



Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

STUDY PORTFOLIO

LCDB7012 Advancing to Doctoral Research Stage
Doctor of Business Administration
University of Wales Trinity Saint David

20xx

Acknowledgements

I know that in most doctoral theses there is a section called “Acknowledgements” after the “Abstract”, however, I am not sure if it is appropriate to have this section in the final module of the DBA Part 1, LCDB7012 Advancing to Doctoral Research Stage’s assignment. Nevertheless, I would like to take this opportunity to share what I have learnt and how I have felt since I officially started my DBA journey in zzzzzzz

I had been teaching at my local private university for three years before I entered my studies and I felt some of the bottlenecks and burnout that my career had brought me. But I spend every day with my colleagues and friends, who are some very talented doctors and professors, and I can learn a lot from them. For example, they have a superb mindset, a perceptive mind and critical understanding of things, the perseverance to spend a lot of time on research, and so on. Since then, I have had a ‘bias’ towards doctors, which is a highly disciplined life, and their spirit has always infected me. Therefore, I also wanted to challenge myself, break through the bottleneck and become the kind of person I like to be, so I applied for my doctorate.

After officially entering my studies, I felt the heart and deep consideration of Dr Caroline Jawad, the DBA programme director, and the university.

Regarding the curriculum, Dr Caroline said earlier on that our cohort was the third reform of the DBA programme. Therefore, the module structure and arrangement are more scientific and rational. For example, every new student has to start with the module LCDB7007 Research Principles and Philosophy, which is very hard and tedious but is also very fundamental and necessary for a doctorate to clarify one’s philosophical views prior to formal research. Moreover, I think the first part is laying the foundations, which should be the most important part of the DBA programme. In the modules, Dr Caroline have structured cover almost every step of the doctoral research and thesis. I think this is very helpful because in the second part we can only communicate individually with our own supervisors, and only about our own field of study. So, the first part of the programme is fundamental and essential. You can see how useful and sensible the module was designed for us by Dr Caroline. I was very fortunate to be able to make the fullest benefit of my first year of the DBA to convert to Part 2.

Regarding the academic life, I think Dr Caroline takes great care of her students. For example, Dr Caroline would slow down her speech in order for the whole class to

understand. Because I often listen to the playback of Dr Caroline lectures after class, in fact, I listen to them the second time at 1.2 or 1.5 times the speed because that is the way normal British people speak. So, I really appreciate that Dr Caroline take care of international students who are not very good at English. Another example is because there is an eight-hour time difference during wintertime, and Dr Caroline has made the change to move up the time of classes so that students don't have to attend late at night, which is a complete sacrifice of her rest time. I am really grateful for that. I think Dr Caroline and the university are really considerate of their students, not to mention the help with academics, Dr Caroline, Dr Steve, Dr Emma, Dr Promise are all very patient and thoughtful. This was very encouraging for me as I had never had any research experience before, so I took every lecture very seriously. I was also very happy to see my grades climbing (see screenshot below).

Results for 21/22	
Module Code	Module Name
LCDB7007	Research Principles and Philosophy
LCDB7008	Visions for the Future - Theoretical Perspectives on Management
LCDB7009	Critical Literature Review for Doctoral Research
LCDB7010	Converting Research into Practice
LCDB7011	Quantitative Research Methods
LCDB7012	Advancing to Doctoral Research Stage

The results gave me a great self-confidence and made me more motivated to take my studies seriously. I also treasure the certificate I received on the best researcher blog (see screenshot below) as it was a great surprise to me.

Moreover, I have been actively involved in scientific collaborations with colleagues and friends. My first published article with colleagues and friends was published on 29 (see screenshot below). Although it is not an authoritative journal and it is not my area of research, and I was the third author with a very limited contribution to the article, I believe it is a very good start to my research journey. I am confident of more outputs in the future!



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Service staff encounters with dysfunctional customer behavior: Does supervisor support mitigate negative emotions?

Finally, and most importantly, I would like to say thanks to the knowledge I have gained from Dr Caroline, Dr Steve, Dr Emma, Dr Promise and the good habits I have developed over the year, I have been able to make rapid progress and build a solid foundation for my studies in Part 2. I am very grateful to have met you all and value studying at an inspiring and supportive university.

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Outline

Tape-scripts

Interviewer: Why did you choose this topic?

xxxxxx: I am asking myself what I am really interested in. My DBA programme director Dr Caroline Jawad's a field of study are CSR, which has been a profound inspiration to me. As a lecturer teaching in a business school, I spend my days lecturing students about how the business makes money and maximises profit. As well as generating profits and being legally responsible to shareholders and employees, businesses also have a responsibility to consumers, communities, society and even the environment where we live. CSR requires companies to go beyond the traditional notion of profit as the only goal. But in reality, some companies have left CSR far behind.

At the same time, I am a heavy social media user and I have seen many people who hurt themselves or even lose their lives because have seen misinformation or rumours shared on social media platforms and choose to believe them. So it got me thinking, are social media platform companies only there to make money? Don't they have to be responsible for the harm and lives of their users? Don't they have to pay their fair share of corporate social responsibility?

The hot issue of the moment is COVID-19, with many people spreading rumours through the internet. Since COVID-19, the world has been fighting against health misinformation, as WHO Director-General Tedros Adhanom said that "we are not simply fighting with a pandemic, we are fighting an 'infodemic'." People are overwhelmed with both true and false information and the information that is neither true nor false spreads through social media much faster than a virus. It is difficult to find credible sources and reliable guidance when people need it, which shows how important it is to tackle rumours and misinformation about health and to provide the general public with trustworthy information.

Therefore, I would like to examine effective transmission mechanisms about health information and explore ways to improve the credibility of corrective health-related information in order to eliminate the negative impact of health-related misinformation on social media.

Interviewer: So what do you propose to do?

xxxxx: From a problem-solving perspective, therefore, I will adopt a pragmatic mixed method to achieve these goals. A qualitative study using interviews was used to find the influencing factors of the transmission mechanism; a quantitative study using a questionnaire with non-probability sampling was used to test these factors and rank them.

In my study, I am more focused on examining effective transmission mechanisms as a way to eliminate the negative effects of health-related misinformation. Of course, this is done to see if the social media platforms are the cause and to see what can be done from the platform's perspective to reduce harm and thus propose more effective solutions.

Finally, this study will help people to find effective access to health information in the event of a global public health pandemic such as COVID-19 so that they do not endanger their lives by listening to rumours on the Internet. In addition to this, this study will provide a theoretical underpinning for future governance management.

Abstract for LCDB7010 Converting Research into Practice

Health-related misinformation is widely disseminated on social media, and people's inability to properly distinguish between true and false information has resulted in a series of serious consequences. This pilot study uses qualitative research semi-structured interviews and a three-level coding of grounded theory to explore users' perceptions, discrimination and behavioural tendencies when receiving health-related corrective information and uses George Gerbner's classical cultivation theory framework to analyse the influencing factors and mechanisms of credibility information, with a focus on improving the credibility and effectiveness of health-related corrective information. The results show that recipients of corrective health-related information, mainly through their general perception of the quality and quantity of information, the channel through which the information is obtained, and the intervention of information technology tools, all contribute to the user's pre-existing knowledge base, especially where there is a cognitive conflict, and the public often use the views of others they trust to refute or convince themselves. People sometimes use their own past experiences or lessons to refute misinformation, which requires a highly credible communicator to convey high-quality information that is well-reasoned and appropriate to the user's level of awareness.

KEYWORDS: health misinformation, social media, credibility, effectiveness, corrective information

Abstract for LCDB7011 Quantitative Research Methods

Health-related misinformation is widely disseminated on social media, and people's inability to properly distinguish between true and false information has resulted in a series of serious consequences. This study is a purely quantitative methodology that aims to investigate the mechanisms and pathways that influence the perceived credibility of corrective health-related information, to ultimately eliminate as much as possible the negative impact of health-related misinformation on people. This study develops a conceptual framework for the perceived credibility of corrective health-related information on social media through an extensive review of past literature and proposes four hypotheses. The sample was analysed by doing an online questionnaire with 100 samples using SPSS statistics: descriptive statistics to check reliability; principal component analysis to check validity; and finally, after confirming the reliability and validity of the variables, multiple linear regression analysis was conducted to analyse the Quality of Information (QI) and the Reliability of Information Channel (RIC) in relation to the dependent variable Perceived Credibility of Corrective Health-Related Information Perceived Credibility of Corrective Health-related Information (PCCI), to determine how various variables affect the perceived credibility of health-related information. The results indicate that Quality of Information (QI) and Reliability of Information Channel (RIC) are the main factors affecting Perceived Credibility of Corrective Health-related Information (PCCI), which provides quantitative data to support the researcher in conducting subsequent studies.

KEYWORDS: health-related misinformation, social media, quality of information, reliability of information channel, perceived credibility, corrective information

Kuhn and Paradigm

These following five points are my understanding and summary of Kuhn and the book *The Structure of Scientific Revolutions* (2012).

1. The manifestation of the paradigm is paradigm shifts.
2. The nature of the paradigm is worldview and methodology.
3. The essential attribute of the paradigm is incommensurability.
4. The vehicle of the paradigm is the scientific community.
5. The realisation of the paradigm is scientific revolution.

Paradigm is manifested in the form of paradigm shifts. Paradigm shifts are usually triggered by innovative young people, so that scientists new to the field are not deeply embedded in the assumed paradigm and they see things in a completely new way because they are guided by a new paradigm to adopt new tools and pay attention to new areas. For example, it was previously thought that the sun revolved around the earth (geocentrism), then it was thought that the earth revolved around the sun (heliocentrism), and now it is thought that this is the result of the gravitational interaction of the two planets (gravity), which is a paradigm shift. Thus, a paradigm in a sense determines the worldview and methodology, providing a way of thinking for members of the scientific community.

According to Kuhn, scientific evolution is not an accumulative process, but a cyclical and dynamic one. Kuhn used to study physics, and later discovered while studying the history of science during his PhD that scientists actually observe things differently. It was thought that the natural sciences, such as physics and biology, were a cumulative process of research by previous generations, but Kuhn says this is not true. He said that the paradigm is incommensurable, meaning that different paradigms are different worldviews and methodologies that have no similarity to each other. For example, many people think that Newton's theory of mechanics is simply a special case of Einstein's theory of relativistic mechanics, and that if this is the case then Newton's mechanical forces can be deduced from Einstein's theory of relativistic mechanics, but in fact they cannot, because many of the core and underlying concepts in Einstein's theory and Newton's theory have completely different connotations. The mass in Newton's theory is conserved, whereas the mass in Einstein's theory can be transformed into energy. Einstein's theory may agree with Newton's theory, but the definition of the

underlying core concepts is completely different. That is why Kuhn said: A scientific revolution is a change in the concept by which scientists look at the world. The world has not changed, but the way we understand it and the underlying assumptions have been transformed, which is the essence of a scientific revolution. This means that only by rejecting the previous paradigm can we accept the new one.

Once a paradigm has been established, there are scientific community that defend the authority of the paradigm. knowledge can only be called knowledge if it is recognised and accepted by the scientific community, and knowledge recognised by experts in a field is not the same as truth.

Kuhn proposed the paradigm that structures and guides everything that happens in a scientific discipline, from the initial formulation of a research question; to the construction of relevant experiments; to the interpretation of observable phenomena. Without a paradigm, scientists cannot follow a coherent overall plan for what to do or how to do it, and their field of study will not achieve the kind of success we expect from a true scientific discipline.

Poster



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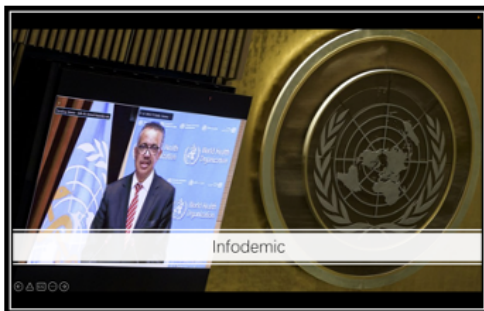
to be continued

ACADEMIC RESEARCH POSTER

Topic

Preamble

Some people say that injections of disinfectants can combat a pandemic, so many people have tried and lost their lives. This is not alarmist talk, it is a real thing that happened. Since COVID-19, the world has been fighting against health misinformation, as WHO Director-General Tedros Adhanom said that "we are not simply battling with a pandemic, we are fighting an 'infodemic'."



Introduction

People are overwhelmed with both true and false information and the information that is neither true nor false spreads through social media much faster than a virus. It is difficult to find credible sources and reliable guidance when people need it, showing how important it is to tackle rumours and misinformation about health and provide the general public with trustworthy information.

Research aim and objectives

1. **Investigate** the transmission mechanisms of health misinformation on social media.
2. **Construct** and **examine** a transmission model of social media.
3. **Propose** strategies and governance recommendations for the management of health misinformation on social media.

Literature review

The literature on health-related misinformation and social media covers different disciplines, including communication, epidemiology, medical internet, psychology and computational science.

1. Classification of fake health information: The main categories are infectious diseases, chronic diseases, medicine, healthcare, food safety, diet and weight loss.
2. Dissemination of fake health information in social media: Research and policy formulation on information disorder can be based on three aspects - the information itself, the information distributor and the information receiver.
3. Current status of research on the governance of fake health information: The first approach (beforehand) is to allow the public to receive true information before being exposed to the false information, or to be warned about the potentially misleading nature of the false information when they are about to be exposed to it. The second approach (halfway) is to apply technologies such as artificial intelligence to identify and stop the spread of disinformation wherever possible. The third way (afterwards) is to explain and correct it.

Methodology

Semi-structure interview for pilot study

Questionnaire

Structural equation modelling

Simulation model

1. Preliminary data collection was done using both quantitative and qualitative approaches, allowing the researcher to avoid the limitations of each method while exploiting the benefits of both at the same time. This study will be driven by the pragmatism paradigm and will apply mixed methods.
2. The pilot study was designed to establish the existence of the phenomenon and to test and complement subsequent research ideas and studies.

Background

Social media is used by a large number of people

According to Statista (2021), social media platforms together serve over 4.2 billion active users worldwide as of February 2021. The Social GlobalWebIndex's flagship study on the current developments in social media, produced by the Global Web Index (2019), finds that social media platforms are used by 98% of internet users. In the US, 72% of adults use no less than one social media site as of February 2019, with the most popular being Facebook and YouTube respectively (Pew Research Center, 2019). In China, over 80% of adults have a WeChat account (Global Web Index, 2019). Especially during the COVID-19 outbreak prevention and control period, many people turned to social media sites to spend time or communicate with friends to maintain social distance, and social media use grew by 20-87% globally (Naeem et al, 2021).

Misinformation regarding health is harmful

Health is closely related to people's lives and health misinformation can lead to misguided lifestyles and medical conditions that can be detrimental to people's health (Lewis, 2006; Allcott and Gentzkow, 2017). Rumours concerning the H1N1 virus, for example, have caused a crisis of trust in the authorities (Shigemura et al, 2015; Pandey, 2010), with rumours relating to the Zika virus gaining traction on Facebook and increasing mass fears by being more popular than accurate and credible correct information (Sharma, 2017). Research that found a relationship between a common children immunisation and autism sparked widespread worry about the vaccine's safety. The UK Department of Health and several other health organisations quickly debunked the allegation and warned parents not to forgo immunizations, and it was then widely reported in the media that the claim was unproven, but the public continues to think that vaccinations cause autism, and even more worryingly, many health professionals still believe it (Hargreaves et al, 2003). "Milk causes cancer", "drink bone broth for calcium and grow taller", "eat more spinach for iron", "kidney stones can be caused by calcium supplementation", "heart disease can be avoided by drinking red wine" and "eating apricot seeds can cure cancer" pseudoscience has infiltrated social media and users seeking the truth about health (Naeem and Bhatti, 2020).

Social media users pay close attention to health-related information

Health-related topics are consistently among the most interesting to the public, with one out of every 20 Google searches being for health-related information (Ramaswami, 2015). More than 70% of American individuals are interested in health and medical information, according to Pew Internet Research (2015), and have looked for some sort of health information on the Internet (Pew Internet Research, 2014; Pew Internet Research, 2019). When asked to choose the three topics of most interest, 37% of Internet users still chose health and medical topics (Pew Internet Research, 2015). In addition to this targeted search, 46% of Facebook users claim they are exposed to health and medical news on a regular basis (Pew Research Center, 2013).

The extensive use of social media has led to the transmission of health-related misinformation

The internet is most people's first port of contact for health information when they need scientific or health information (National Science Board, 2018; Brossard, 2013). Social media, with its convenience, allows the public to access information promptly (Yun et al, 2016), but unlike health information provided by official authorities such as hospitals or medical centres, the veracity of the information provided by users is debatable (Adams, 2010). Because of the extensive use of social media platforms like Facebook, Twitter, WeChat, and Weibo, users of these platforms may increasingly switch from being passive consumers of information to active content creators (Lewandowsky et al, 2012). This has led many users to prefer to use social media platforms to get news rather than keep in touch with friends (Global Web Index, 2019). Information on social media bypasses many of the traditional 'gatekeeping' mechanisms and the ability of users to create information, their intentions and their ability to judge its authenticity varies, making the credibility of information highly variable and allowing health misinformation to spread faster and more widely (Zhang et al, 2014).

The devastating consequences of health misinformation about COVID-19

Following the coronavirus pneumonia pandemic's outbreak in 2019, health misinformation and rumours regarding it were widely disseminated on social media (Naeem and Bhatti, 2020). Some people said that the injection of disinfectant could kill the new coronavirus (Clark, 2020); some patients refused to take anti-inflammatory drugs because they mistakenly believed that they would increase their chances of

contracting the coronavirus pneumonia (MaassenVanDenBrink et al, 2020); others abused vitamin D to treat the coronavirus pneumonia (Soltaninejad, 2020); others even ingested methanol, resulting in mass poisoning and more than 800 deaths (ibid); people in Iran consume high levels of alcohol to prevent coronavirus pneumonia, resulting over 3,000 people poisoned and over 600 dead, etc (Pleasance, 2020; Delirrad and Mohammadi, 2020). In addition to the dissemination of unproven and unreliable preventive measures, incorrect health information poses a serious threat to public health (Zarocostas, 2020), with detrimental consequences for global health and well-being (McKee et al, 2019; Krishna and Thompson, 2019), and may lead the public to question or ignore advice issued by governments or medical institutions and thus not follow the relevant COVID-19 guidelines (Bridgman et al, 2020; Hameleers et al, 2020), with negative consequences that are global and devastating (McKee et al, 2019; Krishna and Thompson, 2019).

The urgency of tackling misinformation

In February 2020, the World Health Organization warned that the coronavirus pneumonia pandemic would be followed by a massive ‘infodemic’ of information, some of which would be accurate but some of which would not, making it difficult for people to access dependable and trustworthy information when they needed it (World Health Organization, 2019). “We are not simply battling an epidemic, we are fighting an ‘information epidemic’,” said WHO Director-General Tedros Adhanom. Misinformation about health on social media is a serious public health hazard, and the WHO’s response strategy specifically targets the COVID-19 ‘information epidemic’. (Laato et al, 2020). This demonstrates the need of combating health misinformation on social media to preserve public health, promote the effective operation of social media platforms, clean up the online environment and maintain social stability (Swire-Thompson and Lazer, 2020).

Research aim and objectives

People are overwhelmed with both true and false information and the information that is neither true nor false spreads through social media much faster than a virus (Zhang et al, 2014). It is difficult to find credible sources and reliable guidance when people need it, which shows how important it is to tackle rumours and misinformation about health and to provide the general public with trustworthy information (World Health

Organization, 2020). This demonstrates the emergency of the need of combating health misinformation on social media to preserve public health, promote the effective operation of social media platforms, clean up the online environment and maintain social stability (Swire-Thompson and Lazer, 2020).

Social media is an interactive environment where, in addition to misinformation, there is also true health information based on scientific evidence, and social media is an important channel for them to share real data in a timely manner (Rosenberg et al, 2020). Explanatory and corrective information is one of the more effective tools when dealing with scientific information and aiming for accuracy (Bolsen and Druckman, 2015). Corrective information corrects misconceptions and helps people to understand the scientific truth (Bode and Vraga, 2015). Correcting health-related misinformation on social media platforms is therefore important for improving public health and maintaining social safety and stability. Therefore, this study aims to investigate the mechanisms and pathways that influence the perceived credibility of corrective health-related information, and to eliminate the influence of health-related misinformation where possible. Therefore, the following objectives were developed for this study:

1. **Investigate** the transmission mechanisms of health-related misinformation on social media.
2. **Construct** and **examine** a transmission model of health-related misinformation on social media.
3. **Propose** strategies and governance recommendations for the management of health-related misinformation on social media.

Literature review

Social media is new in recent decades and the literature on social media is all relatively new. Communication, epidemiology, medical internet, psychology, and computational science are all included in the literature on health-related misinformation. Therefore, this study will review the relevant literature from China, the United States and other countries in the past decade to provide a comprehensive understanding of how health-related misinformation is governed in the context of social media, as well as the current status and gaps of research in each area, to provide a theoretical basis for further research. Focus on databases such as Elsevier ScienceDirect, Emerald, Web of Science, etc. in the context of the keywords “social media” and “social networks”, searching for

“health misinformation”, “health fake news”, “health rumour”, etc. Develop a comprehensive understanding of academic developments so that research priorities can be set.

Classification of health misinformation

The current research on fake health information is divided into infectious diseases, chronic diseases, medicine, health and wellness, food safety, diet and weight loss, etc.

The majority of social media research on health misinformation has focused on infectious diseases such as COVID-19 (Lazarus, 2021), Zika, Ebola, H1N1, Measles, Mumps and Rubella (MMR). With the advent of the coronavirus pneumonia pandemic, a considerable volume of unsubstantiated material, such as mosquito bites conveying the virus, was shared over social media (Lazarus, 2021). Because officials were unable to give definite answers or guidance, the Zika outbreak generated a lot of discussion on Twitter and Facebook (Wood, 2018), and related news (Sommariva et al, 2018), photographs (Seltzer et al, 2017), and videos (Bora, 2018) were widely shared. During the Ebola outbreak, Twitter and Sina Weibo also helped disseminate rumours and speculative information (Fung et al, 2016), and a large number of misleading videos about the Ebola virus disease existed online (Pathak et al, 2015). According to a poll of H1N1 flu films on YouTube, 61.3% included relevant information on the disease, while 23% were deceptive (Pandey, 2010; Shigemura et al, 2015). Misinformation linking the Measles, Mumps, and Rubella (MMR) vaccination to autism was widely disseminated on social media, and it continues to have a strong influence among some groups (Wang et al, 2019; Hargreaves et al, 2003).

While the majority of misinformation research has focused on infectious diseases, misinformation concerning chronic diseases like cancer and cardiovascular disease is frequent on social media. Scholars in Japan analysed internet discussions with different viewpoints on cancer screening and discovered that anti-cancer screening material was the most widely shared (Okuhara et al, 2017). Other scholars have also studied false health messages about chronic diseases such as hypertension (Kumar et al, 2014), psoriasis (Qi et al, 2016), gynaecological oncology (Chen et al, 2018a) and diabetes (Leong et al, 2018).

Unsubstantiated information about diet and nutrition can have harmful effects on susceptible people. Consumers seeking to lose weight rapidly and enhance their health

are becoming increasingly interested in items labelled “detox”, “superfoods”, and “all-natural” (Klein and Kiat, 2015). Anorexia has been pushed as a craze, and research has shown that it may acquire appeal among young female viewers when linked to the notion of beauty in YouTube videos (Syed-Abdul et al, 2013).

The tobacco industry has a long history of misleading consumers by misrepresenting scientific evidence. Federal courts in the United States have found major tobacco firms guilty of conspiring to deny, misrepresent, and minimize the dangers of smoking (Smith et al, 2011). Misleading depictions of the health effects of tobacco in YouTube videos can influence viewers’ attitudes toward tobacco products and motivate smoking (Albarracin et al, 2018). The advent of e-cigarettes has prompted scholars to examine the content of messages and tweeting patterns associated with local public health department e-cigarette campaigns, with part of the misinformation aimed at diverting public attention away from the product and onto messages attempting to undermine authority (Harris et al, 2014).

Other research on pseudo-health messages regarding medications (Al Khaja et al, 2018), paediatric diseases (Strychowsky et al, 2013), abortion (Bryant et al, 2014), dialysis (Garg et al, 2015), suicide (Li et al, 2018), and multiple sclerosis (Li et al, 2018) have been published in social media (Lavorgna et al, 2018). It has been argued that while there may be less pseudo-health information than true health information, it is often the case that pseudo-health information is more popular than evidence-based true information (Wang et al, 2019).

The transmission of health-related misinformation on social media

While social media platforms provide a wealth of opportunities for people to communicate, they also allow misinformation to spread rapidly across the globe, regardless of geographical location. In a globalised world, there is an in-depth discussion about fake health information on social media (Wang et al, 2019), studies have been conducted on several platforms, including Twitter, Facebook, and Sina Weibo (Kirner-Ludwig, 2020; Jin et al, 2017). According to a Council of Europe report, research and policy development on information disorder can be approached from three perspectives - the information itself, the information disseminator and the recipient of the information (Wardle and Derakhshan, 2017). These three components can influence the spread of fake health information both individually and as an integral whole.

The information itself

Firstly, the content of the information itself is the key to the continuation of communication. Fake health information is usually described in the voice of an expert or authority, accompanied by images or videos to confuse the public (Zhang et al, 2019), and features a combination of graphics, use of numbers, integration with current hot topics (Wang, 2015), heavy emotional involved (Chua and Banerjee, 2017) or with political purposes (Harris et al, 2014), etc. (Lu, 2016). Videos with a high level of cultural relevance had a higher level of influence, and research in India revealed that diabetes videos targeted at South Asians were more likely to be deceptive than those that were not (Leong et al, 2018). In addition, information can be inadvertently oversimplified, misrepresented or exaggerated. Scientific health information is complex, and many details of scientific research are harder for laypeople to understand or less interesting, as a result, to be successful, scientific knowledge must be simplified, and any oversimplification might lead to misinterpretation (Lewandowsky et al, 2012). Humorous messages make hesitant parents more aware of the seriousness of rubella, thus reducing resistance to the measles, mumps and rubella vaccine (Moyer-Gusé et al, 2018). Furthermore, the narrative of bogus health information has a personal, hostile, and self-righteous tone, which can frequently elicit negative feelings including dread, wrath, grief, anxiety, and distrust (Panatto et al, 2018; Porat et al, 2019). False information travels wider, quicker, and deeper than true information because false information's content is more unique and generates greater contempt, terror, and surprise (Vosoughi et al, 2018), i.e., content that elicits strong emotions is more likely to be shared (Berger and Milkman, 2012; Peters et al, 2009).

The information disseminator

Secondly, those who disseminate false health information can be divided into “good-faith disseminators” who believe the information to be true, and “malicious disseminators” who know it to be false. Most of those spreading false health information on social media are individuals who are not affiliated with official bodies, and “experienced patients”, for example, are increasingly challenging formal bodies, the border between authority and quasi-skillfulness is becoming blurred (Seymour et al, 2015). In the absence of an authoritative voice, some users may pass on medically unreliable information to other users, unwittingly becoming purveyors of false health information (Chua and Banerjee, 2017; Ozturk et al, 2015). Whereas rumour mongers may be motivated by a desire for attention, hatred of society, fun and amusement, more producers of fake health information are driven by profit (Wang et al, 2019). Even

though some producers of disinformation said in interviews that they were partly driven by political or ideological goals, their websites and articles have proven to be a lucrative source of revenue in some situations (McCoy, 2016; Sydell, 2016). Some studies have investigated the psychology of people who spread misinformation. People appear to share knowledge that elicits an emotional response the most (Cotter, 2008), people's readiness to share knowledge is frequently boosted by emotional excitement (Berger, 2011), and knowledge that might elicit feelings of revulsion, terror, or joy is more likely to spread from person to person than neutral information, especially in a social media environment (Peters et al, 2009; Heath et al, 2011). This may be because the public may be influenced by emotions and intend to share their feelings such as discomfort with others for comfort or empathy (Zhang et al, 2019). Individuals may be less likely to disseminate false health-related information if they are exposed to collective opinions via counting retweets and collective authenticity ratings (Li and Sakamoto, 2015). As a whole, the motivations for creating and spreading fake health information reflect individual and collective qualities, but their behaviour is harder to predict due to the complex psychological factors involved. Some scholars believe it is related to internet users' risk perceptions of fake health information. After experiencing negative events such as food safety risks, people have a tendency to have a pessimistic bias and disseminate information accompanied by a high willingness to share and access information, as well as a low willingness to filter information (Lai and Yang, 2014).

The recipient of the information

Thirdly, scholars have studied the profile of susceptible people from various perspectives to understand the impact of differences in the characteristics of information recipients on their ability to recognise false information. Females (Chen et al, 2015; Liu and Kong, 2017), those with low levels of education (Liu and Kong, 2017; Afassinou, 2014), those of low age (Holliday, 2003), and those with little knowledge (Krishna, 2017), and those who do not pay attention to official misinformation are less likely to recognise false health information (Zhang and Su, 2019). In an analysis of cognitive beliefs and their effect on rumour acceptance, it was found that individuals with strong cognitive beliefs typically process information more vigilantly, while individuals with weaker cognitive beliefs are more inclined to believe false health information online (Chua and Banerjee, 2017), and that developing personal sensitivity can help prevent misinformation from spreading (Li and Ma, 2017). Furthermore, conspiracy theories play a key role in information recipients' acceptance of misleading health information. On Twitter and Facebook, for example, the rumour that the Zika

virus is a biological weapon and that a Zika vaccine is being created to lower the world's population was extensively spread (Wood, 2018; Lewandowsky et al, 2013). Health literacy (Zhang et al, 2017), subjective judgement (Ma and Zhu, 2018), cultural background (Rampersad and Althiyabi, 2020), conspiracy thinking and emotions (Zhang et al, 2019) also influence the processing of information by the receiver of the message. Another related study has focused on key ideas like selective exposure and confirmation bias, as well as the wide spectrum of events that result from them. Selective exposure, in which people intentionally seek out information that supports their opinions and avoid information that contradicts those beliefs to lessen the discomfort or dissonance they feel when confronted with material that contradicts their beliefs (Johnson et al, 2009). The Internet, in particular, has resulted in the division of the information sphere into "echo chambers", with bloggers primarily linking to other blogs with similar viewpoints rather than those with opposing points of view. More than half of blog readers look for sites that support their viewpoints, while just 22.2% look for blogs that oppose them (ibid). Prior views impact people's perceptions of facts, and confirmation bias, or individuals seeking for or interpreting data in support of previous ideas, expectations, or assumptions (Nickerson, 1998), is one of the key reasons why people spread disinformation (Kim and Dennis, 2019). If people are already sceptical of health data, confirmation bias may cause them to seek to confirm information, which misinformation might supply in the absence of true proof, resulting in the construction of online echo chambers (Hart et al, 2009; Del Vicario et al, 2016). Confirmation bias is reinforced by social media, which generates and maintains social echo chambers where specific information is rarely disputed (Spohr, 2017). Some scholars have analysed anti-fluoride online networking groups and found that the strong ties between communities are a barrier to the acceptance of expert opinion (Seymour et al, 2015). Social media may contribute to the simultaneous emergence of these phenomena and thus have complex implications (Del Vicario et al, 2016; Boutyline and Willer, 2017).

Current research on the governance of health misinformation

Misinformation is easy to disseminate but difficult to govern (Wang et al, 2019), and its governance can be divided into three main ways. The first way (beforehand) is to allow the public to receive truthful information before being exposed to it, or to be warned about its potentially misleading nature when they are about to be exposed to it. The second way (halfway) is to apply technologies such as artificial intelligence to

identify and stop the spread of false information wherever possible. The third way (afterwards) is to explain and correct it.

First and foremost, a forewarning. If people are expressly alerted ahead of time that what they are going to view may be untrue, the impact of disinformation may be reduced (Ecker et al, 2010; Jou and Foreman, 2007). Scholars have investigated various methods to prevent the spread of rumours on Twitter based on rumour psychology studies. Warnings (e.g., ‘this tweet appeared on a rumour site’) did reduce the likelihood of participants sharing rumours (Ozturk et al, 2015), and warnings before receiving false information appeared to be more effective than warnings afterwards (Ecker et al, 2010; Chambers and Zaragoza, 2001), possibly This may be because people have a default expectation that the information provided is valid, but a warning can alter this expectation and make the recipient doubt the truth of the information (Lewandowsky et al, 2012). Furthermore, when people are alerted that the information, they are receiving may be erroneous, they take longer to analyse it, implying that people are not quick to dismiss false information but cautious in determining whether it is real or false (Schul, 1993). While a healthy sense of scepticism or resulting mistrust also does not always protect people from false health information, they are still of great help when first exposed to false health information. The use of the Internet to communicate health-related information has been emphasised by researchers in the domains of health and public health (Signorini et al, 2011; Chew and Eysenbach, 2010), looking at ways to increase public acceptance of authentic information or scientific knowledge (Huo et al, 2018; Chou et al, 2015). And the full potential of social media is being used for preventive interventions using smartphones and other mobile technologies (Free et al, 2013; Steinhubl et al, 2015).

Secondly, halfway. Identifying and stopping the spread of misinformation to remove it helps to mitigate but is less likely to eliminate the impact of misinformation (Ecker et al, 2011). Rumours are reinforced and seen as believable when they are transmitted repeatedly (Rosnow, 1991), and the consequent high credibility boosts trust and readiness to propagate rumours (Shin et al, 2017). Repeated exposure to a statement can increase acceptance of its truthfulness (Begg et al, 1992; Hasher et al, 1977), even if the information is rejected in the initial exposure, but if a piece of information is seen multiple times, this may give it some credibility based on familiarity (Lewandowsky et al, 2012), and it may begin to be more convincing than evidence-based facts (Dias da Silva and Walmsley, 2019). Identifying and removing fake health information and reducing its number is thus indispensable. A range of research has focused on

misinformation identification and stopping its spread in time (Vishwakarma et al, 2019; Sicilia et al, 2018), using artificial intelligence techniques like neural networks to detect bogus news and spam on social media sites like Twitter and Weibo, for example. (Jadhav and Thepade, 2019; Ma et al, 2016). Some scholars have designed an online document recognition method based on semantic co-linear matching to identify food safety misinformation (Chen et al, 2018b), as well as using neural network techniques based on user behaviour to improve the accuracy of rumour detection (Chen et al, 2018c). Some models also attempt to identify the sources of rumour propagation (Shah and Zaman, 2011; Zhu and Ying, 2016). The major impact of recognizing and removing erroneous health information is to lower the number of references to false information and to enhance the speed with which false health information is identified, hence maximizing the prevention of public inferences based on false data (Ecker et al, 2010; Ecker et al, 2011).

Third, afterwards. Misinformation can be remedied through corrections, albeit with some time delay, but clarifying the correction and providing a plausible causal explanation can cast doubt on the original false beliefs and thus mitigate the impact of the misinformation to some extent (Seifert, 2002; Sanna and Schwarz, 2006). The ‘Related News’ function on Facebook may be used to correct incorrect health information concerning a possible relationship between immunizations and autism (Bode and Vraga, 2015). The corrective sort of information, in an ideal world, would explain why the inaccurate information was first considered to be right and propose a solution (Lewandowsky et al, 2012; Rapp and Kendeou, 2007). The efficiency of the correction varies depending on the extent of engagement, personal literacy, and socio-demographic variables of each individual. In the United States, the Centers for Disease Control and Prevention (CDC) sent pamphlets to recipients to dispel false health information (e.g., “Flu vaccination side effects are worse than the flu”) and offer pertinent facts (e.g., “Flu vaccine side effects are infrequent and moderate”). When recipients were assessed immediately after reading these leaflets, they were able to discern between the truth and untruth of the information and expressed behavioural intentions that were compatible with the information presented (i.e., the intention to be vaccinated) (Schwarz et al, 2007). However, the warning effect was less pronounced in the elderly and children, possibly because they were more likely to confuse the true and false messages they received and retain only a sense of *déjà vu* (Bastin and Van Der Linden, 2005; Holliday, 2003). Messages that are consistent with worldviews can increase audience acceptance (Kahan, 2010), and even simple changes in wording can make messages more acceptable (Hardisty et al, 2010). Some researchers have

demonstrated how expert organizations may correct disinformation without jeopardizing their reputation, implying an appealing strategy to limit misinformation propagation (Vraga and Bode, 2017). According to research, both algorithmic (by platforms) and social (by peers) corrections are equally successful in removing misinformation, and initiatives to urge users to reject inaccurate or misleading information are needed (Bode and Vraga, 2018).

Theoretical framework

Currently, it is difficult to choose a theory that can reasonably explain this phenomenon due to the relative lack of relevant research. This study adopted the cultivation theory proposed by George Gerbner (1986) because it not only explains the mechanisms of information dissemination but also focuses on the effects it has. As shown in Figure 1.

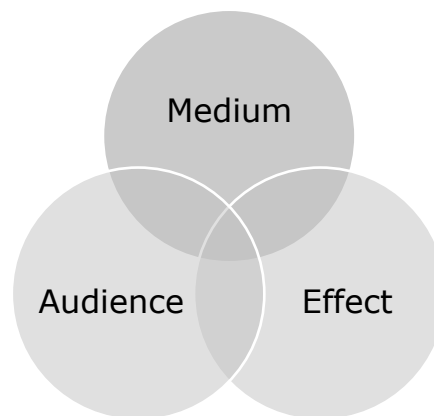


Figure 1 Gerbner's Three Core Assumptions of the Cultivation Theory

American communication experts like Gerbner initiated a series of research on the substance of television violence in the 1960s and 1970s. They examined the influence of television on audience attitudes in addition to the content study of television violence, and finally developed the “Cultivation Theory” (Gerbner et al, 1986). The Cultivation Theory school of thought developed theories of ‘mainstream effects’ and ‘reverberation effects.’ The mainstream effect is the belief that as a result of exposure to television, values that are meant to be various become similar to the mainstream of view provided by television. This coincides with the spiral of silence theory. As a medium of mass communication, television represents and directs the mainstream of social opinion, thus leading to a convergence of public opinion (ibid). The news media should aggressively steer public opinion using this notion. The cultivation theory’s central premise is that mass communication mediums subtly shape their audience’s viewpoint (Mosharafa, 2015). Audiences exposed to a lot of violent television shows, for example, have

substantially higher estimations of the chance of violent assaults than those who have little or no exposure to such shows (West and Turner, 2014). This confirms empirically the long-term effects of the media, which has both positive and negative effects in terms of their impact on audiences' worldviews and values. On the one hand, providing audiences with accurate information and providing an objective, true, and thorough reflection of the objective reality can positively impact the development of healthy and comprehensive worldview ideals. On the other hand, if the media delivers a skewed portrayal of reality, it can affect people's perceptions of reality and lead to wrong worldview values (Bilandzic and Rössler, 2004).

Although cultivation theory emerged from the field of communication theory, one of its main assumptions is the study of how information disseminated through mass communication affects people's perceptions of the world they live in. Thus, a better understanding of the whole is provided in this study using the relevant model. George Gerbner defines three core assumptions of cultivation theory, although these came about in the earliest days of the theory and revolve solely around television. However, they can also be applied here to the role that health-related corrective information on social media plays in this model.

Conceptual framework

This study examines the impact of the quality of information and reliability of information channel on the perceived credibility of health-related corrective information and explores the moderating role played by the recipient's level of knowledge and level of conflict in the pathway of influence. The research framework is shown in Figure 2. The following hypotheses are proposed:

H1: *The quality of information would have a positive relationship with the perceived credible of corrective health-related information.*

H2: *The reliability of the information channel would have a positive relationship with the perceived credible of corrective health-related information.*

H3a: *The recipient's level of knowledge would moderate the quality of information and the perceived credible of corrective health-related information.*

H3b: *The recipient's level of knowledge would moderate the reliability of the information channel and the perceived credible of corrective health-related information.*

H4a: *The recipient's level of conflict would moderate the quality of the information and the perceived credible of corrective health-related information.*

H4b: *The recipient's level of conflict would moderate the reliability of information channel and the perceived credible of corrective health-related information.*

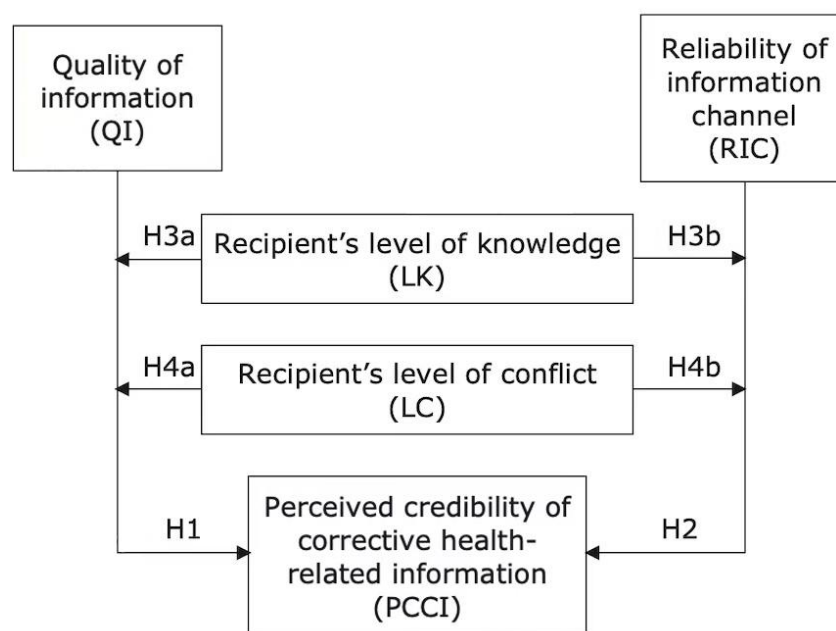


Figure 2 Conceptual Framework

Research gap

By reviewing the research on health-related misinformation in the context of social media found that the current literature, rather than considering the overall political, scientific and social impact of health-related misinformation, on the one hand, the current literature focuses on exploring the mechanisms and patterns of dissemination of misinformation, and on detecting and preventing the dissemination of health-related misinformation with the help of computer technology-related tools (He et al, 2015; Jin et al, 2013); on the other hand, the current literature focuses on exploring the relationship between health-related misinformation and certain human traits, explaining

people's cognitive responses to misinformation and rumours in social networks at an individual level, so as to understand the mechanisms behind health-related misperceptions in social networks (Krishna, 2017; Chua and Banerjee, 2018). This study will not focus on the psychological and cognitive characteristics of people's reception of health-related misinformation, but rather on how to counteract health-related misinformation with corrective information, how to avoid or reduce the negative effects of health-related misinformation, and to explore the credibility of health-related corrective information.

Methodology

Research paradigm and philosophy

Ontology

Kuhn's (2012) work laid the foundation for social constructionism, where the reality that people accept is largely socially constructed (Lincoln and Guba, 1985). The experiences of the participants in the study were personal and possibly unique, relating to their complex experiences (Mackenzie and Knipe, 2006). Therefore, it can be considered that each of my participants has multiple subjective realities (Morgan, 2007).

In this study, the ontology is to understand and clarify the mechanisms by which health-related misinformation is disseminated on social media as a way of proposing appropriate policies and recommendations to reduce the harm of health-related misinformation to people and society, and ultimately to facilitate the flow of truthful and valid information in society (Blaikie, 2013). As a constructivist researcher, the role of the researcher is to seek to understand the different realities of the participants in order to be able to understand their perceptions, discrimination and behavioural tendencies towards health-related misinformation.

Epistemology

Knowledge is a social construction (Crotty, 1998) and knowledge is developed through people's subjective experiences and is formed at the individual level (Mackenzie and Knipe, 2006). Knowledge is active and knowledge is an abstraction or concept that is formed in the mind (Schwandt, 1998). People engage and interpret the world as

constructing knowledge (Crotty, 1998). Therefore, each participant is positioned as having knowledge about themselves and the world.

With a constructionist epistemological perspective, researchers value the interaction with participants (Lincoln and Guba 1985; Morgan 2007) to produce meaning and knowledge within a defined social context (Crotty, 1998). By understanding the behavioural dynamics of participants in response to health-related misinformation, it allows social media platform companies and stakeholders to design problem-solving responses that are relevant in this social context and therefore have a greater likelihood of success with social constructionism (Waylen et al, 2010).

Axiology

For pragmatic axiology, the researcher values practical solutions and consequences in a given context (Patton, 1990) and therefore, mixed methods can be used appropriately to address the research questions in the study (Creswell et al, 2003). In this study, the researcher's values are geared towards improving social stability, the health of people's lives and ultimately social progress (Johnson et al, 2007).

Research methods for qualitative study: pilot testing semi-structure interview

This pilot study seeks to explore effective communication mechanisms through semi-structured interviews with around 5-10 people as a way to investigate users' perceptions and discriminations of corrective information. In contrast to 'misinformation', there is a new phrase 'corrective information'. The main ideas for using this word are as follows. Interviews will be done to collect data that can be used for research, so it doesn't make sense to go and collect data that has been tested over time and that most people know is a rumour. For example, some people say injecting disinfectant to fight the pandemic (Clark, 2020) because people with common sense know that disinfectant cannot be injected into the body and some people look foolish, they have lost their lives because of it. There is also some misinformation because the researcher is not a medical doctor. How does the researcher define and determine if this is misinformation? So, I have been thinking a lot about this issue. Finally, I came up with a more reasonable way, which was to pick a scientifically verified piece of information that did not look like true information and use this type of information to perceive the credibility impact of the interviewee. This means that fake information is not easy to judge as fake, and if it is insisted to be fake, this may hurt some people and involve an ethical risk (Israel and Hay, 2006). However, using scientifically verified corrective information avoids ethical

risks because the corrective information is scientifically proven and substantiated. The steps of the interview are as follows:

1. I will conduct semi-structured interviews with around 5-10 people, approximately 20-30 minutes per interviewee.
2. As xxx is my first language, I will conduct the interview in xxx in order to better understand the interviewee's responses. Later on, all conversations will be translated into English, and the relevant Information Sheet and Consent Form will be presented to the interviewees in a bilingual version.
3. As my interviews are only aimed at social media users, there was a good reason to use the online method of social media for my interviews. The chat function in social media also worked well to make a full record of my interview, either by voice or by typing, which allowed me to conduct the interview independent of time and space and to make sure I could do the whole interview online.
4. xxx is the social media with the largest number of users in Xxxxxx (Global Web Index, 2019). I have 700 adult zz users, who are widely distributed all over the world, while their age, gender, education level and geographical location all meet the nonprobability sampling. So, I will choose my interviewees based on random numbers. This has many advantages, such as ensuring the authenticity of the people I will be interviewing and that I am not dealing with a robot. Guarantee that these people can answer my questions.
5. I will also change the questions at any time based on each interviewee's open-ended responses and add new questions as well. Because new elements and clues may come up during the interview, the semi-structured interview is used to provide new ideas. My initial design of the interview questions will be divided into three phases, which are layered from shallow to deep (interview questions see Appendix 1).

Research method for quantitative study: questionnaire for survey

This study seeks to explore effective communication mechanisms through questionnaire with 300 people as a way to investigate the mechanisms and pathways that influence the perceived credibility of corrective health-related information. Table 1 shows the scale design, measurement items and sources for the variables listed below. The sample then analyse using SPSS Statistics: descriptive statistics to check for reliability; principal component analysis to check for validity; and linear regression analysis for test the relationship between variables. The measurement items are all measured on a Likert 5-point scale and participants can respond based on their actual

perception of the health-related corrective information, with a score of 1-5 on a scale from strongly disagree to strongly agree respectively. The questionnaire is specified in Appendix 2.

	Constructs	Measurement Items	Sources
Dependent Variable	Perceived credibility of health-related information (PCCI)	1. Correct information (PCCI1) 2. Reliable information (PCCI2) 3. Trustworthy information (PCCI3)	Huo <i>et al</i> (2018)
Independent Variables	Quality of information (QI)	1. Helpful information (QI1) 2. Accessible information (QI2) 3. Adequate information (QI3) 4. Relevant information (QI4)	Chou <i>et al</i> (2015); Zahedi and Song (2008); Laugesen <i>et al</i> (2015)
	Reliability of information channel (RIC)	1. Reliable information channel (RIC1) 2. Professional information channel (RIC2) 3. Authoritative information channel (RIC3)	Huo <i>et al</i> (2018); Wu <i>et al</i> (2011)
Moderator Variables	Recipient's level of knowledge (LK)	1. Degree of knowledge understanding (LK1) 2. Degree of knowledge familiarity (LK2) 3. Degree of knowledge acquisition (LK3)	Jiang and Beaudoin (2016); Sussman and Siegal (2003)
	Recipient's level of conflict (LC)	1. Conflict with previous perceptions (LC1) 2. Different from previous perceptions (LC2) 3. Subversion of previous perceptions (LC3)	Chou <i>et al</i> (2015); Ma <i>et al</i> (2017)

Table 1 Measurement Items and Sources

Ethical considerations

In general, ethical considerations should cover three research phases, from the planning and access stage through the data gathering and reporting stage (Flinders, 1992). When

I conduct data collection through questionnaires, all participants involved will be given Participant Information Sheet and Consent Form, respect the privacy or anonymity of participants, and issues such as confidentiality of participant information, and identification and ensuring confidentiality and proper management of data will need to be considered before any empirical work is undertaken (Israel and Hay, 2006). Therefore, the main ethical considerations will follow the ethical principles of the Belmont Report (NCPHSBBR, 1979), such as respect for persons, autonomy, and beneficence. The study will seek ethical permission from the University of Wales Trinity Saint David's Ethics Committee, and it will rigorously follow these criteria.

Appendix 1 Interview questions

My initial design of the interview questions will be divided into three phases, which are layered from shallow to deep.

The first phase is a basic survey of users, simple questions about whether they have seen any corrective information.

1. Have you seen any health-related corrective information?
2. Have seen any health-related corrective information on social media
3. Examine users' perceptions of corrective health information

The second phase is basic identification, presenting the interviewee with health-related corrective information of the kind to bring in thinking.

1. Do you think this information is true or false?
2. Do you have the ability to determine whether it is true or false?
3. What is your attitude when you see corrective information?

The third phase is in-depth questions to provoke reflection.

1. How do you react when you see corrective information that contradicts what you consider to be common sense?
2. How does the authority and professionalism of the person to whom the information is posted affect your receipt of corrective information?
3. Can you give me an example?

Appendix 2 Questionnaire

Questionnaire

Topic

No.***

Please read the following information carefully before deciding to take part in this research.

The study is being conducted as a quantitative study for a doctoral student to study participants' xxx . The survey is a non-commercial survey, and its findings are for academic purposes only. The information you provide will be strictly confidential and anonymous throughout. It will be filed and kept confidential by number only. If you are happy to participate, you will be asked to sign a Participant Information Sheet and Consent Form.

Part 1 Demographics

Q1: Gender

Male ☐

Female..... ☐

Q2: Age

Between 18 and 34 years ☐

Between 35 and 44 years ☐

Between 45 and 60 years ☐

Q3: Qualification

Doctor degree..... ☐

Master degree..... ☐

Bachelor degree ☐

Diploma certificate..... ☐

High school certificate ☐

No certificate..... ☐

Q4: Occupation

- Student (Majors related to medicine, nursing, health care, hygiene).....○
Student (Majors not related to medicine, nursing, health care, hygiene)○
Medical, nursing, health care and hygiene related practitioner○
Government sector employee○
Internet company employee.....○
Non-Internet company employee.....○
Others.....○

Q5: Income level

- Lower class○
Middle class○
Upper class.....○

Part 2 Screenshot

Please view the screenshot below and be prepared to answer the questions in part 3.



The screenshot shows a health article from Daily Mail. On the left is a small image of a woman in a kitchen. To the right, the text reads: 'Health Article Proteins in MILK have virus inhibiting properties that can help prevent COVID-19 from replicating in a person's body and causing infection, study finds'. Below the title, it says 'By Mansur Shaheen U.S. Deputy Health Editor For Dailymail.Com - March 3rd 2022, 10:13:11 pm'. The main text begins: 'Researchers at the University of Michigan have discovered that the protein lactoferrin within milk has antiviral properties. They believe it can serve as the base of antiviral drugs.'

<https://www.dailymail.co.uk/health/article-10575213/Proteins-MILK-virus-inhibiting-properties-help-prevent-COVID-19.html>

Part 3 Survey

The scale to be used in this part is described below:

- 1.....Strongly Disagree
- 2.....Slightly Disagree
- 3.....Neutral
- 4.....Slightly Agree
- 5.....Strongly Agree

Appendix 3 Reading list