Navigating Credibility of Online Information during COVID-19: Using mnemonics to equip the public to spot red flags in health information online

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Abstract

Misinformation creates challenges for the general public to determine truth from fiction in online content. During covid-19 this issue was amplified due to high volumes of news and changing information. Evidence on misinformation largely focuses on understanding the psychology of misinformation and debunking strategies, but neglects to explore critical thinking education for the general public. This viewpoint outlines the science of misinformation and the current resources available to the public. This paper describes the development and theoretical underpinnings of a mnemonic (“CRABS”) for identifying misinformation in online health content. Leveraging evidence-based educational strategies may be a promising tool for empowering the public with confidence to determine truth from fiction in an infodemic.

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Navigating Credibility of Online Information during COVID-19: Using mnemonics to empower the public to spot red flags in health information online

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Abstract:
Misinformation creates challenges for the general public to determine truth from fiction in online content. During covid-19 this issue was amplified due to high volumes of news and changing information. Evidence on misinformation largely focuses on understanding the psychology of misinformation and debunking strategies, but neglects to explore critical thinking education for the general public. This viewpoint outlines the science of misinformation and the current resources available to the public. This paper describes the development and theoretical underpinnings of a mnemonic ("CRABS") for identifying misinformation in online health content. Leveraging evidence-based educational strategies may be a promising tool for empowering the public with confidence to determine truth from fiction in an infodemic.

Introduction

Recognising misinformation in online content is becoming increasingly difficult. The general public struggles with determining credible health information from fiction, but we don't know how best to equip them to do so. In a world of information at our fingertips, determining fact from fiction is a priority. In this paper, I explore the science of misinformation and propose an accessible framework for identifying misinformation in health content online.

Background

The COVID-19 pandemic triggered an "overabundance of information" – an infodemic, according to the World Health Organisation [1, 2] . From daily press conferences to viral videos, health professionals and the general public alike have struggled to keep up with the overload of health information. Peppered amongst the infodemic is misinformation and disinformation, obscuring access to credible information.

Misinformation and science communications is not a new thing. Misinformation is defined as the inadvertent sharing of false or misleading information, whilst disinformation is the deliberate sharing of false or misleading information with the intent to harm [3]. Both topics are of great interest to psychologists and researchers. Prolific misinformation researcher Lewandowsky [4] suggests that misinformation may arise when the situation is evolving or when the information is "piecemeal". This is certainly the case with the pandemic, where we have seen information that was correct at the time has now changed, such as the position on masks to prevent transmission. Other sources of misinformation include: rumours, politicians and government, vested interests and the media, but how is it shared [4, 5]?

The landscape of misinformation

Misinformation is shared on a variety of platforms – Twitter, Reddit, WhatsApp and Facebook, to name a few [6]. But misinformation is not limited to social media, it's also present in traditional media platforms such as articles in magazines, on websites and on the news. For example, in an analysis of health information online, researchers found that of 1300 websites on safe infant sleep, only 43.5% provided correct information [7]. In another study on conception information, only 1 in 2 websites contained accurate information on conception [8]. The examples go on and on, particularly in the case of COVID-19, with multiple accounts of misinformation regarding COVID-19 treatments [9-11].

Topics of misinformation occur in a wide variety of fields – such as health and climate sciences [3]. Whilst difficult to quantify which topics have the most focus, we can get an indication by looking to research. Most research related to health misinformation focuses on vaccines, communicable (e.g. Human Immunodeficiency Virus or COVID-19) and non-communicable diseases (e.g. cancer,

diabetes), drugs (e.g. tobacco) treatments, autism and eating disorders [3, 6, 12].

While misinformation pertains to the inadvertent sharing of false or partially false information, there's a more sinister kind of misinformation – disinformation. Disinformation describes sharing false or partially false information with the intent to harm or profit [13]. (Note: the term "fake news" is not used in this summary as it is not supported by literature surrounding false information). Disinformation is a type of warfare strategy, that has been linked to creating confusion regarding vaccination, disrupting election campaigns and other science issues such as climate change [13, 14].

How does misinformation spread

There are several decades of research dedicated to this issue, so I will not attempt to cover the breadth of research on this complex issue, instead, I will briefly outline why it might spread. I like to consider the reasons why in two broad categories: external and internal. Externally, social media platforms amplify mis/disinformation due to their reach and the complex algorithms at play [4, 5]. Internally, mis/disinformation disrupts our cognitive processes, fragmenting our ability to think logically. The little we do know about how and why misinformation spreads is that it is most often spread by individuals that hold quasi-authoritarian positions (think the social media influencer or politician) and share messages with personal opinions and strong negative tones [15]. In addition, a person's relationship with - or view of - the individual sharing the piece of information influenced the perceived credibility. That is, if they like the individual and know them well, they are more likely to believe the information and less likely to do a credibility check [4, 15]. Misinformation is amplified by the impact of confirmation bias – people are more prone to misinformation that supports their worldview or ideology [16, 17].

Health & digital literacy in an infodemic

While tech platforms such as Facebook and Twitter have a role in curbing the proliferation of mis/disinformation, digital literacy and health literacy is a key factor in slowing down the spread of mis/disinformation. Health literacy can be defined as the "ability of an individual to obtain and translate knowledge and information in order to maintain and improve health in a way that is appropriate to the individual and system contexts" [18]. Coldwell-Neilson defines digital literacy as "the ability to identify and use technology confidently, creatively and critically to meet the demands and challenges of living, learning and working in a digital society" [19]. People with lower health literacy seek out health information less and have lesser ability to interpret health messages [20]. We also know that those with lower digital literacy are less able to identify reliable news sources or manipulated images [16], and those with less digital and health literacy are more likely to share false information [21].

So what's the solution?

With the infodemic unlikely to disappear any time soon, we must consider ways to approach information online. We are quick to defer to experts or exclaim "trust the science!" as a sort of mantra for ordinary people. This doesn't engender trust or transparency in science, but rather, undermines the attempts to engage in conversation about science and reinforces harmful hierarchies – and even leads people to fall for misinformation [22]. The mantra ignores the complexity and nuances of trust and engagement with scientific evidence, such as the influence of political persuasion, worldviews and personal experiences [23]. Instead of restricting autonomy to that of the scientist, I suggest that we consider ways to improve digital and health literacy to empower the general public to make informed decisions about the information they read [24].

What exists?

Several resources on digital and health literacy exist. A quick keyword search of "health literacy course" and "health literacy training" on Google highlights the variety of resources from universities and not for profit organisations. For example, Science Up First, an initiative borne out of the COVID-19 pandemic, focuses on credible pandemic information [25]. Whilst they have a page on credible sources, this page focuses on who they consider as credible, as opposed to identifying components of credibility [25]. In a 2020 systematic review, researchers found that very little

research focuses on critical thinking; even then, the limited research focused on student populations, as opposed to general public [26]. In addition, many courses on digital literacy, health literacy or critical appraisal are pitched at health professionals - such as the Centre for Culture, Ethnicity and Health's courses [27] and Cochrane Training [28]. Research on misinformation extensively explores debunking, fact-checking and pre-bunking (where you prepare a viewer for misinformation that is coming) [4, 5]. To improve the health literacy of the general public, I argue that we should provide accessible appraisal resources, allowing individuals to feel empowered when it comes to health information. In keeping with the constructivist philosophy, this framework proposes that the general public become collaborators in critical appraisal.

Methods & Theoretical Framework

Drawing from this constructivist lens (that knowledge is subjective and informed by experiences), I considered the literature on credibility and critical appraisal and drew from my expertise as an educator to develop a mnemonic [15]. A mnemonic is a specific strategy to enhance memory with the hope to have better recall of information [29]. Mnemonics have been used and researched for many years in education and can be a powerful tool – in the right circumstances [30]. There are many different types of mnemonic techniques, which I won't explore beyond describing the one I have selected. Mnemonics are thought to work by capitalising on memory processes to enhance recall. The type of mnemonic I developed is a "first-letter mnemonic", specifically an acronym, where the first letters of a series of other words creates a new word. "ROYGBIV" is an example of a first letter mnemonic, where each letter is a retrieval cue [30]. There is some argument about the effectiveness of mnemonics for learning, however there is sufficient evidence for the use of mnemonics to trigger processes and memory [30, 31]. The purpose of the mnemonic in this instance is purely to create a memorable word (and visual) to create a mental model for assessing health information online.

The framework

The mnemonic was developed using an iterative process. Following initial identification of key issues related to critical appraisal, I developed the mnemonic "CRABS": Conflict of Interest, References, Author, Buzz Words, Scope of Practice. This was presented to registered nurses in Australia for a professional development activity on exploring credible content in the media. The feedback was overwhelmingly positive regarding the mnemonic, with 70% identifying the mnemonic as their key takeaway from the activity. Since then, the mnemonic has been published on social media platforms and lifestyle magazines to encourage the public to use a systematic approach to assess information. Here I outline the framework and the underpinning rationale.

C - Conflict of Interest

Conflicts of interest occur when an individual stands to benefit from a certain message or decision, making the information less reliable. Conflicts can be overt or subtle [32]. Take the example of an individual who owns a nutrition supplement company. This is an overt conflict of interest as they are likely to prefer their product over others because it benefits them financially. In a subtle example, a doctor may have a family member who owns a company that manufactures wound care – while there may not be any formal agreement, this relationship may influence the decisions the doctor makes about wound care [33]. In research, conflicts of interest may undermine the validity of results and undercut integrity. There have been many reports of trial sponsors inducing favourable results in research [34]. COIs are not limited to finances, they can also include conflicts related to politics, policies and/or employment [33]. COIs should be considered when judging health information online.

R - References

References are a useful gauge of content online as they indicate several things – supporting data, the body of evidence, quality of evidence and plagiarism [35]. Supporting data is obvious to the scientist – one cannot make a claim without evidence. However, in online health information, particularly on social media, the use of referencing is less common. Reminding viewers to consider references may

assist in considering the weight to give the claim. Secondly, references can be a good indication of whether the author is across the body of evidence and key work. Have the cited sentinel work in their blog? If no, this can be a red flag for incomplete information. In addition to these, the references should be checked for recency (science changes fast) and the quality of the scientific sources. The issue of predatory publishing is not a small one. And finally, plagiarism is not limited to scientific mediums, social media is rife with instances of content thieving and misattribution [36, 37].

A - Author

Anyone can write on anything. The internet provides opportunities for everyone to have a voice, with fewer gatekeepers than traditional media [38]. Their expertise and qualifications (or lack of) relative to the topic is important when determining how much weight to give the content. Social media verification, where an account is given a "blue tick" to verify they are, indeed a real person, is not an indicator of credibility, in the traditional sense. Credibility literature states that there are five things to consider with regards to credibility: accuracy, authority, objectivity, currency, and scope [38]. This item encourages readers to check the individuals training, qualifications, and credentials. In 5 to 10 minutes a reader can verify qualifications, explore the level of training the individual has and their peers view of them. If they claim to research in the field, how many publications on the topic are to their name?

B - Buzz words

Linguistics research argues that clues are in the language itself – emotional language is an indication that the information is not credible [24] . Buzz words, or overly emotional words, are designed to deceive you. News that is inaccurate or fake is more likely to use adverbs, verbs and presents with more certainty. This presents challenges in competing against credible science information, which frequently hedges certainty and does not overstate claims [39]. Other work suggests that "framing" the information in a certain way is a key for identifying misinformation – for example, topics of personal concern (health information), emotive topics (your children) and the use of personalisation pronouns ("you") can influence the reader [17, 40].

S - Scope of practice

Scope of practice describes the practice of a profession that combines an individual's qualifications and expertise, the setting of practice and the needs of the client [41]. In a health care setting, it is difficult to overreach scope of practice due to the highly regulated workforce. However, on social media the scope is mostly unmonitored (but not necessarily unregulated). Most do not set out to overreach their scope of practice, however it's a slippery slope. A nurse providing specific nutrition advice for newborns may be inappropriate without additional training – depending on the situational context. In addition, it is easy to overstate expertise or specialty, due to the halo of authority portrayed on social media. For example, a junior doctor can inadvertently portray themselves as an expert in hormones, while not having completed their endocrinology training.

Framework application

This framework is intended to be applied as an overarching concept to apply at a first glance to online content. It is not intended to be a full critical appraisal and may inadvertently exclude key qualities of appraisal that would be otherwise identified. Additionally, the framework may inadvertently exclude information that is credible due to the piecemeal nature of social media.

Here I have presented a framework for the general public to utilise when assessing health information online. There are opportunities for expansion. For example, the work would benefit from expert review and consensus, validity testing and formal useability testing. While anecdotally the feedback suggests the content is representative of the issue and the useability is accessible, this work does not pretend to present it as so. The work has scope for application beyond the COVID-19 pandemic, despite its origins.

Conclusions

In this era of infodemia, the general public requires accessible tools to navigate health information online. Drawing from misinformation and educational research can provide us with tools to navigate

this complex issue and develop resources. Using mnemonics is a practical strategy to encode memory and develop mental models for critical appraisal. The CRABS model may provide a useful strategy to achieve this. More research is needed to explore the validity and useability of such a model for the general public.

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Supplementary Files

Figures

CRABS framework for credibility illustration.