



The hesitation on childhood vaccination: A narrative review on the information published on social media regarding vaccination in modern times

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Abstract: Vaccines are considered one of the most important public health advancements of the modern age and the most cost-effective preventive method of curbing the spread of several diseases with high morbidity and lethality. However, vaccination coverage rates around the world have been threatened by the vaccine hesitancy phenomenon, considered by the World Health Organization (WHO) as one of the ten greatest menaces to public health in the world. Vaccine opposition is a mentality driven by various interests, as old as the vaccine itself, predominantly using the media and social networks, which have an enormous influence on people. They often spread false information about vaccines, frequently with no adequate scientific backing, negatively impacting vaccination rates. To understand the possible correlation between the information spread on social media and childhood vaccination rates, we performed a narrative review on the subject, with a qualitative approach, in original or review articles, indexed in national and international databases and/or journals, in Portuguese and English, published between 2011 and 2021, available in full and free of charge. One hundred and seventy-two articles were extracted from the literature, 49 of which were submitted to analysis. The use of content analysis in a narrative literature review made it possible to interpret the main publications that in the last decade point to the impact of social media as one of the main factors linked to vaccine hesitancy in children. The articles show that communication is presented as a determinant for adherence or vaccine hesitancy, and social media are a useful tool for disseminating information that can influence and mobilize the population, promoting its acceptance or having a negative impact on childhood vaccine coverage rates. Social Media has become fertile ground for the creation and spread of fake news, hence the importance of the health professional's engagement in strengthening the population's confidence in relation to immunization, minimizing vaccine hesitancy.

Keywords: Vaccination coverage; Social media; Child; Narrative review.

1. Introduction

Vaccines are considered one of the most important public health advancements of the modern age and the most cost-effective preventive method of curbing the spread of several diseases. However, after the initial period of distrust in its safety in the 19th century, the non-acceptance and mistrust of the population has once again hindered this process, making vaccine non-adherence a major challenge for health agencies (McClure et al., 2017).

The World Health Organization (WHO) (2012 as quoted in Domek et al., 2018) describes vaccination hesitancy as a delay in accepting or refusing vaccination despite its availability in health care. There are several possible reasons for vaccination hesitancy, but most are a combination of personal, social, political, religious, philosophical, and cultural factors (Succi, 2018). The problem has gained such high proportions that the WHO listed vaccine refusal or hesitancy as one of the ten most significant threats to public health nowadays (Brotas et al., 2021).

The decrease in mandatory and recommended vaccination coverage rates, both in adults and children, was noted worldwide after an article in *The Lancet* in 1999 associated the MMR vaccine with autism, which, at the time, generated some degree of distrust of vaccines. This has gained strength with the advancement of social media. Therefore, the safety of immunobiologicals came to be considered essential for vaccination policies, in addition to the broader availability of adults and the elderly (Signorelli, 2019).

Since 2013, Brazil has registered a drop in vaccine coverage rates and, as a result, there has been a reappearance of diseases that were previously controlled, such as measles, which justifies the need to examine the factors associated with vaccine hesitancy, including the dissemination of false information regarding vaccines on traditional and social media (Frugoli et al., 2021).

The internet stands out as a sphere of social mediation, with social networks and messaging apps such as Facebook, Twitter, and WhatsApp being important forms of sociability and consumption of information and has become a space for the spread of content, including those related to health care (Massarani et al., 2021).

Although the internet and social media have revolutionized the production and popularization of scientific information, extending the reach of health promotion campaigns, it also allows an increasing spread of false and distorted information, becoming a public health problem (Frugoli et al., 2021; Massarani et al., 2021).

Regarding this scenario and aiming to understand the link between social media and childhood vaccination coverage rates, this research question was formulated: what is the current evidence on the influence of social media on the decision to adhere to childhood vaccination recommendations?

2. Methodology

This is a narrative review with a qualitative approach to the literature, aiming to tackle the debate with the research question and answer the proposed objective. We opted for a narrative within a historical context and a qualitative approach to deepen the relationships with the chosen theme. This type of narrative review advocates a broader and more detailed review of a given subject through analysis and interpretation of existing scientific production, highlighting new ideas and perspectives that collaborate for the acquisition and updating of knowledge, favoring the identification of gaps in science for subsidize new research (Rother, 2007; Vosgerau & Romanowski, 2014).

In this research, original or review articles were included, indexed in national and international databases and/or journals, in Portuguese and English, published between 2011 and 2021, available in full and free of charge, and addressed the topic under study. An investigation was carried out to detect in the DeCs and MeSH which indexable descriptors would be used in the search, and based on these, strategies for the search in the databases PubMed, Scielo, and VHL were devised. The search terms were "social media and vaccination coverage and child".

The study was organized in a matrix containing the following information: title, authors' names, year of publication, journal, country, objective, study design, and interpretation of the article (correlating it with its historical moment). The articles were read in total, and according to the intention and interpretation

of the researchers, those that would make up the sample were chosen to understand the question existing in the research. Given that this is a qualitative analysis aimed at increasing reliability, three researchers evaluated the articles.

The first stage of content analysis consisted of a fluctuating reading of the chosen articles, considering the actual meaning contained in the text. In the next step, the papers were organized based on the ideas that emerged from the guiding questions, and pre-analysis was carried out with a more in-depth reading, resulting in the emergence of categories.

Several matrices were created to store the explicit or implicit ideas, form categories, and register units that relate the texts and the theme to explain the result obtained. The foci and registered units were interpreted, and a synthesis was prepared for each. The data analysis and interpretation steps were based on content analysis, which according to Bardin (2016), consists of a set of communication analysis techniques to define the content of messages and qualitative indicators or not, allowing knowledge interpretation concerning the emission/reception conditions.

3. Results and Discussion

The search on the topic in focus found 172 articles (PubMed: 77, SciELO: 1, VHL: 94), which were analyzed according to the flowchart shown below.

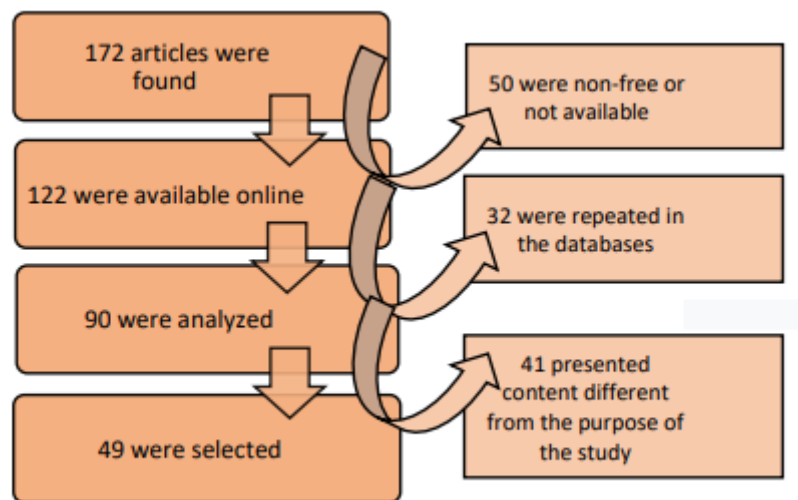


Figure 1. Flowchart of articles selected for narrative review (2011 to 2021).

Articles retrieved from Pubmed that were analyzed are listed in Table 1.

Table 1. PubMed articles on the search for social media and childhood vaccine hesitancy (2011-2021).

	AUTHORS NAME	ARTICLE TITLE	DATE	COUNTRY
1	Ortiz et al.	A systematic literature review to examine the potential for social media to impact HPV vaccine uptake and awareness, knowledge, and attitudes about HPV and HPV vaccination	2019	USA
2	Carrieri et al.	Vaccine hesitancy and (fake) news: Quasi-experimental evidence from Italy	2019	Italy
3	On et al.	Sentiment Analysis of Social Media on Childhood Vaccination: Development of an Ontology	2019	South Korea
4	Kang et al.	Semantic network analysis of vaccine sentiment in online social media	2017	USA
5	Edelstein et al.	Keep calm and carry on vaccinating: Is anti-vaccination sentiment contributing to declining vaccine coverage in England?	2020	UK
6	Liao et al.	Effectiveness and Parental Acceptability of Social Networking Interventions for Promoting Seasonal Influenza Vaccination Among Young Children: Randomized Controlled Trial	2020	China
7	Odone et al.	Effectiveness of interventions that apply new media to improve vaccine uptake and vaccine coverage	2015	Italy
8	Dunn et al.	Mapping information exposure on social media to explain differences in HPV vaccine coverage in the United States	2017	USA

9	Lau et al.	Low Coverage of Influenza vaccination among Chinese children aged 12-23 months: Prevalence and associated factors	2018	China
10	Chimpololo & Burrowes	Use of Social Mobilization and Community Mobilizers by Non-governmental Health Organizations in Malawi to Support the Eradication of Polio, Improve Routine Immunization Coverage, and Control Measles and Neonatal Tetanus	2019	Malawi
11	Palencia-Sánchez & Echeverry-Coral	Social considerations affecting acceptance of HPV vaccination in Colombia: A systematic review	2020	Colombia
12	Nair et al.	Social media, vaccine hesitancy and trust deficit in immunization programs: a qualitative enquiry in Malappuram District of Kerala, India	2021	India
13	Jahan et al.	Changing trends in measles vaccination status between 2004 and 2014 among children aged 12-23 months in Bangladesh	2019	Bangladesh
14	Porreca et al.	Using text mining and sentiment analysis to analyze YouTube Italian videos concerning vaccination	2020	Italy
15	Byström et al.	Confidence in the National Immunization Program among parents in Sweden 2016 - A cross-sectional survey	2020	Sweden
16	Stockwell & Fiks	Utilizing health information technology to improve vaccine communication and coverage	2013	USA
17	Carlson, et al.	An evaluation of the 2016 influenza vaccination in pregnancy campaign in NSW, Australia.	2020	Australia
18	Bozzola et al.	Global Measles Epidemic Risk: Current Perspectives on the Growing Need for Implementing Digital Communication Strategies	2020	Italy
19	Vrdelja et al.	The growing vaccine hesitancy: exploring the influence of the internet	2018	Slovenia
20	Krishnendhu & George	Drivers and barriers for measles rubella vaccination campaign: A qualitative study	2019	India
21	Carlson et al.	Attitudes about and access to influenza vaccination experienced by parents of children hospitalized for influenza in Australia	2019	Australia
22	Newtonraj et al.	Status of coverage of MR vaccination, after supplementary immunization activities in a rural area of South India: A rapid immunization coverage survey	2019	India
23	Tuckerman et al.	Influenza vaccination: A qualitative study of practice level barriers from medical practitioners caring for children with special risk medical conditions	2020	Australia
24	Porat et al.	Content and source analysis of popular tweets following a recent case of diphtheria in Spain	2019	Spain
25	Rodríguez-Blanco & Tuells	Knowledge and Attitudes about the Flu Vaccine among Pregnant Women in the Valencian Community (Spain)	2019	Spain
26	Signorelli	Forty years (1978-2018) of vaccination policies in Italy	2019	Italy
27	Hwang et al.	A survey of parental perception and pattern of action in response to Influenza-like illness in their children: including healthcare use and vaccination in Korea	2017	South Korea
28	Jenness et al.	Measles vaccine coverage among children born to somali immigrants in Norway	2021	Norway
29	Benis et al.	Reasons for taking the COVID-19 vaccine by US social media users	2021	USA
30	Sheikh et al.	Reasons for non-vaccination in pediatric patients visiting tertiary care centers in a polio-prone country	2013	Pakistan
31	Bahk et al.	Publicly available online tool facilitates real-time monitoring of vaccine conversations and sentiments	2016	USA
32	Pisaniak et al.	Parents' opinions and knowledge about vaccination in Poland - a cross-sectional observational study	2021	Poland
33	Choudhary et al.	Demand-side determinants of timely vaccination of oral polio vaccine in social mobilization network areas of CORE Group polio project in Uttar Pradesh, India	2018	India
34	Delany- Moretwe et al.	Human papillomavirus vaccine introduction in South Africa: implementation lessons from an evaluation of the national school-based vaccination campaign	2018	South Africa
35	Ajovalasit et al.	Evidence of disorientation towards immunization on online social media after contrasting political communication on vaccines: Results from analysis of Twitter data in Italy	2021	Italy
36	Robinson et al.	Public health practitioner perspectives on dealing with measles outbreaks if high anti-vaccination sentiment is present	2021	Australia
37	Wu et al.	Choosing the perfect shot - The loaded narrative of imagery in online news coverage of vaccines	2018	UK

After reading the articles, five themes emerged, which will be presented below.

3.1 Theme 1: The influence of social media on vaccination coverage

The discovery of vaccines as a powerful means of preventing diseases is not a recent milestone and has drastically improved the infant mortality rate. Communication, in turn, presents itself as a determining factor for vaccination adherence or hesitancy, the latter attributed as one of the 10 most important

phenomena today to have influenced vaccination coverage rates in several parts of the world, because of the growing search for health information on social media and other sources.

Thus, studies were conducted to understand this correlation better, as demonstrated in the text: “the field of information and communication technologies has grown exponentially in the last few years and will continue to. New media are increasingly accessible to the general population.” (Odone et al., 2014, p. 81). In this systematic review carried out in Italy, the authors rescued the use of text messages, individualized and in accessible language, through cell phones to send reminders and provide education to parents of Italian children. Thanks to its low cost, it reached the socioeconomically disadvantaged, enabling a successful adaptation to prevention and immunization programs. Although the forms of social media available were few at the time, the authors already envisioned the power of the internet, providing a more active role for individuals and more population accessibility.

A few years later, in the United States, Dunn et al. (2017) investigated whether exposure to information via Twitter was related to the difference found in HPV vaccination rates. The study showed a strong correlation between vaccine coverage rates and topics published on Twitter, which involved conspiracies, side effects attributed to the vaccine and distrust in its safety. In that study, social media had more impact on the discrepancy in vaccination coverage than socioeconomic and health factors.

In that same year, in Korea, Hwang et al. (2017) showed that social and mass media (TV/radio/newspapers/magazines) played a positive role as important sources of information for parents and that they were more likely to attribute greater severity to an outbreak of Influenza if they had heard reports in the media.

On the other hand, in Hong Kong, Lau et al. (2018), seeking to understand whether exposure to messages in the media would be a factor associated with the promotion of Influenza vaccination, concluded that this did not have a significant impact and suggested that campaigns in this medium are not advantageous.

Liao et al. (2019) in a randomized study with mothers of Chinese children who received WhatsApp reminders for eight weeks about the risks of infection and the benefits of the seasonal influenza vaccine, associated with discussions with a healthcare professional, also concluded that this intervention did not significantly increase vaccine adherence.

Faisal-Cury et al. (2020), in Brazil, shows in a study that analyzed the HPV vaccine coverage that media campaigns were among the factors that most influenced the population’s vaccine acceptance. Likewise, in Colombia, Palencia-Sánchez and Echeverry-Coral (2020) studied the determinants of immunization against HPV, and also found that the media exerts a strong influence on the acceptance of programs, being the most important factor in their implementation.

In the United Kingdom, Edelstein et al. (2020) analyzed tweets about vaccination, reflecting the difficulty in assessing the influence of social media in this scenario but indicating that the amount of anti-vaccination messages in this region has been declining since 2014, hidden by those who propagate pro-vaccine content. They also point out that anti-vaccine individuals are ideologically isolated, and their content is consumed only by like-minded people.

In Sweden, Byström et al. (2020) state that an individual's attitude and confidence towards vaccination are complex and not based exclusively on scientific evidence and facts. Other authors in Sweden showed that the way people relate to the topic of vaccination is determined by an association of different factors.

This category shows eight articles, four of which showed a positive effect (Italy, Brazil, Colombia, and Korea) on dissemination in the media. In Hong Kong and China, surveys showed that vaccination coverage is not influenced by the media, but in the US, the effect was negative; in England, it seems not to be influenced by anti-vaccination groups, while in Sweden, the influence is not concentrated in the media.

3.2 Theme 2: The communication power of social media

With the growing expansion of social media, online communication has revolutionized the way individuals express themselves and relate to the world, adopting positions on social media that can promote information on health, such as the dissemination of content from vaccination campaigns, or distort this information, being, therefore, an important space and tool of social mediation.

Although mass media campaigns have remained common sources of information, the primary reason for not achieving full vaccination coverage noted by Sheikh et al. (2013), in Pakistan, was the lack of knowledge sources, pointing out that social media failed to fulfill its purpose for the large proportion of illiterate people and the general population.

In Slovenia, Vrdelja et al. (2018) propose a study to explain the forms of communication about vaccination that can be used with mothers of young children from the Situational Theory of Audiences (Gruning, 2005), and underscore the importance of mothers being one of the main target audiences, since inadequate communication can contribute to vaccine hesitancy.

In India, Choudhary et al. (2018) suggest that immunization programs, when defining communication strategies, should consider the media habits of the target population. In that country, television was identified as the most common media, followed by newspapers and radio.

Bobo and Hayen (2020), Debie et al. (2020), Hossain et al. (2021), Tesema et al. (2020), worked in different countries such as Ethiopia, East African countries, and Bangladesh and demonstrated that exposure to social media is a useful tool for disseminating information about vaccination, functioning as a motivational factor, and promoting behavioral changes in relation to childhood immunization practices.

In this respect, Porreca et al. (2020) in Italy, suggested the following: “stimulate public authorities to invest in digital communication for spreading health information, raising awareness among increasingly younger users, and reaching a type of communication that is progressively popular” (p. 7).

In Italy, the authors below state that the internet and social media are amplifiers and disseminators of shocking news and false information, leading to low confidence in vaccines, in addition to raising the alarm about the establishment of "echo chambers":

Evidence shows that echo chambers for negative and positive impressions of vaccines are well established on the web, with strong polarization. Individuals belonging to these echo chambers tend to select and spread information that confirms their own beliefs (confirmation bias) and which reinforce their position (Bozzola et al., 2020, p. 2823).

In the United States, Benis et al. (2021), in agreement with other cited authors, state that health policy managers should consider communication on social networks as a strategic task, using community influencers to promote advertising campaigns for vaccination.

The sociocultural contexts of each region play a crucial role in achieving vaccination campaign goals, with in-depth knowledge about them positively interfering with the creation of more effective communication, showing the relevance of the social factor. This category demonstrates what worked in some locations and what did not, and it points out the inadequacy of certain types of tools for specific audiences or even problems with the current political system.

3.3 Theme 3: Social media and social mobilization as factors to promote vaccination

Studies in this regard have observed a greater correlation between exposure to the media and the development or not of vaccine coverage.

In Ethiopia, Abadura et al. (2015) observed that home exposure to media (TV/radio) at least once a week was considered one of the strongest indicators of immunization, with a greater chance of completing vaccination schedules than those who had no media exposure.

In Australia, Carlson's et al. (2019) studied parents of unvaccinated children hospitalized for influenza. They sought to understand the barriers that led to vaccine hesitancy, with lack of awareness being the main culprit. To intervene in these parameters, parents suggested using social media as an important source of information on prevention, in addition to sending SMS reminders and recommending health professionals. A similar suggestion is made by Tuckerman et al. (2020): “In addition to commercial television, participants suggested web/YouTube videos, targeted local social media and the potential to increase motivation using vaccine ambassadors.” (p. 7811).

In Malawi, Chimpololo and Burrowes (2019) sought to evaluate the promotion of social and community mobilization in the propagation of immunization, suggesting that it is possible to adapt the dissemination tools to the reality of each location, as campaigns in more expensive media, such as television, could not reach remote populations that do not have access to these instruments. For this reason, radio listening clubs, which are community groups that listen to radio programs and discuss them, are an effective way to transform mass communication into interpersonal communication.

In the context of the largest measles and rubella complementary vaccination campaign in India, Krishnendhu and George (2019) carried out a study to analyze the low vaccination coverage in individuals belonging to minority religious groups. Among those vaccinated, the most important social factors were the influence of other parents and the efforts of representative community members, accredited social health activists, and school authorities. The low vaccine coverage reflected the lack of awareness of the importance of vaccination, the lack of knowledge of its purpose, and the sharing of false information by influential people in the community, such as doctors and spiritual leaders.

In the same context, Newtonraj et al. (2019) showed that despite the sharing of false information on social networks and the dissemination of adverse events in the media, vaccination coverage was successful (90.5%) in 30 Indian villages thanks to the action of individuals in the public health system, such as the nursing assistants and midwives, who acted as the main informants about the campaign in these rural areas. The role of midwives in positively influencing vaccine adherence is also reported by Rodríguez-Blanco and Tuells (2019).

Porat et al. (2019) point to the use of popular science authors to disseminate health information and personal opinions on social media, addressing public concerns and disinformation in accessible ways: “the continuing power of traditional media, journalists and science communicators to reach large audiences and amplifying public health messages” (p. 121).

According to Carlson et al. (2020), in Australia, traditional media are an important source of information. Ideally, they can provide information aimed at raising awareness and promoting vaccine adherence, with articles containing engaging and inviting content for interaction, providing greater reach. Jahan et al. (2020) describe similar results in Bangladesh.

Jeness et al. (2021) investigated the low rate of measles vaccination coverage in children born in Norway to Somali immigrant parents compared to the national average, leading to outbreaks in their communities. Among the contributing factors are the use of alternative sources of information and inadequate health literacy. These authors suggest as a strategy the use of social media platforms by digital influencers from the Somali community, enabling them to debate the topic and reduce hesitation in this population.

Social media, as an interaction space, has the power to promote a debate and the dissemination of important information, mobilizing different social agents and being a useful tool for health promotion campaigns, with an emphasis on vaccination. It is also clear that exposure to traditional media can be a factor in promoting vaccination, even more so if combined with digital influencers to reach a large part of the population.

3.4 Theme 4: Feelings, beliefs and opinions as limiting factors for vaccination

In the United States, Kang et al. (2017) investigated the feelings regarding vaccination by analyzing websites shared via Twitter. Among the 50 articles examined, 21 had negative sentiments based on distrust and skepticism, focusing on the vaccine industry, pharmaceuticals, and the media. These negative articles brought up tangential topics, with rhetorical questions and distortion of statistical data.

In South Africa, Delany-Moretlwe et al. (2018) noted that, after the advent of social media, parents are more likely to search for information about immunization on the internet. However, they select their content based on personal beliefs and sometimes may not match the scientific evidence.

In the UK, a study noted that: “The way in which vaccine-related communication is crafted can have a profound impact on the public’s perception of vaccination’s risk and benefit” (Wu et al., 2018, p. 5). In this research, parents tended to perceive negative images, such as children screaming or needles, as more memorable and relevant, influencing their decision to vaccinate.

In Korea, On et al. (2019) analyzed social media posts about childhood vaccinations. Encouraging posts were rated as positive motivating feelings, including vaccination campaigns, parental belief and initiative, vaccine availability, and vaccination policy. The public that disseminated them the most knew their political aspects and believed in the protection of immunizers. Negative publications were made by individuals who experienced post-vaccine adverse effects.

Porat et al. (2019) analyzed the first death from diphtheria that occurred in an unvaccinated child in 1980. They analyzed public health information on social networks, especially popular tweets, written about a month before and two weeks after the news. Of these 47% of the tweets were classified as informative and 53% expressed personal opinions, such as frustrations and humor/sarcasm towards vaccination policy and anti-vaccination groups. Of the total, 58% were pro-vaccination.

Other authors, regarding the discontinuation of the preventive vaccination program, have observed that: "The most common reasons included the incidence of adverse vaccine reactions resulting in fear of the subsequent vaccinations, or postponement of vaccination for health reasons." (Pisaniak et al., 2021, p. 3237).

It was found that parents' perception is the determining factor for vaccination adherence, with the need to articulate convincing mechanisms to attract them. In regions of the world where there is skepticism regarding vaccines, people should be directed to places where competent and reputable professionals provide the answer.

Human action is governed by the experiences, beliefs, and cultural aspects of a given historical moment of the society in which they are inserted. All these factors gain ground from on social network discussions, mobilizing people's choices that determine whether they adhere to health promotion programs, such as vaccination campaigns.

This category references how vaccination is addressed, this being the key that opens doors or not when the subject is brought up.

3.5 Theme 5: Social Media and Fake News

The spread of fake news has become more evident with the increased use of social networks, where any individual can express their opinion without any commitment to the veracity of the facts. This leads to interference with public health, causing misinformation to spread and harming the progress of child immunization.

Stockwell and Fiks (2013) drew attention to the anti-vaccine messages in virtual environments, and the speed with which they spread. They had already warned of the need for intervention by public health organizations to combat these messages with reliable information. "While the internet and social media may be used to promote vaccination, at the same time, these tools are being used to promote anti-vaccination messages, and these messages can spread rapidly" (p. 1807).

Carrieri et al. (2019) noted that the support of a judge in the decision to officially recognize a causal link between the development of autism and the MMR vaccine at the Rimini Court, in 2012 in northern Italy, contributed to the spread of news on social media and for a significant reduction in childhood immunization rates, such that a 10% increase in internet coverage led to a 1.23% reduction in coverage for polio, DTP, MMR, and hepatitis B vaccines.

In the same year, Galindo-Santana et al. (2019) analyzed the anti-vaccination movements in the world. They proposed strategies to combat them in the Cuban health system and showed the expansion and reach of the information disseminated on the internet, where the public has contact with content which, in most cases, is not based on scientific evidence, manipulating information, and promoting fear by highlighting the sole responsibility of parents regarding the risks of vaccinating their children.

It is also worth mentioning that Ortiz et al. (2019), in a North American systematic review to understand how social media affected HPV vaccination, observed that much of the negative content addressed concerns regarding the safety, side effects, and efficacy of the vaccine, in addition to being less associated with reliable scientific sources. It was concluded that exposure to this type of content is related to greater refusal to take the vaccine, lower HPV vaccine coverage, and a greater probability of sharing negative content on social networks.

Indian authors claim that the media is used as a way of spreading negative messages, in which anti-vaccine groups, including naturopaths and homeopaths, use old articles and edited and manipulated videos to spread common and temporary adverse effects as a justification for vaccine hesitancy. They also report that anti-vaccination digital influencers openly use social networks, such as Facebook, WhatsApp, and YouTube, to promote their ideals, negatively impacting vaccination efforts. “Anti-vaccine influencers affect caregivers’ decisions through extensive utilization of social media platforms like Facebook, WhatsApp and YouTube to propagate their ideas.” (Nair et al., 2021, p. 5).

In Albania, Mayerová and Abbas (2021) observed that 30% of mothers used the Internet/social media as their main source of health information and that they were 34% less likely to be punctual in childhood immunization and 56% less likely to trust the vaccine compared with mothers who reported other primary sources of health information.

In that same year, in Australia, Robinson et al. (2021) stated that in outbreak situations, such as measles, media campaigns can be useful if they focus on increasing public awareness of the disease and the importance of isolation, contact tracing, and the risk presented to the most vulnerable since the headlines generated often increase the politicization of the issue and are at odds with the needs and scientific evidence.

In Italy, Ajovalasit et al. (2021) revealed that the spread of news and political speeches against immunization promoted greater interactions on the subject on Twitter and generated a change in citizens' opinion in the short term (short-term disorientation) because of the absence of institutions from Twitter and the lack of communication between public health institutions and the population.

The different articles demonstrate that the internet/social media can have a negative impact on childhood vaccination coverage as they allow the spread of misinformation and fake news, requiring an active reinforcement of public institutions and health professionals in online communication to combat them. A useful strategy for health authorities to monitor content related to vaccination is the Vaccine Sentimeter platform, as reported by Bahk et al. (2016).

Figure 2 shows the path taken in this narrative review, which was proposed to qualitatively describe the various movements permeated by childhood vaccination coverage in the study period.

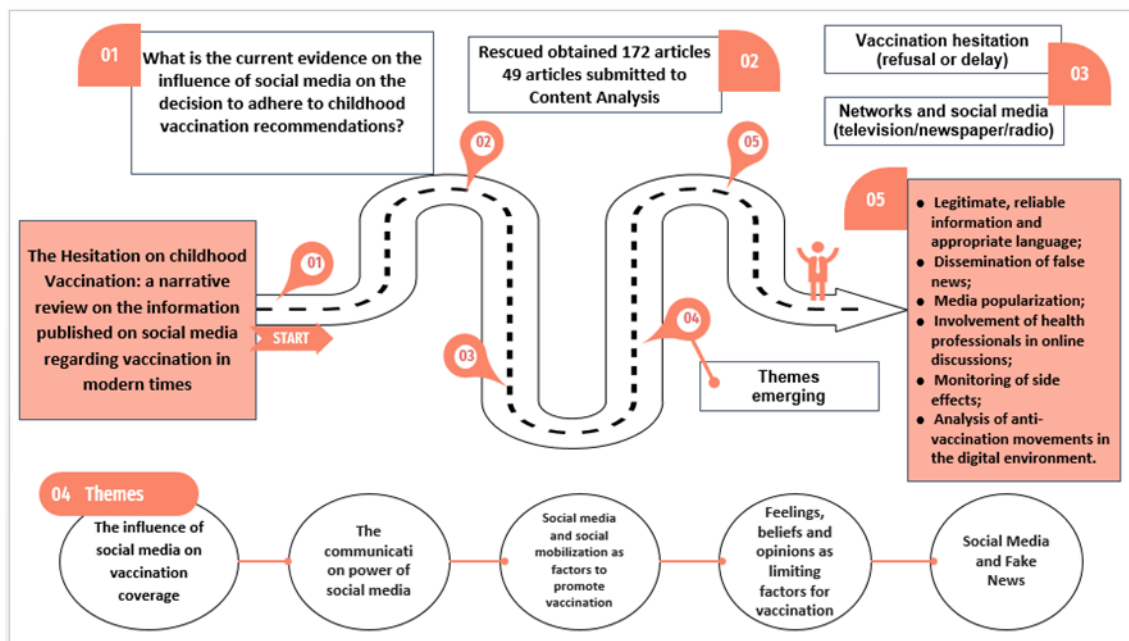


Figure 2. Methodological path of the Narrative Review on scientific research in the world that shows the information released by the media (2011 to 2021) regarding the childhood vaccine decision.

The present review demonstrated that the popularization of social media, while allowing debate and interaction between individuals, also promotes the spread of false information and the growth of anti-vaccination movements, culminating in increased levels of vaccine hesitancy.

The active participation and involvement of healthcare professionals and authorities in online discussions may result in better vaccine acceptance rates since they generate a more positive experience in combating vaccine hesitancy. With their experience, they provide reliable scientific, evidence-based information that directly and succinctly addresses the doubts related to the issue, refuting any arguments against immunization.

It is also necessary to continue monitoring those who experienced post-vaccine side effects. Proper communication is also important for the debate, through transparent discussions on vaccine safety and an analysis of anti-vaccine movements in the digital environment, using strategies that check and unmask facts that can reinforce opinions against immunization, thus positively influencing parents' decisions.

4. Final Considerations

The content analysis technique used in this Narrative Literature Review, made it possible to gather the main articles published during the study period, providing an overview of social media's influence on childhood vaccination, showing its growing impact as one of the main factors linked to vaccine hesitancy in childhood, which has culminated in reducing vaccination coverage rates around the world. Analysis of the articles may prompt new discussions on the theme, indicating the need for future studies that aim to understand better the factors involved in this dynamic.

The effort to make social media a favorable tool for vaccination lies in the need for it to provide legitimate, reliable information using unambiguous language appropriate for the target population to make the masses aware of the importance of vaccines. It is essential that actors and social organizations, such as NGOs and religious entities, which have greater reach among communities, collaborate by combining scientific evidence with stories that resonate with the target audience.

4.1 Strengths and limitations of the study

Articles from different parts of the world were selected, providing a global overview of the issue, highlighting the media's potential to influence the decision positively or negatively about adherence to childhood vaccination, emphasizing the need for appropriate strategies for different situations to demystify false news. The present study used only complete and freely available articles, limiting the ability to include other articles as well as a more complete assessment of the topic.

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