problem termed "infodemics" was created (Swire-Thompson and Lazer, 2020; Vosoughi *et al.*, 2018). Infodemic is a coined terminology that describes how false information can severely damage the efforts to mitigate a disease outbreak by providing unverified counter-information that sways and disintegrates response and boosts the effect of the outbreak (Cifuentes-Faura, 2020).

In Wardle and Derakhshan's (2017) argument, the subject of false information, regarded by Balakrishnan *et al.* (2021) as fake news, is examined through the perspective of an information disorder that can manifest as 'misinformation' (creating false information without intention to harm), "dis-information" (intentionally creating false information to harm) and "mal-information" (using real information to cause harm). Hence, fake news influences people's reliance on inaccurate information to make judgments, creating scepticism towards the truth and making people disbelieve the entire news media (Nyhan and Reifler, 2010; Shu *et al.*, 2019). Nonetheless, the responsibilities of health authorities become necessary in pandemic and infodemic situations as they educate the public on how to fact-check, dispel conspiracy theories and counter false information (Gesser-Edelsburg *et al.*, 2018; Guidry *et al.*, 2017).

The novel Covid-19 pandemic has created the scholarly exigency to investigate the phenomena of social media usage and users' information behaviour. However, the literature on the phenomenon is dispersed, making it difficult to grasp the problems that have been identified and addressed and those that have not. The best attempt at drawing a synthesis into the phenomena was Varma *et al.*'s (2021) systematic review of articles that investigated fake news detection mechanisms before and during the Covid-19 outbreak. The focus of the scholars' investigation was to establish a perspective on the best artificial intelligence (AI) approaches adopted in validating information and detecting those that are fake. Machine and deep learning approaches were the major foundations of their investigation.

As opposed to only determining the technological techniques people employ to detect fake news, this current study harmonises the literature on people's social media behaviour during the Covid-19 pandemic and their ability to function in this era of infodemic. Again, there would be a need to develop studies on the subject area to equip health and information practitioners should future pandemics break, a situation only possible if a systematic review of this nature is produced to guide future research. Specifically, this study explored how social media was used, how users acted on information and false information and how false information was managed during the Covid-19 pandemic. The study additionally explored the methodological, theoretical and geographic evidence in social media and false information research and teased out existing research gaps and future research opportunities. As such, the following research questions were posed in addressing the issues.

RQ1. Methodological Approaches

(1). Which methodological approaches dominated the literature on social media and false information during the Covid-19 pandemic?

RQ2. Theoretical Underpinnings

(1). Which theories, concepts, models and frameworks served as the foundation for studies on social media and false information during the Covid-19 pandemic?

RQ3. Geographical Distribution

(1). Which countries were affiliated with research on social media and false information during the Covid-19 pandemic?

RQ4. Social Media Usage

(1). How was social media used during the Covid-19 pandemic?

RQ5. Information Behaviour

(1). What is the information-seeking behaviour of social media users during the Covid-19 pandemic?

(2). What is the information-trust behaviour of social media users during the Covid-19 pandemic?

(3). What is the information-sharing behaviour of social media users during the Covid-19 pandemic?

RQ6. False Information Behaviour

(1). What is the nature of false information during the Covid-19 pandemic?

(2). What is the false information-sharing behaviour of social media users during the Covid-19 pandemic?

(3). What are the effects of false information on social media users during the Covid-19 pandemic?

RQ7. False Information Management

(1). What are the processes of curbing false information during the Covid-19 health crisis?

2. Methodology for the review

This study employed the systematic review approach to better comprehend the literature on social media, information and false information in the wake of the Covid-19 pandemic. Purssell and McCrae (2020) contend that multitudes of articles are published in different disciplines in academic journals, and new researchers within those disciplines consult previously completed literature reviews in the bid to solve research problems, build theories and establish evidence of their own (Gough *et al.*, 2012). As such, systematic reviews provide them with the simplest, fastest, unbiased and most comprehensive means to keep up with evidence in the array of literature (Patole, 2021). This is possible through the thorough discussion and synthesis of what has previously been investigated, how it has been investigated and what those investigations have discovered (Gough *et al.*, 2012). This study falls within the remit of such rationales by discussing and synthesising the literature on the phenomena above. Specifically, articles hosted on the databases of Emerald and ScienceDirect were considered for this review.

2.1 Review scope

Peer-reviewed articles which were published in the English language were the only resources included in this review. The justification is that peer-reviewed articles go through rigorous

publishing processes where there is room for expert evaluation of the professionalism and originality of scientific work done by researchers in their field of specialisation (Lee *et al.*, 2012). As such, other publications, such as expert briefings, case studies, executive summaries and encyclopaedias, among others, were excluded. Although books, book chapters and book parts go through exhaustive review processes as well (Zuccala and Garcia, 2019), they do not fall within the scope of this study. Grey literature such as dissertations, unpublished working papers and conference posters and papers, among others, were also not considered for this study. This is because grey literature lacks the rigidity and scrutiny of peer review (Corlett, 2010). The study also collected articles published from January 2020 to January 2022, a time frame selected due to the newness of the Covid-19 pandemic (Allam *et al.*, 2020).

2.2 Searching for literature

Using a variety of search queries, a search was undertaken to discover social media, information and false information studies in the wake of the Covid-19 pandemic between January 2020 and January 2022. Search queries such as Social Media* AND Information* or False Information* or Misinformation* or Disinformation* or Misinformation* or Fake News* or False News* AND Covid-19* or Coronavirus* or COVID* or Sars-Cov-2* were explored in the search bars of the databases. Including the asterisk (*) permitted the identification of closely related words and the singular and plural forms of the search queries (Flaherty *et al.*, 2021).

The literature extraction process employed the "Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) Statement" approach (Moher *et al.*, 2009, p. 337). According to Moher *et al.* (2009), the PRISMA Statement prescribes a list of elements and a flowchart of four categories that suggest to researchers how to report systematic reviews. Whereas the checklist was judiciously adopted in evaluating the articles selected for this review, the flowchart, as illustrated in Figure 1, was instrumental in the identification, screening, eligibility and inclusion of articles in this review.

The process of identifying literature on the databases of ScienceDirect and Emerald, using the aforementioned search queries, yielded some 2,202 search results. A screening method was then applied to purge the literature of duplicates. This reduced the search results to 1,814. The study further applied all eligibility criteria by excluding studies that were not conducted in the English language, studies that were published before January 2020, studies whose titles and abstracts do not fall within the scope of this study and publications that were not peer-reviewed research. Following the robust process, 56 articles were selected and used for the analysis.

3. Findings and discussions

3.1 RQ1 methodological approaches

The review shows the adoption of three methodological approaches – quantitative (n = 28, 50%), qualitative (n = 22, 39%) and mixed-method (n = 6, 11%). The focus of the quantitative studies was to mainly find the relationships between constructs that aid in the information-seeking process (Chawla *et al.*, 2021), the information and false information-sharing process (Apuke and Omar, 2021; Chen and Chiu, 2021; Sharma and Kapoor, 2021; Zhou *et al.*, 2021), the false information management process (Igbinovia *et al.*, 2020; Jo *et al.*, 2021; Li *et al.*, 2021) and the communication processes of various authorities (Landi *et al.*, 2021; Syn, 2021), among others. As such, quantitative researchers mostly employed survey methods as a roadmap on which their empirical studies were grounded.

Figure 2 illustrates the methods employed by the articles in this review. These "methods" stem from the research designs or the data collection methods used by the studies under review, depending on how the authors conceptualised "methods".

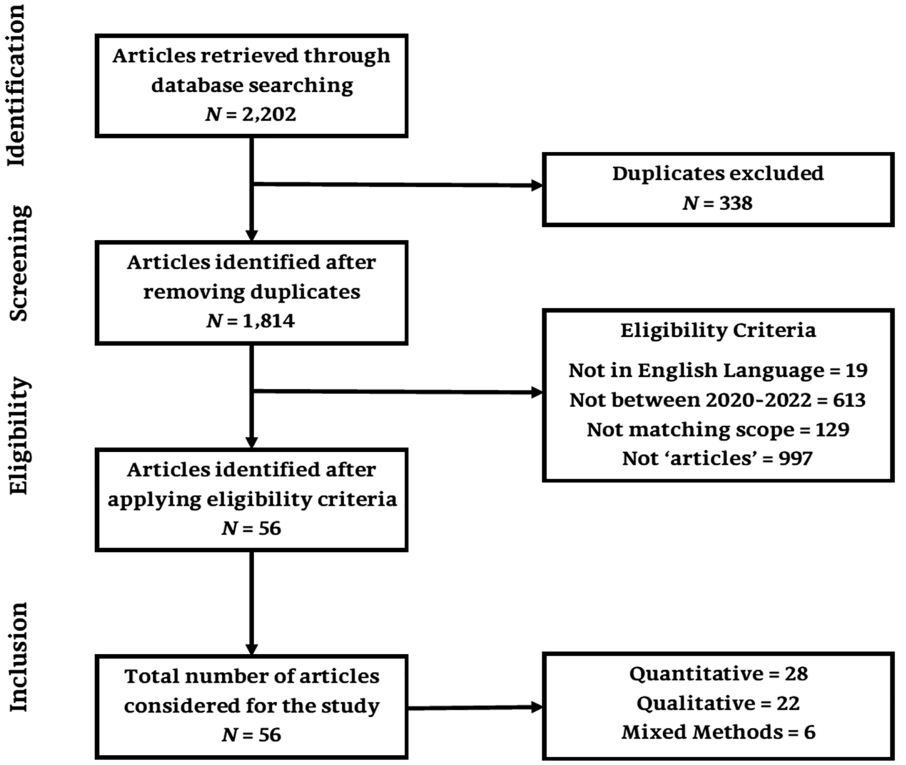

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Figure 1. Preferred reporting items for systematic reviews and meta-analysis (PRISMA) statement approach to selecting literature for the review

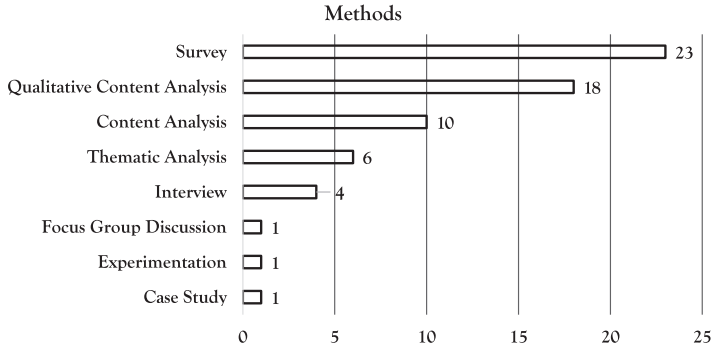

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Figure 2. Distribution of methods employed in the literature

3.2 RQ2 theoretical underpinnings

The studies were grounded on 68 theories, models, frameworks and concepts. Figure 3 depicts the distribution of these underpinnings. Whilst theory-based studies (41%) emerged as the most prevailing, followed by concept-based studies (28%), studies that did not specify

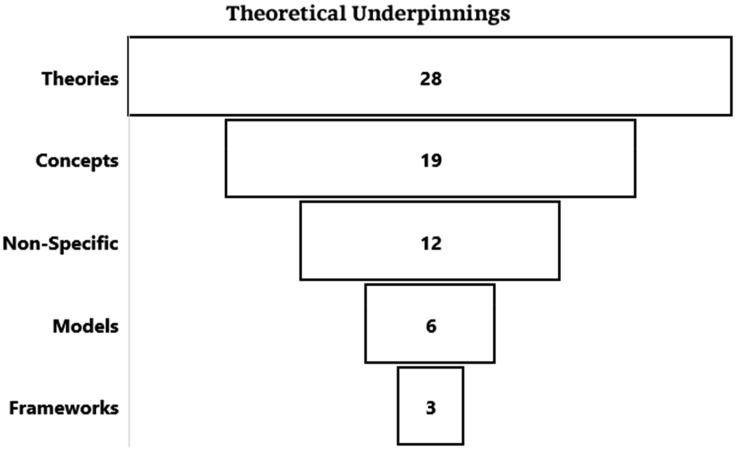

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Figure 3.
Distribution of theoretical underpinnings in the literature

their theoretical underpinnings also recorded a noteworthy figure (18%). Articles that described their theoretical foundations as models (9%) and frameworks (4%) were minimal.

The theory-based studies comprised of social, psychological and behavioural theories (*conspiracy theories, cognitive overload theory, protection motivation theory, theory of planned behaviour, social support theory, reversal theory, third-person perception theory, anomie theory, self-determination theory*), media and audience theories (*media richness theory, uses and gratification theory*), communication theories (*dialogic theory of engagement, theory of informal scientific communication mode, theory of rumour transmission*) and risk and deviance theories (*terror management theory, theory of uncertainty and social proof, benign violation theory, strain theory*).

3.3 RQ3 geographical context

Figure 4 presents the geographical distribution of the studies under review. To address reservations about the feasibility of geographically identifying data gathered online, the review attentively evaluated all articles and highlighted studies that explicitly stated the geographies of their data. For studies that analysed online content but did not specify the geography of the data, the country or countries in which the online data was collected was assigned. The same criterion was applied to studies that seemed general in scope due to their online nature but were not global studies. Geographies of multiple-country studies were treated as different independent studies and allocated to all countries included in that study. The careful process thus shows that studies from the United States (18), the United Kingdom (13) and China (11) were dominant. Regarding continental geographical distribution (Figure 5), studies on Europe (38) and Asia (37) dominated, collectively contributing to 69% of global geographical distribution, while studies on North America (23) followed with 21%. Africa (5), Oceania (4) and South America (2) constituted the least researched continent.

3.4 Thematic discussions of issues and evidence

As Oliver *et al.* (2012) put forward, some of the themes were appropriated from the conceptualisation of previous studies (Ford, 2015; Wilson, 2000), whilst others were generated by examining the trajectory of thoughts in the different articles. This section thoroughly assesses the literature published on these themes and presents their findings.

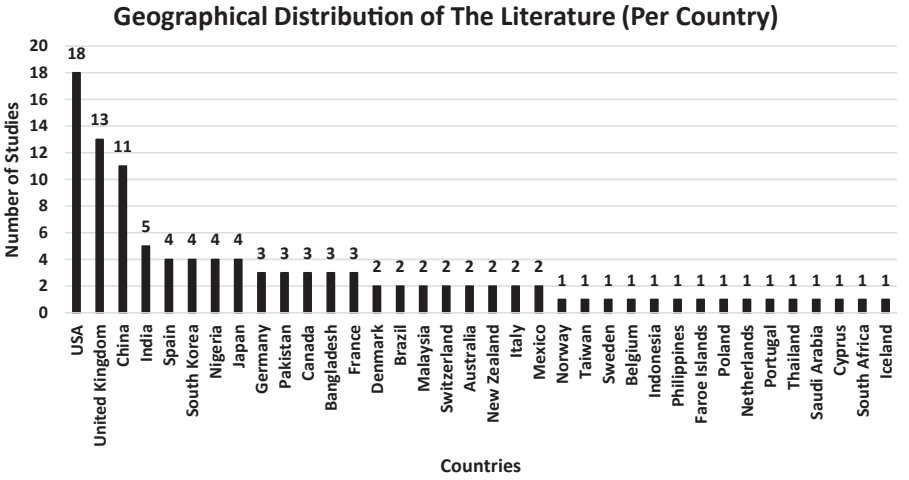

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Figure 4.
Geographical distribution of the literature (per country)

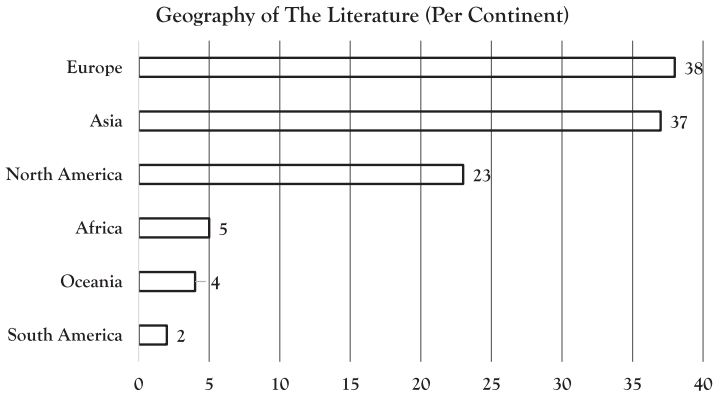

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Figure 5.
Geographical distribution of the literature (per continent)

3.4.1 RQ4 social media usage during Covid-19. Social media is among the most efficient modes of communication today (Kaya, 2020). Statista (2020) data revealed that more than half of the world's population uses the medium. Adekoya and Fasae (2021) and Batool *et al.* (2021) maintained that social media platforms during the Covid-19 health crisis provided the means for sharing information as several online users cited the medium as their source for accessing Covid-19 announcements, safety measures and facts about infection and mortality rates. This has turned social media into a fertile ground for the dissemination of false information during the pandemic (Su, 2021), with several of these false information being scientifically unverified, such as fermented soybeans working as one of the remedies to fighting Covid-19, being circulated on the medium (Cato *et al.*, 2021). Kaya (2020) also claimed that social media usage during the Covid-19 period did not evoke helpful behaviour in fighting the disease psychologically; rather, users' self-awareness reduced their beliefs in fake news and panic. The researcher added that the usage of the medium was different

during the Covid-19 era from the pre-Covid-19 era. Users were preoccupied with retrieving information that may help fight the virus during the health crisis period rather than sharing their lifestyles with other users as they would have done previously. Therefore, companies that reveal their hygienic conditions on social media obtained high purchasing behaviour.

3.4.2 RQ5 information behaviour. The systematic review, in its thematisation, also identified studies that were grouped under the concept of information behaviours as conceived by Wilson (2000). According to Wilson (2000, p. 49), information behaviour is "the totality of human behaviour concerning sources and channels of information, including both active and passive information seeking and information use". Ford (2015, p. 17) expanded the concept and established the "components of information behaviour", which includes "assessing the suitability of information" (Trust behaviour) and "using information" (Sharing behaviour). Thus, the review adopted these terms and unravelled the major issues and evidence discussed by the studies that focused on them.

3.4.2.1 Information-seeking behaviour. According to Lu (2003), uncertainty often leads to individuals scrambling for information to gain adequate knowledge and make meaningful judgements, usually not just for themselves but also to assist others. Different information sources are important as individuals seeking these information use them to answer specific needs (Case, 2013). This premise served as the motivation for Superio *et al.* (2021) to investigate the effects of the information-seeking behaviour of college students in the Philippines on knowledge, fear of Covid-19 and precautions. Evidence from the findings showed that the Philippines government frequently disseminated factual information about the Covid-19 pandemic. Thus, the respondents indicated a high level of knowledge about the pandemic due to their motivation to seek available and accessible information. The respondents also applied precautionary measures against the virus due to their information-seeking behaviour. The finding of Chawla *et al.* (2021), which demonstrates consistency with Superio *et al.* (2021), also established that individuals who actively search for Covid-19 information, such as posts and updates on social media, have higher knowledge of the pandemic. Evidence from the scholars shows that although availability and access to information can highly influence knowledge, the individuals' motivation in seeking the information predominantly leads to higher knowledge, as far as passively receiving information not sought is also access to information. It is also important to note that the enthusiasm for information-seeking behaviour is a result of the state of the Covid-19 pandemic in the countries of individuals seeking the information. This is supported by Chawla *et al.*'s (2021) study, conducted in multiple countries, which revealed that respondents from countries with high Covid-19 cases led the information search. On the relationship between knowledge of the pandemic and individuals' behaviour, the scholars also assert that individuals with higher knowledge of the pandemic have higher tendencies to adhere to safety protocols and were less afraid of the disease.

3.4.2.2 Information trust behaviour. Lee *et al.*'s (2021) study evaluated how people's perception of the characteristics of online news media and social media can affect trust in citizens and governments and how this trust can lead to precautionary actions against the pandemic. The researchers argue that online news media have the characteristics of reliability and trustworthiness as it is seen as a supplement to the traditional media. Thus, Lee *et al.*'s (2021) findings proved that the perception of these characteristics enables news recipients to trust in citizens and the government. The finding is homogeneous with the position of Superio *et al.* (2021), who stated that the mass media is perceived as the most believable, and Chawla *et al.* (2021), the most reliable medium of Covid-19 information dissemination. On the effect of the perception of social media on trust in citizens and government, Lee *et al.* (2021) only found the impact on trust in citizens and not in government. They suggest that although online news media and social media are all operated as

platforms, information quality is rigorously checked on the former than on the latter; hence, trust is mitigated on social media. However, because social media is a community of users who identify as members (Seargeant and Tagg, 2014), interact with one another emotionally (Oh *et al.*, 2014) and have the discretion to select from information that they are only interested in (Lee *et al.*, 2021), trust in citizens was supported in the findings whereas trust in government was not. This finding is, however, inconsistent with Superio *et al.*'s (2021), which found that only 4 in every 100 respondents reported that they trust the information on social media. The concluding findings of Lee *et al.*'s (2021) study show that the significant role of trust in citizens and the government led to precautionary actions against the virus.

3.4.2.3 Information-sharing behaviour. Sharma and Kapoor (2021) conducted two separate studies in India and the United States to assess the influence of message type (news/rumour) and message polarity (positivity/negativity of messages) on information-sharing behaviour. The researchers found that messages perceived as news are more convincing and effective in eliciting information-sharing behaviour than messages perceived as rumours. Similarly, the importance of the message type had a suitable relationship with sharing behaviour such that messages perceived as news were deemed important to share and led to greater anxiety than rumours. Nonetheless, there was contrasting evidence in the two geographies on the influence of message polarity on information-sharing behaviour. In India, for instance, people perceived messages with positive emotions as worth sharing, whilst negative messages, which sometimes invoke fear and discomfort, propelled people to verify to greater extents (Sharma and Kapoor, 2021). Evidence from the United States was, however, the inverse. In the United States, users were more susceptible to sharing negative messages than verifying positive ones (Sharma and Kapoor, 2021). According to Griffin *et al.* (2020), the feeling of loneliness and isolation of American citizens, which is a result of Covid-19, combined with America's socio-political environment, contributed to the lack of trust in the government and the various institutions responsible for fighting the pandemic.

On the other hand, Chen and Chiu (2021) interrogated the relationship between the density of connection (called network cluster) of Facebook users and the frequency of posting and sharing information (called transmitter activity). They assert that in a network of high density, users become very familiar with one another and share information per the preferences of their audiences. Thence, the cluster of the network is what positively determines the activities of transmitters in the information-sharing business. For the researchers, in sharing information about the Covid-19 pandemic across social platforms such as Facebook, the network cluster and the transmitter activity variables are the descriptors.

Xing *et al.* (2021) also proposed a six-stage information-sharing process by analysing the evolutionary trend of interactions among social media users during the early and outbreak stages of the pandemic. The researchers assert that social media users were absent in the first stage of information dissemination. The second stage saw their emergence, connectivity and participation, but their interaction was complicated and disorganised. In the third stage, another form of users (called influential users) emerged, and with their power, they created and shared information in communities and encouraged others to share. The fourth stage created certain frontiers among these communities, making them independent from others and affecting cross-community interaction. The fifth stage saw the dispersal of most of the communities, and the sixth stage revealed a decline in the popularity of the subject of Covid-19, contributing to a fall in its information-sharing.

3.5 RQ6 false information behaviour

3.5.1 Nature of false information. Forati and Ghose (2021) conducted a geospatial examination of the roots and nature of false information disseminated on Twitter in the

United States of America. The nature of false information was identified as wielding negative sentiments. These sentiments included downplaying the severity of the virus and circulating conspiracy theories and false information on religious and health grounds. The false information is composed of the faith that the most devout followers of a supernatural being (God) will be spared from the destruction of the virus and the belief that alcohol was a very effective way of preventing the virus. Similarly, some tweets framed the virus as a government's machinery employed to limit the people's freedom.

In a similar study, Al-Zaman (2021) found that Bangladeshi locals were the country's primary sources of false information. Among health-related misinformation was the outspread notion that hot water and alcohol were a remedy to the virus amidst several unscientific health information. For religious-related misinformation, people believed that the virus was a plague sent by Allah to destroy the infidels. True believers would be saved by their unwavering faith in Allah. Political and crime-related misinformation focused on the political capital of misinforming the citizenry and high crime rates due to the virus. Entertainment-related misinformation addressed humorous claims, such as a football match arranged between those who tested positive for the virus and those who tested negative.

Zeng and Chan (2021) also conducted a comparative study of the topical and temporal characteristics of Covid-19 misinformation in China, India, France, Germany and the United States. Claims about remedies and vaccines and the government's response to Covid-19 regarding lockdowns and curfews heralded the countries' misinformation circulation. The situation was erratic for the findings of China and India. While Chinese misinformation circulation focused on travel restrictions, children and how to prevent virus transmission, India was very high on lockdown misinformation due to the government's response to the virus and medical prescriptions. Zeng and Chan (2021) emphasised that the Chinese were sharing false information on transmission rate due to a breach in travel restrictions whilst the Indians were absorbed in a religious infodemic, especially against the Muslim communities, characterised by the stringent lockdown rules. The United States was very high on politically driven misinformation. For the time series analysis, the scholars assert that China, Germany and France experienced a Point-Source Infodemic (PSI) over the seven months, whilst the United States and India encountered a Continuous Infodemic or (CI). According to the researchers, misinformation is a by-product of Covid-19 infection in PSI countries, such that a rise in infection rate will lead to a rise in the spread of misinformation. However, in the CI countries, whether there is a rise in infection rate or not, there is an alarming rise in misinformation.

3.5.2 False information sharing behaviour. Balakrishnan *et al.* (2021) found Entertainment, Ignorance and Altruism to be some of the motivation factors for citizens to spread fake news in Malaysia. This means that when individuals share false information without envisaging any reward in return or anticipating its virality, their altruistic false information sharing behaviour is activated. Similarly, individuals who are lazy in verifying the information they receive tend to re-share it out of ignorance. Entertainment motive in this context implies that individuals share false information for the fun of it or to amuse themselves.

Furthermore, Apuke and Omar (2020) and Apuke and Omar (2021) conducted an identical study on the population of Nigeria. A position in their 2020 findings which is akin to the findings of Balakrishnan *et al.* (2021), is that Altruism leads to circulating fake news. However, Balakrishnan *et al.'s* (2021) entertainment motive was not confirmed as the Nigerian population does not deem fun, humour and amusement a good reason to share fake news. The findings further established that because individuals want to feel a sense of connectedness and have a good relationship with others online (Socialisation motive) and because individuals want to be timely in sharing the news they receive (Instant news-sharing motive), they become liable to sharing fake news. What is more, Apuke and Omar (2020) posited that although self-promotion could lead to sharing fake news, the outcome is usually negative as the credibility of the sharers is tainted over time.

On the other hand, the 2021 study (Apuke and Omar, 2021) demonstrated some consistency in the findings on Altruism, Entertainment and Socialisation. However, by introducing three more motives, the researchers observed that individuals spread fake news to relax from a tedious engagement (Passing time motive), to look for (Information-seeking motive) and to disseminate information (Information-sharing motive), leading to the spread of fake news.

Zhou *et al.* (2021) also contend that misinformation that bears health warnings and advice and/or seeks health-related help is highly disseminated. This is because individuals become anxious about finding health solutions in an emergency. Again, ambiguity was discovered to have a very strong influence on disseminating these types of misinformation because when some components of the message are difficult to understand, individuals cannot detect their falsehood.

3.5.3 False information effect. Several studies included in the review demonstrated the effects of false information on people and institutions in society. For instance, Mahmud *et al.* (2021) studied the effects of false information on vaccine administration in Bangladesh. They found that Bangladeshi youths under the age of forty were unreceptive towards vaccinations due to the widespread counter-official information shared through fake news. The researchers posit that when people's beliefs in misinformation soar, their intention toward vaccination reduces. Naeem and Ozuem (2021) also discovered that misinformation on social media posed social, psychological and physical threats to users' purchasing behaviour. For example, several images and videos (social threats) were posted to support the propagation of the false information that shelves of supermarkets in other countries were becoming empty, imploring people at home to run out and buy products in bulk before scarcity sets in during the pandemic. These photographs and videos also depicted quarrels and brawls in lengthy queues (physical threats) at shopping malls and grocery stores, increasing the people's chances of infection. As a result, social media users in countries where similar actions were non-existent were motivated to hoard and panic buy even when they did not want to Naeem and Ozuem (2021).

According to Naeem (2020), authentic information can also be repacked to create harm during a health crisis. This is proven in the researcher's discovery that information shared by public health officials and government institutions intended to encourage people to stay at home due to the adverse effects of the infectious Covid-19 was repackaged by social media users to induce stockpiling behaviour among other users. Videos of infected persons encouraging others to stay home to avoid contracting the virus were circulated as evidence of why they needed to stockpile as soon as possible. However, Tan *et al.* (2021) do not see stockpiling as caused by false information but rather by exposure to online content. The researchers argued that consumers still make panic purchasing decisions even after verifying news because of the perception or fear of scarcity or the fear of a surge in demand and a corresponding shortage in supply.

3.6 RQ7 false information management

3.6.1 Curbing false information. Bangani (2021) argues that official sources should be intentional about sharing credible and accurate information about Covid-19 because the availability of such information demotivates the sharing of fake news. The scholar also suggested that educating online users on information literacy and fake news to improve their fact-checking capabilities (Juneström, 2020) is a possible remedy for curbing the circulation of false information. Bangani (2021) concluded that libraries should acquire fake news materials to facilitate research into the phenomenon. Igbinovi *et al.*,'s (2020) findings are also in affirmation, demonstrating that adequate competence in information literacy among undergraduate students in Nigeria resulted in a lower spread of fake news on Covid-19.

Choudrie *et al.*'s (2021) study found that older adults do not have the technological sophistication to decipher between false information and facts. Thus, they rely heavily on traditional media to receive information. The researchers suggested that because of this digital divide deficiency, official sources should also utilise traditional mediums in propagating information about the Covid-19 pandemic.

Other studies (Kim *et al.*, 2021; Li *et al.*, 2022) demonstrated that the spread of misinformation could be controlled when people can recognise information that is deceptive or false. For instance, Li *et al.* (2022) developed a false information recognition scheme to curb false information circulation. The scheme suggests that health information with grammatical deficiencies, credibility pretence and exaggerations are highly likely to be false. Individuals' identification abilities based on this scheme will consequently safeguard them from the potential effects of fake news. Conclusively, Jo *et al.*'s (2021) research signified that when people understand the need to curb the spread of false information, they will be willing to contribute more to eradicating them. This assertion is heavily evident in their findings, which posited that the South Koreans were willing to make a 9-US-dollar equivalent donation to the government to implement a fact-checking systems policy.

4. Research gaps and implications

An important direction for this research was to synthesise previous studies conducted on social media usage and the behaviour of users towards information and false information on the Covid-19 pandemic to establish existing gaps and guide future research. This study has achieved that objective by presenting several illustrative and thematic analyses of the literature on the phenomena. As a result, the study has identified some gaps that could guide future research.

Figure 2 above presents the gap in methods and shows that the qualitative and mixed-method approaches are the most underexplored research methodologies in the 56 articles under review and, as such, should be utilised in future research on the subject area. Regarding quantitative studies, it is substantial to state that future studies should focus on conducting longitudinal studies. This is because most of the quantitative literature analysed cited the cursory time frame, due to the novelty of the pandemic, as a major limitation to the generalizability of their findings. The recommendations of Kaya (2020), alongside other quantitative studies that explicitly presented an age distribution of respondents, also indicate that research samples are predominantly under the age of 50. Due to the possibility that the behavioural patterns of this age group vary from those of older persons, further studies must be conducted for complete generalisable findings.

The Covid-19 pandemic has affected the world, but research into how social media users behave towards information and false information about the disease has been under-explored in developing economy contexts. Figures 4 and 5 have illustrated contexts that have mostly been researched and those that have not. The minimal attention towards Africa, Oceania and South America should inform future research as behaviour can differ from context to context (Lee *et al.*, 2021; Sharma and Kapoor, 2021).

Some noteworthy practical implications have also been identified in the literature on the subject. Among the most prevalent is the issue of the lack of information literacy training among social media users (Balakrishnan *et al.*, 2021; Batool *et al.*, 2021; Kaya, 2020). This is regarded as one of the major contributors to the problem of infodemics (Swire-Thompson and Lazer, 2020). It is general knowledge that social media users belong to different institutions in society, such as educational, professional and religious institutions, among others. Whilst public health authorities can embark on information literacy training on their social media platforms or through the mass media, they can also liaise with these societal institutions to curb the menace.

Similarly, the issue of fake accounts, known as backchannel accounts (Mansilla *et al.*, 2021) or social bots (Lazer *et al.*, 2018), which are contributors to infodemics, has received minimal attention in the literature. These accounts are defined as unauthorised, secret or irregular forms of communication or automated parodies contributing to the spread of false information (Lazer *et al.*, 2018; Mansilla *et al.*, 2021; McCarthy and Boyd, 2005). It is estimated that approximately 90 million Facebook accounts are fake (Nicas, 2020), and 15% of Twitter accounts are social bots (Varol *et al.*, 2017). These illuminating statistics must be a concern to mitigating the effects of Covid-19 by governments and health agencies. As a result, health institutions and governments must provide accurate official information to combat fake accounts. Future studies must also investigate the phenomenon's effect on people's information behaviour.

Finally, there are some grey areas that we find insightful but have not been answered by the studies under review. For example, given the geographical distribution of the research, which social media platforms are mostly studied? How does social media usage affect information and false information behaviour? How do information and false information behaviour interact? What motivates false information management? How does false information management affect social media usage? We believe that future research can attempt to answer these questions, especially in different geographical contexts, to enrich the existing literature.

5. Conclusion and limitations

This study was carried out by discussing the evidence in the literature on social media usage and the behaviour of users towards Covid-19 information amidst the era of false information or fake news. It consequently established the research problems that have been addressed and proposed ideas for future research. The study also illustrated the methodological, geographical and theoretical underpinnings in the literature on the subject area. The study thoroughly discussed social media usage during the pandemic, information-seeking, information trust and information-sharing behaviour of people in the wake of the disease. It further examined the nature of false information, false information-sharing behaviour, verification behaviour and effects of false information, such as negative consumer decisions triggered by Covid-19. It concluded with a discussion of how false information was curbed and how different authorities communicated at the height of the pandemic.

The systematic review is not devoid of limitations. First, it acknowledges that only peer-reviewed articles published in journals hosted by Emerald and ScienceDirect were used. This selection criterion means that the colossal information in journals hosted by other databases, and other publications such as books, case studies, executive summaries, expert briefings and encyclopaedias, among others, are ignored. This is also applicable to grey literature that is not published. Additionally, only articles published in English from January 2020 to January 2022 were utilised because of the novelty of Covid-19. This also eliminates information provided in later publications of the said date. With these limitations, the study notes that articles considered for this study may not be entirely representative of all publications on the subject. Consequently, the problems addressed in this study, albeit sufficient, may not be complete; instead, they serve as potential guides indicating existing gaps and future research opportunities.

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