



Construction of influencing factors model for public information avoidance behavior in major infectious disease outbreaks based on meta-ethnography

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ABSTRACT

Objective: Major infectious disease outbreaks are highly susceptible to diffuse outbreaks due to their sudden and more widespread nature. Compared to previous outbreaks such as the Spanish flu and SARS in China, COVID-19 has greatly affected the health of citizens and the economic development of countries worldwide, and is representative of major infectious disease outbreaks in many ways. Information avoidance, a common information behaviour during major infectious disease outbreaks, can alleviate the stress caused by information overload as a strategy to reduce negative emotions and maintain optimism. However, it can also bias risk perceptions and avoid content of greater value. Therefore, a deeper understanding of public information behaviour, particularly how and why relevant information is circumvented, places a demand on researchers. **Methods:** A meta-ethnographic qualitative research methodology was used, and the seven steps of the methodology were strictly followed, including identifying integration themes, defining the connotations of integration themes, reading original studies, identifying relationships between studies, inter-translation between studies, synthetic translation, and presenting integration results. 26 original studies were integrated in a unified research framework, with a macro perspective that integrates consistent as well as complex and even contradictory findings and identifies dominant factors.

Conclusions: Identify demographic factors, information literacy, risk perception, cognitive structure, information quality, information sources, external characteristics of information, and environmental characteristics sub-dimensions around the dimensions of 'individual', 'information' and 'environment'. The study also explored the factors under each sub-dimension. The study finally identified three dimensions, nine sub-dimensions and 26 factors, and obtained a more complete theoretical framework to construct a "model of factors influencing public information avoidance behaviour in major infectious disease epidemics", with a view to providing a theoretical basis and practical reference for relevant departments in guiding public information behaviour and health practices in major infectious disease epidemics.

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1. Introduction

A major infectious disease outbreak is an event that occurs within a short period of time, has an incidence rate higher than the usual level of incidence, is widespread and has a large number of infected or fatal cases. Compared to general emergencies, major infectious disease outbreaks are characterised by their suddenness, social nature, urgency, ease of transmission, and the long span and wide spread of catastrophic events [1]. Once it occurs it can spread more rapidly and radiate over a wider area than a typical outbreak. Compared to previous outbreaks such as the Spanish flu and SARS in China, COVID-19 occurs in the context of a huge amount of information, multiple information subjects and objects, and the complex information dissemination pathways of the all-media era and media convergence, which greatly affects the health of global citizens and the economic development of the country, and is representative of major infectious disease outbreaks in many ways.

On February 2, 2020, Dr Sylvie Briand, Global Infectious Disease Preparedness Specialist at the World Health Organization (WHO), pointed out that the outbreak of COVID-19 was accompanied by an “information epidemic” that had a huge impact on people’s lives. An “information epidemic” is a situation in which too much relevant information is mixed with contradictory or incorrect information, which can have a number of effects on the recipients of the information in the environment, reinforcing additional uncertainty, triggering negative emotions, and damaging physical and mental health [2]. In such situations, the public may adopt a coping strategy - information avoidance behaviour [3] - to remove uncertainty and maintain a positive emotional state.

In fact, information avoidance is a common information behavior defined as “any behavior intended to prevent or delay access to available information that may not be needed.” Based on uncertainty management theory [4], information avoidance allows people to limit their interactions with unnecessary or threatening information that may cause mental discomfort. Accordingly, it is an effective coping approach in crisis management [5], especially in health. For example, more than one third of cancer patients avoid accessing information related to their disease [6]. Other studies have further confirmed information avoidance behavior across different demographic groups with varying health status [7,8]. Whereas, during major infectious disease outbreaks epidemic, information avoidance may, on the one hand, alleviate the stress brought by information overload as a strategy to reduce negative emotions and maintain optimism [9]; on the other hand, it may also bias one’s risk perceptions and avoid more valuable content, such as how to take preventive measures [10].

Therefore, a deeper understanding of public information behavior, especially how to avoid relevant information and why, poses a requirement for researchers. Currently, there is not a wealth of research on information avoidance, although scholars have studied public information avoidance behaviours from the perspective of major infectious disease outbreaks, particularly around the new Crown Pneumonia outbreak, but most of them are centred around a specific group, focusing on a certain dimension or a certain country. This study adopts a meta-ethnographic qualitative research method to integrate complex and even contradictory findings from a macro perspective within the same research framework, to identify the dominant factors, and to obtain a more complete and explanatory theoretical model of “factors influencing citizens’ information avoidance behaviour in major infectious disease epidemics”, with a view to providing a theoretical basis and practical reference for the relevant authorities in guiding public information behaviour and health practices in major infectious disease epidemics.

2. Literature review

Information avoidance is a manifestation of user information behaviour. The information-seeking process model proposed by Wilson (1981) [11] assumes that users actively search for information in order to meet diverse information needs. However, as Maslow [12] stated, “We can reduce anxiety by seeking information, or we can reduce anxiety by avoiding access.” Active information seeking is obviously not an absolute assumption of information exchange, and information avoidance behavior, as a manifestation of information behavior, is particularly common in daily life. Sweeny (2010) [13] explains information avoidance as a coping behavior that aims to “prevent or delay access to available information that may not be needed”. There are two main characteristics of information avoidance, firstly, autonomy, although the degree of aggressiveness of information avoidance varies, it is a user-initiated avoidance behaviour, so it is different from information filtering, which is a passive act of choice. Secondly, subjectivity, information avoidance behaviour occurs when the user does not necessarily know the content of the information, and therefore information avoidance behaviour is mostly derived from the user’s subjective judgement of the impact of the information. Therefore, information avoidance behaviour mostly comes from users’ subjective judgement of the impact of information [14]. Individuals are more likely to take avoidance behavior when confronted with information that may lead to undesirable changes in their beliefs or behaviors or information that may cause emotional burden. The ability to handle potential changes in beliefs, behaviors, or emotions is situational, and external stressors will have an impact on coping strategies.

Research on information avoidance behaviour was initially seen in information behaviour models. Johnson (1993) earlier proposed a comprehensive model of health information search, in which perceived control and self-efficacy are the core elements, which explains that users’ information avoidance behaviour occurs because the perceived control of their condition exceeds their own mastery, which triggers self-efficacy deficits and causes users to avoid their information needs [15]. Savolainen (2014) proposed a model of everyday information behaviour search based on emotional appraisal theory to explore the effects of positive and negative emotions on search results. Individuals’ information behaviours are evaluated from the beginning to the end of the expected behaviour in terms of the impact it brings, and the results of the evaluation may cause the user’s emotions to change, which leads to different information-seeking behaviours such as avoidance, initiation, expansion, restriction and termination [16].

For a long time, information avoidance has not developed into a separate branch to receive academic attention, and is more often treated as a subvariable of other information. Wilson (2015), based on the theory of information behaviour, divides information

behaviour into information-seeking behaviour, information-processing behaviour and information-utilising behaviour [17]. These three stages start with the user's need for information and focus on information utilization, thus constituting a complete closed loop of information behaviour. Neben's (2015) information avoidance model divides information avoidance into three categories: information contact avoidance, information absorption avoidance and information utilization avoidance [18]. Information contact avoidance refers to the restriction or termination of information-seeking behaviour with the aim of directly avoiding contact with information, which has a similar connotation to complete information avoidance as defined in Savolainen's study. Information absorption aversion refers to the purposeful and selective restriction or termination of the absorption of relevant information, which has similar connotations to selective information aversion as defined in Savolainen's study [19]. For example, people with hedonic desires selectively absorb information that they want to see, and ignore information that does not interest them or threatens them.

And research on different areas of information avoidance has centred around economics, psychology, intelligence and healthcare.

In the field of economics, information avoidance is explained as an extrinsic motivation for individuals to maximize benefits and minimize costs when making economic decisions. Golman (2017) [14] found that information could directly enter into a person's utility function, thus creating an incentive to avoid or seek information. Even if information is useful and free, people sometimes tend to avoid it. From an economic perspective, perceived threat or risk is an important factor influencing information avoidance. Where, risk aversion implies disappointment aversion, and in dynamic environments, recursive disappointment aversion inevitably leads to information aversion until all uncertainty is immediately resolved [20].

The existing psychological literature suggests that sensory stimuli in the environment can influence individuals' internal state and subsequently lead to information avoidance behavioral responses [21]. Motivation and individual differences are important factors to consider when interpreting online information avoidance behavior. Howell (2016) [22] referred to the information avoidance and seeking framework proposed by Sweeny (2010) [13] to explain information avoidance and seeking behavior based on individual differences using individual differences and motivations (self-regulation, obligation to act, and threat to beliefs) as predictors.

In the fields of intelligence and communication, many studies regard information avoidance as the antithesis of information search, pointing out that information search removes uncertainty, while information avoidance maintains uncertainty. For example, Soroya (2021) points out that information overload caused by too many sources of information can increase information anxiety, prompting users to shift their search for health information to avoidance [23], and Wang (2022) investigates that in order to avoid possible privacy leakage in information search and communication, users will avoid health information in the interest of privacy protection [24]. In fact, information avoidance in the social media environment also often occurs in the information browsing or reading feedback stage, where negative emotions such as social media fatigue and dissatisfaction triggered by information overload, information ministry relatedness, and social overload have a positive impact [25].

In health care, people may avoid health-related information for different reasons, such as avoidance of fear, anxiety, certain belief changes, or lifestyle shifts [26,16]. Avoidance of health information may cause negative outcomes for the individual, prevent access to valuable information for better decision-making, thus delaying or missing the optimal time for disease screening and consultation [14]. For example, Peng (2022) [26] found that more than 180 million Chinese middle-aged and older adults suffer from chronic diseases, and each has a "live with disease" time of up to eight years, with the proportion of those suffering from one or more chronic diseases as high as 75%. Due to the stress of life, they may have negative feelings towards the health information they are exposed to, thus choosing to avoid the information and delaying the discovery and treatment of their illnesses. And when a major infectious disease outbreak occurs, the public is inundated with abundant relevant information from various sources such as television, newspapers, government, websites, and social media, and the use of these media amplifies the public's perception of risk [27]. Such information keeps stimulating the public and may cause negative emotions such as sadness and anxiety [28], which in turn generates information avoidance behavior and reduces compliance with preventive measures [29].

3. Research methods and process

3.1. Meta-ethnographic approach

Proposed by Noblit and Hare [30] in 1983, it is a comprehensive research method regarding how to formulate and screen questions, how to identify, evaluate and select literature and how to integrate them [31]. They divided meta-ethnography into seven steps, including identifying integration themes, defining the connotations of integration themes, reading original studies, identifying relationships between studies, inter-translation between studies, synthetic translation, and presenting integration results. Where, the integration translation process involves the process of extracting data from individual studies and interpreting and representing them as a whole.

Unlike quantitative meta-analyses and common literature reviews, meta-ethnography summarizes and establishes new models and frameworks based on the integrated analysis of original studies, integrates them into a higher-order theoretical framework that exceeds the theoretical level achieved by any individual empirical study [32]. The method was proposed early and mostly applied in the fields of psychology, medicine, and education, which is less used in the fields related to information resources. For example, Sanders [33] et al. combined insights from two independent empirical studies on health care services in AIDS countries to explore issues related to medical expertise in the health care system; Bhattacharya [34] explored women's experiences and perceptions of depression in India by integrating 13 qualitative data; Yang [35,36] used the method to respectively integrate 19 and 12 studies and explore the models regarding factors influencing information avoidance and information encountering, respectively.

3.2. Identify integration themes

By identifying research themes to inform subsequent searches of relevant literature, this study uses the New Coronary Pneumonia outbreak as an example to explore the factors influencing public information avoidance behaviour in the context of major infectious disease outbreaks, so literature searches can be conducted around this theme.

3.3. Define the connotation of the integration theme

After determining the research topic, literature retrieval needs to be conducted and the literature derived from the retrieval needs to be identified and screened. The author mainly retrieved the original research through Web of Science, searched TS=(information) AND TS=(avoid*) to access literature related to information avoidance, and then conducted retrieval of COVID-19 (Corona Virus Disease 2019), corona virus pneumonia, NCP (Novel coronavirus pneumonia), major infectious disease outbreaks or public health emergency/event. 1810 papers were retrieved. Meanwhile, a retrieval of Chinese literature through China National Knowledge Infrastructure, Vip and Wanfang databases yielded 6 papers.

Subsequently, PRISMA and CASP were followed for literature screening and quality evaluation, and literature related to the topic was retrieved systematically in two stages. During the literature screening process, Magret explored differences in participants' information-seeking behaviours in the context of COVID-19, and although information avoidance was mentioned, it was not explored in depth and was therefore excluded; Farooq explored the effect of online information on self-isolation intentions during COVID-19, and although information overload was mentioned, information avoidance was not addressed and was therefore excluded. The final evaluation criteria and results are shown in Fig. 1.

3.4. Read original studies

Finally, 26 original studies were identified, and after detailed reading, the research questions, research methods, and research findings of each original study were summarized, as shown in Table 1 below.

3.5. Identify relationships between studies

All of the original studies involve the exploration of factors influencing the public's information avoidance behavior in the context of public health emergency-COVID-19. After repeated reading and identification of related concepts, especially the analysis, discussion

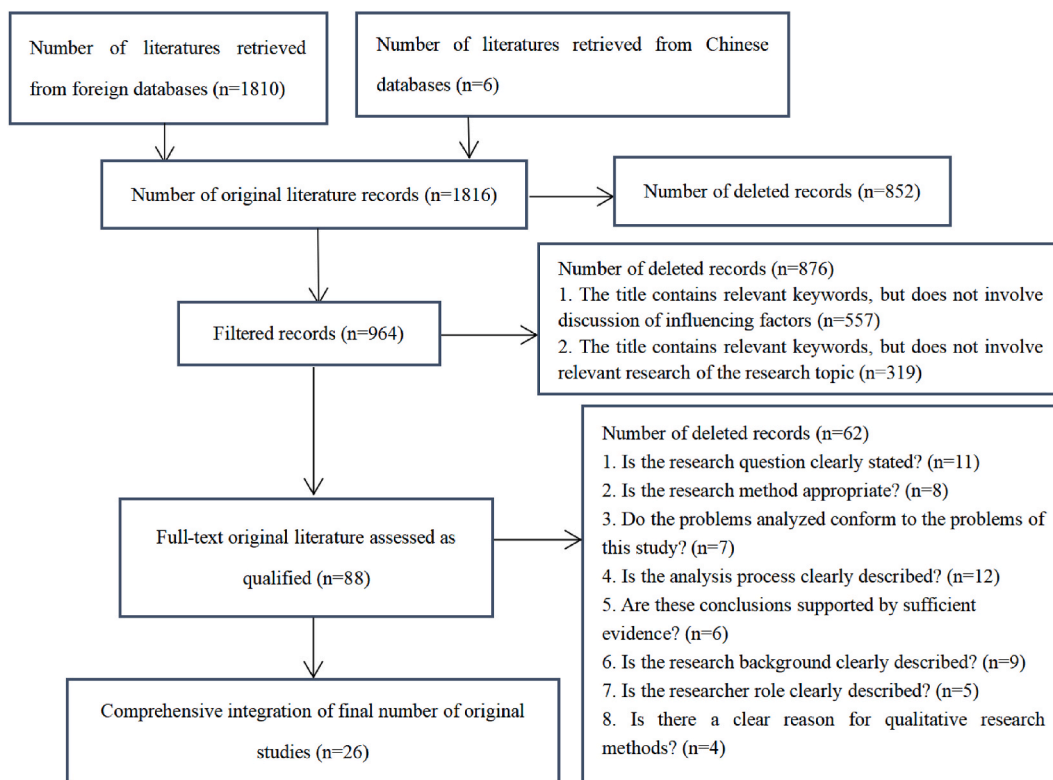


Fig. 1. PRISMA evaluation criteria and screening process.

Table 1
Summary of original studies.

Original literature	Research purpose	Research method	Research conclusion
Zhu Zhipeng (2022) [37]	Explore the factors influencing avoidance of COVID-19 information	The health belief model was used to construct a model of the factors influencing avoidance of COVID-19 information, and 433 questionnaires were distributed and analyzed by structural equation modeling.	Perceived susceptibility, perceived benefits, cueing factors and self-efficacy had significant effects on information avoidance.
Wen Xinyue (2022) [38]	Explore the factors and mechanisms influencing information avoidance behavior of social media users in public health emergencies.	The qualitative research method of rooted theory was used to conduct in-depth interviews with 28 college students, and the data were analyzed with the help of NVivo12 qualitative data management software.	Information overload, environmental factors, risk perception, cognitive structure, emotional factors, and social media type influenced information avoidance.
Chen Qiong (2020) [39]	How information overload influenced information avoidance behavior through users' psychological and cognitive states during the COVID-19 epidemic	A questionnaire was used, 343 questionnaires were distributed and analyzed using structural equation modeling.	Information overload could cause users to develop negative emotions and exaggerate their own likelihood of contracting COVID-19, which led to users' defensive psychology against the information in question and therefore less contact with the information.
Zhao(2021) [40]	How and when information seeking during the epidemic affects prevention behavior.	Hypotheses were made through the SMCC model, 856 online questionnaires were distributed to the U.S. population over the age of 18 and validated using structural equation modeling.	News media information seeking was positively correlated with avoidance behavior.
Yoori(2022) [41]	Whether information fatigue during COVID-19 leads to greater levels of information avoidance.	A questionnaire survey was conducted among 821 Korean adults and analyzed using SEM.	Information fatigue was positively correlated with information avoidance.
Zhou(2021) [42]	Assess the effect of the RISP model in explaining online information seeking and avoidance during the epidemic at three different time points.	263, 280 and 280 people were surveyed in three time points.	Information deficit at the three time points had a slight negative effect on information avoidance. No relationship between fear and information avoidance was observed at any time point.
Wang(2022) [43]	Explore the drivers of risk information avoidance in the context of COVID-19.	719 respondents were recruited and 523 valid data were retained for analysis using structural equation modeling.	Social norms, attitudes, risk perception, and emotional response to risk were associated with information avoidance.
Svenja(2022) [44]	Avoidance of international news during COVID-19 epidemic and its predictors.	Using the Austrian Corona Panel Project organized by the Vienna Research Center, 1500 respondents were surveyed and data were analyzed using OLS linear regression analysis.	The vast majority of participants avoided news about COVID-19, a behavior that can be explained by a lack of trust in COVID-19-related news and negative emotional reactions to news.
Tahmin(2022) [45]	Explore the influence of personal fears and situational motivations on online information avoidance.	Using self-determination theory and information avoidance theory, data were collected from multiple locations in the United States through a questionnaire using the MTurk platform, and 375 responses were received.	Fear and external regulation were associated with increased online information avoidance; intrinsic motivation and identified regulation were associated with decreased online information avoidance; fear, intrinsic motivation, and external regulation drove information avoidance, with intrinsic motivation being the most important; and identified regulation was a key inhibitor of information avoidance.
Song(2021) [46]	Discuss users' information avoidance behavior in the context of public health emergencies.	Questionnaires were distributed to 721 samples through Sojump, and the data were analyzed using PLS.	External stimuli (perceived threat, perceived information overload) and internal state (sadness, anxiety and cognitive dissonance) affected the occurrence of information avoidance.
Zhao(2021) [47]	Examine the relationship between cognitive and affective factors in information seeking and avoidance behavior in a risk context.	1946 online questionnaires were distributed in mainland China in February 2020 and analyzed by multiple regression.	Information seeking increased with perceived risk severity, information avoidance increased with perceived risk sensitivity, perceptual response efficacy was negatively correlated with information avoidance, and different affective factors had different effects on information avoidance.
Ruben(2021) [48]	How and why young cohort users avoid information.	25 in-depth interviews were conducted with Belgian news users under 35 years of age.	Information overload and information content negativity during an epidemic affected information avoidance behavior.
Qu(2021) [49]	How individuals avoid COVID-19 information via the internet.	1304 representative samples were obtained by sending survey links to numerous respondents with different demographic characteristics in Qualtrics of the United States.	It was found that four variables had different levels of influence on information avoidance.

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Table 1 (continued)

Original literature	Research purpose	Research method	Research conclusion
Chen(2022) [50]	Explore the relationship between health information literacy and information avoidance.	An online survey was conducted from April to June 2020 using a simple random sample of 561 college students in the South Central region of the United States.	Those with lower information literacy were more likely to avoid information, and the negative correlation between health knowledge popularization and information avoidance was consistent across all types of health knowledge popularization.
Bruin(2021) [51]	Investigate the level of news avoidance during the Dutch epidemic.	Two different panel surveys were conducted in the Netherlands. The first panel survey provided insight into news avoiders and their reasons for not watching the news; the second panel made an analysis to reveal the causal relationship between news avoidance and mental health.	The increase in avoidance behavior could be explained by the increase in citizens' negative emotions and feelings, and news avoidance sometimes required one to maintain mental health.
Ding(2022) [52]	Factors influencing information avoidance and how it leads to avoidance behavior.	55 events were summarized based on 120,000 words of text data and semi-structured interviews.	Information avoidance was not caused by a single factor, but was the result of a combination of several factors, such as information literacy, negative emotions, and perceived information.
Link(2021) [53]	Predictors of source-specific information avoidance and avoidance behavior among German residents in the context of COVID-19.	Hypotheses were made using the RISP model, a survey of 1000 German residents was conducted and validated using structural equation modeling.	Risk perception and information deficit were not associated with information avoidance, while attitude and information overload were the most influential factors.
Jisoo(2022) [54]	How trust affects individuals' emotions in seeking and avoidance behaviors in the context of COVID-19.	A multi-country survey was conducted in Korea, the United States, and Singapore.	Trust was negatively correlated with fear, anger, sadness, and anxiety, and positively correlated with hope. Except that anger had an effect on information avoidance, other emotions played a mediating role in the effect of trust on information avoidance.
Siebenhaar (2020) [55]	Whether distress about information predicts higher probability in avoidance of COVID-19 information.	An online questionnaire survey was conducted among 1059 samples and analyzed using multiple regression.	Distress from information was associated with better adherence, and distress led to higher odds of avoidance.
Kim(2020) [56]	Highlight the negative outcomes associated with wrong information during COVID-19 epidemic, explore possible cultural and situational differences when people interpret and respond to wrong information.	1500 people in Korea, 1023 people in Singapore, and 419 people in the United States were selected for the online survey.	The release of wrong information reduced information deficits and subsequently led to more information avoidance and heuristic processing.
Liu(2021) [57]	Explore the public's information-seeking and avoidance intentions during COVID-19.	Based on an online sample of 1031 Chinese adults, the PRISM model was used to hypothesize the public's information-seeking and avoidance intentions during the outbreak.	Influencing factors of Information avoidance included subjective information norms, seeking attitudes, and risk perceptions, with subjective information norms being the strongest predictor of seeking and avoidance.
Ojio(2022) [58]	Explore the association between mothers receiving epidemic information from different information sources and avoidance of examination of their children.	Based on a network questionnaire survey, participants included 5667 Japanese postpartum women with children under 2 years of age, and data were analyzed using logistic regression.	Specific types of information sources differentially influenced mothers' decision of whether to let their children receive examination.
Buneviviene (2021) [59]	Predictors of reduced interest in COVID-19-related news and avoidance.	Online survey was conducted on a random sample of 1036 general citizens.	Decreased interest in and avoidance of COVID-19-related news was a common phenomenon associated with younger age, severe post-traumatic emergency symptoms, less fear of COVID-19, and less frequent use of health care professionals to access COVID-19 information.
Julia(2021) [60]	Explore differences in information avoidance behavior across different age groups.	500 participants were recruited for an online questionnaire, 90% of whom were from a representative online panel and 10% were from a database of confirmed identities.	Age was associated with reduced media consumption behavior and avoidance behavior. Different age exerts varying degrees of influence on information avoidance behavior in terms of emotion, motivation, and cognition. Older adults were more likely to behaviorally avoid relevant information and reduce media consumption.
Li(2023) [61]	Explore the information avoidance behavior of individuals in the context of COVID-19.	A meta-analysis was used to quantify the effects of a number of antecedent factors on avoidance behavior in COVID-19 epidemic.	Information-related factors such as channel beliefs and information overload were more important in the individual's decision to engage in avoidance behavior, and avoidance was less likely due to psychosocial aspects.
Wu(2023) [62]	Exploring college students' willingness to avoid information in the context of COVID-19.	A questionnaire was used to obtain a valid sample of 523 university students, and the data were analyzed using SPSS 26.0.	Social climate, perceived fear, and cognitive dissonance all have an impact on willingness to avoid information.

process and findings of each study, three core concepts related to this topic were identified, namely, “individual dimension,” “information dimension,” and “environmental dimension”. There are different sub-dimensions under each dimension that influence the occurrence of information avoidance behavior.

3.6. Intertranslation between studies

3.6.1. Individual dimension

During major infectious disease outbreaks, the public, as the subject of information behavior, plays an important role and influences the occurrence of information behavior. In the individual dimension, demographic factors, information literacy, risk perception, and cognitive structure are mainly included.

Differences in information such as age, gender, education level, and place of residence influence individual-specific information behavior, and these factors are all classified under the scope of demographics and represented in the two original studies. Compared to women, men may be more numerate and reflective in seeking keywords about COVID-19 and demonstrate more prominent information avoidance behaviors [61]. As the more educated public is also more literate in health information and more willing to receive information proactively, information avoidance behaviors are more likely to occur among the public with middle and high school education than those with undergraduate and higher education. Similarly, in terms of place of residence, urban prevention and control propaganda is more effective than in rural areas, leading to a lack of protection awareness among rural residents and a greater tendency to avoid related information and news [37].

According to the “Information Literacy Competency Index System for Universities in Beijing Region”, information literacy includes information awareness, information needs, and information ethics. In this study, information literacy is reflected in the public’s ability to assess the importance of information and decide which valuable information to consume through self-competence, and the possibility of information avoidance is reduced, as reflected in the eight original studies [39,43,45,48,50,52,55,58]. When the public has a weak ability to perceive information, has insufficient judgment about the quantity, quality, and content of information, and feels “incompetent to cope with the information environment,” they will actively avoid information in order to avoid certain consequences. In addition, if citizens are motivated to stay away from epidemic information, they will have a negative attitude toward such information and subconsciously close the channels for receiving such information, which is information avoidance behavior.

Risk perception influences the behavioral intentions and attitudes of the public, not only directly affecting their information avoidance behavior, but also triggering public emotions to indirectly affect avoidance behavior, as reflected in the thirteen studies [37, 38,43–47,50–52,55,57,61]. In the present study, risk perception includes three factors: perceived control, perceived credibility, and self-efficacy. Perceived control is the individual’s perception towards the degree of mastery over the development of events [39]. Perceived control is negatively associated with information avoidance during major infectious disease outbreaks. If individuals perceive the information source as untrustworthy, they will take a positive attitude toward avoidance behavior and choose to avoid the information. This suggests the importance of trust in risk communication, which influences how the public perceives risk and determines the extent to which they are willing to accept information delivered from a particular source. In addition, self-efficacy refers to an individual’s self-judgment of whether one can accomplish a certain behavior [63]. When one is powerless in the face of crisis and perceives information as negatively affecting their well-being or damaging their effectiveness, such information will be avoided.

Faced with a vast amount of information such as epidemic defense and the latest news, the public usually prefers to seek information that matches their own cognitive structure, and the odds of information avoidance behavior are higher when the information conveys views inconsistent with already perceived views, as reflected in the four original studies [62,38,43,49]. When individuals take their attention away from news reports or jump to other types of topics, this enables individuals to avoid accessing conflicting information points that would otherwise generate stronger negative emotions. “Sometimes when I see an opinion with a strange position, it can be inflammatory and sometimes make me angry” [38].

3.6.2. Information dimension

Information, as the object of public information behavior, is an external factor that affects the public’s information avoidance behavior during major infectious disease outbreaks. It is mainly reflected in three aspects: information quality, information sources, and external characteristics of information.

Seen from the internal characteristics of information, its quality affects the public’s judgment and sense of experience. The primary characteristics are information reliability, ease of identification, novelty, usefulness, and authority, etc. Five original studies have explored different factors of information quality [38,43,48,50,56]. In the original studies, some information has low content value and chaos organization, which, while taking up public resources, can cause negative emotions such as fatigue and anxiety in the public, resulting in avoidance behaviors to alleviate the emotional burden of uncertainty. If information is perceived as complex, uncertain, and not easily accessible, individuals need to spend extra costly time and energy to search and understand information, so avoidance behavior occurs.

Correspondingly, external characteristics of information in this study are mainly manifested in information overload and information negativity, as reflected in eleven original studies [38,39,43,46,48,51,53,54,56,57,61]. Under major infectious disease outbreaks, government agencies, major mainstream media, and individual microbloggers release abundant but complicated information resources, and the public is prone to stress and confusion when they receive too much information at once and cannot handle it properly, thus triggering avoidance behavior. When different media report the same news or non-mainstream media release a lot of unconfirmed information, on the one hand, it takes up a lot of information resources, on the other hand, it will create a feeling of information overload among the public, increase the perception of uncertainty among information consumers, and generate boredom.

“I feel that many public accounts forward the same content in a day, which makes me tired” [38], “overwhelmed,” “overloaded”. “The same information is repeated over and over again” [48], which hinders acting decisions and incurs information avoidance. In addition, since most of the news information is negative during the epidemic, excessive negative reports will cause a certain mental stress to the public. “We can’t go outside normally anymore, if we continue to take in negative news, we will collapse” [48]. At this time, they are more likely to avoid information and process relevant information heuristically.

Information sources, as sources and providers of information, are also the main channels through which the public obtains information about external news and information during major infectious disease outbreaks [38,47,49,53,55,58]. Microblog, Twitter, radio, and magazines as information sources significantly increase the probability of information avoidance. “If it is a comment from some internet users, I will only take a quick look, after all, the authenticity is to be considered” [38]. However, WeChat, QQ, professional media, television, family, and friends reduce the chance of information avoidance. In general, a large number of online users or non-professional organisations publish information on weakly-related media platforms, leading to uneven platform quality, which affects users’ trust and increases the occurrence of avoidance behavior.

3.6.3. Environmental factors

The public’s environment indirectly influences their information avoidance behaviour, and this study is limited to the context of a major infectious disease outbreak, in which different environmental characteristics of the public influence their avoidance behaviour, mainly in terms of social climate, subjective norms and time pressure, as reflected in the five original studies [62,38,43,49,57].

Based on the public nature of major infectious disease epidemics, the dissemination of information is more closely integrated with the social climate. In the process of receiving health information, individuals who are subjected to external social pressure or in a discriminatory social atmosphere may cause individuals to block access to information and turn to information avoidance. Since the outbreak of COVID-19, the social atmosphere in which all citizens are united and in the same boat has influenced the public’s continuous access to information. As a result, the more favourable the social climate, the weaker the willingness to avoid information.

Subjective norms indicate the individual’s response to social expectations and function mainly in terms of empathy. Individuals will search for information more actively when those they consider important to them want them to grasp some information about an issue, and vice versa. Although information avoidance is an individual’s behavior, it is also affected by intergroup beliefs, such as family, relatives, friends, other peers, etc. “Peers may be a little bit more influential, it’s a kind of imperceptible influence. There’s a kind of intergroup norm that everybody cares together or everybody doesn’t care” [38].

In addition, “when there is a study task or something else, one is much less likely to get information about the epidemic” [38]. The forced time pressure of completing a task prevents individuals from distracting energy to handle other information and thus avoidance behavior occurs.

3.7. Synthetic translation

3.7.1. Whether emotional states have an effect on the public’s information avoidance behavior

An individual’s emotional state is a factor that researchers focus on in the 17 original studies, but there are opposing findings in these studies that require secondary interpretations to reach an understanding of mutually exclusive concepts and optimize the translation results.

Based on the research themes, emotional states are more focused on psychologically negative or positive emotions. 12 original studies have consistent findings [43–45,48,51–53,55–59], all indicating that negative emotional states positively influence individual’s information avoidance behavior, such as fear, worry, anxiety, sadness, anger, and agitation. When individuals are in these emotions, they reduce their trust in information media and perceive the need to take measures to maintain well-being, i.e., to avoid information. In contrast, negative emotional states obtained from four other studies did not support information avoidance behavior [39,46,54,61]. Song found that although both sadness and anxiety were negative emotional states, sadness reduced the intention to avoid information; Li found that negative emotional responses to risk were irrelevant with information avoidance behavior; Jisoo found that sadness was positively correlated with information avoidance and anxiety was negatively correlated with information avoidance; Chen Qiong found that the more anxious users felt in an information epidemic, the less likely they were to become defensive, and they may even actively search for relevant information to relieve their anxiety.

Li used meta-analysis to synthesize 17 empirical studies, which included 18,297 participants. Most of the samples were non-representative, more than half of the studies were conducted in a Western context, and most of the studies were conducted using non-representative sampling. No significant relationship was found between emotional responses, probably because different emotional states have different degrees of influence on information avoidance. The difference between the effects of these discrete emotions explains the insignificant overall effect of negative emotional states in the meta-analysis. In addition, some empirical studies were conducted at the early stage of the epidemic, when the public may have perceived COVID-19 as just a familiar but not fully threatening virus. However, emotional responses take time and experience to accumulate, leading to an insignificant association between negative emotional states and information avoidance. Jisoo explored emotional states in individual information seeking and avoidance behaviors in multiple countries in Korea, the United States, and Singapore. Compared with other studies, he confined his research questions to emotional states, making his study more targeted. Taken together, the author believes that sadness usually carries more feelings of helplessness, such as the inability to think about the next move [64], and thus information avoidance occurs. However, anxiety can stimulate individuals to take action to alleviate discomfort, e.g., people who are in excessive anxiety about their health may develop problematic Internet use behaviors and thus spend a lot of time and energy searching for health information to confirm their health status.

Therefore, this study finally synthesized the findings of the original studies and added new emotional state sub-dimensions to the individual dimension, which includes fear, worry, anxiety, sadness, anger, and agitation.

3.7.2. Whether age has an effect on the public’s information avoidance behavior

Five original studies included age as an influencing factor of the public’s information avoidance behavior [48,50,55,60,61]. Where, Rubin, Li, Chen, and Katharina found that with age, the public had more stable efficacy beliefs as they gained life experience. In contrast, the beliefs and attitudes of younger groups are susceptible and changeable, which may thus lead to strong behavioral responses such as information avoidance. However, Julia argued that older adults were at greater risk of COVID-19 infection compared to younger people, who were less likely to seek relevant information in the media. Not only are older adults unable to find the correct information due to lack of information handling ability, they may also actively engage in avoidance behavior because information overload interferes with their positive emotions.

In terms of research subjects and research methods, Li used meta-analysis to synthesize 17 empirical studies and quantify a range of antecedent factors; Katharina selected 1059 samples for a questionnaire survey and used multiple regression to analyze the data; Chen used a random sample of 561 college students for an online survey; Rubin conducted 25 in-depth interviews with news users in Belgium; and Julia used an online recruitment of 500 participants for the questionnaire, 90% of whom were from Qualtrics and 10% from identified persons. The studies holding different conclusions all used questionnaire methods and utilized multiple regression in the supplementary analysis, but the meta-analysis and in-depth interviews included not only quantitative analysis, but also were based on qualitative methods, which enriched the research methods and ensured the scientific validity of the findings. In addition, only 10% of Julia’s participants were identified, and the study of Rubin, Li, Chen, and Katharina was more complete not only in terms of sample size but also in terms of quality.

Therefore, this study finally integrates Rubin, Li, Chen, and Katharina’s findings that young people are more likely to engage in information avoidance behavior than older people in the demographic sub-dimension of individual dimension.

3.8. Presentation of integration results

The final integrated theoretical model of “Factors influencing public information avoidance behaviour in major infectious disease outbreaks” is shown in Fig. 2 below.

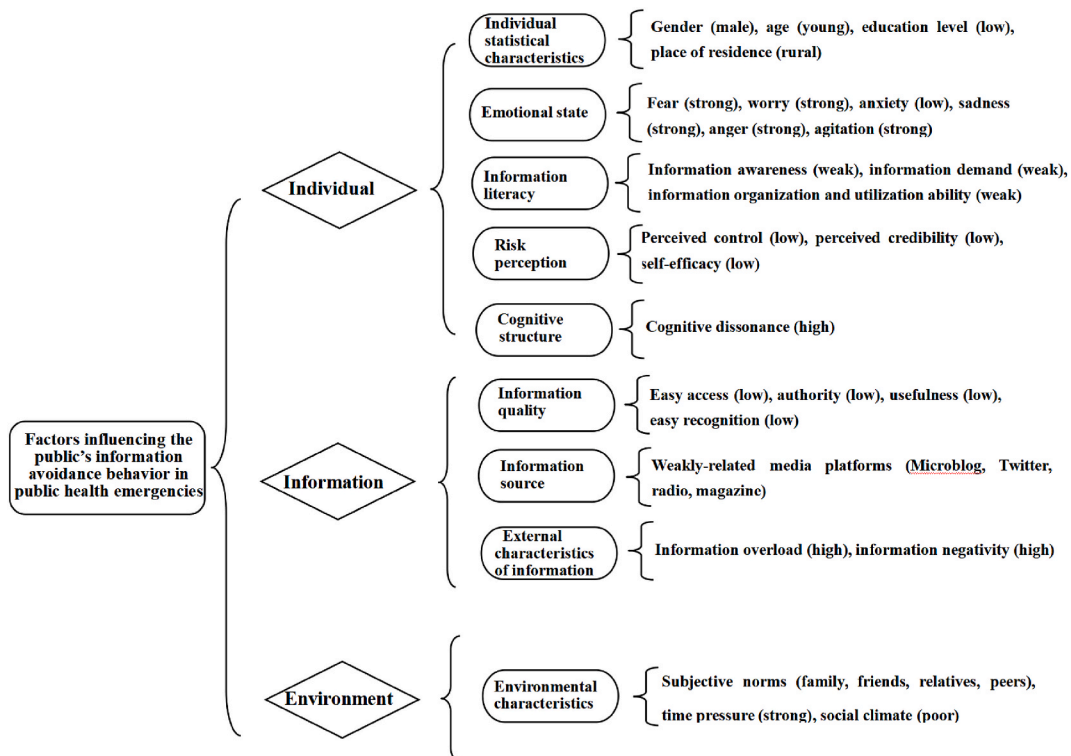


Fig. 2. Theoretical model of “Factors influencing public information avoidance in major infectious disease outbreaks.

4. Analysis of factors influencing public information avoidance in major infectious disease outbreaks

In this study, a meta-ethnographic approach was used to synthesize and integrate the 26 original studies, resulting in the identification of 3 dimensions, 9 sub-dimensions, and 26 factors. Among the different factors, some of them belong to the fetch, where different fetches have an impact on the occurrence of information avoidance by users, and some of them belong to the categorisation, where the categorisation is unable to determine the specific impact situation of information avoidance. Therefore, on the basis of the determination of each factor, it should be further divided into the value to make the system more complete. As shown in Table 2 below.

Individual dimensions include individual statistical characteristics, emotional state, information literacy, risk perception, and cognitive structure. Where, men are more likely to engage in avoidance behaviors than women, and young people are more likely than older people to change their behaviors due to external influences, such as information avoidance. Individuals with lower education levels have relatively lower information literacy, weaker ability to acquire and organize information, and are more likely to engage in avoidance behaviors. Residents who live in rural areas are more likely to avoid information than urban residents due to lower education or inefficient epidemic propaganda, etc. Negative emotional states directly affect the public's information behavior. When the public is in an emotional state of fear, worry, sadness, anger, and agitation, they tend to adopt avoidance measures to alleviate negative emotions, but anxiety will stimulate individuals to search for more information to gain a sense of comfort. In addition, the public with lower information literacy, such as weak information awareness, weak information needs, and weak information organization and utilization ability, will feel at a loss even when faced with valuable information. Similarly, under lower degree of information perception, such as low perceived control, low perceived credibility, and low self-efficacy, information avoidance behavior will more likely occur. In addition, when faced with information inconsistent with their cognitive structure, the public tends to avoid conflict with their own cognitive structure by avoidance.

Information dimensions include information quality, information source, and external characteristics of information. Where, information quality is an internal characteristic of information, and information with low accessibility, low authority, low usefulness and low identifiability is of low quality, which not only takes up public resources, but also fails to meet the public's information needs, making the public prone to negative emotions and then choose avoidance. Compared with strongly-related platforms, the public less trusts information from weakly-related platforms (microblog, Twitter, radio, magazines), which to a certain extent amplifies the impact of information on public perception and emotion. In addition, the external characteristics of information include information overload and information negativity. The emergence of abundant information resources and negative information will disturb the public's cognition, increase the public's stress and negative emotions, resulting in avoidance behaviors.

Environmental dimensions include environmental characteristics. Among other things, the public is easily influenced by the social environment; the better the social climate, the weaker the willingness to avoid information. Subjective norms are important environmental factors that influence public attitudes and behaviors, and individuals are more likely to be influenced by those closer to

Table 2
Values and categorisation of factors.

Major dimension	Subdimension	Factor	Take a value	Classify	Classification of values	
Individual	Individual statistical characteristics	gender	–	✓	male or female	
		age	–	✓	Young, middle-aged or elderly	
		education level	–	✓	high or low	
		place of residence	–	✓	rural or urban	
	Emotional state	fear	–	✓	strong or weak	
		worry	–	✓	strong or weak	
		anxiety	–	✓	high or low	
		sadness	–	✓	strong or weak	
		anger	–	✓	strong or weak	
		agitation	–	✓	strong or weak	
	Information literacy	information awareness	–	✓	strong or weak	
		information demand	–	✓	strong or weak	
		information organization and utilization ability	–	✓	strong or weak	
	Risk perception	perceived control	–	✓	high or low	
		perceived credibility	–	✓	high or low	
self-efficacy		–	✓	high or low		
Information	Cognitive structure	cognitive dissonance	–	✓	high or low	
		easy access	–	✓	high or low	
	Information quality	authority	–	✓	high or low	
		usefulness	–	✓	high or low	
		easy recognition	–	✓	high or low	
		Information source	weakly-related media platforms	✓	–	–
		External characteristics of information	information overload	–	✓	high or low
			information negativity	–	✓	high or low
	Environment	Environmental characteristics	Subjective norms	–	✓	Are they influenced by people around them
			time pressure	–	✓	–
social climate			✓	–	–	

them, such as family, friends, relatives, and peers. In addition, under greater time pressure, individual energy is more limited, so people are less likely to be attracted by other information or may even actively avoid other information.

5. Strategies and reflections on public information avoidance in major infectious disease outbreaks

As a major infectious disease epidemic with large-scale and massive outbreaks worldwide, the conclusions obtained from this study focusing on COVID-19 are representative and of great practical significance. Based on the previous conclusions, the author believes that among different factors, different values have an impact on information avoidance, and the controllability of the factors has a certain impact on increasing or decreasing information avoidance, which can be adjusted through the value of the controllable factors to adjust information avoidance.

5.1. Screening for the establishment of an information dissemination system

The media is an important tool for keeping the public informed during times of crisis. Research findings confirm that official media, such as government and professional organisations, are more trustworthy than user-generated content, e.g. the World Health Organisation (WHO), the Centres for Disease Control and Prevention (CDC), and healthcare professionals are considered to be the most reliable sources of information during major infectious disease outbreaks, and should be actively involved in prevention, control and resolution of the event by publishing constructive and problem-solving measures in a timely manner rather than a list of mere problems, especially in times of crisis. Social media should focus on improving the quality of information on their platforms.

Social media should focus on improving the quality of information on their platforms, capturing the public's views on the evolution of epidemics and related social opinions, and targeting hot topics that the public is eager to learn about according to users' interests and social hotspots, and focusing on targeted reports in order to satisfy the public's information needs in a highly efficient manner. In the process, social media websites and search engine developers should pay attention to screening misinformation, false information and repetitive information, ensure that high-quality information is published in simple language, and provide auxiliary information processing functions to alleviate the public's barriers to understanding and cognitive load.

Relevant authorities should also strengthen the regulation of social media, with an emphasis on weak-relationship social media, in order to prevent the "information epidemic" from harming the public. At the same time, the public should be empowered to supervise and report, so that when users browse information that they have doubts about, they can ask social platforms to verify it, thus improving the disinformation filtering mechanism in the dissemination of information, increasing the proportion of valid information, and reducing the cost of screening by other users.

5.2. Focus on improving information literacy

On an individual level, the public's awareness of health information seeking is hampered by the fact that they often do not really recognise the true state of certain diseases, which can lead to increased fear, anxiety or worry. Accordingly, the public should reasonably assess the severity of major infectious disease outbreaks through multiple channels, enhance their correct knowledge of major infectious disease outbreaks, reduce their negative emotions towards them, participate in health knowledge seminars, improve their psychological stress level, reduce unnecessary worries about health information, so as to enable them to better cope with major infectious disease outbreaks and improve their self-efficacy in terms of health.

At the same time, it is necessary for governments and communities to identify groups with low health literacy and high information avoidance and develop strategic measures to intervene to promote their preventive behaviours. On the one hand, comforting and hopeful messages, appropriate psychological counselling and interventions are provided to the emotionally negative public to foster positive attitudes towards information, while on the other hand, targeted epidemic risk communication is carried out for the public who have no intention to take health measures to enhance their perceptions of the specific situation.

Due to information avoidance, people with low information literacy may not be informed about the most important ways of protection and the value of vaccination to protect themselves from infection. Therefore, there is a need for information literacy training, embedded in multiple channels, with the use of media such as self-published media, television and radio, to develop public awareness of health information and to improve the ability to access, judge and use health information. Particularly in rural areas, village committees should direct public attention to official media releases, while at the same time using traditional media such as publicity loudspeakers and bulletin boards to disseminate information to the entire village, and should also play the role of village cadres, village doctors, and other "opinion leaders" to broaden the channels of information acquisition.

5.3. Reasonable response to subjective norms

When exposed to information, the public may be affected by social pressure that reduces their self-confidence in resisting the outbreak and creates negative emotions that can lead to information avoidance behaviours. In this regard, public health departments, health service providers and other organisations should actively guide the public to learn how to seek help from medical professionals, family members, relatives and friends to alleviate social pressure. At the same time, the relevant departments should popularise health knowledge, concepts and techniques in the community to create a good social atmosphere. A good social atmosphere and a high level of health information literacy can effectively reduce the chances of public information avoidance behaviours. Therefore, community-based health education lectures, competitions and trainings, and shaping a healthy social atmosphere of learning for all, play an

important role in alleviating the public's sense of shame and discomfort when facing health problems.

6. Conclusion

This study takes the major infectious disease epidemic as the background, and chooses to take the COVID-19 as an example to explore the influencing factors of public information avoidance behaviour in this context, and forms a more complete theoretical system based on the three dimensions of "individual", "information" and "environment". Based on the three dimensions of "individual", "information" and "environment", a more complete theoretical system is formed. The findings of this study provide theoretical support for an in-depth understanding of public information avoidance behaviours during major infectious disease epidemics, as well as practical guidance for social media, public health departments, and the public to cope with health communication and crisis management.

This study also has some limitations. First, by focusing on the context of COVID-19, the findings are representative but may limit the direct applicability to other infectious diseases or public health emergencies. Secondly, due to the meta-ethnographic approach, based on the synthesis and integration of existing studies, although contradictory conclusions were analyzed during the synthetic translation process, there is still the limitation of the potential bias of the original study itself. Future research could build on this foundation by combining quantitative methods to scientifically validate the findings, or by bringing different groups into the same framework to explore the underlying reasons for differences in their information avoidance behaviours.

Author contribution statement

Yuqi YANG: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper. Rui HU: Conceived and designed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data. Yongqing GE : Contributed reagents, materials, analysis tools or data. Jing YIN : Contributed reagents, materials, analysis tools or data.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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