

An Internet-Based Qualitative Research on Vaccine Opposition and Hesitation in Türkiye: Scientific and Ethical Analysis of Social Media Posts from a Primary Care Perspective

Türkiye’de Aşı Karşıtlığı ve Aşı Tereddüdüne İlişkin İnternet Temelli Nitel Bir Araştırma: Birinci Basamak Sağlık Hizmetleri Perspektifinden Sosyal Medya Paylaşımlarının Bilimsel ve Etik Analizi

✉ Murat Doğan¹, ✉ Arif Hüdai Köken²

¹Kırşehir Ahi Evran University Faculty of Medicine, Department of Family Medicine, Kırşehir, Türkiye

²Kırşehir Ahi Evran University Faculty of Medicine, Department of History of Medicine and Ethics, Kırşehir, Türkiye

ABSTRACT

Background: Vaccine opposition and hesitancy have become increasingly visible in digital environments, where scientific claims are frequently intertwined with ethical concerns, cultural interpretations, and personal beliefs. This study examines how vaccine-critical narratives are articulated on Turkish social media and explores their underlying scientific and ethical dimensions from a primary care perspective.

Materials and Methods: A qualitative case-study design was adopted. Publicly accessible posts shared on X (formerly Twitter) and Facebook between January and March 2025 were identified through purposive sampling. Posts written in Turkish and expressing vaccine-hesitant or anti-vaccine viewpoints were included. A total of 1,100 posts were analyzed using descriptive content analysis informed by a phenomenological interpretive framework, enabling the identification of recurring themes and shared meanings within user narratives.

Results: The analysis identified four main thematic domains: (1) biopolitics and global power structures, (2) vaccine insecurity linked to insufficient or distorted information, (3) tensions between individual freedom and state intervention, and (4) religious and cultural interpretations of vaccination. Across these domains, distrust of pharmaceutical companies, fears about long-term side effects, and opposition to compulsory vaccination emerged as particularly prominent patterns.

Conclusion: The findings demonstrate that social media serves not only as a source of information but also as a space in which vaccine skepticism is socially reinforced and ethically legitimized. Addressing vaccine hesitancy in this context requires strategies that extend beyond factual correction, emphasizing transparent scientific communication, ethical awareness, and empathetic engagement, especially within primary care settings where trust-based relationships play a central role.

Keywords: Vaccine, vaccine hesitancy, anti-vaccination, social media, ethics, primary care

ÖZ

Amaç: Aşı karşıtlığı ve aşı tereddüdü, bilimsel iddiaların sıklıkla etik kaygılar, kültürel yorumlar ve kişisel inançlarla iç içe geçtiği dijital ortamlarda giderek daha görünür hâle gelmiştir. Bu çalışma, Türkiye’de sosyal medyada aşıya eleştirel anlatıların nasıl ifade edildiğini incelemekte ve birinci basamak sağlık hizmetleri perspektifinden bu anlatıların altında yatan bilimsel ve etik boyutları araştırmaktadır.

Gereç ve Yöntemler: Nitel bir vaka çalışması deseni benimsenmiştir. Amaçlı örnekleme yoluyla, Ocak–Mart 2025 tarihleri arasında X (eski adıyla Twitter) ve Facebook’ta paylaşılan, herkese açık gönderiler belirlenmiştir. Türkçe yazılmış ve aşı tereddüdü ya da aşı karşıtlığı içeren görüşleri ifade eden paylaşımlar çalışmaya dâhil edilmiştir. Toplam 1.100 gönderi, kullanıcı anlatıları içindeki yinelenen temaları ve paylaşılan anlamları belirlemeye olanak tanıyan fenomenolojik-yorumlayıcı bir çerçeveden beslenen betimsel içerik analizi ile incelenmiştir.



Address for Correspondence: Asst. Prof. Murat Doğan, MD, Kırşehir Ahi Evran University Faculty of Medicine, Department of Family Medicine, Kırşehir, Türkiye

E-mail: muratdogan@ahievran.edu.tr **ORCID ID:** orcid.org/0000-0003-0776-3644

Received: 04.01.2026 **Accepted:** 07.05.2026 **Epub:** 16.10.2026

Cite this article as: Doğan M, Köken AH. An internet-based qualitative research on vaccine opposition and hesitation in Türkiye: scientific and ethical analysis of social media posts from a primary care perspective. Hamidiye Med J. [Epub Ahead of Print]



Copyright© 2026 The Author(s). Published by Galenos Publishing House on behalf of University of Health Sciences Türkiye, Hamidiye Faculty of Medicine. This is an open access article under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 (CC BY-NC-ND) International License.

Bulgular: Analiz sonucunda dört ana tematik alan belirlenmiştir: (1) biyopolitika ve küresel güç yapıları, (2) yetersiz ya da çarpıtılmış bilgiyle ilişkili aşı güvensizliği, (3) bireysel özgürlük ile devlet müdahalesi arasındaki gerilimler ve (4) aşılama yönelik dinî ve kültürel yorumlar. Bu tematik alanlar boyunca, ilaç şirketlerine duyulan güvensizlik, uzun dönem yan etkilere ilişkin korkular ve zorunlu aşılama karşı çıkış özellikle öne çıkan örüntüler olmuştur.

Sonuç: Bulgular, sosyal medyanın yalnızca bir bilgi kaynağı olarak değil, aynı zamanda aşı şüpheciliğinin toplumsal olarak pekiştirildiği ve etik açıdan meşrulaştırıldığı bir alan olarak işlev gördüğünü göstermektedir. Bu bağlamda aşı tereddüdünün ele alınması, salt olgusal düzeltmelerin ötesine geçen; şeffaf bilimsel iletişimi, etik farkındalığı ve özellikle güvene dayalı ilişkilerin merkezi bir rol oynadığı birinci basamak sağlık hizmetlerinde empatik etkileşimi vurgulayan stratejileri gerektirmektedir.

Anahtar Kelimeler: Aşı, aşı tereddütü, aşı karşıtlığı, sosyal medya, etik, birinci basamak sağlık hizmetleri

Introduction

Resistance to vaccination is not a phenomenon unique to the modern era. From the earliest implementation of the smallpox vaccine in the late eighteenth century, vaccination practices have generated both acceptance and opposition within society. While the protective benefits of vaccines were gradually acknowledged by medical authorities, segments of the public remained skeptical, particularly in response to compulsory vaccination measures. Historical records indicate that organized resistance emerged alongside early immunization policies. One notable example is the establishment of the Anti-Vaccination League in London in 1867, followed by similar movements across different parts of Europe. These early objections were not merely medical in nature but were closely linked to broader concerns about individual autonomy, state authority, and trust in emerging public health institutions (1).

Although early vaccine resistance was often rooted in overt political or religious objections, contemporary forms of opposition tend to reflect a more diffuse sense of mistrust toward medical authorities, the pharmaceutical industries, and scientific expertise (2). This shift has become more visible with the expansion of digital communication platforms. Social media environments, particularly platforms such as X (formerly Twitter) and Facebook, allow users to exchange health-related information outside traditional institutional frameworks. Beyond information sharing, these platforms facilitate the formation of informal networks in which skeptical views are repeated, normalized, and socially validated. Previous research suggests that, within such digital spaces, personal testimonies and peer-generated content may be perceived as more credible than guidance provided by healthcare professionals or official public health sources (3).

The rapid spread of vaccine-related misinformation became particularly evident during the Coronavirus Disease-2019 (COVID-19) pandemic. Uncertainty surrounding newly developed vaccines, concerns about adverse effects,

and frequent changes in public health recommendations contributed to increased public hesitation (4). These concerns were often framed around individual autonomy and personal rights, especially in digital environments where alternative narratives circulated widely. Reflecting the global scale of this issue, the World Health Organization identified vaccine hesitancy as one of the major threats to public health in 2019 (5).

Importantly, vaccine hesitancy cannot be explained solely by a lack of information. Previous research highlights the role of social, cultural, and psychological factors, including parental beliefs, distrust toward authority, and the influence of online communities (6). These dynamics are shaped by broader contextual elements such as socioeconomic conditions and political identity, complicating public health communication efforts (7).

Although vaccination remains among the most effective public health interventions, public acceptance depends not only on scientific evidence but also on ethical considerations. Principles such as autonomy, justice, and transparency play a critical role in shaping attitudes toward immunization policies (8). Within this framework, the present study explores narratives of vaccine opposition and hesitancy on Turkish social media, focusing on their scientific, cultural, and ethical dimensions to inform more context-sensitive approaches in primary care.

Materials and Methods

Research Design

A qualitative case study design was adopted to examine how vaccine opposition and vaccine hesitancy were reflected on Turkish social media. This design was chosen because it makes it possible to investigate complex social issues within their own context and within a defined period of time (9). In this study, social media platforms were conceptualized as naturally occurring online settings in which users openly shared views, concerns, and justifications regarding vaccination.

The analytical process was informed by an interpretive phenomenological perspective. Here, phenomenology was not used in the classical sense of exploring lived experience through face-to-face interviews. Rather, it was used to interpret how meanings related to vaccination were expressed, framed, and negotiated in public online discourse. The purpose of the study was not to determine how common vaccine-critical views were, but rather to examine recurring patterns of meaning, justificatory narratives, and ethical standpoints that are visible in social media posts from a primary care perspective.

Data Collection

Data were collected from publicly available posts shared on X (formerly Twitter) and Facebook between January and March 2025. These platforms were preferred because they are widely used in Türkiye for public discussion and the sharing of opinions.

Purposive sampling was applied to identify anti-vaccine and vaccine-hesitant views expressed by individual users

in Turkish. Relevant posts were found through the built-in search functions of the platforms, using predefined hashtags and keywords. The search process relied on Turkish hashtags and terms commonly linked with vaccine opposition, such as #Aşıyahayır, #AşıKarşıtlığı, #AşıZararları, #Aşıdeğilbiyolojiksilah, #Kitleimhasilahıaşılar, and #AşıTereddüt.

Only publicly accessible posts created by individual users were included in the analysis. Institutional or organizational posts, news reports, promotional content, duplicate posts, and posts not directly related to vaccine opposition or vaccine hesitancy were excluded. Posts with insufficient textual content for meaningful interpretation were also excluded.

Sampling continued until thematic saturation was reached, meaning that additional posts no longer contributed substantially new concepts or thematic variation. In total, 1,100 posts were included in the full analysis. The process of data identification, screening, inclusion, and thematic analysis is summarized in Figure 1.

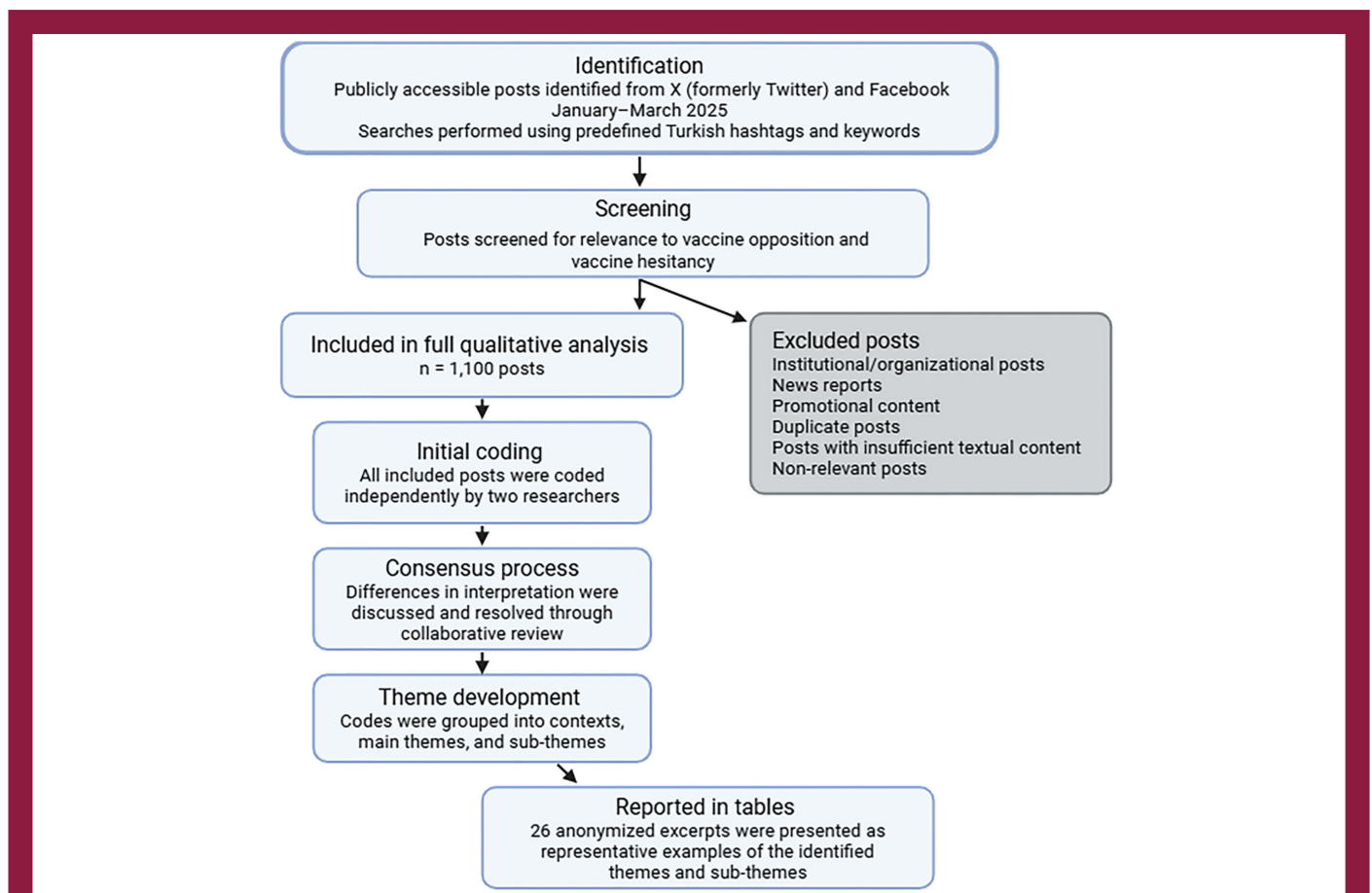


Figure 1. Flowchart of data identification, screening, inclusion, and thematic analysis.

Data Analysis

Descriptive content analysis with an inductive approach was used in the analysis of the data (10). The posts were read repeatedly during this stage in order to identify recurring ideas, narrative patterns, and common justifications related to vaccine opposition and hesitancy.

Initially, coding was carried out independently by two researchers. The codes were then compared, and any differences were discussed during repeated review until agreement was reached. Over time, similar codes were grouped under broader categories, which made it possible to identify contexts, main themes, and sub-themes. Thus, the thematic framework was developed from the data rather than established in advance.

Although all 1,100 posts were analyzed, including the entire dataset in the manuscript was not feasible. Therefore, 26 anonymized excerpts were presented in the tables as representative examples of the identified themes and subthemes. These excerpts were selected to capture the variety and content of the themes while preserving anonymity.

The coding and theme development stages were completed manually, without the use of qualitative analysis software, so that the data could be examined more closely. Reporting of the study followed the Standards for Reporting Qualitative Research (11).

Trustworthiness and Rigor

Several steps were taken to strengthen the trustworthiness of the findings. Credibility was supported through independent coding by two researchers and through later discussions aimed at reaching a common interpretation. To support dependability, the analytical process was systematically documented during the study.

Confirmability was addressed by maintaining consistency in coding decisions and by reviewing category development as the analysis progressed. Transferability was improved by describing the data and the sociocultural setting in which vaccine-related narratives were produced as clearly as possible.

Ethical Considerations

The study relied solely on publicly accessible social media content. Accordingly, formal ethics committee approval was not required under national regulations. Nevertheless, ethical considerations were observed throughout the research.

Only public posts were analyzed. No data were taken from private accounts, closed groups, or password-protected sources, and no contact was made with any social media users. Usernames and other potentially identifying details

were anonymized during data collection and reporting. The research was conducted in line with the Declaration of Helsinki and accepted guidance for internet-based qualitative research

Results

The analysis focused on identifying viewpoints and arguments that were commonly associated with vaccine opposition or hesitation. These perspectives were organized into contexts, main themes, and sub-themes, as presented in Tables 1 and 2.

A review of the dataset showed that vaccine-critical narratives tended to cluster around four broad thematic areas: vaccine insecurity related to limited or distorted information, biopolitics and global power dynamics, individual liberty in relation to state intervention, and religious or cultural interpretations of vaccination. Across these thematic areas, several recurring sub-themes were observed, including concerns about vaccines being perceived as experimental products, suspicions regarding their contents, fears of adverse effects, and mistrust toward pharmaceutical companies. In many posts, vaccination was described not only as a health-related intervention but also as a perceived threat to bodily autonomy or religious beliefs (Table 1).

Vaccine-related narratives differed according to vaccine type, as summarized in Table 2. COVID-19 vaccines were most frequently discussed and often associated with fears of side effects, concerns about personal freedom, and distrust of corporate actors. Other vaccines, including tetanus, rabies, and measles, were also mentioned occasionally, in connection with conspiracy-based claims such as permanent bodily harm, infertility, or doubts about disease origins.

Discussion

Vaccine opposition and vaccine hesitancy remain major public health concerns, particularly in digital environments where scientific information, personal experience, and ethical concerns intersect. The present study suggests that anti-vaccine discourse in Turkish social media is shaped not only by misinformation and information gaps, but also by how individuals interpret ethical concepts such as autonomy, bodily integrity, freedom from harm, and decision-making rights (12). Four main thematic areas emerged from the analysis: biopolitics and global power relations, vaccine hesitancy linked to a lack of information, religious and cultural interpretations, and tensions between individual freedom and state intervention. These themes can all be read in connection with the bioethical principles of non-maleficence, autonomy, and informed consent (13). More

Table 1. Thematic categorization of general anti-vaccination and hesitancy discourses identified on Turkish social media platforms (X and Facebook).

ID	Theme	Sub-theme	Expression (excerpt)	Source
1	Vaccine insecurity	Experimental fluid	"Cover-up variant for deaths caused by experimental fluids."	X
2	Vaccine insecurity	Content suspicion	"Vaccines are a lie; they contain toxins like mercury, aluminum."	X
3	Vaccine insecurity	Side effect fears	"Vaccines cause gender confusion, early cancer in children."	F
4	Vaccine insecurity	Side effect fears	"Every day we lose someone due to vaccination."	X
5	Vaccine Insecurity + biopolitics	Content & company distrust	"I won't let Western vaccines harm my children."	X
6	Vaccine Insecurity + biopolitics	Side effects & company distrust	"Vaccines correlate with brain damage, autoimmune diseases."	F
7	Biopolitics	Corporate power	"Vaccines cause health issues; profits are made through incubators."	X
8	Biopolitics	Corporate power	"Scientific institutions serve corporate imperialism globally."	X
9	Biopolitics	Company distrust	"Vaccination is used to create lifelong hospital clients."	X
10	Biopolitics	Population control	"Vaccines are part of a new war strategy via health system."	X
11	Biopolitics	Population control	"Vaccines enable silent, cost-effective population control."	X
12	Liberty and state	Against mandates	"So-called patriots surrender their bodies to toxic vaccines."	X
13	Religion and culture	Faith-based concerns	"God provides immunity; vaccines harmed our babies."	X
14	Religion and culture	Faith-based concerns	"Vaccines corrupted our generation, led to gender confusion."	X

Table 2. Vaccine-specific hesitancy narratives and anti-vaccination themes categorized by vaccine type (COVID-19, tetanus, smallpox, rabies, measles, and flu).

ID	Vaccine type	Theme	Sub-theme	Expression (excerpt)	Source
15	COVID-19	Liberty and state	Freedom to travel	"I made my 3rd out-of-town trip during the year."	X
16	COVID-19	Vaccine insecurity	Side effect fears	"I warned my father, he got the vaccine, now he is under the ground."	X
17	COVID-19	Vaccine insecurity	Side effect fears	"Why are healthy children dying after the vaccine?"	X
18	COVID-19	Vaccine insecurity	Content suspicion	"A study was launched to camouflage Biontech's side effects."	X
19	COVID-19	Biopolitics	Company distrust	"No one takes responsibility for vaccine-related mistakes."	X
20	COVID-19	Biopolitics	Corporate power	"They'll vaccinate again. #WAKE UP!!!"	X
21	Tetanus	Vaccine insecurity	Side effect fears	"Tetanus vaccine causes thyroid disease in pregnant women."	F
22	Smallpox	Biopolitics	Company distrust	"Behçet's disease is a typical vaccine disease!"	F
23	Rabies	Biopolitics	Company distrust	"Rabies vaccine doses are pushed via fear and coercion."	X
24	Rabies	Biopolitics	Corporate power	"Rabies virus is a lie created to sell vaccines and kill."	X
25	Measles	Vaccine insecurity	Side effect fears	"Measles vaccine causes autism and other diseases."	X
26	Flu	Biopolitics	Corporate power	"The flu is not viral; it's a biological reaction to stress."	F

COVID-19, Coronavirus Disease-2019.

specifically, lack of information may weaken the person's ability to make an informed decision, while the theme of state intervention brings forward the question of whether autonomy should be seen as an absolute right or as a freedom shaped, at least in part, by social responsibility (13).

Biopolitics and Global Powers

One of the prominent themes in the analyzed posts was biopolitical concern and perceptions of global power. Vaccination was often described as a profit-oriented practice

driven by pharmaceutical companies, and some users linked public health policies to economic interests, social control, or population management. Although these claims are not supported by scientific evidence, their repeated circulation in online spaces seems to deepen distrust toward both health authorities and the pharmaceutical industry (14). In the posts examined here, suspicion toward vaccine manufacturers was often expressed alongside allegations of hidden data, concealed side effects, or undisclosed agendas (Tables 1-2, X7, X8, X24).

This pattern suggests that vaccination may no longer be viewed solely as a medical issue but also as an issue interpreted through political and moral resistance. When trust in institutions becomes weak, people may begin to rely less on scientific evidence and more on suspicion, social belonging, or ideological closeness when making health-related decisions (15). In that sense, anti-vaccine discourse can be seen not only as a problem of misinformation but also as a digital expression of weakened institutional trust.

At the same time, social media claims such as “side effects are being hidden” or “data is being manipulated” are not readily compatible with the established operation of pharmacovigilance systems. Institutions such as the World Health Organization, the European Medicines Agency, and the European Centre for Disease Prevention and Control continue to operate monitoring systems that assess vaccine safety and continually review possible adverse effects (16,17). For this reason, the biopolitical suspicions circulating on social media seem to draw less on verified scientific evidence than on distrust in institutions and conspiracy-based narratives (17,18).

Vaccine Hesitancy, Information Deficit, and the Principle of Do No Harm

The rapid development of vaccines during the pandemic appears to have led some individuals to question whether safety assessments were sufficiently thorough. In social media discussions, this speed was often interpreted as a sign that scientific rigor had been weakened. In particular, mRNA-based COVID-19 vaccines were frequently portrayed as new-generation biotechnological products that were not yet fully understood, which seems to have made existing concerns more visible (19,20). Despite strong evidence from clinical trials and real-world data, such perceptions continued to circulate on social media (3). Claims relating to autism, cancer, infertility, or long-term harm have also remained in public discourse through repeated reproduction, even though these claims have not been supported or have been refuted in many studies (21).

These findings can be read in relation to the bioethical principle of non-maleficence. In many anti-vaccine narratives, the focus is placed almost entirely on the possibility of harm from the vaccine itself. Fear is often amplified through risk claims that are not supported by scientific evidence, and this may shift vaccination decisions away from evidence-based evaluation toward uncertainty, anxiety, and emotional reaction (22,23). In this sense, social media discourse does not simply reflect safety concerns; it may also reshape how the idea of “do no harm” is understood in practice.

However, non-maleficence should not be interpreted solely as the avoidance of possible side effects. It also

includes preventable harms that may arise, both for individuals and for society, when vaccination is refused (22). Vaccine refusal is therefore not only a personal matter but may also become a broader public health concern, particularly for vulnerable groups at increased risk from infectious diseases. In this context, the relationship between misinformation and health-related anxiety also deserves attention. Fear-based content that circulates repeatedly in digital settings may increase uncertainty, distort perceptions of vaccine safety, and even contribute to cyberchondria-like reactions (24). This, in turn, may reinforce disproportionate fears toward interventions that are generally regarded as safe on the basis of scientific evidence.

Religious and Cultural Factors

Religious and cultural frameworks also appear to shape how some social media users make sense of vaccination. In the posts analyzed in this study, vaccination was sometimes associated with moral decline, disability, changes in gender identity, or interference with divine order (Table 1, X13, X14). Although these interpretations are not supported by scientific evidence, they still seem to influence certain ideological or faith-based communities (25).

These findings suggest that vaccine hesitancy cannot be explained solely by a lack of biomedical knowledge. For some individuals, being vaccinated may come to represent not a scientific or medical intervention, but a moral, religious, or cultural stance (26). Therefore, when responding to this type of hesitancy, merely providing technical information may not be sufficient. A more effective approach may involve communication that is non-judgmental, culturally sensitive, and attentive to the person’s own values and concerns (27).

Individual Freedom, State Intervention, and Autonomy

One of the themes that appeared repeatedly in anti-vaccine narratives was the perceived threat to individual freedom and bodily autonomy. Expressions such as “My body, my choice” suggest that mandatory vaccination, as well as public restrictions linked to vaccination, were often interpreted as violations of personal rights (28). During the COVID-19 pandemic, restrictions on travel, entry, or access to public spaces for unvaccinated individuals were also described in many posts not as measures intended to protect public health, but as forms of oppression (29). This seems to have intensified public debate on social media about the limits of collective measures aimed at protecting health and the boundaries of individual rights and freedoms (30).

From a bioethical perspective, however, autonomy is not merely the right to refuse an intervention. It also includes the capacity to make decisions on the basis of accurate, sufficient, and unbiased information (12). In this

respect, misinformation, echo chambers, and recurring fear-based narratives on social media may appear to support the language of “free choice,” while at the same time weakening the conditions required for autonomous decision-making (12). For this reason, a choice shaped mainly by misinformation may be difficult to regard as fully autonomous in ethical terms.

In the Turkish context, this discussion also has a legal dimension. The Constitutional Court’s 2015 individual application decision on the legal basis of mandatory vaccination (the Halime Sare Aysal application) set out an important legal framework by stating that mandatory vaccination cannot be implemented without a clear legal basis. Although this decision provides protection for individual autonomy and bodily integrity, it may sometimes be interpreted more broadly on social media than in its original legal context and used as a wider argument for vaccine refusal (31,32). In this way, legal claims based on individual rights may be recast within social media discourse as ethical grounds for refusing vaccination, with possible implications for public health (33).

Informed Consent: Both a Problem and a Solution

The findings of this study suggest that informed consent represents both a problem area and a possible route toward a solution in the context of vaccine hesitancy. Misleading content on social media makes it more difficult for individuals to access accurate, balanced, and understandable information about vaccines. This may expose them to misinformation and also weaken the decision-making process itself (33). Informed consent should not be reduced to signing a form or simply accepting an intervention; it also requires that the individual understand the options, benefits, risks, and uncertainties involved (13). If a decision is shaped by misinformation, fear, conspiracy narratives, or social media pressure, the ethical validity of that consent becomes uncertain. For this reason, vaccine hesitancy may be understood not only as an information gap, but also as a problem of impaired informed consent shaped by manipulation (13,33).

Global Vaccine Side Effects and Legal Proceedings

In recent years, international debate has also included scientific discussion of rare adverse events associated with COVID-19 vaccines and legal claims alleging vaccine injuries. In particular, legal claims and compensation cases have been reported in several countries, including Germany, in relation to alleged side effects such as myocarditis or pericarditis associated with mRNA vaccines (34). From a bioethical perspective, such proceedings may be interpreted within the broader framework of transparency, accountability,

and the duty of institutions and manufacturers to respond to safety concerns appropriately.

Similarly, the withdrawal of the Oxford-AstraZeneca (Vaxzevria) vaccine from the market by the manufacturer following concerns related to the rare but serious adverse event known as thrombosis with thrombocytopenia syndrome in May 2024 has also been used on social media as a new basis for anti-vaccine rhetoric (35,36). However, from an ethical perspective, such developments may also be seen as evidence that pharmacovigilance and risk-management systems continue to operate and respond to emerging safety signals. Although social media users may interpret recalls or legal proceedings as the exposure of hidden truths, these processes can also be understood as part of modern medicine’s capacity for continuous monitoring, reassessment, and harm reduction (34,37). Therefore, it is reasonable to acknowledge that such global legal and scientific debates may provide a real background that influences vaccine hesitancy on social media and may shape individuals’ perception of risk during the informed consent process (37).

Strategic Solutions and the Physician’s Role in Primary Care

Reducing vaccine hesitancy cannot be achieved simply by correcting misinformation. It requires a broader approach, including transparent communication, cultural sensitivity, stronger institutional trust, and careful responses to misinformation in digital environments. International recommendations also show that communication is more effective when people’s concerns are not dismissed, uncertainties are discussed openly, and the scientific process is explained more clearly (18).

Primary care physicians play an especially important role in vaccination decision-making. In Türkiye, family physicians are often the first point of contact for both childhood and adult immunization (38,39). For this reason, their role goes beyond providing information alone; they may also assist patients in navigating the ethical aspects of decision-making. Using non-judgmental language, taking concerns seriously, directing patients to reliable sources, and treating informed consent as a real dialogue may all help rebuild trust in vaccination (8,15).

Study Limitations

This study has several limitations. First, the analysis was limited to publicly available content on X and Facebook. As a result, narratives circulating in closed groups or on platforms such as Telegram and WhatsApp were not included. Second, because there were no verifiable demographic or geographic data about users, it was not possible to make interpretations specific to subgroups. Finally, although the

coding was carried out independently by two researchers, some degree of subjectivity is unavoidable in qualitative interpretation.

Conclusion

Social media platforms increase the visibility and persistence of anti-vaccine discourse, often by combining misinformation with ethical, cultural, and political justifications. The findings of this study showed that anti-vaccine sentiment and vaccine hesitancy, expressed on Turkish social media, were primarily organized around the themes of biopolitical distrust, safety concerns, religious values, and individual freedom.

These findings suggest that vaccine hesitancy cannot be understood only as a problem of insufficient scientific knowledge. It also needs to be considered in light of the ethical principles of non-maleficence, autonomy, and informed consent. Public health policies should, therefore, do more than provide information alone. They should also support a form of communication that respects individual autonomy while making collective responsibility more visible. In this process, the trust-based, empathetic, and explanatory role of primary care physicians may be especially important both for informed decision-making and for strengthening public trust in vaccination.

Ethics

Ethics Committee Approval: Ethics committee approval was not required because the study relied solely on publicly accessible social media content.

Informed Consent: Informed consent was not required because only publicly accessible social media posts were analyzed, no contact was made with users, and all potentially identifying information was anonymized.

Footnotes

Authorship Contributions

Concept: M.D., A.H.K., Design: M.D., A.H.K., Data Collection or Processing: M.D., A.H.K., Analysis or Interpretation: M.D., A.H.K., Literature Search: M.D., A.H.K., Writing: M.D., A.H.K.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

References

- Ortiz-Sánchez E, Velando-Soriano A, Pradas-Hernández L, Vargas-Román K, Gómez-Urquiza JL, Cañadas-De la Fuente GA, et al. Analysis of the anti-vaccine movement in social networks: a systematic review. *Int J Environ Res Public Health*. 2020;17:5394. [\[Crossref\]](#)
- Kata A. A postmodern Pandora's box: anti-vaccination misinformation on the Internet. *Vaccine*. 2010;28:1709-1716. [\[Crossref\]](#)
- Wilson SL, Wiysonge C. Social media and vaccine hesitancy. *BMJ Glob Health*. 2020;5:e004206. [\[Crossref\]](#)
- Danielson L, Marcus B, Boyle L. Special feature: countering vaccine misinformation. *Am J Nurs*. 2019;119:50-55. [\[Crossref\]](#)
- Kata A. Anti-vaccine activists, Web 2.0, and the postmodern paradigm—an overview of tactics and tropes used online by the anti-vaccination movement. *Vaccine*. 2012;30:3778-3789. [\[Crossref\]](#)
- Burki T. Vaccine misinformation and social media. *Lancet Digit Health*. 2019;1:e258-e259. [\[Crossref\]](#)
- Larson HJ, Jarrett C, Eckersberger E, Smith DM, Paterson P. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: a systematic review of published literature, 2007-2012. *Vaccine*. 2014;32:2150-2159. [\[Crossref\]](#)
- Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: influence, impact and implications. *Expert Rev Vaccines*. 2015;14:99-117. [\[Crossref\]](#)
- Priya A. Case study methodology of qualitative research: key attributes and navigating the conundrums in its application. *Sociol Bull*. 2021;70:94-110. [\[Crossref\]](#)
- O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med*. 2014;89:1245-1251. [\[Crossref\]](#)
- Tekindal M, Attepe Özden S, Gedik TE, Ege A, Erim F, Tekindal MA. Standards for reporting qualitative research: Turkish adaptation of the SRQR checklist. *OPUS Int J Soc Res*. 2021;18:5425-5433. [\[Crossref\]](#)
- Williamson L, Glaab H. Addressing vaccine hesitancy requires an ethically consistent health strategy. *BMC Med Ethics*. 2018;19:84. [\[Crossref\]](#)
- Ogugua JO, Anyanwu EC, Olorunsogo T, Maduka CP, Ayo-Farai O. Ethics and strategy in vaccination: a review of public health policies and practices. *Int J Sci Res Arch*. 2024;11:883-895. [\[Crossref\]](#)
- Faasse K, Chatman CJ, Martin LR. A comparison of language use in pro- and anti-vaccination comments in response to a high profile Facebook post. *Vaccine*. 2016;34:5808-5814. [\[Crossref\]](#)
- Goldenberg MJ. Vaccine hesitancy: public trust, expertise, and the war on science. Pittsburgh (PA): University of Pittsburgh Press; 2021. [\[Crossref\]](#)
- Durand J, Dogné JM, Cohet C, Browne K, Gordillo-Marañón M, Piccolo L, et al. Safety monitoring of COVID-19 vaccines: perspective from the European Medicines Agency. *Clin Pharmacol Ther*. 2023;113:1223-1234. [\[Crossref\]](#)
- Lewandowsky S, Cook J. The conspiracy theory handbook. 2020.
- World Health Organization. Development of WHO immunization policy and strategic guidance: methods and processes applied by the Strategic Advisory Group of Experts on Immunization (SAGE) to develop evidence-based recommendations. Geneva: World Health Organization; 2024. [\[Crossref\]](#)
- Cole A, Webster P, Van Liew D, Salas M, Aimer O, Malikova MA. Safety surveillance and challenges in accelerated COVID-19 vaccine development. *Ther Adv Drug Saf*. 2022;13:20420986221116452. [\[Crossref\]](#)
- Younus MM, Al-Jumaili AA. An overview of COVID-19 vaccine safety and post-marketing surveillance systems. *Innov Pharm*. 2021;12:10.24926/iip.v12i4.4294. [\[Crossref\]](#)
- Hviid A, Hansen JV, Frisch M, Melbye M. Measles, mumps, rubella vaccination and autism: a Nationwide cohort study. *Ann Intern Med*. 2019;170:513-520. [\[Crossref\]](#)
- Kowalik M. Ethics of vaccine refusal. *J Med Ethics*. 2022;48:240-243. [\[Crossref\]](#)
- Rus M, Groselj U. Ethics of Vaccination in childhood—a framework based on the four principles of biomedical ethics. *Vaccines (Basel)*. 2021;9:113. [\[Crossref\]](#)

24. Luo X, Chang JY-S, Cheah J-H, Lim WM, Lim XJ. Health anxiety and information-seeking in the digital age: a two-wave study of cyberchondria. *Internet Res.* 2026;1-26. [\[Crossref\]](#)
25. Weinberg GA, Szilagyi PG. Vaccine epidemiology: efficacy, effectiveness, and the translational research roadmap. *J Infect Dis.* 2010;201:1607-1610. [\[Crossref\]](#)
26. Tiwana MH, Smith J. Faith and vaccination: a scoping review of the relationships between religious beliefs and vaccine hesitancy. *BMC Public Health.* 2024;24:1806. [\[Crossref\]](#)
27. Schaffer DeRoo S, Limaye RJ. Culturally aware vaccine promotion to prevent outbreaks. *JAMA Netw Open.* 2024;7:e2429612. [\[Crossref\]](#)
28. Hussain A, Ali S, Ahmed M, Hussain S. The anti-vaccination movement: a regression in modern medicine. *Cureus.* 2018;10:e2919. [\[Crossref\]](#)
29. Bardosh K, de Figueiredo A, Gur-Arie R, Jamrozik E, Doidge J, Lemmens T, et al. The unintended consequences of COVID-19 vaccine policy: why mandates, passports and restrictions may cause more harm than good. *BMJ Glob Health.* 2022;7:e008684. [\[Crossref\]](#)
30. Moreno JD, Sándor J, Schmidt U. Autonomy and social responsibility: the post-pandemic challenge. *Perspect Biol Med.* 2022;65:426-441. [\[Crossref\]](#)
31. Anayasa Mahkemesi. Halime Sare Aysal başvurusu. Başvuru No: 2013/1789. 11 Kasım 2015.
32. Yıldırım E. Compulsory vaccination and the Turkish constitutional court. *Eur J Health Law.* 2020;27:476-494. [\[Crossref\]](#)
33. Aktaş Kuyucu M, Özdemir BP, Aksoy İU. Anti-vaccination and vaccine hesitancy in social media: a systematic review in the context of Türkiye. *İletişim Kuram ve Araştırma Dergisi.* 2025;(70):240-256. [\[Crossref\]](#)
34. Goldberg R. Vaccine liability in the light of Covid-19: a defence of risk-benefit. *Med Law Rev.* 2022;30:243-267. [\[Crossref\]](#)
35. Hulscher N, Alexander PE, Amerling R, Gessling H, Hodgkinson R, Makis W, et al. Withdrawn: a systematic review of autopsy findings in deaths after COVID-19 vaccination. *Forensic Sci Int.* 2024;112115. [\[Crossref\]](#) Retraction in: [\[Crossref\]](#)
36. Matar RH, Than CA, Nakanishi H, Daniel RS, Smayra K, Sim BL, et al. Outcomes of patients with thromboembolic events following coronavirus disease 2019 AstraZeneca vaccination: a systematic review and meta-analysis. *Blood Coagul Fibrinolysis.* 2022;33:90-112. [\[Crossref\]](#)
37. Ip S, North TL, Torabi F, Li Y, Abbasizanjani H, Akbari A, Horne E, et al. Cohort study of cardiovascular safety of different COVID-19 vaccination doses among 46 million adults in England. *Nat Commun.* 2024;15:6085. [\[Crossref\]](#)
38. Yörük S, Türkmen H, Durgut A, Erbek M. Vaccine mistrust among family healthcare professionals and vaccine hesitancy in the communities they serve in Turkey in 2019: a cross-sectional study. *Hum Vaccin Immunother.* 2020;16:3155-3162. [\[Crossref\]](#)
39. Ozisik L, Tanrioer MD, Altınel S, Unal S. Vaccinating healthcare workers: level of implementation, barriers and proposal for evidence-based policies in Turkey. *Hum Vaccin Immunother.* 2017;13:1198-1206. [\[Crossref\]](#)