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MOTIVATIONS FOR INVESTIGATING HEALTH INEQUITIES IN OBSERVATIONAL EPIDEMIOLOGY: A CONTENT ANALYSIS OF 320 STUDIES

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Abstract

Objectives: To enhance equity in clinical and epidemiological research, it is crucial to understand researchers' motivations for conducting equity-relevant studies. Therefore, we evaluated author motivations in a randomly selected sample of equity-relevant observational studies.

Study design and setting: We searched MEDLINE for studies from 2020-2022, resulting in 16,828 citations. We randomly selected 320 studies purposefully sampled across income setting (high vs low-middle-income), COVID-19 topic (vs non-COVID-19) and focus on populations experiencing inequities. Of those, 206 explicitly mentioned motivations which we analyzed thematically. We then used discourse analysis to investigate the reasons behind emerging motivations.

Results: We identified the following motivations: 1) examining health disparities, 2) tackling social determinants to improve access, and 3) addressing knowledge gaps in health equity. Discourse analysis revealed that motivations are likely due to concern for social justice and acknowledging the need to emphasize it in research. Other discourses include aspiring to improve healthcare efficiency, wanting to understand cause-effect relationships, and seeking to contribute to an equitable evidence base.

Conclusions: Understanding why researchers assess health equity can aid in developing guidance for health equity that tailors to authors' needs. We will take authors' motivations into account when developing and sharing equity guidance to meet their needs.

Keywords: Equity, observational studies, discourse, themes, motivation, qualitative study design, reporting guidelines

What is new?

Key findings

- Assessment of health equity in observational studies was driven by interest in inspecting health disparities such as differences in disease burden between populations.
- Discourse analysis revealed that motivations are likely due to concern for social justice and acknowledging the need to emphasize it in research.

What is added to what is known?

- The first analysis of motivations for assessing health equity in research.

What is the implication, what should change now?

- Authors need to explicitly describe their motivations for assessing health equity to improve and tailor guidance appropriately.

1. Introduction

Achieving health equity is crucial for meeting various Sustainable Development Goals, including good health, gender equality, and reduced inequalities (1). It plays a central role in public health, global policies, and health systems, emphasizing the importance of incorporating an equity perspective in research (2-5). However, not all research is structured to draw equity-related conclusions (6, 7).

Jull et al. (8), established a framework for identifying equity-relevant evidence, which either focus on populations experiencing inequities or interventions' effects on a subset of these populations. Several frameworks could be used to identify sources of inequities in health, such as the PROGRESS-Plus framework, which considers sociodemographic variables that account for inequitable variations in health outcomes (9). The PROGRESS framework considers Place of residence, Race or ethnicity or culture or language, Occupation, Gender or sex, Religion, Education, Socioeconomic status, and Social capital. PROGRESS-Plus also recognizes additional factors that are context-specific, such as individual characteristics (e.g., sexual orientation), features of relationships (e.g., exclusion from school), and time-dependent transitional periods of life (e.g., incarceration).

Although the concept of equity-relevant evidence was initially proposed for randomized trials (8), it is also relevant to observational studies (10), which can be either analytical or descriptive (11). Observational studies are the prevalent research design in health research (12, 13), often used to explore associations between interventions or exposures and outcomes (14) for informing public health responses (15, 16).

The focus on equity integration in health decisions has spurred guidance development for incorporating equity in epidemiological research. For example, SAGER (Sex and Gender Equity in Research) guidelines emphasize sex and gender analysis (17) and equity reporting guidelines aid investigators in reporting equity-related evidence for informed health decisions and policy (18, 19). Moreover, guidance exists for incorporating equity in trial and systematic review designs (20, 21). However, equity guidance for observational studies remains fragmented and inconsistent (22, 23), lacking integration into global reporting guidelines like STROBE (Strengthening the Reporting of Observational Studies in Epidemiology), potentially complicating equity integration for users.

Despite existing guidance for incorporating health equity in research, challenges persist in generating robust equity-driven evidence. These challenges include the underrepresentation of marginalized populations in research (24, 25), limited focus on social determinants of health, and misalignment of research with the needs of marginalized groups (26). To foster widespread integration of health equity, researchers must engage with tools and reasons for considering equity appropriately, understanding various research motivations. Uncovering these motivations can inform future guidance, enhancing the production of effective health-equity evidence. Notably, the specific arguments advocating for equity consideration in research remain unknown.

The objective of our study is to describe and interpret the reported motivations of authors behind considering equity. We used a qualitative study design with thematic and discourse analyses in a random sample of purposefully selected equity-relevant observational studies to achieve this aim. In this study, we define motivation as the drive that makes a person work towards a specific goal or outcome (27).

2. Methods

2.1 Study overview

Our qualitative analysis of published studies was conducted within a broader initiative to create an equity extension for the STROBE reporting guideline (28, 29). We followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) reporting guidelines (30) and the Guidance for Reporting Involvement of Patients and the Public (GRIPP-2) (31) to report this study.

2.2 Eligibility criteria

Following our study protocol, we utilized a purposeful random sampling method to select 320 observational studies relevant to health equity, guided by Jull et al.'s framework (8). This process involved a three-factor randomized sampling technique, aiming for a balanced representation across different criteria, including country income settings, COVID-19-related studies, and those focusing on populations facing inequities. We randomly screened studies until we reached the inclusion criterion of 320 equity-relevant studies. Screening was conducted by reviewers in duplicate and independently. Additional details are provided in the protocol

(29).

2.3 Searching

An information specialist (TR) developed and reviewed the search strategy in line with the Peer Review of Electronic Search Strategies guideline (32), with further details available in supplementary appendix III. We conducted an Ovid MEDLINE search from January 2020 to March 2022, using a validated search filter for health equity studies (33), owing to the anticipated significance of health equity during the pandemic. To identify cross-sectional studies (34), we modified the observational studies filter by incorporating two specific terms (lines 242 and 243 in supplementary appendix II). The inclusion criteria were expanded to include observational econometric studies, incorporating terms such as "Instrumental variable," "discontinuity design," "interrupted time series," "matching," "synthetic control," and "difference-in-difference." Furthermore, we employed validated study design filters (35) to exclude review articles and randomized controlled trials.

2.4 Sample size and sampling

Based on discussions with our interdisciplinary team, we decided to proportionately sample across the following three factors relevant to understanding variations in equity reporting:

1. Studies focused on populations experiencing inequities and those that stratify their analyses (as defined by the framework proposed by Jull and colleagues (8),
2. Country income setting (high-income vs low and middle-income according to the World Bank Classification),
3. COVID-19 studies and those that are not.

Rationales for selecting these factors are described in the protocol (29).

2.5 Data extraction

We gathered information on the exposure/intervention, the condition under study, study design, and the world region of the studies based on the World Bank Classification (36). To identify explicit mentions of motivations, we scrutinized text segments in the introduction sections of the manuscripts that offered insights into equity considerations in the studies. Screening and data extraction were facilitated through DistillerSR (37). All data were extracted independently by two reviewers, with conflicts resolved through discussion (OD, GM, GMT).

2.6 Analysis and synthesis

We analyzed a subset of studies explicitly mentioning motivations for assessing health equity, using thematic analysis, defined as a method for organizing and reporting themes within a dataset (38). Lead author (GM) used a random sample of 40 studies from the 320 observational studies as an 'open coding' sample, developed initial themes for motivations through recursive and axial approaches, in consultation with the co-lead (OD) (39). Subsequently, we transitioned from axial to relational coding, exploring relationships between coding components (40, 41). We iteratively refined our account of major themes with input from the senior author (GJMT) for audit and verification.

Additionally, we adopted discourse analysis to investigate how power relations shape discourses, focusing on the role of discourse in producing and challenging dominance (42). We examined written communication in the research reports to discern underlying motivations.

2.7 Patient and public engagement

JaT and RGS are members of our patient and public advisory board who are contributing to the development of the STROBE-Equity guidelines. Their involvement has been vital in recognizing the need for these guidelines and refining the checklist by highlighting areas that require equity considerations. These individuals have lived experiences of health inequities and actively participate in health equity research. They were chosen through nomination and prior involvement in related groups.

Throughout the project, our patient and public partners actively shaped the design of this methodological review and provided input on the primary findings. Regular updates were shared with them via email newsletters, quarterly technical advisory meetings, and dedicated patient advisory board meetings. During these interactions, our patient partners emphasized the importance of assessing authors' motivations to inform guideline development.

During the manuscript's initial stages, drafts were shared with both our patient partners and researchers, and their feedback, alongside that of over 45 authors, was thoughtfully incorporated. Prior to the final draft, we

sought their approval, finalizing their crucial role in the project.

3 Results

We identified 16,828 citations from the search. After removing duplicates, we had a total of 15,412 at the title and abstract stage. We assessed a total of 4,021 citations to obtain the first 320 equity-relevant observational studies (Figure 1). We included 206 studies explicitly reporting statements that could be used to understand motivations.

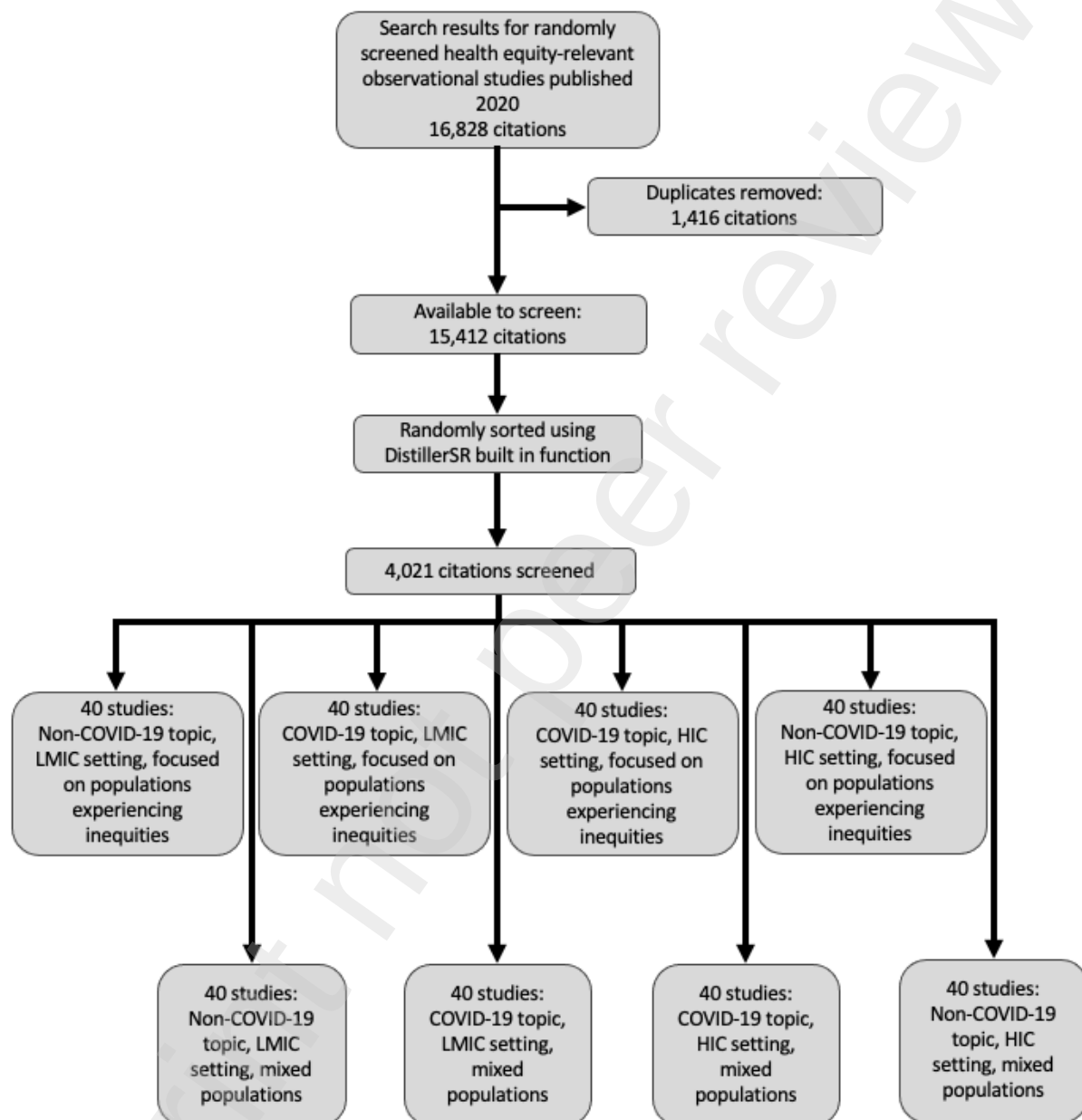


Figure 1. Flow of studies diagram. LMIC: Low-Middle Income Country; HIC: High Income Country.

3.1 Characteristics of included studies

The most common (28%) country of research was the United States of America, followed by China (9%) and India (7%). The majority (69%) of the studies were cross-sectional in design. Most of the studies were relevant to the generic health and well-being of individuals (53%). The most frequent conditions assessed were mental health (15%), metabolic and endocrine conditions (5%) and infections (4%). Over a third (38%) of the studies assessed the effects of a person's individual characteristics on the outcomes of interest. Sixteen percent assessed the impact of social and economic environment on study outcomes, and 15% of the studies assessed physical environment. Eight (4%) studies reported partnership with patients or stakeholders in the research question formulation and study design.

Table 1. Characteristics of included studies.

World region	N (%) = 206
East Asia & Pacific	35 (17)
Europe & Central Asia	33 (16)
Latin America & Caribbean	16 (8)
Middle East & North Africa	11 (5)
North America	70 (34)
South Asia	21 (10)
Sub-Saharan Africa	17 (8)
Multiple regions	3 (1)
Study design	
Cross-sectional	141 (68)
Retrospective cohort	45 (22)
Prospective cohort	18 (9)
Case-control	2 (1)
Conditions	
Generic health relevance	103 (50)
Mental health	33 (16)
Metabolic and endocrine	13 (6)
Infection	9 (4)
Cardiovascular	9 (4)
Cancer and neoplasms	9 (4)
Disputed aetiology and other	2 (1)
Injuries and accidents	5 (2)
Musculoskeletal	2 (1)
Neurological	1 (0.5)
Oral and gastrointestinal	6 (3)
Renal and urogenital	6 (3)
Reproductive health and childbirth	8 (4)
Respiratory	1 (0.5)
Skin	1 (0.5)
Stroke	2 (1)
Exposure/intervention	
Person's individual characteristics and behaviours	70 (34)
Physical environment	23 (11)
Social and economic environment	34 (17)
No exposure/intervention	92 (45)
Involved patients or stakeholders in research question formulation and study design	8 (4)

3.2 Themes for the motivation behind assessing health equity

We identified three themes through the thematic analysis framing the motivation behind assessing health equity in observational studies: 1) inspecting health disparities such as differences in disease burden between populations, 2) addressing social determinants through exploring approaches to eliminate access issues in populations experiencing inequities, and 3) directing research questions to fill knowledge gaps related to

health equity. (Table 2 provides exemplar quotes from included studies). The themes and their respective subthemes are described below.

Table 2. Themes of motivations for assessing equity in equity-relevant observational studies.

Theme/motive	N (%)	Exemplar quote from included studies
Health disparities		
Differences in outcomes of care	38 (12)	"Such information is necessary to better understand the role health systems and stroke services play in stroke inequities and inform the development of programmes that achieve greater equity."(43)
Differences in disease burden between populations at risk and other populations	114 (36)	"Inequalities in infant mortality in England and Wales remain of concern, with relatively high risks in some Black and South Asian ethnic groups [1] and for disadvantaged mothers. [2] These inequalities reflect similar ethnic and socioeconomic variation in the occurrence of preterm birth, [1, 2] which is very closely associated with infant mortality. Preterm babies (under 37 weeks' gestation) constituted 8% of live births in England and Wales in 2015, but 72% of those who died in infancy."(44)
Addressing social determinants		
Political/professional priority	29 (9)	"Eliminating oral health disparities is among the national goals of the U.S."(45)
Reducing healthcare access issues	48 (15)	"Despite global and national efforts to improve maternal care, progress in the utilization of maternal health care services has been uneven across and among countries (Magadi et al., 2003; Say & Raine, 2007; Chopra et al., 2009). Moreover, the extent of inequality has been found to be larger within countries than between them (Mohanty & Pathak, 2009; Ahmed et al., 2010; Barros et al., 2012; Singh et al., 2012). Thus, inequality in access to, and utilization of, maternal health care services remains a significant challenge in many developing countries, including India."(46)
Investigating research questions about equity		
Lack of data	90 (28)	"There are no published studies focusing on ethnic disparities in HBV infection among couples planning for pregnancy, which may help us to assess the priority ethnic groups for HBV intrafamilial prevention and control and to formulate evidence-based policies and data for action, thereby increasing health equities within the hepatitis response in China."(47)
Improve understanding of risk factors	55 (17)	"Determining clinical risk characteristics of COVID-19 from routinely available data of these patients would provide preliminary information regarding risk profiles that clinicians can practically consider for early prevention and counseling of these vulnerable patients from the infection and adverse consequences during this unprecedented situation."(48)
Inconsistent data	17 (5)	"A positive association between resting heart rate (RHR) and mortality has been repeatedly demonstrated in the literature. This association has been replicated in diverse study populations, including cohorts with known CVD, and in healthy populations [2–6]. There is general agreement, that in men, this relationship is driven by excess CVD mortality. However, reports for women are conflicting, varying from a more pronounced effect [7], to a weakened or absent association [8–11]."(49)

3.2.1 Health disparities

Some researchers aimed to assess equity in health care to evaluate the impact of care across diverse populations, seeking to reduce morbidity and mortality of disease conditions. However, interventions often had the potential to mitigate health inequities or worsen them.

For example, Young and colleagues adopted an equity and social justice lens to understand the impact of interventions, highlighting disparities in outcomes between African Americans and whites undergoing simultaneous kidney and pancreas transplantation (50). On the other hand, authors like Wei and colleagues sought to examine health equity due to observed differences in disease burden between populations, exemplified by significant sex differences in the disease burden of oncogenic HPV-related cancers worldwide (51).

3.2.2 Addressing social determinants

Some authors aimed to respond to organizational calls for equity-oriented research by addressing knowledge gaps identified as professional or political priorities. For instance, Gandhi and colleagues sought to provide insights into factors associated with self-reported health status among vulnerable minority adults in the United States, aligned with their study's motivation (52). Conversely, other authors assessed health inequities to reduce access barriers affecting the overall quality of care for equity-deserving populations. Barriers identified included systemic issues, such as, Latinas facing obstacles in seeking care for urinary incontinence and understanding information about pelvic floor disorders due to systemic inequalities (53). Additionally, geographical challenges, such as those seen in rural areas of Nepal, which were highlighted as contributors to difficulty in accessing healthcare .

3.2.3 Investigating research questions about equity

Few authors recognized the limited data available to understand equity-related differences, directing efforts and resources to address these gaps. This was particularly evident in COVID-19 research, revealing the disproportionate impact on people of color, those with low-income, and chronic conditions caused by long-standing racial disparities in health and healthcare access. Authors in this context identified this lack of information as a driving force for assessing health equity. For instance, Fernandes and colleagues underscored the need to understand the effects of COVID-19 on low-income hospitalized pediatric populations due to the dearth of research in this area (54).

Alternatively authors focused on identifying risk factors in the causal chain of inequities to unravel their complex origins. For example, Sees and colleagues highlighted the challenges in identifying signs and symptoms of compartment syndrome (CS) in children and aimed to pinpoint risk factors such as age and sex/gender to expedite the identification of pediatric CS (55).

In another subtheme within this category, authors sought to investigate inconsistencies in evidence. For example, Hipp and colleagues aimed to explore the relationship between parenthood and the incidence of heart disease, utilizing data from the US Health and Retirement Study (HRS) to inform policy and decisions. They specifically considered predisposing characteristics (e.g., age, birthplace), socioeconomic factors (education and income), and lifestyle characteristics (smoking status and physical activity [PA]) (56).

3.3 Discourse structures

Our discourse analysis identified four discourse strands that uncover the unspoken and unstated assumptions implicit within the motivations: 1) investigating research for its implications to social justice, 2) improving healthcare efficiency, 3) understanding cause-effect relationships and, 4) contributing to an equitable evidence base. Exemplar quotes are presented in Table 3.

Table 3. Discourses for assessing equity in equity-relevant observational studies.

Discourse	N (%)	Exemplar quote from included studies
Emphasizing social justice in health	128 (40)	"The currently available treatments to prevent PTB, including weekly 17 alpha-hydroxyprogesterone caproate (17OHP À C) injections and cervical cerclage, are available only to a small number of pregnant women, who had a prior spontaneous PTB (3–5% of pregnant women) [12] or short cervical length (approximately 2% of pregnant women) [13], reflecting the current lack of specificity in identifying women at risk for PTB and the limited application of effective PTB prevention approaches [14]. Altogether, these results suggest that the focus on within-person risk factors have limited impact on the PTB landscape within the United States."(57)
Prioritizing Healthcare efficiency	48 (15)	"Although improving access to timely health care is a priority across orthopedics, it is especially important after pediatric ACL injuries, where delays in care have been shown to increase the risk of chondral injury and irreparable meniscal damage. ^{21,22} With the incidence of ACL injuries in children and adolescents rising, it is paramount to identify disparities in care to address them promptly. ^{23,24} Previous investigations have found decreased access to care for adolescents with Medicaid after ACL injury. ²⁰ Williams et al found an increased incidence of chondral injury and meniscal tears and a longer delay to treatment in children with public insurance after ACL injury. These findings highlight both the importance of early care after ACL injury and the clinical impact of disparities in pediatric and adolescent ACL care."(58)

Understanding cause-effect relationships	47 (15)	"Ethnic and generational differences in six physical health outcomes (including both subjective and objective indicators), and exploring whether the generational differences (if any) can be explained by health-related behaviors and socio-economic status." (59)
Contributing to an equitable evidence base	53 (17)	"There is a growing need for research on the roles of racial and ethnic health disparities in mobility and physical functional limitations (Manton & Gu, 2001; Manton et al., 2008) that often are not fully described in existing descriptive studies." (60)

3.3.1 Emphasizing social justice in health

In nearly half of the studies, authors articulated motivations to assess health equity, emphasizing social justice and its implications for the research conducted. They applied the concept of social justice in various contexts, resulting in different definitions and understandings of health equity. For example, Bublitz and colleagues highlighted the inequitable access to pre-term birth (PTB) treatment for women in the United States, emphasizing the lack of specificity in identifying at-risk women, thereby hindering optimal treatment provision (57). Some authors conceptualized social justice in terms of individuals' ability to maintain their roles and activities after experiencing health events. Schneider and colleagues drew attention to the significant social involvement loss experienced by individuals with burn injuries, impacting employment, relationships, and social interaction (61). They linked this to increased social isolation and financial hardship, thereby affecting their ability to fulfill previous social roles.

3.3.2 Prioritizing healthcare efficiency

The discourse of prioritizing healthcare efficiency aims to restructure medical services for better resource allocation, emphasizing time pressures, economic tensions, and care processes that might compromise best practices (62, 63). Previous investigations have shown reduced access to care for adolescents with Medicaid after ACL injury, resulting in delays and subsequent complications, placing an increased burden on the healthcare system and escalating costs. This emphasis highlights the desire to ensure appropriate distribution of healthcare resources.

3.3.3 Understanding cause-effect relationships

Authors often approach health equity from a cause-effect perspective, aiming to unravel the intricate pathways shaping health outcomes. This process acknowledges that health inequities stem from social, political, and economic factors. For example, Yahirun and colleagues aimed to understand the impact of children's education on the depressive symptoms of low socio-economic older parents, highlighting the underlying factors contributing to health inequities and proposing strategies for their mitigation or prevention (64).

Another aspect of this discourse involves identifying equity-relevant factors influencing the endpoint outcome. For instance, Holmberg and colleagues investigated the influence of first language on all aspects of COVID-19 infection control and treatment, including public education, testing, treatment, and contact tracking, emphasizing the relationship between first language and COVID-19 infection rates and health outcomes (65).

3.3.4 Contributing to an equitable evidence base

To bridge the equity gap, data-driven equity decisions require an equity lens, diverse study participants, and inclusion of populations experiencing inequities in research. Using and collecting data from databases representative of diverse racial, ethnic, and socio-economic backgrounds is essential to establish an equitable evidence base. For instance, Kim and colleagues studied the influence of racial differences on social well-being in older adults, aiming to provide nationally representative evidence for the United States (66). Moreover, in areas lacking equity-related evidence, research can address these gaps by exploring the impact of programs and interventions on equity, thereby promoting more equitable outcomes. This was illustrated by Vasquez and colleagues as they sought to investigate racial disparities in mobility and physical function in older adults, given the lack of evidence available in descriptive studies (60).

4. Discussion

In this article, we aimed to understand the motivations and rationales of authors in equity-relevant observational studies. Most frequently, the motivation for assessing equity centered around investigating the impact of interventions on populations experiencing inequities, with additional themes such as clinical investigation and examination of social determinants.

Our findings align with existing guidance on considering equity in health research (17, 67-69). For example, the Cochrane Handbook for Systematic Reviews of Interventions discusses how the differential prevalence of a disease can lead to health inequities and outlines steps to address unfair disparities (20). Similarly, CONSORT-Equity reporting guidelines and the STROBE-Equity interim guidelines highlight the identification of unjust health burdens as a catalyst for investigating underlying health inequities within a condition (19, 23).

The implications of our study emphasize the need for future guidelines to address the motivations identified, encouraging authors to report differences in disease burden between populations and the impacts of interventions on health outcomes. Additionally, understanding researcher motivations presents an opportunity for improved knowledge translation, enabling the design of tools that cater to their needs and enhance the uptake of equity guidance.

While our qualitative analysis entailed subjective interpretation, we maintained rigor by involving two reviewers and an expert in qualitative research to ensure robust thematic and discourse analysis. Our sampling strategy adhered to established methodological studies, employing a study power calculation and a random sample of studies to ensure comprehensive representation of the literature.

5. Authors reflexivity

Our diverse, global, and multidisciplinary research team consists of patients, observational study authors, epidemiologists, social scientists, methodologists, statisticians, funders, ethicists, and knowledge users. This inclusive team composition represents a spectrum of low- and high-income countries, genders, ethnicities, career stages, and disciplines. Notably, our team comprises experts from the Royal College of Physicians and Surgeons of Canada, PAHO/WHO, esteemed journal editors, the Public Health Agency of Canada, and the Canadian Agency for Drugs and Technologies in Health, all sharing a common interest in advancing social justice in health research. With extensive proficiency in qualitative, quantitative, mixed-method approaches, and systematic reviews, our diverse team also possesses expertise in community engagement, health policy, health inequities, and equity, diversity, and inclusion. For a comprehensive overview of our team's capacity and credentials, please refer to Appendix IV.

6. Conclusions

Our study offers insights into the motivations underlying the assessment of equity in observational studies. By uncovering potential sources of confusion in the conceptualization of health equity through language and meanings, our research can inform the development of more inclusive and equitable research strategies. For authors facing challenges aligning their research with an equity-oriented perspective, our findings provide valuable insights into potential reasons. Understanding these motivations can guide the customization of future guidance to better support researchers in their work.

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Conflict of interests

The authors declare no competing interests. LGC is employed by the Pan American Health Organization (PAHO/WHO). The ideas expressed in this manuscript are the authors' own and do not necessarily reflect the decisions and policies of PAHO/WHO.

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