Systematic Literature Review of Studies on Communication and COVID-19 from 2020 to 2022: An Agenda-Setting Perspective

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ABSTRACT

The COVID-19 pandemic that commenced early 2020 took the world by storm with its unexpected arrival. As of September 2024, the World Health Organisation (WHO) reported COVID-19 cumulative cases totalling 776 million and cumulative deaths at 7.1 million. Several research studies have been conducted globally on COVID-19 and communication that saw the agenda setting of foci points in articles through their findings. The articles examined were published from 2020 to 2022 which was the peak of the COVID-19 pandemic and were extracted from SCOPUS, Web of Science, and the Google Scholar platforms. It appears that a systematic review of the literature from the agenda setting perspective had not been carried out previously thus creating a research gap. The study was guided by the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) guidelines and was analysed thematically. There were two research questions guiding the study: the first focused on the research methods used in the 76 studies on COVID-19 and Communication selected from 2020 to 2022, and the second research question focused on their findings. The most salient theme for the first research question is *Quantitative research* and for the second research question, *Effective communication strategy during COVID-19*. The findings underscore the importance of the use of quantitative research and effective communication strategies during the COVID-19 pandemic.

Keywords: *COVID-19, communication, agenda setting, systematic review, meta-analyses.*

INTRODUCTION

Communication on the COVID-19 pandemic was strategically delivered by the World Health Organization, governments and other stakeholders as it has caused about 7.1 deaths worldwide as of September 2024, according to the World Health Organization (2024). Communication must be effective for nations to contain the COVID-19 pandemic. Digital media somewhat plays a crucial role in the communication of COVID-19 by using visual images to spread information, mobile health practices to manage medical resources, social media to promote public health campaigns and digital tools to assist population management and disease tracing (Bao et al., 2020). In-home media consumption increased globally with 35 percent of the respondents having read more books or listened to more audiobooks at home and 18 percent having listened to more radio, whilst more than 40 percent of consumers have spent longer messaging and have used social media more (Watson, 2022). A study finds that information shared through social media succeeded in creating awareness during the pandemic especially to university students in Malaysia (Uran et al., 2022).

Numerous studies were conducted on communication and COVID-19 worldwide, but they have not been examined through a systematic review raising the intrigue as to the types of research methods used and the findings of the studies. This study examined selected studies through Systematic Literature Review (SLR) from the agenda-setting theory

perspective. Previous studies on SLR, COVID-19 and communication examined peer-reviewed articles to determine the content of provider communication resources before making recommendations (Wittenberg et al., 2021), the social media effects on public health responses (Gunasekeran et al., 2022), communication effects of COVID-19 on K-12 education (Huck & Zhang, 2021) and public communication related to uncertainty during COVID-19 (Ratcliff et al., 2022) but had not used agenda-setting theory on research methods and findings of studies and hence, there was a research gap which needed addressing. The research questions of the current study were:

1. Which research methods were used in the studies from 2020 to 2022 on COVID-19 and communication from the agenda-setting perspective?
2. What were the key findings of studies from 2020 to 2022 on COVID-19 and communication from the agenda-setting perspective?

THEORETICAL FRAMEWORK

Agenda-setting theory is usually used to examine news stories on the salient topics that are focused on by the media that affect people by making them think in a certain way (McCombs, 2002). When applying agenda-setting theory to political campaigns, the mass media can determine important issues through what the candidates say thus setting the agenda (McCombs & Shaw, 1972). A study using agenda-setting focuses on major and minor issues found in the mass media as communicated by political parties identified by their placement as the lead story, as one of the criteria; newspapers and magazines would have major issues positioned in the front sections of the media vehicles for example (McCombs & Shaw, 1972). A news agenda would help shape public opinion (McCombs, 2002). An expanded agenda-setting theory that was used in research studies in the 1995 elections in Spain explains the effects of the mass media on how people think about people and subject matters in the news (McCombs et al., 1997). The study also depicts that the role played by the media is not limited to the setting of social priorities (a first-level agenda of issues) but encompasses in addition to this, the choice of the specific attributes of the candidates from which voters will form their own opinions about the candidates. This review study focused on identifying salient themes and codes in studies on COVID-19 and communication from 2020 to 2022 that could affect the opinions of the community of scholars, students and other readers as aptly described by the first level of agenda-setting. The salience of themes refers to the theme with the greatest number of codes and the salience of codes corresponds to the greatest number of subcodes without examining their effects on audiences.

METHODOLOGY

a. Literature Search

The study adopted the Preferred Reporting Items for Systematic Review and Meta-analyses (PRISMA) guidelines that involve a PRISMA statement with a 27-item checklist (Moher et al., 2009) leading to the PRISMA flow diagram that entails the inclusion and exclusion process of the review of previous studies (Figure 1). Studies on COVID-19 and communication from 2020 to 2022 were selected and analysed thematically. Studies that were non-empirical and research papers not displayed in full were excluded from the study. Various themes and codes were generated from the SLR using agenda-setting theory to examine the salience of the data in terms of key research methods and findings of studies on COVID-19 and communication from 2020 to 2022. This study is useful for academicians and public health practitioners to

understand studies from 2020 to 2022 to determine what has been investigated and what needs further investigation.

b. Selection of Articles

There were 450 articles on COVID-19 and communication derived from SCOPUS, Web of Science, and the Google Scholar platforms from 2020 to 2022. A total of 136 full text articles derived from the databases were reviewed by the researchers and 314 articles were excluded, as they did not fulfil the criteria of articles that focused on COVID-19 and communication after being screened. The remaining 136 were further checked for eligibility resulting in 76 articles after 60 systematic literature review analysis and conceptual papers were discarded.
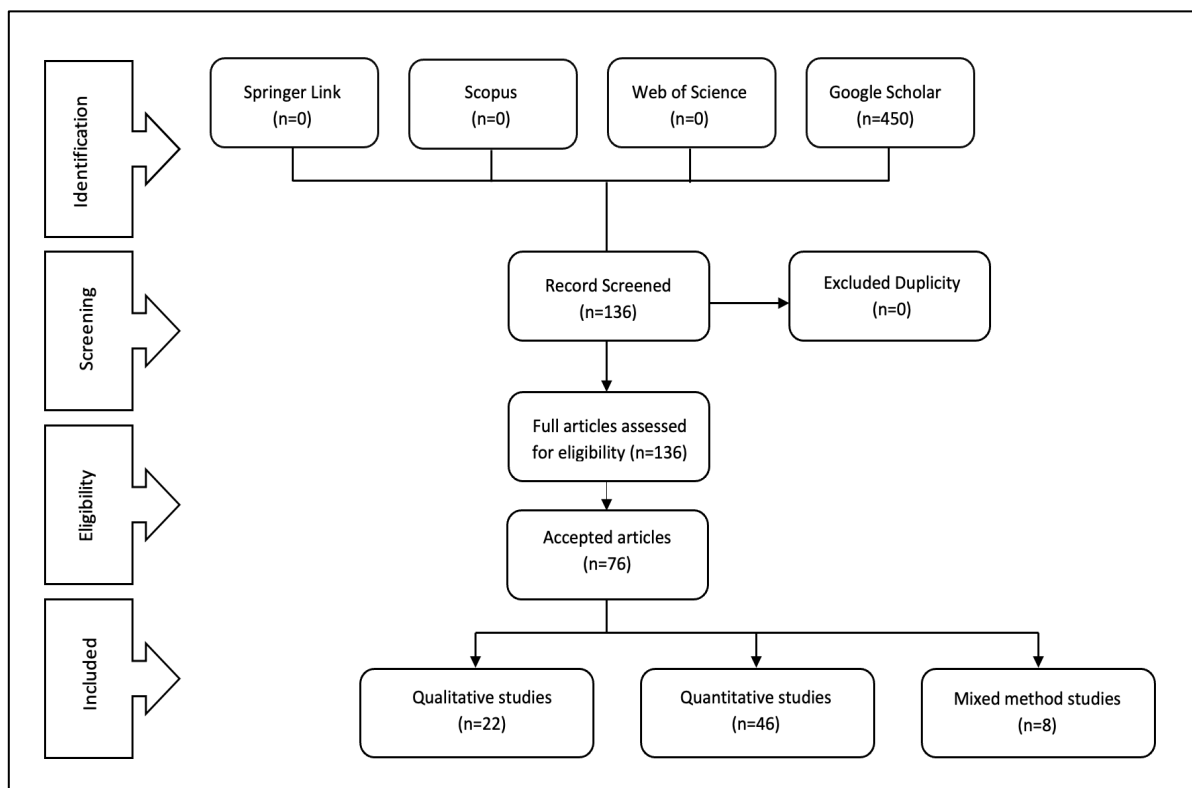
c. Preparing Phase

Figure 1: PRISMA flow diagram

d. Analysis Phase

Various themes and codes were then identified using Braun and Clarke's (2006) thematising approach that involves a series of phases (see Figure 2). The qualitative analysis software, NVIVO, was used to analyse the data to identify the research methods and to generate themes and codes from the research methods and findings. Credibility of the data was established through peer debriefing with the help of an experienced researcher scrutinising the themes and codes for duplication (Lincoln & Guba, 1985).
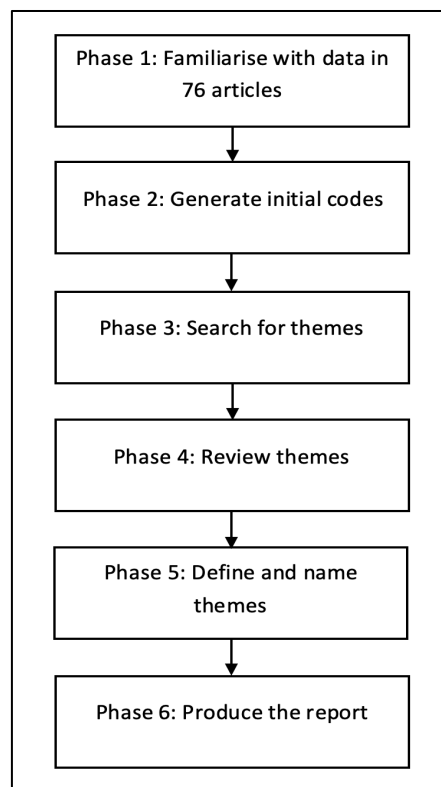
Phase 1: Familiarise with data in 76 articles

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Phase 2: Generate initial codes

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Phase 3: Search for themes

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Phase 4: Review themes

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Phase 5: Define and name themes

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Phase 6: Produce the report

Figure 2: Thematising phases for data analysis (Braun & Clarke, 2006, p. 87)

RESULTS AND DISCUSSION

Table 1: Themes and codes regarding research methods

Themes	Codes	Frequency of codes
Quantitative Research	a. Survey	
	Online survey	29
	Virtual and telephone survey	3
	Online panel survey	2
	Face to face survey	1
	b. Experimental design	
	Experimental survey	6
	Online narratives vs non-narratives experimental study	1
	c. Content Analysis	
	Independent content analysis	2
	Altmetric methods and content analysis	1
	d. Readability index	1
Subtotal		46

Qualitative Research	a. Qualitative content analysis	6
	b. Interviews	
	Telephone and online interviews	1
	Telephone, F2f and video call interviews	1
	F2f and online interviews	1
	Telephone interviews	1
	c. Netnography	2
	d. Multistakeholder engagement design	1
	e. Documentary research	1
	f. Narrative review	1
	Qualitative descriptive research	1
	g. Online, offline, interviews, online observations, and textual analysis	1
	h. Online qualitative survey	1
	i. Critical case study analysis	1
	j. Interviews and content analysis	1
	k. Content and framing analysis	1
	l. WeChat ethnography	1
Subtotal		22
Mixed Methods	a. Online survey and phone interviews	3
	b. Online survey and observation	1
	c. Online survey and online FGD	1
	d. Qualitative, quantitative content analysis and textual analysis	1
	e. Content analysis and discussions	1
	f. Online survey and documentary research	1
Subtotal		8
Grand Total		76

The most salient theme for the first research question is *quantitative research* (46 codes) and the most salient code under the theme is *survey* (35 codes) (see Table 1 and Figure 3). The subsequent most salient theme is *qualitative research* (22 codes), and the most salient code under this theme is *qualitative content analysis* (6 codes). The least salient theme overall is *mixed methods* (8 codes) with the most salient code being *online survey* and phone interviews under this theme (3 codes).
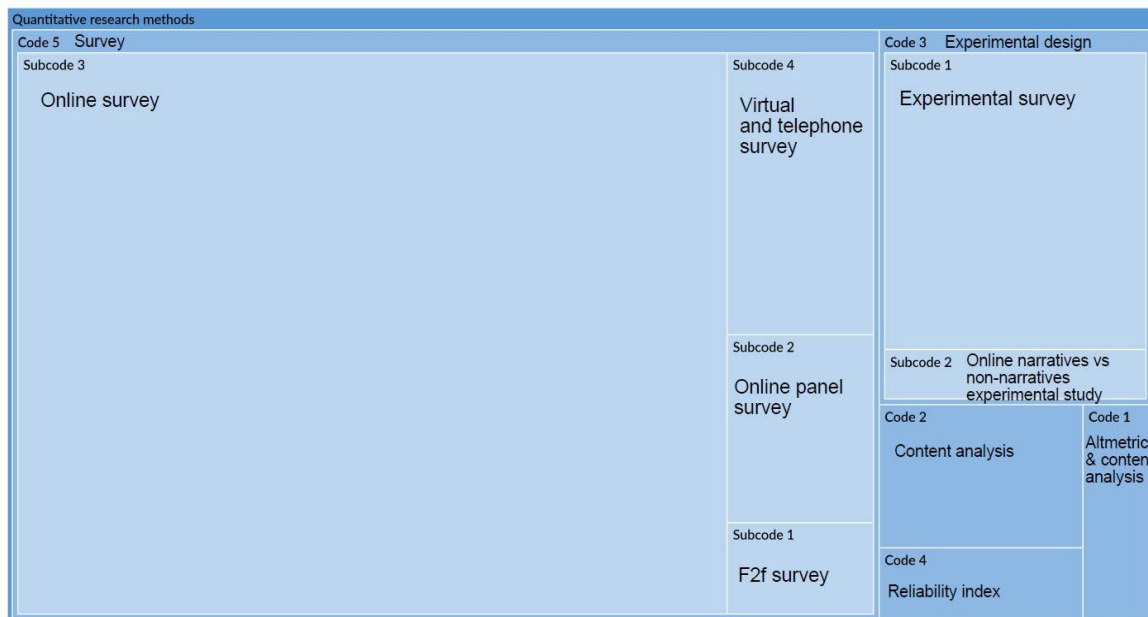
Theme 1: Quantitative Research

Figure 3: Hierarchy chart of quantitative research methods used in the literature of COVID-19 and communication studies from 2020-2022

Quantitative research, refers to quantitative data-gathering techniques and statistical analysis, tends to be deductivist and influenced by positivism (Bryman & Bell, 2019). The quantitative research design was the most popular method used in the studies examined with 46 studies in over 76 studies compared to qualitative research (22 codes or 29 percent) and mixed methods (8 codes or 10.5 percent). The *survey* (35 codes), *experimental study* (7 codes) and *content analysis* (3 codes) were the more common research methods but there are also other forms of research methods used like the *readability calculator* (1 code), and combination of *altmetric methods and content analysis* (1 code) that are not commonly used and less cited in the research studies examined. Altmetrics refers to alternative metrics that allows researchers to track anything from articles to software packages (Altmetrics, n.d.). Fleerackers et al. (2022), used Altmetrics fused with content analysis to track online research activity in the media. A *readability calculator* was used to measure the level of readability for the first 100 websites in English that mentioned information on 'Coronavirus' by Basch et al. (2020) which was also used in a study making this finding likewise uncommon.

Furthermore, most of the studies used the survey (35 codes) with most using online surveys (29 codes) that have benefits especially during COVID-19. As conventional surveys were not feasibly conducted, online surveys were an important tool for COVID-19 research (Hlatshwako et al., 2021). Online surveys were useful during social distancing and lockdown instances and can capture data straight onto a database. Other forms of survey used were the combined virtual and telephone survey (3 codes), online panel survey (2 codes) and face to face survey (1 code). A panel survey is longitudinal on a group of people as the sample (Survey Monkey, n.d.). The Experimental design (7 codes) was the second most popular with a more common experimental survey used most (6 codes) and the uncommon online narratives versus non-narratives experimental study used in one study to determine whether using narratives is the best strategy to use in communicating on COVID-19.
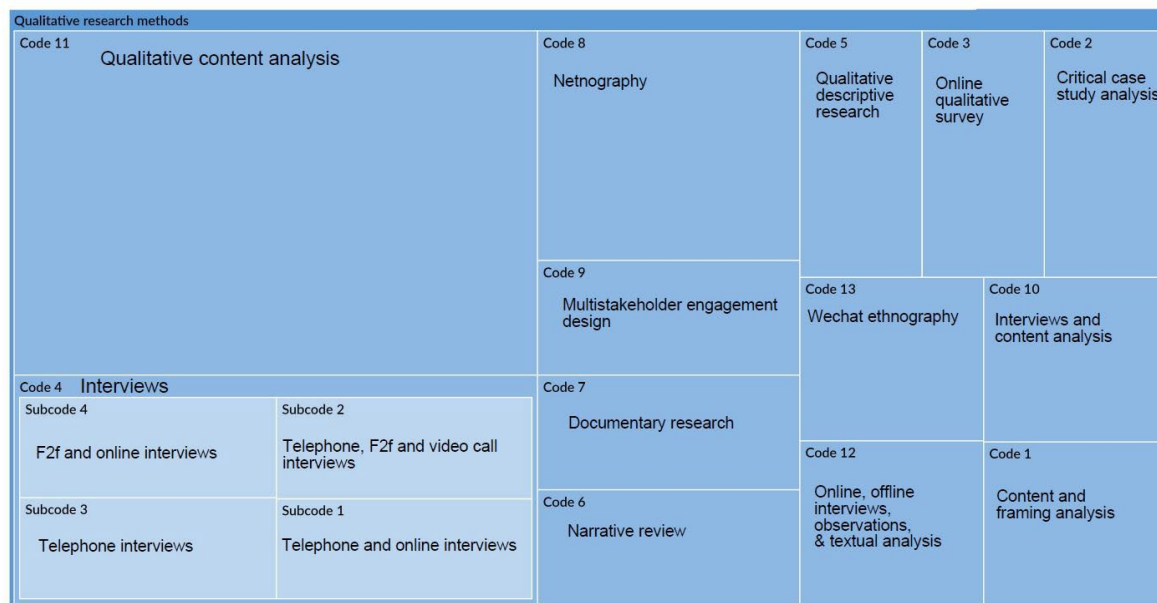
Theme 2: Qualitative Research

Figure 4: Hierarchy chart of qualitative research methods used in the literature of COVID-19 and communication studies from 2020-2022

The second most salient theme is *qualitative research* with *qualitative content analysis* as having the highest number of codes (6 codes). The qualitative research design uses predominantly words, images, and other symbols that are not numerical as data and involves little quantification or none, is inductivist, constructivist, and interpretivist in orientation; but qualitative researchers do not always refer to all three attributes (Bryman & Bell, 2019). Qualitative research studies appear more diverse in type for COVID-19 research studies (see Table 1) with more common types such as *qualitative content analysis* (6 codes) and *interviews* (4 codes) that had several combinations of the different types of interviews. *Netnography* was carried out in two studies (2 codes), and one study used each type of research method: *multistakeholder engagement, documentary research, narrative review, qualitative descriptive research, online and offline interviews, online observations and textual analysis, online qualitative survey, critical case study analysis, interviews and content analysis, content and framing analysis and WeChat ethnography*.

Qualitative content analysis (QCA) is different from its quantitative counterpart as it involves describing material and classifying them (Schreier, 2012). It would have been safer to conduct content analysis than face-to-face (F2f) interviews and face-to-face focus group discussions (FGD) during the COVID-19 pandemic. Netnography is a qualitative approach that involves using ethnography on social media by adapting traditional ethnographic methods (Kozinets, 2019). Whilst Qualitative descriptive research is about understanding phenomena through participants' experiences and assigning meanings to them (Karidakis et al., 2022). A study used the multi-stakeholder engagement method by engaging with a few stakeholders that proposed a digital plain language COVID-19 recommendation tool to communicate on the COVID-19 guidelines to patients, caregivers, and the public for better comprehension.
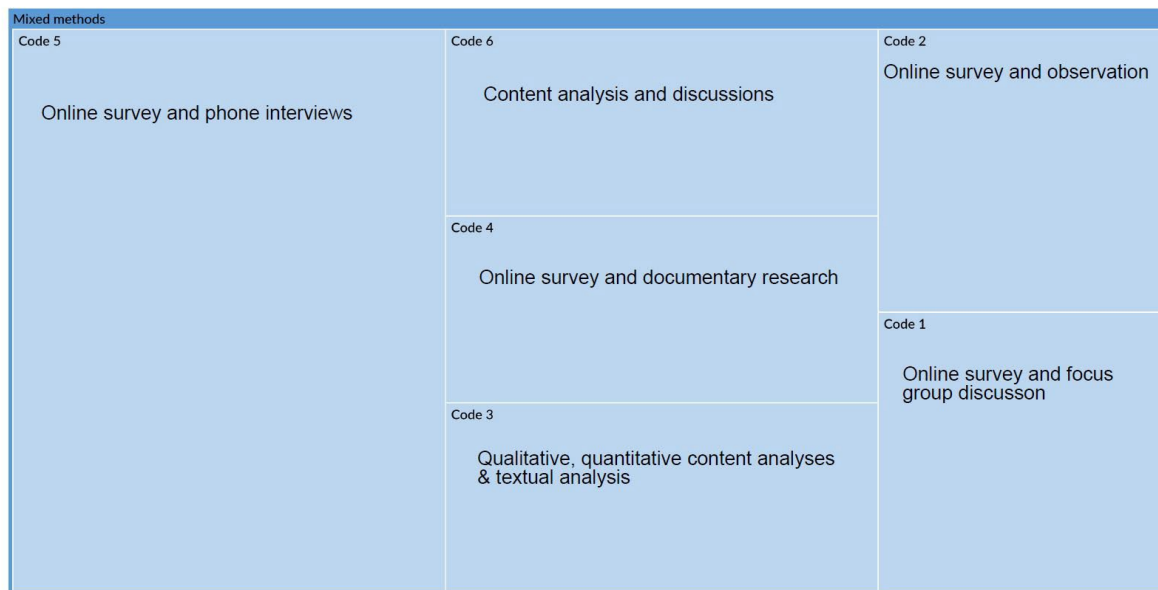
Theme 3: Mixed Methods

Figure 5: Hierarchy chart of mixed methods used in the literature of COVID-19 and communication studies from 2020-2022

Mixed methods combine quantitative and qualitative studies in the same research project (Bryman & Bell, 2019). When it came to agenda-setting focusing on the salience of themes and codes, the Mixed methods was the least popular theme compared to quantitative and qualitative research in the studies examined. This is perhaps due to its complexity which was hampered due to COVID-19 restrictions. Using mixed methods entails a richer data collection exercise that takes advantage of the different research paradigms: the interpretivist paradigm for qualitative research involves in-depth variables and factors that relate to a context, considers humans differently from physical phenomena as they generate profoundness in meanings (Alharahsheh & Pius, 2020). The writers mention quantitative research methods that focus on the positivist paradigm by depending on the philosophical stance of the natural scientist related to reality that can be observed in society leading to generalisations made (Alharahsheh & Pius, 2020).

There were several combinations of mixed methods used in the studies with *online survey and phone interviews being* the most popular (3 codes). Other types were only used in one study each: *online survey and observation*; *qualitative, quantitative content analyses and textual analysis*; *online survey and online focus group discussions*; *content analysis and discussions*; and *online survey and documentary research*.

With regards to the second research question, there were several themes emphasised in the studies of COVID-19 and communication (see Table 2).

Table 2: Themes and codes of findings in order of salience

Theme No.	Themes	Codes
Theme 1	Effective communication strategy during COVID-19	Code 1: Effective communication affects vaccination acceptance.
		Code 2: Government communication needs to be effective.
		Code 3: Effective support with good communication important

		Code 4: Effective communication leads to preventive behaviours. Code 5: Visual communication on COVID-19 is effective. Code 6: Interactive communication strategy used. Code 7: Business Adapting during COVID-19 Code 9: Effective communication in organisations leads to good outcomes (job satisfaction/less stress). Code 10: Attitudinal posts by media were more engaging and positively associated with public engagement. Code 11: A framework of the degree to which Greek people followed the recommended measures for their protection from COVID–19 produced.
Theme 2	Risk communication and risk perception interrelated	Code 1: Risk communication has an interactive relationship with risk perception Code 2: Emotions are central to risk perception. Code 3: Communication negatively predicted psychophysical strain over time Code 4; Perception and media affect anxiety Code 5: Increased media exposure leads to risk perception and perceived media roles. Code 6: Highly educated people perceive a positive relationship between risk perceptions and socioeconomic status (SES)
Theme 3	Media preferences during COVID-19	Code 1: Patterns of digital communication usage during COVID-19 Code 2: Social media plays a role in COVID-19 Code 3: Media usage in education during COVID-19 Code 4: Traditional media preferred over online medium
Theme 4	Ineffective communication strategy during COVID-19	Code 1: Obstacles to effective communication during COVID-19 Code 2: Failed risk communication by Governments. Code 3: Negative feelings affecting recipients.

Theme 1: Effective Communication Strategy During Covid-19
This is the first theme that generated the largest number of codes at eleven.

a. Code 1: Effective Communication Affects Vaccination Acceptance
Studies on COVID-19 vaccinations were also underscored by several researchers. This code has seven subcodes proving that it was important for the communication on COVID-19 and vaccinations to be well-written and planned as messages focusing on scientific evidence and certainty proved to be more effective messages (Kelp et al., 2022), there has to be trust in the formal sources of evidence to encourage vaccination against COVID-19 (Tan et al., 2022), and messages that underscored personal health risks and collective health consequences of not vaccinating greatly increased Americans' intentions to vaccinate (Motta et al., 2021). The message strategy that used narratives (Iles et al., 2022) and Word of Mouth (WOM) were important for vaccine acceptance (Toth-Manikowski et al., 2022). WOM was also important for vaccine acceptance amongst minorities (Azer & Alexander, 2022). To influence the public to accept COVID-19 vaccinations, the messages must also be in the right medium. It is important to use communication strategies to attend to the public's concerns about the

safety and development process of COVID-19 vaccines when persuading them to accept them (Thorpe et al., 2022). There were anti-vaxxers who used toxic language to users who had neutral accounts and often targeted postings on vaccine operations (Miyazaki et al., 2022). Communication between doctor and patient reinforced the negative effect of knowledge of the vaccine on perceived susceptibility and severity (Zheng et al., 2022) and doctors should commence their vaccination knowledge online or when meeting patients. The next most salient code with six subcodes focuses on government communication about COVID-19.

b. Code 2: Government Communication Needs to be Effective
There were effective strategies in communication by the government that were practised and should be practised by future leaders of governments in the case of a pandemic highlighted by the second code. There are six subcodes belonging to the second code: *Taiwan government more effective in communication on COVID-19 than US* (Chang, 2020), *Communication engagement important during public health crisis* (Fotheringham et al., 2021) and *Positive communication by government leadership during COVID-19 important* as in the case of the New Zealand Prime Minister (McGuire et al., 2020) and *Using an effective communication strategy that is important to gain trust* was highlighted by two studies (Hirschfeld & Thielsch, 2022; Lee & Li, 2021), African Government RCCE strategies to contain COVID-19 (Adebisi et al., 2021) and Australian Prime Minister Morrison included many aspects of Crisis and Emergency Risk Communication (CERC) proposed by the World Health Organization and US Center for Disease Control and Prevention in his official communication (Bernard et al., 2021).

The effectiveness in governmental communication in Taiwan compared to the US was evident when the former adopted the five-step mediation effect in a significant way, such as exposure to government information → perceived government empowerment → intrapersonal empowerment → preventive behaviours → reduced vulnerability and worry (Chang, 2020). The findings of a study suggest that the quality, quantity and frequency of top-down communication in the form of revised published government policy guidance contributed to school leader stress, while horizontal communication and collaboration between school leaders and across school communities supported leaders during rapid change (Fotheringham et al., 2021). Trust is important in effective government communication (Hirschfeld & Thielsch, 2022; Lee & Li, 2021). Lee and Li (2021) saw that in the early stage of COVID-19, information sustainability by state governments and institutes expanded public trust that positively influenced their perceived risks, behavioural control and subjective norms. On the other hand, Hirschfeld and Thielsch (2022) discovered that crisis communication strategies had no great effect on participants' ratings of behavioural measures, instead they influenced participants' trust in the mayor. The subcode *African Government risk communication and community engagement (RCCE) strategies to contain COVID-19* (Adebisi et al., 2021) proved to be greatly effective as it encompassed several aspects such as focused training and capacity building for one, but the countries also encountered challenges.

c. Code 3: Effective Support with Good Communication Important During COVID-19
With five subcodes, the theme underscored the important practice of using effective communication on frontliners or by frontliners during the COVID-19 pandemic if not uncertainty will be felt by them that could be chaotic. Effective communication that is

courteous, innovative, and professional was required during the pandemic with internal and external stakeholders such as between physicians and their patients as an example (Reddy & Gupta, 2020). The subcodes are *Support quality better with experience for Speech Language Pathologists (SLP) using aided augmentative and alternative communication (AAC) telepractice* (Biggs et al., 2022), *Effective communication in End of Life (EOL) and Intensive Care Unit (ICU) care important* (Ersek et al., 2021; Rose et al., 2021), and *Effective communication for supporting patients, pharmacists and nurses practised* (Karasneh et al., 2021; Lord et al., 2021; Simonovich et al., 2021), *Motivation messages increases job satisfaction and communication skills but lowers compassion fatigue for emergency nurses* (Goktas et al., 2022) and *Patients anxious and clinicians unsure on COVID-19 recommendations* (Alpert et al., 2022).

The first subcode mentions that the increased experience of Speech Language Pathologists gave them confidence in providing support to patients (Biggs et al., 2022). Subsequent subcodes focused on the effective use of communication in providing support to patients or frontliners (nurses and pharmacists) (Ersek et al., 2021; Karasneh et al., 2021; Lord et al., 2021; Rose et al., 2021; Simonovich et al., 2021). There was excellent remote communication reported (Ersek et al., 2021) and Virtual visits and a dedicated Intensive Care Unit (ICU) team in hospitals led to reducing patient psychological distress, enhancing staff morale, and redirection of patients with delirium (47 percent) (Rose et al., 2021). Another subcode finds that effective communication planning for pharmacists was carried out by first determining their level of awareness of COVID-19 and risk perception (Karasneh et al., 2021). Most nurses in a study obtained enough information regarding COVID-19 and about caring for patients with the virus, but they were worried about spreading COVID-19 to their families and most were willing to care for patients with COVID-19 (Lord et al., 2021). Another study found that effective communication affected patient care and nursing practice experiences during COVID-19 positively (Simonovich et al., 2021). Emergency nurses need to be given motivation messages to ensure their job satisfaction (Goktas et al., 2022) but the problem of ineffective communication is also evident as *Patients* were *anxious and clinicians unsure on COVID-19 recommendations* (Alpert et al., 2022) which highlights the importance of using effective communication by authorities to clinicians. The subsequent codes have fewer subcodes.

d. Code 4: Effective Communication Leads to Preventive Behaviours
Five subcodes were generated from the examination of the findings that depicted the importance of using effective communication during COVID-19 times. These include the act of allowing others to be exposed to COVID-19 risk communication messages on preventive behaviours that otherwise could be detrimental to the Chinese society (Wang et al., 2020) and using humour in COVID-19 messages to reduce anxiety and mood swings (Curşeu et al., 2021). Moreover, the relationship between COVID-19 knowledge of and social distancing practices was validated by a study (Yu et al., 2022) and constant communication with others led to better self-control and better emotional wellbeing (Huang et al., 2022) depicting how African American students' emotional wellbeing was improved with communication and self-care techniques.

Another study found that communication (through news media, social media, and interpersonal communication) raises perceptions of efficacy, norms, and threat, which in turn impacts health protective behaviour marking the important role of communication

engagement during a public health crisis (Friemel & Geber, 2021). What are effective communication strategies? Effective communication strategies refer to the use of risk communication that involves the communication exchange of information, advice and opinions between experts or officials and people who encounter a threat to their survival, health or economic or social wellbeing to enable people who are at risk to reduce the effects of a disease like COVID-19 (World Health Organisation, 2023). Employing effective communication strategies in COVID-19 messages was essential to ensure that COVID-19 was prevented from being spread with the promotion of behaviours such as social-distancing and the wearing of masks but also ensured that anxiety and panic were not widespread.

e. Code 5: Visual Communication on COVID-19 is Effective
The fifth code is the effective use of visuals to convey information on COVID-19. The reason is, "consumers had more positive cognitive responses and aesthetic judgments to: product designs with moderate (vs high) novelty; and products with visual design stories than without" (Seifert & Chattaraman, 2020, p. 913). Another study found that visual narratives are a useful tool for engaging broad audiences in risk messages and public health precautions for COVID-19 in the form of flashcards that made learning about COVID-19 easier on disease prevention (Jarreau et al., 2021) so it was not surprising that visuals were more effective in terms of conveying complex scientific information in a manner that was positive. The two subcodes generated are *Infographics are effective in conveying about COVID-19 on social media* (Lee et al., 2022) and *Hope-oriented visuals on COVID-19 better than fear messages* (Petersen et al., 2022). The second subcode depicts visuals that projected hope motivates public action more effectively than a fear-oriented visual communication that focuses exclusively on the threat of the new variant (Petersen et al., 2022).

f. Code 6: Interactive Communication Strategy Used
There are two subcodes under the sixth code. The first subcode is *Shift to multi-stakeholder interactive strategy from written strategy* which found a transformation from written communication to interactive exchanges between authorities and community leaders (Karidakis et al., 2022). The study investigated how Culturally and Linguistically Diverse (CALD) organizations communicate to their communities on COVID-19 public health information in Australia. Another subcode is *Change to interactive communication strategy* (Michela et al., 2022). Both subcodes depict the importance of passive and one-way forms of communication turning to become interactive as time went by to fit the needs during COVID-19. As the pandemic intensified, there was a shift from written communication to more interactive exchanges between authorities and community leaders. Community leaders played a significant role in engaging their community members with accurate key health information. Another study that examined effective communication also saw announcements more common during the early stages of the pandemic (and were engaged more collaboratively), with community-building posts more common later by school districts (Michela et al., 2022).

g. Code 7: Business Adapting During COVID-19
The two subcodes for the seventh code are: *Adaptive ways of doing business practised* (Femenia-Serra et al., 2022) and a *Positive relationship between leader crisis communication and salesperson resilience* (Tuan, 2022). The notion of being adaptive to the COVID-19 situation is essential for marketers in terms of travelling through the way one communicates

to customers as outlined by the four themes generated by Femenia-Serra et al. (2022, p. 5) that are: "(i) Impact on travel influencers, business diversification and pivoting; (ii) Changes in travel influencers" communicative practices; (iii) Changes in engagement practices; (iv) Role of influencers in crisis communication and recovery marketing in travel and tourism.' For the second subcode by Tuan (2022), it highlights the finding that sales managers should focus on using effective crisis communication by clearly communicating on the company's policies related to social distancing, personal hygiene and other information important to disseminate during COVID-19 to develop a positive stress mindset.

Standalone Codes 8-11

The eighth code *Multi-stakeholder development process of recommendation formats* (Pottie et al., 2022) refers to the development of a digital communication tool to enhance the implementation of up to date COVID-19 information by using plain language so as to improve patient, caregiver and public understanding of healthcare advice on COVID-19 looked at how important it was to make COVID-19 easy to understand to the public. The ninth code is *Effective communication in organisations leads to good outcomes (job satisfaction/less stress)* (Einwiller et al., 2021; Zito et al., 2021). The findings uncover that organisational communication needs to be effective for positive outcomes to be generated. Einwiller et al. (2021) claim that both relational and informational communication have their impacts on employees with the latter affecting employees' acceptance of managerial decisions, relational communication impacting affective commitment. The protective role of organizational communication could safeguard the impact of technostress and enhance self-efficacy, which is usable to the alleviation of disorders that are psycho-physical (Zito et al., 2021).

There were strategies of reporting news that encouraged effective public engagement such as attitudinal and judgmental posts on Weibo. This explains the tenth code *Attitudinal posts by media were more engaging and positively associated with public engagement by the* Chinese Communist paper *People's Daily* (Yao & Ngai, 2022). Also, the eleventh code *A framework of the degree to which Greek people followed the recommended measures for their protection from COVID–19 produced* (Kamenidou et al., 2020) was also generated that found Greek citizens avoiding non-mandatory transportation, avoiding interaction with individuals with respiratory symptoms, and vulnerable groups who were at high risk of illnesses but they avoided checks of body temperature and wearing masks the most. There were also five groups of citizens generated from the study from the cautious to the reckless but nevertheless targeted communication that is effective and easy to comprehend should be carried out.

Theme 2: Risk Communication and Risk Perception Interrelated

The second theme, *Risk Communication and Risk Perception Interrelated* has six codes. Risk perception seems to be affected by risk communication according to this theme. Heydari et al. (2021) claim that risk communication (RC) has direct and indirect positive effects on preventive behaviour (PB) ensuring that RC must be tailor-made well to be effective. The results of the study by Vacondio et al. (2021) depict that worry was the best predictor of perceived threat in the United Kingdom, Italy, and Austria during the first wave of the pandemic. Another study found that perceived risk of being infected at work (PRIW) positively predicted psychophysical strain over time, whereas communication negatively predicted psychophysical strain over time with PRIW regarded as a job demand and communication as a job resource with the balance of JD and good exchange of information can be regarded as a JR. *Perception and media affect anxiety* hence it is found that the role of community age-

friendly communication in easing anxiety of the infodemic is needed (Wong et al., 2022). The findings indicate how people have indulged in social media to pave their business communication needs (Yu et al., 2022). It is apparent that the relationship between social distancing and attitudes to social media use during COVID-19 challenges have moved businesses online. Code No. 6 is about *Positive relationship between risk perceptions and socioeconomic status (SES)* (Reed-Thryselius et al., 2022) signifying that those who were highly educated with high incomes were reported to be abiding by protective measures against COVID-19 and had greater health literacy.

Theme 3: Media Preferences During COVID-19
The next salient theme is *Media preferences during COVID-19* with four codes.

a. Code 1: Patterns of digital communication during COVID-19 usage
The first most salient code produced six subcodes that reflected increased digital communication usage leading to positive outcomes during COVID-19. The first subcode is *Digital communication technology provided social support in lockdowns* in Italy through online emotions ("e-motions") and online social support ("e-support") that led to positive mental health for individuals (Canale et al., 2022). The second subcode, *Online and social media preferred over traditional media* is from a study on the Turkish public when information seeking on COVID-19 (Gökaliler et al., 2022). The third subcode *Socioeconomic status determined use of digital technologies* (Nguyen et al., 2021) entails people with high socioeconomic status, Internet skills and online experiences use digital communication more compared to others. The fourth subcode, *Digital tech supported social relationships* (Gabbiadini et al., 2020) implies that the amount of digital technology used alleviated feelings of loneliness, anger or irritability, boredom and augmented belongingness through social support. The final subcode *Teleconsultations not inferior to the quality of face-to-face consultation* (Kludacz-Alessandri et al., 2021) highlights patients satisfied with the quality of their consultations with doctors using technologies during COVID-19.

b. Code 2: Social Media Play a Role in COVID-19
For the second most salient code there were several subcodes uncovered. The subcodes indicated either positive or negative social media usage, both positive and negative usage of social media and the sentiment of the public from public Tweets. For Kandzer et al. (2022), Facebook can be used to effectively communicate on COVID-19 by using scientific information through conversational voice and organization-public relationship (OPR) indicators in videos. The negative usage of social media was found when social media content created more anxiety because of the prevalence of fake news online that was exposed to college students (Li et al., 2020), Tweets can be used to examine sentiments of government activities on COVID-19 (Rahmanti et al., 2021). It was found that more than half (52 percent) of the population had a 'positive' sentiment towards the Indonesian government's risk communication and epidemic control measures on the 'New Normal' while 41 percent of them had a 'negative' perception.

The second last subcode is *Social media and group chats important to convey on COVID-19 coordination effectively* (Parolin & Pellegrinelli, 2022). It was found that social media and group chat systems had central roles in enabling the spontaneous creation of the group, and the succeeding development of coordinated voluntary emergency activities that

brought help to many locals. It was also found that the social media strategy and network position of health agencies affected the degree of public engagement on COVID-19 content of Twitter (Kim et al., 2021).

c. Code 3: Media Usage in Education During COVID-19

The first subcode for the third most salient code is: *WhatsApp groups have pros and cons in educational usage during COVID-19* (van den Berg & Mudau, 2022). The pros were that WhatsApp provided students with an effective and affordable means to communicate leading to a sense of belonging; however, the con was that it was distracting if used non-academically.

The second subcode is *Moderate teachers' communication skills and students' tension in online learning* (AlKhamaiseh, 2022) meaning that teachers faced a tough time communicating digitally and that students' tension worsened due to the lack of school capabilities in addressing psychological issues amidst learning online. The next subcode is *Preference for face-to-face communication over digital communication for parents with teachers* (Chen & Rivera-Vernazza, 2022). Both teachers and parents agreed that emailing, mobile messaging, and ClassDojo, were the main digital platforms used during COVID-19 in the US, but parents indicated preferences for face-to-face communication over them. Next, the subcode: *Person-to-person medium preferred over online medium by students when learning* (Alawamleh et al., 2020). When it came to the classroom, physical classes were preferred over online classes because the latter developed a "lack of motivation, understanding of the material, decrease in communication levels between students and their instructors and their feeling of isolation" (Alawamleh et al., 2020, p. 1). The final subcode is *Experience improves online teaching* in Romania through better efficiency and when this happens online teaching becomes sustainable as a suitable method of training through online communication (Petrila et al., 2022).

d. Code 4: Traditional Media Preferred Over Online Media

The fourth code, looked at the opposite of what would have been expected in terms of the preference of online media when several studies found that traditional media was preferred over online medium that brings us to the subcodes: 1. *Television preferred over WhatsApp for COVID-19 news* (Moreno et al., 2020); and, 2. *Phone and video communication were effective but inferior to in-person communication* (Kennedy et al., 2021).

For Moreno et al. (2020), three of the four most used information channels were considered mainstream news media: television, online newspapers and radio. People who relied more on mainstream news media for COVID-19 information were most likely to express positive opinions of the government's communication strategy. The second subcode is, *Phone and video communication were effective but inferior to in-person communication* (Kennedy et al., 2021). Phone calls were perceived by both clinicians and families useful for sharing information and briefing updates and video calls were best for bringing together clinician and family perspectives, but clinicians and families were conflicting in some respects for example, clinicians felt they were unsuccessful in communicating empathy from a distance, but families saw it successfully communicated through phone and video.

Theme 4: Ineffective Communication Strategy During COVID-19
There are three codes for the fourth most salient theme.

a. Code 1: Obstacles to Effective Communication During COVID-19
There are several subcodes under the first most salient code: *Face coverings inhibit communication* (Saunders et al., 2021), *Websites used difficult text* (Basch et al., 2020), *Crisis communication guidelines not applied consistently to form trust* (MacKay et al., 2021), *COVID-19 messages freedom threatening for risk takers* (Kemp et al., 2022), *Bad quality vertical communication causes job insecurity and is partially mediated by perceived role ambiguity* felt by flight attendants (Charoensukmongkol & Suthatorn, 2022) and *Preprint expresses uncertainty in research* (Fleerackers et al., 2022).

There appears to be various obstacles found that inhibit effective communication whether it is in the form of the physical (masks, websites, restricted COVID-19 messages) (Saunders et al., 2021), guidelines that are inconsistently applied (MacKay et al., 2021) or bad organisational communication affecting perceptions of job security (Charoensukmongkol & Suthatorn, 2022). The causes of ineffective communication during COVID-19 can be detrimental making it important to ensure that there is effective communication through comprehensible messages even through masks. It was difficult to speak with face coverings on and difficult to understand websites on COVID-19 with complex text. Although face masks and social distancing are important to carry out in crowded places at times when COVID-19 is still present, the mask muffles interpersonal communication leading to the recommendations of coping strategies that would help in the form of nonverbal communication to transparent face masks (Mheidly et al., 2020). Websites that are difficult to read as they use greater than Grade 10 standard on the first English 100 websites on COVID-19 put off the average American making it important for them to be understood and read easily. The importance of trust established through communication was evident through the consistent application of crisis communication guidelines. For the subcode *Preprint expresses uncertainty in research* (Fleerackers et al., 2022), preprints are studies that are unreviewed, preliminary, and/or in need of verification and half of them are framed with uncertainty. A preprint is the Author's Original Manuscript (AOM), that is the version of the article before submission to a journal for peer review (Taylor & Francis, n.d.). The study found that there were a few preprints related to research on COVID-19 that journalists were not willing to write on because of their uncertainty.

b. Code 2: Failed Risk Communication by Governments
The second most salient code has the subcodes: *Wuhan government failed in risk communication* (Zhang et al., 2020), *US government did not communicate on COVID-19 well* (Kim & Kreps, 2020), *Lack of COVID-19 communication to PwDs* (Dai & Hu, 2021), *Low acceptability of existing communication practices during C-19 and the importance of leadership for better communication* (Istanboulian et al., 2022) and *Inverse relationship between the tweet count and topic diversity* (Park et al., 2021).

It is proven from the subcodes that effective risk communication by governments during COVID-19 was important to conduct. Another subcode of ineffective communication during COVID-19 is the failed risk communication by governments of Wuhan and the United States caused by the delayed decision making of Wuhan local government officials (Zhang et al., 2020). The United States government on the other hand made blunders during its

communication on COVID-19 compelling recommendations such as actively seeking and responding to relevant information of health crises and building good relationships with other nations for better response coordination (Kim & Kreps, 2020). Also, better communication was needed to PwDs in China who are vulnerable and bad communication was used in ICUs during COVID-19 (Dai & Hu, 2021). Another subcode highlights the low acceptability of existing communication practices by healthcare providers to patients and their families during COVID-19 that left needs unfulfilled and the importance of leadership for better communication (Istanboulian et al., 2022). It was found that when the Tweet count in four Asian countries increased during COVID-19, the diversity of topics decreased in range and mainly focused on fake news (Park et al., 2021). Fake news was an issue during the peak of the COVID-19 pandemic when people were immersed in social media the most as they stayed at home.

c. Code 3: Negative Feelings Affect Recipients

The third code has the subcodes: *Fear of Missing Out (FoMo) affects problematic social networking site use (PSNSU)* (Gioia et al., 2021), *Concerns of COVID-19 negatively affected people's hurricane evacuation intentions* (Botzen et al., 2022), and *Unclear risk Communications led to feelings of stress for paramedics* (Oliphant et al., 2022).

FoMO might enhance people's need to maintain their connection and communication with others, causing PSNSU like the need for "ego validation" through comparison, emotional sharing and social encounters as indicated by Gioia et al. 's (2021) study. Another subcode is *Concerns of COVID-19 negatively affected people's hurricane evacuation intentions* in the United States (Botzen et al., 2022). It was found that older populations were less likely to evacuate voluntarily. During the COVID-19 pandemic in 2020, hurricane storms struck the US several times making improving hurricane preparedness of evacuations during a health risk (such as a pandemic) a must. Also, paramedics need to be taken care of, or they will be negatively affected as COVID-19 safety and risk communications targeted at paramedics were unclear serving an additional stressor for them as evident by the subcode *Unclear risk Communications led to feelings of stress for paramedics* (Oliphant et al., 2022). Paramedics were stressed by the feelings of uncertainty regarding the safety of paramedics and their families, the use of the personal protective equipment (PPE), the lack of autonomy amongst them leading to the need for clear risk communication from management.

CONCLUSION

The themes, codes and subcodes generated by the study reflect the range of research methods and findings on studies that were carried out on COVID-19 and communication studies published from 2020 to 2022. Agenda-setting theory was used as the theoretical framework to determine the salience of themes and codes of the study. Salience in agenda-setting is applied differently here with the number of codes and subcodes gauging the salience of themes and codes. There were two research questions that were underscored in the study. The first focused on uncovering the types of research methods used and the second was on the findings of the studies. The themes reflected the salience of research methods and topics depicting their importance in studies published on the COVID-19 pandemic. The most salient research methods type is Quantitative research in the form of online surveys which proved to be a safer method of data collection during COVID-19, and the most salient finding was on *Effective communication strategy during COVID-19* that depicts the

significance of practising communication in a manner that would promote preventive behaviours whether it was by the government, frontliners or organisations.

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