TMR Trends in Medical Research

OPEN ACCESS

Misinformation about Sunscreens on Brazilian Social Networks: A Risk to Public Health

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ABSTRACT

This study examines the pervasive issue of misinformation about sunscreens on Brazilian social networks and its implications for public health. Despite the well-established effectiveness of sunscreens in preventing skin cancer, a growing wave of false information has been spreading across platforms like Instagram, Facebook and TikTok. This misinformation ranges from claims that sunscreens are ineffective to assertions that they are harmful and could even cause cancer. Such narratives are particularly dangerous in Brazil, where skin cancer is the most prevalent form of cancer due to the country's high levels of ultraviolet (UV) radiation. The study aims to understand the origins and impact of these misleading messages, with a focus on the role of health professionals who, rather alarmingly, contribute to the dissemination of these falsehoods. Through a qualitative analysis of social media content, scientific literature and public health reports, this research identifies the key sources of misinformation and examines their potential to influence public behavior. The findings reveal that misinformation is often driven by conspiracy theories and a lack of scientific literacy among both the public and some health professionals. The study also highlights the critical need for enhanced media literacy education and stricter regulations on the dissemination of health-related content on digital platforms. The author argues that combating this misinformation is essential for maintaining public trust in evidence-based medicine and for ensuring that effective preventive measures, like sunscreen use, are widely adopted. The research concludes by advocating for international collaboration and robust public health campaigns to counteract the spread of harmful misinformation and protect public health in Brazil and beyond.

KEYWORDS

Disinformation, sunscreens, dermatology, Brazilian social networks, prevention

INTRODUCTION

In recent years, the spread of incorrect and potentially dangerous information on social networks has become a growing concern in several countries, especially Brazil, where the use of these platforms is particularly widespread[1]. Social networks, which initially emerged as tools for communication and social interaction, have evolved to become the main source of information for a significant portion of the population[2]. However, this change has brought with it a significant increase in the circulation of disinformation, especially on sensitive issues such as public health[3].

ISSN: 2151-6065 (Online)
ISSN: 1819-3587 (Print)
https://doi.org/10.3923/tmr.2024.285.292

Received: 12 Aug. 2024
Accepted: 19 Sep. 2024
Published: 20 Sep. 2024

Among the most damaging claims circulating online is the idea that the use of sunscreen, rather than protecting against skin cancer, could be a factor in causing the disease[4]. This false and alarmist narrative has been widely propagated on social networks such as Instagram, Facebook and TikTok, reaching millions of people in a short space of time. Such misinformation is especially dangerous in Brazil, where skin cancer is the most common type of cancer, posing a serious threat to the health of the population[5].

This phenomenon highlights one of the many challenges posed by the digital age, where editorial barriers and fact-checking, common in traditional media, are almost non-existent. Studies show that false information tends to spread faster than true information on social media, especially when it involves controversial or sensationalist topics[6].

This dynamic makes misinformation particularly dangerous, as it gives social networks an almost monopolistic role in shaping public opinion, as traditional sources of information, such as TV news, print newspapers and magazines, have lost ground. In Brazil, where ultraviolet (UV) radiation is intense all year round, misinformation about the use of sunscreen can have disastrous consequences for public health.

The primary objective of this study is to critically examine the proliferation of misinformation regarding sunscreen use on Brazilian social networks and its profound implications for public health. By analyzing the origins, dissemination patterns and the roles played by health professionals in spreading such false information, the study aims to elucidate the factors contributing to the erosion of public trust in scientifically proven preventive measures. Furthermore, it seeks to underscore the urgent need for enhanced media literacy, regulatory interventions and evidence-based public health strategies to counteract the damaging effects of misinformation and safeguard the well-being of the population.

Social networks and the spread of misinformation: Brazil is one of the countries with the highest number of social media users and Brazilians are among the people who spend the most time a day on these platforms. Approximately 79% of Brazilians use social networks as their main source of information, far outstripping TV news and printed newspapers[7]. This trend reflects a significant change in the population's information behavior, where digital media has replaced traditional media as the main channel of information.

Historically, the traditional media, made up of newspapers, magazines and TV news, acted as a quality filter in the dissemination of information, following strict protocols for verifying facts before publication[8]. This editing and proofreading process served as an important barrier against the spread of disinformation, ensuring that the public had access to accurate and reliable information. However, with the advent of social media, anyone can publish content without going through these editorial controls, significantly increasing the potential for spreading false information.

This transition to social media as the main source of information makes the population more vulnerable to fake news, especially about health issues. Research indicates that false information tends to spread faster and more widely on social media than verified information, due to its sensationalist nature and the emotional appeal it often carries[8]. The architecture of social networks, which prioritizes engagement and sharing, often favors the dissemination of polarizing and sensationalist content, further increasing the risk of misinformation[9].

In the Brazilian context, the proliferation of disinformation on social media is particularly dangerous due to the lack of regulation and the rapid spread of unverified content. This is especially worrying in public health issues, where disinformation can lead to harmful behavior and ill-informed decisions by the population[10]. For instance, the circulation of false information about the ineffectiveness or dangers of using sunscreen can discourage people from taking preventive measures against skin cancer, resulting in serious public health implications.

Skin cancer

An underestimated threat: Skin cancer is the most common type of cancer in Brazil, accounting for approximately 30% of all cases of malignant neoplasms diagnosed in the country[5]. This scenario is particularly worrying due to the high incidence of ultraviolet (UV) radiation in Brazil, a country with a tropical and subtropical climate, where sun exposure is intense for most of the year. More than 180,000 new cases of skin cancer are registered every year in Brazil, with a predominance of the non-melanoma type, which is less lethal but highly prevalent[11]. On the other hand, melanoma, although less frequent, is responsible for a higher mortality rate due to its aggressiveness and ability to metastasize[12].

Although skin cancer is the most prevalent, there is a much clearer perception of the risks associated with breast and cervical cancer for women and prostate cancer for men, than there is of the risk of skin cancer in Brazil. This disparity in risk perception can be attributed, in part, to failures to publicize the risks and the high incidence of skin cancer, which is often underestimated compared to other types of cancer that are better known and discussed publicly[13]. The lack of effective awareness campaigns and the predominant focus on other types of cancer in the media can contribute to the misconception that skin cancer is less serious, despite its high incidence and potential lethality.

The regular use of sunscreen is widely recognized as one of the most effective preventive measures against the development of skin cancer. Sunscreens act as a physical and chemical barrier that absorbs or reflects UV radiation, preventing the formation of thymine dimers and other damage to the DNA of skin cells that can trigger carcinogenesis processes[14]. The effectiveness of sunscreens in preventing skin cancer is supported by a vast body of scientific evidence. For example, a meta-analysis published in the Journal of Clinical Oncology showed that daily use of sunscreen significantly reduced the risk of melanoma, highlighting the importance of this practice as an essential public health strategy[15].

Epidemiological studies have shown that sun protection can reduce the incidence of all types of skin cancer, including basal cell carcinoma and squamous cell carcinoma, which, although less lethal than melanoma, represent a substantial burden on the health system due to their high prevalence[16]. In the Brazilian context, where awareness of sun protection is still limited in many regions, misinformation about the risks of using sunscreens can have devastating consequences.

It is therefore imperative that public health campaigns continue to promote the correct use of sunscreen, especially in countries like Brazil, where sun exposure is intense and prolonged. The misinformation circulating on social media, suggesting that sunscreen can be harmful, not only contradicts scientific evidence but also puts at risk the health of millions of people who depend on this information to make informed decisions about their protection against skin cancer.

Misinformation about sunscreens on social media: Despite robust scientific evidence proving the efficacy of sunscreens in preventing skin cancer, there is a growing spread of misinformation on Brazilian social media, claiming that these products are useless or even harmful[17]. This misleading narrative is propagated by a vocal minority who, for the most part, lack any kind of specialization in the health field. Not the majority of those spreading these claims on social media have relevant academic training or technical knowledge in dermatology or oncology. However, it should be noted that even health professionals, including doctors, have participated in these processes of spreading fake news in the health area.

Some of these videos, presented by doctors, say-without presenting any concrete evidence-that the effectiveness of sunscreen is "debatable" or that these products supposedly contain "compounds that are harmful to neurons". Other content suggests that not using sunscreen can improve skin problems, such as melasma or even accuses the product of causing cancer, again without basing these claims on any scientific evidence.

Some claims accuse sunscreens of not blocking type C ultraviolet rays (UVC), pointing to these rays as the main causes of skin tumors. However, the problem is that several studies show that UVC doesn't even reach the earth's surface, as it is blocked by the ozone layer that covers our planet and cannot have any effect on human skin[18].

These claims are often based on false premises or conspiracy theories, without any support from quality scientific studies. For example, a recently published study showed that misinformation about sunscreens is often linked to conspiracy theories about chemicals, such as the false idea that sunscreen ingredients are toxic or cause harm to health, which is widely refuted by the scientific community[17].

An argument often found in these discussions is that the number of skin cancer cases is increasing as people use more and more sunscreen. While this line of reasoning may seem logical at first glance, it ignores crucial factors that contribute to the increase in skin cancer cases. One of the most significant factors is the increase in global life expectancy. As people live longer, they are exposed for longer to mutagenic factors, which increases the risk of developing skin neoplasms[19]. Improved diagnostic methods also play an important role. In the past, many cases of skin cancer may have gone unnoticed or been misdiagnosed, which means that the increase seen today may partly reflect greater accuracy in diagnosis[20].

Another aspect to consider is the environmental impact of the hole in the ozone layer, which, although it has been largely mitigated by international policies, may still have persistent effects on the incidence of skin cancer[21]. It should also be remembered that many of the people being diagnosed with skin cancer today belong to generations who, in their youth, did not use sunscreen. On the contrary, practices such as using suntan lotions and exposure to tanning beds were commonplace, contributing to an accumulation of mutations that are now manifesting as skin cancer[22].

Consequently, if the population resists the misinformation spread by some members of the medical community and continues to follow the scientific evidence, persevering in the use of sunscreens, in a few years we will likely see a significant reduction in the number of cases of skin cancer. Effective prevention, based on proven practices such as the regular use of sunscreens, is the best strategy to combat the growing incidence of this disease.

Dangerous role of health professionals in spreading disinformation: The danger of misinformation becomes even more pronounced when the propagators of these ideas are health professionals, especially doctors, who are traditionally seen as reliable sources of knowledge. This phenomenon creates a worrying paradox: The traditional advice to "see a doctor", which should be a guarantee of access to safe, evidence-based information, may in some cases not ensure that the patient receives scientifically correct advice. The trust placed in these professionals can create a dead-end paradox when they disseminate misinformation that goes against the established scientific consensus, directly damaging public health[23]. Many of these doctors position themselves as revolutionaries, because they go against the majority trend in science, as if they had made an extraordinary discovery that goes against the grain of the majority, leading to a false impression of novelty and genius, which ends up increasing the number of hits and engagement on the internet and social networks.

The federal council of medicine (CFM), which should act as a regulator of these practices and guarantee ethics in the work of doctors, has been criticized for its ideological alignment and for supporting "medical freedom", a notion that, in practice, allows doctors to prescribe treatments without a solid scientific basis[24]. This attitude has contributed to the proliferation of questionable practices, such as ozone therapy[25] and "detox" treatments to eliminate possible harmful effects of vaccines[26], both without any scientific backing and with potential health risks[23]. The legitimization of these practices by the CFM can be seen as a worrying deviation from the norms of evidence-based medicine, which advocates that all medical interventions should be based on rigorous, peer-reviewed research.

A notorious example of this was the prescription of the so-called "COVID Kit", widely promoted in Brazil during the COVID-19 pandemic. This set of drugs included a combination of dewormers, corticoids, antibiotics and antineoplastics, among others, which in some cases included up to 18 different drugs, but which were also prescribed separately, being equally innocuous and also dangerous, due to their possible side effects[27]. Most alarmingly, the separate prescriptions of these ineffective drugs against the SARS-CoV-2 virus were often carried out preventively, i.e., in people who had not even contracted the virus, with the promise of avoiding infection or minimizing its effects. However, none of these drugs had demonstrated efficacy in the early treatment or prevention of COVID-19 in robust clinical trials and the indiscriminate use of these drugs was associated with a series of adverse effects and complications[28].

The promotion and prescription of these drugs without solid scientific evidence have led to serious consequences. The adoption of the "Kit-COVID" not only created false expectations among the population but also diverted resources that could have been directed toward proven effective treatments. In the meantime, the inappropriate and excessive use of these drugs may have exacerbated the clinical condition of many patients, increasing the risk of serious adverse events such as liver toxicity, antibiotic resistance and cardiovascular complications[29].

The promotion of unscientific therapies by doctors not only undermines public health but also contributes to the erosion of trust in evidence-based medicine and health authorities. When the population is repeatedly exposed to contradictory information, especially from sources that should be trusted, an environment of generalized mistrust can be created. This encourages the acceptance of false information and the adoption of dangerous practices to the detriment of proven interventions. The proliferation of misinformation in this way not only hinders the implementation of evidence-based health policies, which are essential for promoting collective well-being but also poses a significant risk to people's lives[30].

Consequences and solutions to disinformation: Misinformation about sunscreen use poses a significant threat to public health, especially in a country like Brazil, where ultraviolet (UV) radiation is intense all year round. If the population is led to believe that sunscreens are harmful or ineffective, as suggested by some false narratives, there is a substantial risk that people will begin to avoid using them. This could result in a considerable increase in the incidence of skin cancer over the coming decades. Robust epidemiological studies confirm that adherence to sunscreen use is one of the most effective strategies for reducing skin cancer rates, especially in regions with high sun exposure, such as Brazil[14]. The consequences of this kind of misinformation are serious. Reduced use of sunscreen can lead to an increase not only in the incidence of skin cancer but also in other conditions related to sun exposure, such as severe sunburn and premature skin ageing.

A worrying parallel can be drawn with the recent COVID-19 crisis in Brazil, where misinformation played a central role in the adoption of inadequate and dangerous medical practices. The country, which has 2.7% of the world's population, was responsible for 10% of global deaths caused by COVID-19[31]. This is a tragic and recent example of how misinformation kills, illustrating the devastating impact it can have on public health.

To combat this wave of misinformation, comprehensive media and digital education strategies must be implemented both in schools and in the ongoing training of health and education professionals. Media literacy must be incorporated into school curricula so that future generations are better prepared to critically evaluate the information they receive, distinguishing between evidence-based facts and false information[32]. This includes teaching students to recognize reliable sources of information, understand the importance of evidence-based science and develop critical skills to navigate the contemporary digital environment.

Civil and organized society must step up their efforts to fight back against the spread of scientific fake news. Valuing and promoting evidence-based knowledge is essential to ensure that correct information prevails. Brazilian initiatives such as the Instituto Questão de Ciência and science communicators like Attila Iamarino have shown success in disseminating accurate information and debunking dangerous untruths[33]. These actions are vital to counteract disinformation and restore public confidence in science and preventive health practices.

In addition to media education, social media platforms must be held accountable for spreading misinformation. Stricter regulatory and policy measures are needed to ensure that health-related content is verified by experts before it is widely disseminated. The implementation of fact-checking mechanisms and the development of algorithms that prioritize verified and evidence-based information can help curb the spread of misinformation[9].

Another important point is the role of health professionals in the fight against misinformation. Doctors, nurses and other health professionals should be encouraged to actively engage in digital platforms to provide accurate information and educate the public about evidence-based health practices. The creation of official communication channels, where the population can directly access information from reliable sources, is a strategy that can help reduce the influence of false and dangerous narratives.

It is also necessary for regulatory bodies, such as the Federal Council of Medicine, to take a firmer stance against misinformation spread by health professionals. Doctors who disseminate unproven treatments or propagate conspiracy theories must be held accountable and where necessary, punished to ensure that medical practice in Brazil remains based on rigorous scientific evidence[34]. Finally, international collaboration is essential. Disinformation is a global problem and effective solutions require cooperation between governments, non-governmental organizations, social media platforms and the International Scientific Community. Sharing best practices, supporting global education initiatives and working together to develop effective policies are important steps to combat disinformation on a global scale[35].

CONCLUSION

Combating disinformation is a collective challenge that requires the mobilization of all spheres of society, including educators, scientists, health professionals, regulatory bodies and the general population. Only with a coordinated and informed response will be possible to reverse the damage caused by false information and protect public health effectively. The adoption of evidence-based practices, such as the use of sunscreen, is essential for the prevention of skin cancer and the promotion of public health in general. The implementation of robust educational, regulatory and communication strategies can help mitigate the negative impacts of misinformation and ensure that the population has access to accurate and reliable information, which is fundamental for making informed and safe decisions about their health.

SIGNIFICANCE STATEMENT

This study addresses the critical issue of sunscreen misinformation circulating on Brazilian social networks, highlighting its potential to undermine public health by increasing the risk of skin cancer. By analyzing the role of health professionals and the rapid spread of false narratives, the research emphasizes the urgent need for media education and regulatory policies to combat such disinformation. The study contributes to the academic understanding of how misinformation can jeopardize preventive health measures and underscores the importance of integrating evidence-based practices into public health strategies. Future efforts should focus on implementing media literacy education and enforcing regulations to prevent the spread of sunscreen misinformation, safeguarding public health.

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