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Comparative synthesis of sociocultural and political influences (SPIs) on COVID-19 vaccine hesitancy: an interdisciplinary systematic review

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Abstract

Background COVID-19 vaccine hesitancy has been shaped by diverse sociocultural and political influences (SPIs), rendering it a multifaceted and context-specific issue. Various studies spanning different academic domains have endeavoured to dissect these diverse SPIs, revealing that the impact of a particular influencer can vary significantly depending on the context and disciplinary interpretation. However, prevailing review literature has predominantly focused on enumerating influential factors without providing in-depth contextual backgrounds or disciplinary interpretations. Additionally, a majority of these studies have been confined within specific disciplines, hindering the development of a holistic understanding of vaccine hesitancy. To broaden the scope of knowledge, this study aims to systematically review how SPIs on COVID-19 vaccine hesitancy have been approached and interpreted across disciplines.

Methods This systematic review adopted a qualitative comparative synthesis approach to explore how SPIs on COVID-19 vaccine hesitancy had been approached (including their selection and application) in each study across disciplines. Five databases (PubMed, PsycINFO, Web of Science, CINAHL, and Scopus) were searched to identify peer-reviewed studies that primarily focused on exploring SPIs on COVID-19 vaccine hesitancy among healthy adults. Out of 665 records initially retrieved, 28 studies met the eligibility criteria.

Results Studies that adopted theoretical frameworks explored SPIs from four approaches: 1) Social Cognitive, 2) Disposition-Environment Interaction, 3) Critical Medical anthropology/Medical Ecology, and 4) Social Structures. For studies without theoretical framework were synthesized into three main themes: 1) influences from political ideology, 2) interaction between political views and trust in science; and 3) contextual social cognitive determinants.

Conclusions This qualitative comparative synthesis facilitated the comparison of diverse studies from multiple disciplines. The integration of theoretical and empirical evidence illustrated how different disciplines interpreted SPIs on COVID-19 vaccine hesitancy, enhancing interdisciplinary understanding and underscoring theoretical and practical research opportunities and gaps. These findings highlighted the complexity of COVID-19 vaccine hesitancy and

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emphasised the necessity of an interdisciplinary approach in advancing future vaccine research and communication. Additionally, the findings outlined promising avenues for future interdisciplinary research.

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Keywords Sociocultural and political influences (SPIs), COVID-19 vaccine hesitancy, Qualitative comparative synthesis, Systematic review, Interdisciplinary approach

Introduction

Vaccine hesitancy, the reluctance or resistance to receive vaccinations despite their availability [1, 2], has long been shaped by sociocultural and political influences, from childhood immunizations to influenza and other vaccine-preventable diseases. During the COVID-19 pandemic, these dynamics became particularly visible. The unprecedented speed of vaccine development and shortened clinical trial timelines, together with persistent uncertainties [3] surrounding the virus, did not fundamentally change the nature of vaccine hesitancy. Instead, these factors collectively amplified pre-existing sociopolitical sensitivities [4, 5]. These amplified dynamics manifested differently across contexts. For instance, in some contexts, divergent governmental responses were perceived to prioritise political considerations over public health, generating a crisis of trust and fuelling public scepticism, thereby undermining adherence to vaccination policies [6–8]. In other settings, resistance more often took the form of opposition to mandates or to what was perceived as excessive vaccine promotion, frequently framed as a violation of personal autonomy. These dynamics were not mutually exclusive and frequently overlapped within the same setting. Morever, these sociopolitical contexts were further complicated by the influence of social media and *infodemics* – that is, the circulation of an overabundance of both accurate and inaccurate information during a health crisis [9, 10]. This environment of uncertainty was often politicised by sociopolitical groups, who reframed debates on COVID-19 vaccination from matters of health protection into issues of political contention.

As COVID-19 vaccine hesitancy has evolved into a more complex issue, scholars from different disciplines have framed its sociopolitical influences (SPIs) in distinctive ways. Public health research, for instance, has often attributed the emergence of conspiracy theories to a lack of knowledge or low trust in science, advocating for solutions based on a knowledge-deficit approach [11]. This perspective, however, has been critiqued as a "deficit model" of science communication, which portrays those resisting expert authority as simply uninformed while overlooking broader contextual and structural influences [12, 13]. Communication studies, in turn, have highlighted the role of echo chambers and algorithm-driven misinformation in shaping public perceptions [14]. From a structural perspective, frequently associated with sociology, scholars have emphasised how social structures shape the spread of conspiracy theories. For example, limited access to reliable resources or lower levels of information literacy can constrain people's ability to evaluate and verify information [15]. Together, these insights demonstrate that the same factor can be conceptualised in very different ways depending on disciplinary framing. For example, while Quon and Walker [14] interpreted media outlets as proxies for political ideology, Chen and Zhang [15] treated media exposure as a pathway to conspiracy beliefs. Similarly, early in 2014, the World Health Origination (WHO) Vaccine Group proposed the Determinants of Vaccine Hesitancy Matrix [2], which categorised the various determinants of vaccine hesitancy into *contextual influences, individual and group influences* and *vaccine-specific influences*. Despite comprehensively covering the relevant factors, the matrix's reliance on classification and listing presents myriad possibilities, limiting its ability its ability to capture patterns of how hesitancy is studied and interpreted across contexts.

Despite the growing recognition of the sociopolitical dimensions of vaccine hesitancy, most existing reviews are confined to disciplinary boundaries [16–18] and rarely focus explicitly on the interaction of SPIs. As a result, they often provide broad lists of factors influencing vaccine hesitancy but pay less attention to how these factors are conceptualised across disciplinary perspectives. The study described in this paper aims to address this gap in cross-disciplinary analysis by identifying which SPIs have been studied and analysing how they have been framed and operationalised. To do this, we employed a qualitative comparative synthesis [16, 19] combined with systematic review methodology to map how different disciplines have approached SPIs in COVID-19 vaccine hesitancy. Rather than assessing the relative quantitative weight of specific factors, this review provides a comparative synthesis of how SPIs have been conceptualised and studied across disciplines. In doing so, it highlights key strengths and limitations and offers a foundation for more integrative interdisciplinary research on vaccine hesitancy.

Methods

This review was registered prospectively with PROSPERO (CRD42023440041) and conducted following the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines [17].

Search strategy

Two systematic searches were performed across five electronic databases (PubMed, PsycINFO, Web of Science, CINAHL (via EbscoHost), and Scopus) on July 19 and July 26, 2023. The search terms included variations of (Vaccine communication OR vaccine hesitancy OR health communication OR vaccine OR immunisation) AND (socio-political factor OR sociocultural factor OR political factor OR cultural factor) AND (Coronavirus OR SARS-CoV-2 OR COVID-19). The search strategy focused on topic, abstract and summary variations adjusted for each database (see Appendix 1).

A total of 665 studies were initially retrieved, with 105 duplicate entries removed. Following title and abstract screening, 525 records were further eliminated. Thirty-five studies proceeded to full-text screening, resulting in the inclusion of 28 studies in the systematic review. The screening process and reasons for exclusion are delineated in Fig. 1. Author MK independently conducted the study selection process. At the same time, another author (MT) reviewed 30% of both selected and excluded studies to ensure inter-rater reliability.

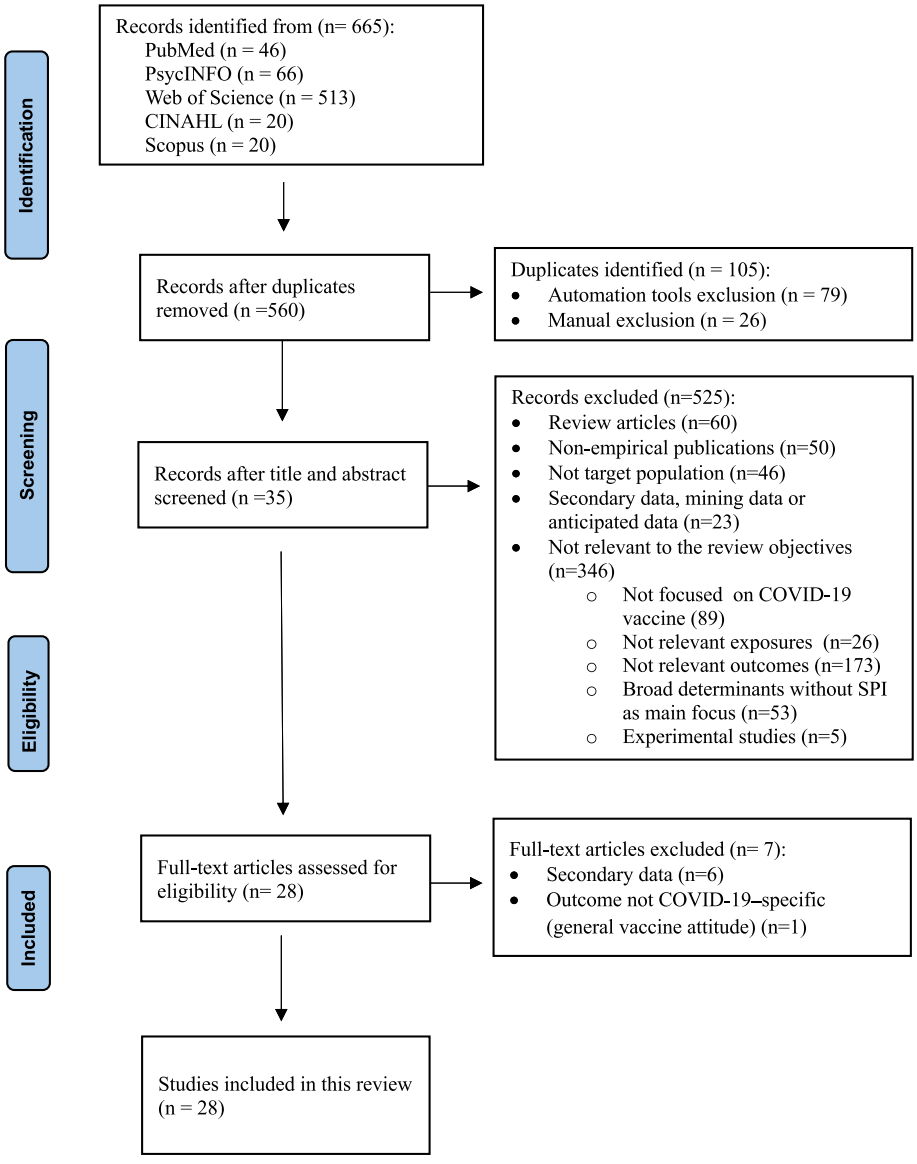

Fig. 1 PRISMA flowchart for systematic review

Inclusion criteria and study selection

The inclusion and exclusion criteria were defined to align with the review's objective of analysing how sociocultural and political influences (SPIs) are framed and applied within studies of vaccine hesitancy.

Inclusion criteria were as follows: (1) original, peer-reviewed empirical studies that specifically examined COVID-19 vaccine hesitancy or vaccination decisions/attitudes; (2) sociocultural and/or political influences (SPIs) framed as a central analytical focus, either in the stated research aims or within the conceptual/theoretical framework guiding the study design; (3) use of direct empirical data collection, excluding studies relying solely on anticipated data, large-scale data mining, or secondary datasets; and (4) participants were healthy adults aged between 18 and 60 years, ensuring full decision-making autonomy and reducing the influence of age-related vulnerabilities.

Exclusion criteria were as follows: (1) review articles, commentaries, or other non-empirical publications; (2) studies not primarily focused on COVID-19 vaccination; (3) studies in which SPIs appeared only as background variables, descriptive covariates, or incidental factors rather than as a central analytical focus; (4) studies addressing outcomes outside the scope of vaccine hesitancy (e.g., programme logistics, rollout efficiency, or service delivery evaluations); (5) studies involving participants outside the targeted group (e.g., individuals younger than 18 years whose vaccination attitudes are shaped by parental authority, or adults whose decisions were primarily constrained by chronic illness, displacement, or institutional residence); (6) studies relying solely on anticipated, secondary, or large-scale mining data without direct empirical collection (see inclusion criterion 3); and (7) experimental intervention studies designed to manipulate vaccination behaviour.

Restricting the participant age range to 18–60 enabled a focus on adults with independent decision-making capacity, while reducing potential bias introduced by health vulnerabilities in older populations or parental authority in younger groups. Similarly, populations affected by chronic illness, displacement, or living in institutional settings were excluded, as their vaccination decisions were likely shaped more by medical risks, access conditions, or structural constraints than by sociocultural or political considerations. Consistent with the review's objective, only studies in which SPIs were treated as a central analytical construct were included; those in which SPIs appeared only as background covariates or descriptive controls were excluded, as they lacked the analytical depth required for cross-disciplinary synthesis. A full categorisation of excluded records, aligned with the PRISMA flowchart, is provided in Appendix 2.

In terms of the scope of sociocultural and political factors, this review referred to the *contextual influences* and some of the *individual and group influences* which were defined by the Determinants of Vaccine Hesitancy Matrix [2]. Specifically, contextual influences included the communication and media environment, influential leaders, community, historical influences, religion/culture/gender/socio-economic, politics, geographical barriers and perception of the pharmaceutical industry. Some of the individual and group influences included personal, family and or/community member experience with vaccination, beliefs, attitudes, knowledge/awareness, health system and personal experience, risk/benefits (perceived heuristics) and immunisation as a social norm. In addition, due to the rise of infodemics and conspiracy theories regarding COVID-19, numerous studies investigated how information use/mis/disinformation and conspiracy theories affected COVID-19 vaccination among individuals. These studies were included in this review since the communication and media environment has been significantly impacted by infodemics and conspiracy theories in light of the widespread use of social media.

Quality assessment

All selected studies underwent methodological quality assessment using the Mixed Methods Appraisal Tool (MMAT) [18]. Quality scores were calculated by assigning one point for meeting the criteria and zero points for not meeting the criteria or "can't tell". All 28 articles were assessed as suitable for inclusion in the qualitative synthesis. The full quality assessment sheet is provided in supplementary Appendix 3. Author MK conducted the assessment, with another author (MT) cross-checking 30% of the papers to ensure inter-rater reliability, resulting in 100% agreement after discussion.

Data extraction and synthesis

For data extraction, we recorded key details from each study, including first author and year of publication, geographic location of data collection, study design (and sample size), and the SPIs examined (see Table 1). To facilitate comparison and synthesis of how SPIs were investigated, information such as study title, objectives, and methodology, including the use of theoretical frameworks and other contextual considerations was additionally extracted (see Tables 2 and 3).

Drawing on the methodologies of Noblit and Hare [19] and together with those of Atkins and Lewin [16], the synthesis was conducted as a qualitative comparative analysis. This process involved three stages. First, we examined how each study investigated SPIs. Second, we compared study summaries to identify commonalities and recurring themes. Third, we analysed the summaries further to consolidate conceptually similar themes across

Table 1 Data extraction of the selected study

Study	Study location	Study design	Measurement of Sociocultural and Political influences (SPIs)	
			Sociocultural influences	**Political influences**
Zhu, Beam et al. (2022) [20]	US	Cross-sectional online survey ($n=800$)	/	• Partisanship • Frequency of media use (media with political leaning) • Attitude for governmental officials (DV)
Matute, Palau-Saumell et al. (2022) [21]	Spain	Cross-sectional online survey ($n=507$)	**• Subjective norm and moral norm** **• Social class (control)**	**• The perceived fairness of the government's management of the vaccination process** **• Trust in the central government** **• Political ideology**
Mehta, Chakrabarti et al. (2023) [22]	US	Mixed methods (Interviews (n = 11); Survey $n=283$)	• Collectivism scale	• Party affiliation (Demo)
Keselman, Arnott Smith et al. (2022) [23]	US	Cross-sectional online survey ($n=140$)	• Importance of religion in life • Frequency of attending religious services • Interpersonal Trust	• Political Party affiliation • Political ideology **• Public health Trust**
Winter, Riordan et al. (2022) [24]	New Zealand	One wave of longitudinal online survey ($n=1,358$)	• Conspiracy beliefs	• Political beliefs
Raffetti, Mondino et al. (2022) [25]	Italy and Sweden	Cross-sectional online survey (Sweden ($n=2144$) and Italy ($n=2010$))	• Information on direct experience of an epidemic	• Political orientation (Demo) Trust in authorities
Lin, Chen et al. (2022) [15]	Hong Kong, Japan, South Korea, Singapore, the UK	Cross-sectional online panel survey ($n=6,034$)	**• Perceived information overload about COVID-19 vaccines** • Belief in COVID-19 misinformation **• Collectivism**	**• Authoritarian mentality**
Schernhammer, Weitzer et al. (2022) [26]	Austria	Cross-sectional online survey ($n=1,007$)	• Psychosocial attributes (**Optimism, Resilience, Need for cognitive closure)** • Reasons for adherence • Questions regarding the pandemic and COVID-19 vaccine	• Voting behaviour (SES)
Bogg, Milad et al. (2023) [27]	US	Longitudinal online survey (Baseline: $n=500$; Wave1: $n=451$; Wave 3: $n=393$)	**• Big Five Traits** (agreeableness, conscientiousness, extraversion, neuroticism, openness to experience) **• Guideline-Related Social Cognitions**	• Political orientation
English, Wang et al. (2023) [28]	29 provinces in China	Cross-sectional online survey ($n=1872$)	**• Personal trait (responsibilism)** **• Descriptive & injunctive norms**	/
Ali-Saleh, Bord et al. (2023) [29]	Israeli Arabs	Cross-sectional online survey ($n=558$)	• Religion (Demo) • Degree of religiosity (Demo) • Trust in informal • factors (the clergy, friends, and family members) • Trust in information from the formal media • Trust in information • from the informal media • Pandemic fatigue	• Trust in formal factors: trust in State of Israel
Enders, Uscinski et al. (2022) [30]	US	Cross-sectional online survey ($n=2,065$)	**• Conspiracy thinking** **• Social media use** **Religiosity**	**• Ideology** **• Partisanship** **• Trump Thermometer**
Park, Ham et al. (2021) [8]	South Korea	Cross-sectional online survey ($n=1000$)	/	• Political identification (Demo) **• Trust in government**
Siani, Carter et al. (2022) [31]	UK	Cross-sectional online survey ($n=389$)	• Religious beliefs Stance on social and economic matter	/

Table 1 (continued)

Study	Study location	Study design	Measurement of Sociocultural and Political influences (SPIs)	
			Sociocultural influences	**Political influences**
Salazar-Fernández, Baeza-Rivera et al. (2022) [32]	Chile, Mexico, and Colombia	Cross-sectional online survey ($n=2,075$)	• Social influence on COVID-19 vaccination intent • **Conspiracy beliefs about COVID-19 vaccine**	• Political orientation (Demo)
Huynh, Zsila et al. (2023) [33]	US	Cross-sectional online survey ($n=362$)	• **Trust in physicians** • **Subjective norm** **Subjective Socioeconomic Status**	• **Political orientation**
Wollebæk, Fladmoe et al. (2022) [34]	Norway	Cross-sectional online panel survey ($n=50,000$)	• Complacency (anxiety/concern • regarding the consequences of the pandemic) • Alternative media use	• **Ideological constraint** • Confidence (institutional trust, trust in parliament, trust in medical research) • Opposition to COVID-19 policies
Paschoalotto, Costa et al. (2021) [35]	Brazil	Cross-sectional online survey ($n=1,623$)	/	• Political leaning Perception of several institutions' performance
Dye, Barbosu et al. (2021) [36]	173 countries	Cross-sectional online survey ($n=7,411$)	• Sociocultural • measures: Child or elder care responsibilities, • religion) • Psychosocial measures (perceived social support,Multidimensional Health Locus of Control (MHLC), COVID-19-specific measures, COVID-19 prevention strategies)	• Effectiveness of selected institutions and sectors
Cárdenas, Orazani et al. (2023) [37]	Australia	Study 1: Longitudinal online survey ($n=3,024$); Study 2: Cross-sectional online survey ($n=499$)	• **The quality of national social relations** • **National identification** • **Social identity scales** • **Individualism** • **Social dominance orientation**	• **Trust in federal government** • Political orientation (Demo)
Quon, Walker et al. (2023) [38]	US	Prospective online survey ($n=1,757$)	• Frequency of interaction with digital information • Perceived influence in personal physician and in their personal sphere	• Political affiliation • **Media source** • Presidential candidate choice
Santirocchi, Spataro et al. (2023) [39]	Italy	Cross-sectional online survey ($n=750$)	• **COVID-19 misinformation**	• Political orientation • **Trust in science and medical professionals**
Lau, Yuen et al. (2022) [5]	Hong Kong	Cross-sectional online panel survey ($n=4,386$)	• Interpersonal influences • Trust towards family and friends • **Collective good** • **Complacency** • **Constraints** • **Calculation**	• Institutions trust • **Confidence in government's policy** • Vaccination as support to government • Political orientation
Durkin, Flynn et al. (2023) [40]	US	Cross-sectional survey ($n=144$)	/	• Political Ideology
Han, Zheng et al. (2023) [41]	In 25 countries	Longitudinal survey study ($n=2,663$)	• **Injunctive norms** • **General conspiracy beliefs** COVID-19 vaccine-specific conspiracy beliefs	• Religion • Political orientation • Trust in government regarding COVID-19 • **Support for strict collective virus containment measures**
Dolman, Fraser (2022) [42]	US	Cross-sectional online survey ($n=1427$)	• **Social Trust**	• Perceived mass polarization • Political party affiliation

Table 1 (continued)

Study	Study location	Study design	Measurement of Sociocultural and Political influences (SPIs)	
			Sociocultural influences	Political influences
Santavicca, Ngov (2023) [43]	Canada (Multi-province sample)	Cross-sectional online survey ($n=4905$)	• Actions and opinions of friends and family	• **COVID-19 conspiracy theory scale** • Trust in provincial government • Trust in science
De Medeiros and Muniz de Medeiros (2022) [44]	Brazil	Cross-sectional online survey ($n=500$)	• Belief in fake news (mis/disinformation)	• Political orientation • Current president's approval

Note 1. Bold indicates the validated scales

Note 2. "demo" or "SES" refers to items measured in the demographic characteristics or socioeconomic status (SES)

papers. During this iterative process, our initial broad groupings of themes were gradually refined and ultimately developed into the final set of themes presented.

All 28 studies were analysed using an inductive approach. Distinguishing between studies with and without an explicit theoretical framework was essential, as the presence of a framework strongly influenced how SPIs were conceptualised. For framework-based studies, data extraction emphasised the framework's scope and application. For studies lacking a framework, extraction instead focused on the stated objectives, rationales, and contextual considerations.

Results

Study characteristics

The 28 selected papers involved more than 100,000 healthy adults worldwide, with individual sample sizes ranging from ranging from 140 to 50,000. Studies were conducted across a diverse range of countries, with the United States being the most frequently represented (nine studies). Single-country studies were conducted in Australia, Austria, Brazil (two studies), Canada, China, Hong Kong, Israel, Italy, New Zealand, Norway, South Korea, Spain, and the United Kingdom. Additionally, five cross-national studies examined regions such as Italy and Sweden; Chile, Mexico, and Colombia; and Hong Kong, Japan, South Korea, Singapore, and the United Kingdom. Two further studies involved samples from 25 and 27 countries, respectively.

Across the included studies, the most frequently examined SPIs related to COVID-19 vaccine hesitancy were grouped into three categories: (1) sociocultural influences encompassing individuals' perceived levels of collectivism-individualism, social beliefs, psychological traits, and adherence to social norms. (2) political influences involving political views, trust in government, and attitudes towards governmental performance. (3) influences concerning both sociocultural and political aspects include media engagement, exposure to misinformation, and belief in conspiracy theories. Various disciplines have investigated how these SPIs shape COVID-19 vaccine hesitancy, offering diverse insights on this multifaceted issue. A detailed overview of study characteristics is provided in Table 1.

Qualitative comparative synthesis

Two distinct groups of studies emerged based on how SPIs were conceptualised: (1) The first group comprised 13 studies that adopted a theoretical framework to inform study design and delineate their chosen SPIs. As the adopted theoretical framework primarily guided these studies, the synthesis was based on the framework's scope. Accordingly, beyond study title and aims, extraction focused on the name, description, and application of the employed theoretical framework (2) The second group comprised the remaining 15 studies that did not employ a theoretical framework. In these studies, the selection of SPIs was justified by alignment with study objectives, substantiated through literature reviews or by addressing salient contextual issues. For these studies, data extraction and synthesis focused on study objectives, rationales for selecting SPIs, and contextual features described in the literature.

Synthesis of studies that used the theoretical framework

Among the 13 studies that adopted theoretical frameworks, four distinct approaches were identified in the comparative synthesis regarding how SPIs were investigated: (1) Social Cognitive Approach; (2) Disposition-Environment Interaction Approach; (3) Critical Medical Anthropology/Medical Ecology Approach; and (4) Social Structures Approach (see Table 2).

Social cognitive approach Three studies were grouped together as they adopted the Social Cognitive Approach-that is, focusing on cognitive mechanisms such as perceptions, attitudes, beliefs, judgements, and trust in governmental or healthcare authorities, and their impact on COVID-19 vaccination intentions or hesitancy [45]. Specifically, Zhu and Beam [46] adopted the recipro-

Table 2 Synthesis of studies applying theory/framework

Study Characteristics			Theory/Constructs Details		
Authors	**Title**	**Aim**	**Name**	**Description**	**Application in the study**
Social cognitive approach					
Zhu, Beam et al. (2022) [20]	A Social Cognitive Theory Approach to Understanding Parental Attitudes and Intentions to Vaccinate Children during the COVID-19 Pandemic	To understand the contextual factors that influence parents' attitudes towards health officials and their intention to vaccinate children	Reciprocal determinism (TRD) model	Illustrates the interplay among personal factors, environmental factors and behaviour in a reciprocal and dynamic manner	Explored how personal factors of partisanship, the behavioural factor of news media use, and the environmental factor of geographic location related to their attitudes toward health officials and vaccination intention for children
Matute, Palau-Saumell et al. (2022) [21]	Are you getting it? Integrating theories to explainintentions to get vaccinated against COVID-19 in Spain	To explores the factors explaining individuals' intentions to be vaccinated against COVID-19	The integration of the Health-Belief-Model (HBM), the Theory of Reasoned Action (TRA) and moral norms, and fairness views based on the social exchange theory	HBM and TRA explained how people's perceived beliefs, attitudes and social norms predict their health-related behaviours. Social exchange theory studies social behaviour in the interaction of two parties that implement a cost–benefit analysis to determine risks and benefits	Used people's beliefs and perceptions, social norms added moral norms, and perceived justice towards the government to identify predictors affecting people's willingness for vaccination
Huynh, Zsila et al. (2023) [33]	Psychosocial Predictors of Intention to Vaccinate Against the Coronavirus (COVID-19)	To explore predictors of intention to vaccinate against COVID-19 among demographic and personal factors, health behaviors and beliefs, COVID-19-specific beliefs, and trust in physicians	The biopsychosocial model, added trust in physicians, political orientation and the constructs of HBM and TPB	The biopsychosocial model recognizes conceptualizes health and illness as multifaceted phenomena influenced by a combination of biological, psychological, and social determinants	The present study added factors of trust in physicians and political orientation to the biopsychosocial model. It also added the constructs that assessed the general infectability to diseases, disease severity, and susceptibility based on HBM and TPB
Salazar-Fernández, Baeza-Rivera et al. (2022) [32]	Predictors of COVID-19 Vaccine Intention: Evidence from Chile, Mexico, and Colombia	To evaluate the predictive role of beliefs about negative consequences of the COVID-19 vaccine, conspiracy beliefs about this vaccine, and social influence on the intention to vaccinate against COVID-19	The adaptation of the theory of reasoned action	Used negative beliefs towards the consequences of the COVID-19 vaccine, conspiracy theories about the COVID-19 vaccine, and the social influence on the vaccination intention for COVID-19 as predictors of vaccination intention	
Disposition-environment interaction approach					
Bogg, Milad et al. (2023) [27]	COVID-19 Vaccine Intention: Prospective and Concurrent Tests of a Disposition-Belief-Motivation Framework	To test a novel integration of prospective and concurrent associations with COVID-19 vaccine intention	An integrated Disposition-Belief-Motivation Framework	Suggests that a person's actions are determined by their dispositions (personality traits, attitudes, values), beliefs (perceptions, knowledge, understanding of the world), and motivations (desires, needs, goals)	Guides the organization of the posited effects of antecedent demographic and stable characteristics and emergent pandemic-related beliefs, behaviors, and experiences on vaccine intention
English, Wang et al. (2023) [28]	Cultural traits or social norms? Both responsibilism and norms linked to accepting COVID-19 vaccine	To study the factors that influence attitudes toward the COVID-19 vaccine	Trait-situation Theory	Argues that behavior and attitudes are shaped by one's traits and also situational factors	Explored how personal trait (responsibilism) and situational factors (social norms) in affecting people's COVID-19 vaccine acceptance

Table 2 (continued)

Study Characteristics			Theory/Constructs Details		
Authors	**Title**	**Aim**	**Name**	**Description**	**Application in the study**
Enders, Uscinski et al. (2022) [30]	On the relationship between conspiracy theory beliefs, misinformation, and vaccine hesitancy	To explore whether beliefs in conspiracy theories and misinformation should be treated as exogenous to vaccine hesitancy and refusal	A conceptual model of relationship between conspiracy beliefs in COVID-19 and vaccine hesitancy	Demonstrated that vaccine hesitancy and refusal is not directly caused by conspiracy and misinformation, but pre-existing social, political, and psychological motivations	
Santirocchi, Spataro et al. (2023) [39]	Trust in science and belief in misinformation mediate the effects of political orientation on vaccine hesitancy and intention to be vaccinated	To investigate the associations of political orientation with vaccine hesitancy and intention to be vaccinated against COVID-19, and the potential mediating roles of trust in science and belief in misinformation	The Mind Sponge Theory	Explains how and why an individual evaluates and eventually comes to accept cultural values coming from the external setting	Political orientation was conceived of as an established set of core values; Right-wing adherents implied a strong conflict with existing beliefs in their mindsets; Trust in science was a priority channel that facilitates the reception and acceptance
Critical medical anthropology/medical ecology approach					
Mehta, Chakrabarti et al. (2023) [22]	Assessing the role of collectivism and individualism on COVID-19 beliefs and behaviors in the Southeastern United States	To explore the factors explaining individuals' intentions to be vaccinated against COVID-19	Critical Medical Anthropology	emphasizes the critical analysis of power structures, social inequalities, and cultural beliefs that influence health outcomes	
Dye, Barbosu et al. (2021) [36]	Science, healthcare system, and government effectiveness perception and COVID-19 vaccination acceptance and hesitancy in a global sample: an analytical cross-sectional analysis	To estimate impact of perception of science, healthcare systems, and government along with sociodemographic, psychosocial, and cultural characteristics on vaccine acceptance	The Critical Medical Ecology theoretical framework	Examines the relationships of health to physical, biological, and social environments	Prioritises understanding context in analysing health, including systems and power relationships, include a range of variables reflecting biological, sociocultural, healthcare and abiotic measures
Lau, Yuen et al. (2022) [5]	Understanding the societal factors of vaccine acceptance and hesitancy: evidence from Hong Kong	To examine the role of societal factors in COVID-19 vaccine hesitancy in Hong Kong	An integrated socioecological framework based on the 5 "Cs" model, constructs of the HBM and trust	Based on the 5 "Cs" model; threat appraisal were adapted from the HBM, and the self-developed interpersonal influences scales	
Social structures/belief approach					
Lin, Chen et al. (2022) [15]	Contextualized impacts of an infodemic on vaccine hesitancy: The moderating role of socioeconomic and cultural factors	To explore how perceived information overload and misinformation affect vaccine hesitancy and how this is moderated by structural and cultural factors	An extended Fundamental Cause Theory (FCT)	Describes the relationship between socioeconomic statutes and the accessible health resources in communities	Through the process of choice constraints (SES) and competitive valuations (cultural orientation) to affect people's accessibility and evaluation of misinformation
Cárdenas, Orazani et al. (2023) [37]	Social cohesion predicts COVID-19 vaccination intentions and uptake	To assess the link between social cohesion: a multidimensional construct encompassing the experienced quality and importance of the group and COVID-19 vaccination	Social Cohesion (theoretical constructs)	Focuses on three well-supported subdimensions capture both the quality and importance of the group: (1) the positive social relations within the group; (2) social identification; (3) and trust in institutions	

Table 3 Synthesis of studies without theory/framework

Study Characteristics			Extractions from literature review
Authors	**Title**	**Aim**	
Influence from political ideology			
Park, Ham et al. (2021) [8]	Political Ideologies, Government Trust, and COVID-19 Vaccine Hesitancy in South Korea: A Cross-Sectional Survey	To assess the correlation between political ideologies, government trust, and COVID-19 vaccine hesitancy in South Korea	- Context and history, Politics and trust - Government and trust - Many South Koreans refused to get their normal influenza vaccines in 2020 due to their political views
Quon, Walker et al. (2023) [38]	The Influence of Mass Media on the COVID-19 Vaccination Decision-making Process: Prospective Survey-Based Study	To explore decision-making on COVID-19 vaccination, focusing on the influence of media outlets, political orientation, personal networks, and the physician–patient relationship	- Media effects on attitude and thus behavour - Infodemic impact - Political leaning scores assigning to each media outlets
Durkin, Flynn et al. (2023) [40]	Vaccine Attitudes Mediate Relationships Between Caregiver Political Ideology and Likelihood of Child Vaccination for COVID-19	To assess political ideology, vaccine-related beliefs, and likelihood of having their child vaccinated against COVID-19	- Political ideology and VH, US context (In the US, political ideology related to attitude towards vaccine.) - Cognitive drivers of behaviour
Wollebæk, Fladmoe et al. (2022) [34]	Right-wing ideological constraint and vaccine refusal: The case of the COVID-19 vaccine in Norway	To explore how politics affected vaccine attitudes in Norway	- Norway, a country relatively mildly hit by the pandemic and characterized by high trust and a consensual political culture - Coherent ideological views are more stable traits than party preference - More stable (belief) political item
Dolman, Fraser [42]	Opposing views: associations of political polarization, political party affiliation, and social trust with COVID-19 vaccination intent and receipt	To examine associations of political polarization, political party affiliation, and social trust with COVID-19 vaccination intent and vaccine receipt	- Rising political polarization in the U.S - Perceived ideological gaps tied to adverse health outcomes - Liberal elites endorse vaccines; conservative elites distrust them
Political views and trust in science			
Keselman, Arnott Smith et al. (2022) [23]	Cognitive and Cultural Factors That Affect General Vaccination and COVID-19 Vaccination Attitudes	To explore how different cognitive and cultural factors shape public's general vaccination attitudes, attitudes towards COVID-19 vaccines vaccination status	- Novel pandemic, misinformation, trust in experts matters, as modern biomedical knowledge is complex - Some may healthcare establishment (e.g.researchers, practitioners, and policy makers) as hostile outsiders - Information-processing behaviour shapes attitudes - Political views affect trust in authorities and experts - The ability to search, evaluate, and verify construct information literacy
Winter, Riordan et al. (2022) [24]	Conspiracy beliefs and distrust of science predicts reluctance of vaccine uptake of politically right-wing citizens	To determine 1) whether one political orientation predict of an individual belief in conspiracy theories and whether this relationship can be exacerbated by distrust in science; 2) how such a relationship explain an individual vaccine hesitancy	- Political orientation, trust in science affect conspiracy beliefs and thus behaviours - Covid-19 conspiracy affected political party, cross-party support for covid policy - A shift in political alignment between national and parties. Need to know the relationships - Focus on conspiracy theory, politics and vaccine hesitancy, trust in science - In context where political polarized
Siani, Carter et al. (2022) [31]	Political views and science literacy as indicators of vaccine confidence and COVID-19 concern	1) To elucidate whether science literacy and political views predict vaccine confidence. 2) To investigate the association of with different levels of concern about the COVID-19 pandemic	- Historical vaccine hesitancy, low confidence in vaccines - Political views affect trust in authorities and science - "Vaccine hesitancy and political populism are driven by similar dynamics: a profound distrust in elites and experts"
Contextual social cognitive determinants			

Table 3 (continued)

Study Characteristics			Extractions from literature review
Authors	**Title**	**Aim**	
Raffetti, Mondino et al. (2022) [25]	COVID-19 vaccine hesitancy in Sweden and Italy: The role of trust in authorities	To unravel the influence of the risk perception of epidemics along with individual and contextual factors on adherence to COVID-19 vaccination campaigns in Italy and Sweden	- Country level & individual determents were considered in affecting vaccination programme adherence - Perception of the epidemics (experience, likelihood, knowledge, trust in authorities) - Two EU countries with similar welfare state organization, but differing in authority response to the COVID-19 pandemic and their history of vaccination scepticism
Paschoalotto, Costa et al. (2021) [35]	Running away from the jab: factors associated with COVID-19 vaccine hesitancy in Brazil	To investigate how sociodemographic conditions, political factors, organizational confidence, and non-pharmaceutical interventions compliance affect the COVID-19 vaccine hesitancy in Brazil	- Concern regarding public confidence in the vaccination process - Literature indicated that sociodemographic conditions (e.g., education, age, or job occupation) and political and organizational trust aspects affect people's vaccination willingness
Han, Zheng et al. (2023) [41]	Why some people do not get vaccinated against COVID-19: Social-cognitive determinants of vaccination behavior	To examine determinants of actual COVID-19 vaccination behavior by July 2021, with country-level intercept as random effect	- Social-cognitive determinants of vaccination intention and behavior (Perceived risk and seriousness of infection, Attitudes toward COVID-19 vaccines as determinants of perceived efficacy, Sources of COVID-19 information and determinants of trust) and Contextual factors influencing willingness to be vaccinated (Religiosity and Political orientation)
Schernhammer, Weitzer et al. (2022) [26]	Correlates of COVID-19 vaccine hesitancy in Austria: trust and the government	To explore correlates of vaccine hesitancy, considering political believes and psychosocial concepts	- Explored attitudes towards governmentally mandated lockdown measures and correlates of vaccine hesitancy - Vaccine hesitancy could be seen as a symptom of rejection of government or state action - Fear and uncertainty can be countered by improving the understanding of system complexity and the associated risks
Santavicca, Ngov (2023) [43]	COVID-19 vaccine hesitancy among young adults in Canada	To assess the links between vaccine hesitancy profiles, COVID-19 conspiracy beliefs, general vaccine attitudes, and COVID-19–specific factors	- Vaccine hesitancy is a multifaceted process not fully explained by demographics & traditional models - Conspiracy beliefs reflect institutional distrust and linked to lower vaccination intent - General vaccine attitudes and trust in scientists/government vs. unverified sources critically shape hesitancy
De Medeiros and Muniz de Medeiros (2022) [44]	Fake news mediate the relationship between sociopolitical factors and vaccination intent in Brazil	To examine whether belief in fake news mediates the relationship between sociopolitical factors and COVID-19 vaccination intent	- Mis/disinformation influencing vaccine attitudes and intent - Political ideology, education, and age shape susceptibility to fake news, which in turn reduces vaccination intent - Brazil provides a context with strong immunization culture yet intense political polarization

cal determinism model to demonstrate the interplay of political beliefs (personal factors), geographic location (environmental factors), and media usage (behaviours) in shaping trust in authorities and COVID-19 vaccination intention.

Matute and Palau-Saumell [21], together with Huynh and Zsila [33], explored broad social cognitive predictors of COVID-19 vaccination intention, drawing on constructs from conventional behavioural theories, including the Theory of Planned Behaviour (TPB), the Theory of Reasoned Action (TRA), and the Health Belief Model (HBM), to assess people's risk perceptions of the disease. Notably, additional factors such as trust in government and in physicians [21], as well as political orientations [33], were incorporated into the theoretical frameworks. Matute and Palau-Saumell [21] further introduced a novel dimension by integrating perceived fairness of governmental performance, drawing on fairness theory, together with moral norms, into the framework.

Huynh and Zsila [33] claimed to adopt the biopsychosocial approach, a framework focusing on the interconnectedness of biological, psychological, and social factors in shaping human experiences [47]. However, despite incorporating psychosocial elements such as trust in physicians, subjective norms and socioeconomic status, the "biological factors" were operationalised using constructs from the HBM and TPB (disease severity and susceptibility), both of which are cognitive variables. Since the study ultimately relied on cognitive predictors of beliefs and risk perceptions to explain vaccination intentions, it was categorised in this review as an example of the social cognitive approach.

Disposition -environment interaction approach Four studies interpreted individuals' beliefs and behaviours regarding COVID-19 vaccination as an interaction between pre-existing characteristics (e.g., personal traits, demographics, sociocultural contexts) and external influ-

ences (e.g., situational factors, experiences during COVID-19, exposure to misinformation). Particularly, Bogg and Milad [27], as well as English and Wang [28], focused on how behaviours were shaped by antecedent traits and evolving beliefs and circumstances. Bogg and Milad [27] adopted the integrated Disposition-Belief-Motivation Framework, suggesting that vaccination behaviour was shaped by pre-existing dispositions (e.g., personal traits, political orientations), beliefs about COVID-19 and its vaccines, and intentions to vaccinate. English and Wang [28], drawing on Trait-Situation Theory, examined how perceived levels of individualism and shared social norms advocating vaccination influenced vaccine acceptance.

Conversely, Santirocchi and Spataro [39], together with Enders and Uscinski [30]focused on belief formation. Specifically, Santirocchi and Spataro [39] utilised the 'mind sponge' theory, an information-processing framework, to examine how established political orientations shaped trust in science and susceptibility to misinformation, thereby influencing acceptance of COVID-19 vaccines. Enders and Uscinski [30] proposed a conceptual model, arguing that vaccine hesitancy and refusal stemmed primarily from pre-existing sociocultural and political contexts rather than from conspiracy theories and misinformation.

Critical medical anthropology/medical ecology approach Mehta and Chakrabarti [22], Dye and Barbosu [36] and Lau and Yuen [5] examined the influences of cultural beliefs and social structures, as well as the impacts of power dynamics and environmental contexts, in shaping COVID-19 vaccine hesitancy. Specifically, Mehta and Chakrabarti [22] approached COVID-19 vaccine hesitancy through a medical anthropology lens, focusing on how sociocultural beliefs and structures shaped health outcomes [48]. They considered how shared national exceptionalism and individualism, together with politicised beliefs about the COVID-19 pandemic, interacted with structural social inequalities to explain vaccine hesitancy in the United States.

In contrast, Dye and Barbosu [36], as well as Lau and Yuen [5] examined sociopolitical influences on vaccine hesitancy within ecological contexts, particularly power dynamics and political ecology. Dye and Barbosu [36] aimed to predict vaccine acceptance by assessing both sociocultural perceptions of COVID-19 and perceived effectiveness of government and healthcare systems, in a study spanning 173 countries. Lau and Yuen [5], in a study conducted in Hong Kong, analysed factors influencing vaccine hesitancy using the 5Cs model [49]. The study further incorporated political trust in government and interpersonal influences, a consideration especially relevant given the political polarisation and trust crisis prevalent in Hong Kong at the time.

Social structures/belief approach Studies conducted by Lin and Chen [13], together with Cárdenas and Orazani [33] examined how social structures and beliefs affected health-related resources and behaviours. Lin and Chen [15] adopted an extended Fundamental Cause Theory (FCT) framework to illustrate how underlying health disparities were rooted in social structures, such as differences in socioeconomic status (SES), which served as fundamental causes of differential impacts of misinformation. This highlighted the role of knowledge and information as mechanisms contributing to social disparities. Conversely, Cárdenas and Orazani [37] examined the concept of social cohesion, emphasising positive social relations within groups, social identification, and trust in institutions. These factors were used to predict whether perceptions of group quality and importance influenced vaccination intentions and behaviours. This measure was particularly valuable, as vaccination serves not only to protect individuals but also to contribute to herd immunity [50].

Synthesis of studies without theoretical framework

The 15 studies that did not employ a theoretical framework were synthesised into three themes: (1) influences of political ideology; (2) interactions between political views and trust in science; and (3) contextual social–cognitive determinants (see Table 3).

Influences of political ideology Four studies specifically examined the role of political ideology in shaping COVID-19 vaccine hesitancy. Park and Ham [8] reported a significantly low vaccination rate in South Korea one month after the start of the national programme. Building on prior research linking political ideology with negative attitudes toward seasonal influenza vaccines, they examined political views, governmental trust, and COVID-19 vaccine hesitancy. In the United States, [42] examined how partisan identity and perceived political polarisation were associated with vaccination intentions and uptake. Similarly, Quon and Walker [38] explored how the use of different media outlets affected vaccination decisions. They reported politicisation in media use and outlet selection in the US, assigning political-leaning scores to the selected outlets [24], thereby treating media influence as a proxy for political ideology.

In light of the politicisation of COVID-19 vaccine attitudes, Wollebæk and Fladmoe [34] aimed to explore whether Norway, a country characterised by high political trust and a consensual political culture, also shared the same pattern. They hypothesised that attitudes towards vaccines would be more deeply rooted and less susceptible to change if associated with ideology rather than partisanship. To mitigate the influence of elite cues, the study avoided conventional left–right

or conservative-liberal scales, instead employing a composite measure of political ideology based on responses to issues unrelated to COVID-19 or partisanship. This approach provided a more reliable assessment of underlying ideological stances.

Interaction between political views and trust in science Three studies went beyond examining political views alone and instead examined how political views influenced trust in science and scientific literacy, thereby shaping attitudes toward COVID-19 vaccines.

Both in studies conducted by Keselman and Arnott Smith [23], as well as Winter and Riordan [24] emphasised the significance of political polarisation, highlighting the challenges political affiliation posed to trust in science and subsequent vaccine hesitancy. This reflects the widely documented tendency for conservatives to express greater scepticism toward science, resulting in heightened reluctance toward novel vaccines. Against this backdrop, Winter and Riordan [24] focused on the evolution of COVID-19 conspiracy theories, showing how these shifted political alignments between parties and highlighting the need to examine associations among conspiracy beliefs, political orientations, and vaccine hesitancy. Beyond political views and religion, Keselman and Arnott Smith [23] emphasised the importance of trust in science and the critical role of information literacy in enabling individuals to seek, evaluate, and verify information during the pandemic and the rapid development of COVID-19 vaccines.

In contrast to political polarisation, Siani and Carter [31] reported that the UK's historical vaccine hesitancy stemmed from low vaccine confidence. Their study highlighted the influence of political views on trust in authorities and, consequently, on perceptions of the government's handling of the pandemic and vaccination programme [14], while also emphasising the role of scientific literacy in shaping vaccine confidence.

Contextual social cognitive determinants Some studies, with a broad focus on social cognitive determinants, have explored a wide range of political, psychological, and cultural factors influencing COVID-19 vaccine hesitancy. These studies focused more on complex contextual characteristics instead of focusing on specific patterns or employing a theoretical guiding framework. For instance, in Brazil, scholars have underlined how a polarized political context, especially the influence of a president with a history of scepticism towards science shaped vaccine attitudes. Paschoalotto and Costa [35] examined demographic factors, organisational confidence, political trust, and adherence to government-recommended control policies to assess their impact on vaccine hesitancy. In the same setting, De Medeiros and Muniz de Medeiros [44] identified that political orientation, approval of the president, and belief in vaccine-related fake news were critical sociopolitical factors influencing vaccination intent. In Austria, Schernhammer and Weitzer [26] reported that local vaccine hesitancy reflected resistance to government intervention, leading them to examine attitudes and rationales behind government-endorsed measures. They also considered psychological attributes, such as optimism and need for closure, in light of uncertainties and potential side effects of novel vaccines.

According to Raffetti and Mondino [25], a cross-national study was conducted in Italy and Sweden where the authors reported two similar countries with contrasting levels of trust in vaccine programs and authorities. They explored people's perception of the epidemic, including the perceived likelihood of getting the disease, trust in authorities and their perceived epidemic impact on individuals, to examine the effects of social and cultural factors on COVID-19 vaccine hesitancy through the comparison. Similarly, Han and Zheng [41] conducted a longitudinal survey across 25 countries to analyse the impact of social and psychological factors on vaccine hesitancy. They assessed vaccine attitudes and enduring belief factors, including trust in information and authorities, and further investigated how trust in governments related to acceptance of conspiracy theories, thereby influencing vaccine hesitancy. Similar dynamics was observed in Canada and reported by Santavicca and Ngov [43], that conspiracy beliefs, general vaccine attitudes, and institutional trust were central determinants of hesitancy among young adults.

Overall, the synthesis highlighted that studies adopting theoretical frameworks tended to formalise SPIs within defined conceptual models, while those without frameworks more often addressed them through contextual or pragmatic considerations. Together, these patterns underscore the varied ways in which SPIs have been examined, setting the stage for the comparative discussion that follows.

Discussion

This study employed a qualitative comparative synthesis to systematically review how 28 selected studies investigated SPIs on COVID-19 vaccine hesitancy across disciplines. Among the studies with theoretical frameworks, SPIs were examined and synthesised into four approaches: the Social Cognitive Approach, the Disposition-Environment Interaction Approach, the Critical Medical Anthropology/Medical Ecology Approach, and the Social Structures Approach. For studies without theoretical frameworks, approaches were synthesised into three themes: Influences of Political Ideology, Interaction between Political Views and Trust in Science, and Contextual Social–Cognitive Determinants.

Rather than relying on topical syntheses or reviews confined to a single disciplinary standpoint, this comparative synthesis illustrates how different disciplines have conceptualised SPIs and their relationship with COVID-19 vaccine hesitancy. Mapping studies in this way highlights both the interdisciplinary understanding of SPIs and the multifaceted nature of vaccine hesitancy. This synthesis of approaches forms the basis for a more integrated discussion of how SPIs have been interpreted, what they reveal about the complexity of vaccine hesitancy, and the conceptual and practical gaps that remain.

Interdisciplinary interpretation of SPIs

The synthesis illustrated how different disciplines interpreted the same SPIs, emphasising the importance of examining how SPIs were approached rather than merely identifying them. For example, in the case of individualism, vaccines provided both direct protection to individuals and indirect protection to the community through herd immunity [51, 52], and were therefore often framed as a prosocial rather than solely individual decision. Accordingly, the concept of individualism or similar concepts, defined as the tendency or preference of individuals to prioritise their own interests, needs, and rights over those of society as a whole [45, 46], was interpreted in diverse ways across disciplines when assessing its influence on COVID-19 vaccine hesitancy.

In the selected studies, [28] measured individualism as a personal trait to assess perceptions of vaccination as a social responsibility, showing that prosocial vaccination tendencies varied according to individual differences in social responsibility. By contrast, adopting a sociological lens, Cárdenas and Orazani [37] argued that readiness to engage in prosocial behaviours was not a fixed trait but was shaped by perceived social relationships, social identity, and government approval. They conceptualised willingness to vaccinate for the group as a function of perceived group quality (positive social relations and trust in institutions) and group importance (social identification). This interpretation was consistent with previous literature. For example, in a qualitative study conducted in Hong Kong, some participants reported prioritising individual concerns when trust in the government's pandemic management was low [3]. Nonetheless, from an anthropological perspective, Mehta and Chakrabarti [22] interpreted individualism as collective national sociocultural norms in the United States, shaping both the nation-state's pandemic preparedness and response and individuals' adherence to policies and vaccination behaviour. This interpretation was consistent with prior research showing that individuals from collectivist cultures were more likely to vaccinate than those from individualistic cultures [37, 38].

Taken together, these examples demonstrated how 'individualism' was examined from social–psychological, sociological, and anthropological perspectives, each providing valuable insights for promoting prosocial vaccination in future communication. More importantly, these perspectives complemented one another, emphasising the complexity of vaccine hesitancy and underlining the necessity of interdisciplinary exploration in future research.

Interdisciplinary interpretations of vaccine hesitancy

The findings also demonstrated how COVID-19 vaccine hesitancy was conceptualised across disciplines. By examining SPIs at individual and societal levels, the synthesis highlighted the multifaceted nature of vaccine hesitancy and revealedthe inherent limitations of addressing such complexity from a singular perspective.

Interpretations from social cognitive approach

Studies adopting the Social Cognitive Approach indicated that broader sociocultural and political factors influenced COVID-19 vaccine-related attitudes and behaviours through individuals' cognitive processes. Although traditionally employed in health-behaviour research, this approach has often been criticised for treating individuals as predominantly rational decision-makers while neglecting emotions and motivations. For example, individuals who perceived a low infection risk lacked motivation to be vaccinated even when they had high confidence in vaccine effectiveness [49]. Furthermore, the social cognitive approach often underemphasises the the broader sociocultural factors essential for contextualising vaccine hesitancy. To mitigate these limitations, several of the included studies that employed social-cognitive models integrated additional theoretical constructs to enhance explanatory power [21, 32, 33]. However, such integrations inevitably inherited some of the approach's constraints, particularly when applied to health communication strategies.

Interpretations from the disposition-environment approach

In the included studies, the Disposition-Environment Approach viewed vaccination behaviour as the outcome of interactions between relatively stable individual traits and environmental factors. However, it faced difficulties in capturing the multidimensional nature of both traits and contexts, especially given the subjectivity of personal dispositions. The approach also was criticised for overemphasising personal traits while overlooking underlying cognitive mechanisms. In one included study, Milad [25] incorporated people's beliefs and social-cognitive components into the framework to address this limitation. Nevertheless, concerns remained that broader contextual influences were under-represented. As shown

by English and Wang [28], treating individualism purely as a personal trait could not fully explain its predictive role in prosocial vaccination behaviour.

Interpretations from the critical medical anthropology/ medical ecology approach

Several selected studies [5, 22, 36] adopted the critical medical anthropology/medical ecology framework, recognising vaccination behaviour as influenced by broader structural factors such as socioeconomic status, political power, institutional discrimination and cultural norms within society [47, 48]. Although multidisciplinary in orientation, these two approaches often lacked clearly defined constructs, leaving the selection of influential factors to authors' subjective understandings of the research question or specific context. Accounting for a broad spectrum of factors without considering their interrelationships risked overlooking key interactions and producing an incomplete understanding of mechanisms shaping hesitancy. Moreover, the subjective selection of SPIs posed challenges for evaluating and generalising methods and findings. As illustrated in this review, comparing and synthesising studies that employed these approaches was particularly time-consuming and complex.

To sum up, this synthesis demonstrated the diverse ways in which COVID-19 vaccine hesitancy was interpreted across disciplines, contributing to a more integrated understanding of this multifaceted phenomenon. Examination of each approach revealed distinctive strengths and inherent limitations. Importantly, the findings indicated that these approaches were not contradictory but complementary, collectively showing that vaccine hesitancy was shaped by interacting cognitive, social, political, and cultural dimensions. Recognising this complementarity underlined the value of interdisciplinary inquiry for advancing vaccine hesitancy research and guiding more context-sensitive communication strategies.

Limitations

There are several limitations associated with this study. First, the search strategy did not include terms such as *trust*, *misinformation*, or *media*, which may have led to the omission of relevant studies. This reflected a scope choice to prioritise SPIs as analytical constructs rather than topical domains. Second, all included articles were quantitative because the eligibility criteria required SPIs to be a central analytical focus. As many qualitative studies examine vaccination alongside a wider set of determinants rather than isolating SPIs, they did not meet the inclusion criteria. This constraint limited the review's capacity to capture qualitative, process-level insights; a dedicated qualitative synthesis would therefore be a valuable complement to the present review. Finally, the comparative synthesis approach, while useful for integrating evidence across disciplines, was labour-intensive and required cross-domain conceptual judgement, which may affect replicability. Transparency was strengthened by reporting study characteristics in Table 1, detailing extraction variables in Tables 2 and 3, and providing a PRISMA-aligned breakdown of excluded records in Appendix 2.

Conclusion

Vaccine hesitancy is shaped by diverse sociocultural and political influences (SPIs) and is therefore multifaceted and context-specific. This review adopted a qualitative comparative synthesis to examine how SPIs related to COVID-19 vaccine hesitancy were conceptualised and investigated across disciplines. The synthesis of 28 studies highlighted four prevalent theoretical approaches (Social Cognitive; Disposition-Environment Interaction; Critical Medical Anthropology/Medical Ecology; and Social Structures) and three recurrent non-theoretical themes (influences of political ideology; interactions between political views and trust in science; and contextual social-cognitive determinants). By synthesising these perspectives, the review consolidated prior work and clarified the respective strengths and limitations of different approaches, thereby advancing theoretical understanding and informing context-sensitive vaccine communication. In doing so, it underscored the interdisciplinary nature of vaccine hesitancy and provided a foundation for more integrative, cross-disciplinary study designs. Although the immediacy surrounding COVID-19 vaccine hesitancy has eased as the acute phase of the pandemic has passed, the lessons remain substantively significant, offering guidance for future vaccination research, the refinement of communication strategies, and the continued development of interdisciplinary inquiry.

Abbreviations

SPIs	Sociocultural and Political Influences
COVID-19	Coronavirus Disease 2019
WHO	World Health Origination
PRISMA	Preferred reporting items for systematic reviews and meta-analyses
MMAT	Mixed Methods Appraisal Tool
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
HBM	Health Belief Model
FCT	Fundamental Cause Theory

Supplementary Information

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Supplementary Material 1: Appendix 1. Databases, search strategy and results. Appendix 2. Summary of study exclusions based on review scope and design. a. General exclusion categories. b. Breakdown of studies

excluded due to age or special populations. Appendix 3. MMAT quality assessment.

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Authors' contributions
Authors KM and MT designed the study, refined the searching terms, and determined the appropriate methodology for data extraction and data analysis. KM was responsible for the initial literature search and selection process. MT cross-checked the study selection and data extraction. MC advised on the use of methodology and data analysis. KM took the lead in drafting the manuscript, with substantial contributions from MT and MC during the revision process. All authors approved the final manuscript submission.

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The data supporting the findings of this review are available in the supplementary material accompanying this paper. Additionally, the literature sources referenced in this review are publicly available and can be accessed through academic databases or libraries.

Declarations

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Not applicable.

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Competing interests
The authors declare no competing interests.

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