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CENTERING RACIAL HEALTH EQUITY IN SYSTEMATIC REVIEWS

Paper 4: a systematic review on the use of logic models and frameworks for methodological conduct of evidence synthesis

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Abstract

Objectives: To identify evidence syntheses of health interventions addressing racial health equity reporting the use of equity-focused frameworks and logic models.

Study Design and Setting: The search strategy included three sources; a search of three bibliographic databases to identify systematic reviews assessing interventions to improve racial health equity, semistructured interviews with diverse group and a targeted organization website searches (eg, National Institute of Health, United States Preventive Services Task Force) to identify relevant logic models and frameworks. The searches were conducted between January 1, 2020, and January 25, 2023. We used a qualitative approach to identify and describe key characteristics of equity-focused logic models and frameworks used in evidence syntheses.

Results: Of the 153 racial health equity-focused evidence syntheses identified, two explicitly used logic models to describe the intervention mechanism. We identified seven existing health equity frameworks from semistructured interviews and electronic search of key websites that were categorized by stated purpose as providing guidance for 1) research, 2) health policy, 3) digital health-care solutions, and 4) clinical preventive services. Two out of seven frameworks included guidance on integrating frameworks or logic models in evidence synthesis while the majority provided contextual information on how to define or consider race or racism as a structural determinant of health.

Conclusion: There is limited use of logic models and frameworks in evidence syntheses addressing racial health equity. There is a need for more applied frameworks providing guidance for framing, conducting and interpreting findings of evidence syntheses addressing racial health equity.

Keywords: Logic model; Stakeholder engagement; Interest holders; Engagement; Framework; Scoping review; Systematic reviews

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Plain Language Summary

The goal of this study was to find reviews of health programs that focus on improving racial health equity, and to see if they used special frameworks or models designed to address equity. To do this, we searched three major research databases, conducted interviews with a diverse group of people, and looked at relevant organization websites (like the National Institute of Health and the World Health Organization) between January 2020 and January 2023. We used a qualitative approach to study the key features of these equity-focused frameworks and models. We found 153 reviews focused on racial health equity, but only two of them used logic models to explain the intervention. From interviews and website searches, we identified seven existing health equity frameworks. These were grouped into four categories: research, health policy, digital health care, and clinical preventive services. Only two of these frameworks provided advice on how to use them in evidence reviews, while most focused on understanding how race and racism impact health as a social factor. In conclusion, there is limited use of frameworks and models in reviews about racial health equity. More practical frameworks are needed to help guide the research and interpretation of these reviews.

1. Introduction

Systematic reviews play a pivotal role in evidence-based health care, offering a rigorous methodology for synthesizing research findings and guiding decision making in clinical practice and policy development [1−3]. In recent years, there has been a growing recognition of the importance of addressing racial health disparities and promoting equity in health-care outcomes. As a response to this imperative, the incorporation of logic models into systematic reviews has emerged as a valuable approach [4−6]. A logic model is a visual representation of the underlying processes by which an intervention effects a change on individuals, communities, or organizations [7,8]. Common synonyms for logic models include idea maps; frameworks; rich pictures; action, results or strategy maps; and mental models. It is well documented that logic models clarify the steps in the systematic review at the outset, such as refining the research question and selecting subgroup analysis based on linkages in the causal chain [8−11] Logic models may also provide a structured approach for understanding complex interventions and their underlying mechanisms, making them particularly relevant in the context of racial health equity [12−14]. However, definitive methodological guidance that incorporates logic models into systematic reviews with a focus on racial health equity is limited.

Lack of knowledge of and disjointed efforts to address the systemic roots of inequity may explain decades of public health failure to reduce health disparities [15]. In the context of racial health equity, systematic reviews urgently need to expand beyond traditional statistical methods linking interventions to clinical outcomes, to also apply health equity frameworks to disentangle mechanisms useful for reducing inequities. However, methodological guidance is needed on integrating these recognized social determinants, the root causes of health inequity, in developing the systematic review evidence base [15]. Despite the undeniable importance of systematic reviews in guiding public health intervention and clinical practice, the absence of a comprehensive racial health equity framework underpinning synthesis methods and interpretation of findings may limit its usefulness in addressing racial health inequities. In this perspective, we conducted a systematic review which addressed the following key questions (KQs):

KQ 1. What logic models and frameworks have been used in evidence syntheses addressing racial health equity?

KQ 2. How can logic models and frameworks guide the methodological conduct of systematic reviews addressing racial health inequities?

2. Methods

The reporting of this review adhered to the PRISMA and PRISMA-E guidelines (Appendix1) [16,17]. We registered the protocol with the Open Science Framework (https://osf.io/nh9mu/) on March 21, 2023.

2.1. Searching and recruitment

KQ 1: We electronically searched MEDLINE via PubMed, the Cochrane Library, and from January 1, 2020, through to January 25, 2023, (reference paper 1 of the series, Viswanathan et al) to identify evidence syntheses assessing interventions to improve racial health equity (eg, scoping reviews, systematic reviews, overview reviews, rapid reviews, synthesis protocols).

KQ 2: To document available logic models or frameworks that provide racial health equity guidance applicable to evidence syntheses, we used semistructured interviews conducted with 29 diverse health equity researchers, policy makers and funders. These participants were recruited from our project steering committee and by referrals reported in detail elsewhere (reference paper two of the series, Ali

What is new?

Key findings

- Less than 2% (2 out of 153) of evidence syntheses addressing interventions to improve racial health equity reported using a logic model for methodological conduct or centering racial health equity in evidence syntheses.
- Seven additional frameworks identified address racial heath equity in general but offered little guidance on integrating these frameworks or logic models in evidence syntheses.

What this adds to what was known?

- There is limited use of logic models and frameworks in evidence syntheses addressing racial health equity.
- Available frameworks in the health equity space fall short of providing comprehensive methodological guidance for use of logic models in evidence syntheses.

What is the implication and what should change now?

- Logic models provide an opportunity to hypothesize pathways for testing influence social and other determinants on racial health equity.
- The knowledge base of health equity frameworks can be updated to include practical guidance for integrating a race lens in evidence syntheses addressing racial health inequities.
- Research in evidence synthesis methods should pilot racial health equity-focused logic models, explanatory models, and other conceptual frameworks to center racial health equity in evidence syntheses.

et al) The 60-minute virtual semistructured interviews addressed racial health equity definitions, scoping considerations, interest holder involvement, evidence synthesis methods, reporting standards, evidence translation, training and resources, and critical next steps for centering racial health equity in systematic reviews. A key question addressed in the interview and of relevance to this paper was ''what systematic review methods are of particular importance to answer questions specific to racial health equity?''. Participants were specifically prompted with the question *''Are you familiar with any frameworks that might help to operationalize racial health equity in systematic reviews?''* to identify relevant frameworks in the published and gray literature. To locate preidentified frameworks from semistructured interview along with other racial health frameworks and logic models we conducted a targeted search of organizational websites (eg, National Institute of Health, WHO, Agency for Healthcare Research and Quality [AHRQ]) and MEDLINE via PubMed. For this review, we defined preidentified health equity frameworks as guidance documents that inform how equity should be considered in research, clinical practice or policy using a defined structure whether described or outlined using graphical illustration.

2.2. Selection and extraction

KQ 1. We used evidence syntheses identified from the primary search done for the centering racial health equity in evidence syntheses project (Reference paper 1, Viswanathan et al). Following pilot testing to ensuring team consensus on the selection and abstraction tool, independent investigators (DF, AP, OD) further extracted data from evidence syntheses reporting on the use of logic models and frameworks for methods and interpretation of results in the review process using prespecified templates in Distiller SR [18].

Conflicts were resolved by discussion and consensus or by consulting a third member of the review team (NS, VW). Quality assessment of all included systematic reviews was done separately using the AMSTAR two and reported elsewhere (Reference paper 5 & 6 of the series, Sathe et al and Welch et al).

KQ 2. We sought guidance documents for using equity-focused logic models to center racial health equity in evidence syntheses. Two investigators (DKF, AP) independently reviewed and extracted data on guidance for the use of logic models and frameworks in evidence syntheses from health equity frameworks identified from semistructured interviews. Information extracted from the systematic review included 1) the logic model design (*a priori*, stated, iterative, or unclear); 2) did the logic model informed the analysis; 3) did the logic model offer methodological insights (eg, inclusion of PROGRESS-Plus); 4) did the logic model address context of the intervention (eg, social or ecological); 5) did the logic model include intervention inputs/activities that allowed for linkage to health outcomes; and 6) did the logic model address different levels of outcomes (eg, intermediate, proximal or distal). Each of these questions were assessed as yes, no or unclear with supporting description from the review (Appendix 2).

2.3. Data synthesis and analysis

We described the use of logic models in evidence syntheses narratively by type and potential use of logic models across 6 dimensions, adapted from Kneale and Harris [8].

We summarized existing health equity frameworks were qualitatively. We included (1) characteristics of the health equity frameworks, (2) a summary of guidance for the conduct and interpretation of findings in evidence synthesis

and (3) whether equity-focused logic models are explicitly mentioned in a table. We also provided a descriptive summary of gaps in these guidance documents.

3. Results

We identified 153 intervention syntheses addressing interventions to improve racial health equity (Fig 1).

Seven existing health equity frameworks [19–24] were identified from semistructured interviews that were reviewed for guidance on logic models and frameworks in the methodological conduct of systematic reviews.

3.1. KQ 1. Use of logic models and frameworks for methodological conduct of evidence synthesis

3.1.1. Do evidence syntheses addressing racial health equity integrate logic models or frameworks to guide, conduct, or interpret findings of the review?

From our review of 153 evidence syntheses addressing KQ 1, 2 explicitly reported logic models as a visual conceptual framework or narrative description of the framework [25,26] for addressing racial health equity in reviews. Both reviews demonstrated the use of the logic model/framework to delineate the intervention mechanisms and more broadly how social determinants may be considered. The remaining reviews, while assessing interventions for improving racial health inequities did not report a logic model or framework for providing methodological insights, intervention context or reporting and dissemination of findings.

Hamm and colleagues conducted a scoping review addressing access to eye care for nondominant ethnic groups in high-income countries utilizing the Levesque logic model for health-care access [26]. The authors used this approach to outline how the characteristics of the intervention might improve access to care from both provider and patient perspectives. The Levesque logic model consists of two perspectives along a linear path, the provider perspective, and the patient perspective. The logic model aligns the intervention pathway across five dimensions, 1) perception or needs and desire for care, 2) health-care

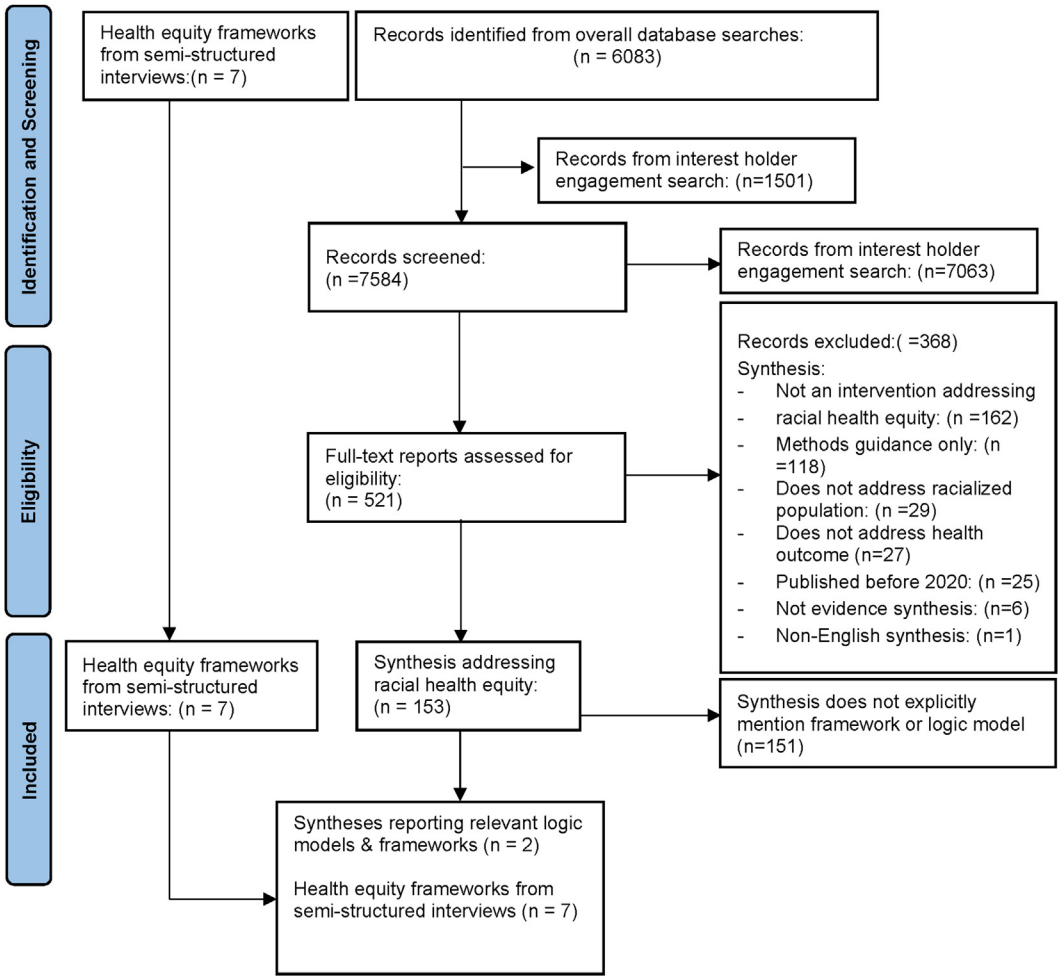


Figure 1. Flowchart of syntheses and guidance documents included in review.

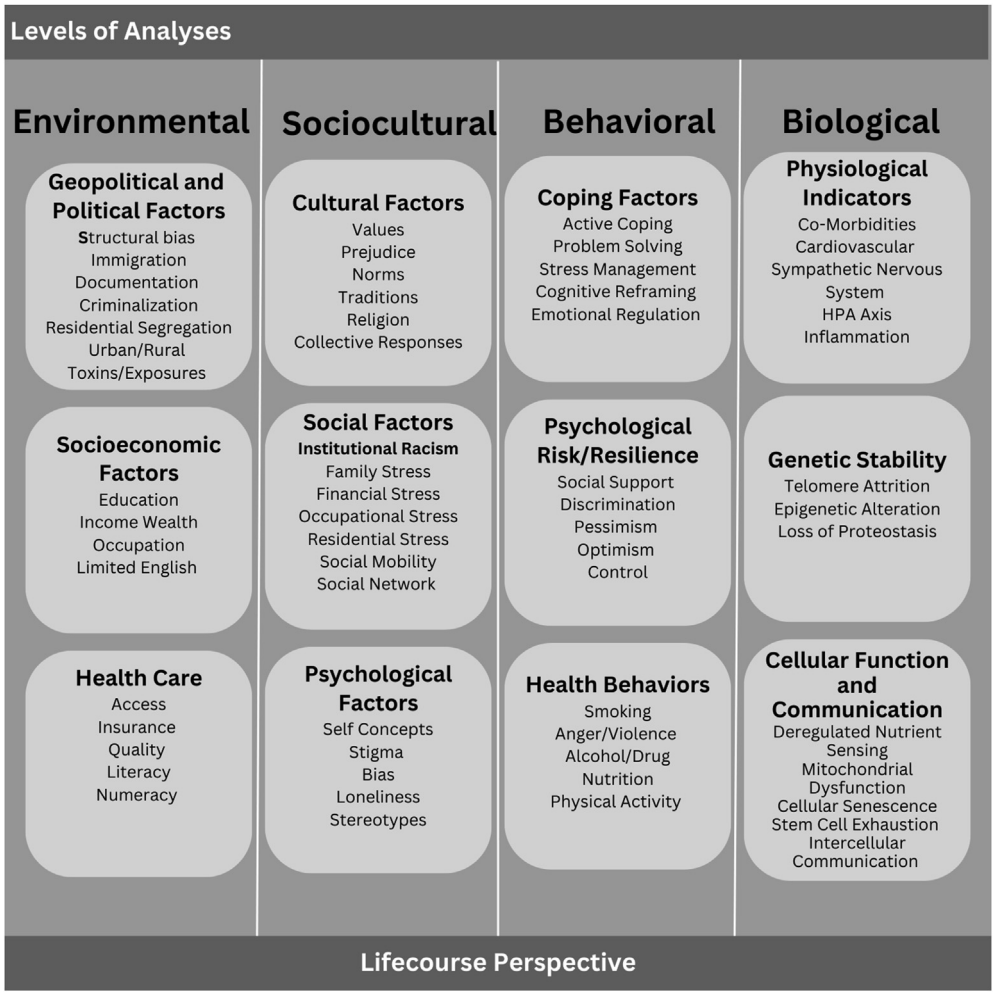


Figure 2. The National Institute on Aging Health Disparities Research Framework ''Reprinted with permission'' [21].

seeking, 3) health-care reaching, 4) health-care utilization, and 5) health-care consequences (Fig 2). The framework was also used to categorize primary studies as interventions that were patient-focused, provider-focused, or both. It was unclear from the review if the Levesque model considered PROGRESS-Plus or contextual factor to the population or intervention.

The second evidence synthesis that reported a logic model was described as a systematic review and highlighted a framework on the ''proposed levels of responsibility for enacting change in social determinants of health in women's cardiovascular disease,'' particularly those of minority racial or ethnic background [25]. Overall, it was unclear how this logic model was used to inform analysis, context and linkages between inputs and outcomes in this review. We were also unable to discern the logic model design. The review outlines a logic model depicting social determinants of health and cardiovascular disparities in women for which it proposes the levels of responsibility for change in health disparities. Four levels of responsibility were proposed as the driving factors for changing health disparities in cardiovascular disease among women. The areas were identified as 1) individual (eg, diversification of patient enrollment in clinical studies), 2) instruction (eg, bias training for health-care staff), 3) professional societies (eg, provision of education on racism and discrimination), and 4) policy (eg, transportation infrastructure).

Overall, both conceptual frameworks and logic model included multiple perspectives (provider or institution and patient). Levesque's framework focused primarily on access without addressing the larger social determinants of health that often interact with access. Meanwhile, the social determinants of health were outlined as the intervening pathway for reducing health disparities in cardiovascular disease among women in model proposed by Lindley and colleagues [25]. Apart from clarifying the intervention and its mechanism, we could not discern whether the reported logic model and framework in these syntheses informed developing or refining the research question,

developing search strategy, selecting outcomes, analyzing data, or communicating findings of the review.

3.2. KQ 2. Existing health equity frameworks: guidance on the use of logic models and frameworks for the conduct and interpretation of findings in evidence syntheses addressing racial health inequities?

We also identified seven existing health equity frameworks [19−24] that provide guidance on the conduct and interpretation of findings in evidence synthesis addressing racial health equity. The characteristics of these health equity frameworks including evidence of explicit guidance on integration of visual or descriptive equity-focused logic models in evidence synthesis is outlined in Table 1.

The National Institute on Aging (NIA) health disparities framework. This framework was developed to highlight fundamental factors that determine priority populations for health disparities research [21]. The framework identifies race, ethnicity, socioeconomic status, disability status and gender, and sex identity as important to all levels of analysis. It defines 4 levels of analyses across the life course: environmental, sociocultural, behavioral, and biological, which should be included as targets for interventions to reduce health disparities (Fig 2). This framework does not explicitly provide guidance for or refer to the evidence synthesis process in addressing health inequities.

The Institute on Minority Health and Health Disparities framework. As an evolution of the NIA health disparities framework, this framework combines the NIA framework with the WHO socioecological model for health. This Institute on Minority Health and Health Disparities research framework proposes a multilevel, multidomain model used to depict the varying health determinants relevant to understanding and addressing minority health and health disparities promoting health equity [20]. The framework highlights the need for research addressing both biological and social determinants of health rather than exclusively focusing on one or the other. The framework includes domains of influence across the life course and levels of influence across the socioecological factors linked to health outcomes (Fig 3). The framework also defines minority populations as Blacks/African Americans, Hispanics/Latinos, Asians, American Indians/Alaska Natives, and Native Hawaiians/other Pacific Islanders. However, there is a notable absence of guidance on how to incorporate this approach in evidence synthesis aimed at addressing racial health disparities.

Racism and Health Framework. Williams & Mohammed [24] outline a framework establishing pathways between racism and health. The framework provides a logic model depicting the causal pathway between basic contributors such as institutional and cultural racism and health outcomes such as mortality and disability (Fig 4). This logic model also includes components of the WHO socioecological model in addition to providing mechanism through which biology or geographic origin, societal institutions and racism both intersect and influence health outcomes through a shared set of intermediate pathways. The framework thus provides a causal mechanism which researchers may use for conceptualization of racial equity in the review as well as inform scoping of the review question, search development, analyses, and interpretation of findings. However, it does provide guidance to facilitate the integration of this framework in the processes of conducting systematic reviews.

AHRQ Digital Healthcare Equity Guide. We also identified an AHRQ project [19] working to develop a digital health-care equity guide. At the time of this review, there were no data beyond the project description, which indicates that the framework guide will be applicable to both patient-facing solutions, such as mHealth applications, and clinician-facing solutions, for clinical decision support and risk prediction algorithms.

The Racial Equity Framework for Assessing Health Policy. This framework [23] provides an approach for analyzing the racial equity implications of health policies. The framework presents a set of key questions that addresses the engagement of minoritized populations in the policy process but does not report any guidance specific to methods in evidence synthesis reviews.

The United States Preventive Services Task Force (USPSTF) Health Equity Framework. This framework [22] aims to incorporate a health equity lens through the entirety of the USPSTF recommendation-making process. The framework provides a checklist of key items for consideration in evidence deliberation and evidence review. The framework references the importance of system-based logic models/conceptual models and the added value they provide in capturing the complexity of interventions, in communicating key contextual moderators, and as a visual tool for communicating the scope of the evidence review. It provides detailed guidance on the evidence review process, ranging from key questions, searching, quality appraisal, data synthesis, and analysis, to expert review and public comment. The USPSTF health equity framework also supports the use of an Evidence-to-Decision framework to help organize the evidence deliberation by end users.

The World Health Organization Social Determinants of Health. The conceptual framework for action on the social determinants of health outlines the interrelatedness of social, economic, and environmental factors that influence health outcomes [28]. The framework outlines in a visual model how the socioeconomic and political context interplays with structural determinants and social determinants of inequities to influence intermediary determinants and the impact on equity in health and well-being. These components, in particular structural determinants, demonstrate both the influence of race/ethnicity on health opportunities and risks as well as the inequities that results when root causes are not considered. The framework presents a way for systematic review researchers to conceptualize

Table 1. Summary of existing health equity frameworks: guidance for systematic reviews

Name of framework, year of publication	Source	Stated purpose of the framework	Does the framework describe the evidence synthesis processes to ensure that equity is considered at one or more stages, if so, how?	How does the framework help organize knowledge around the significance of race and its role as a contextual factor, core determinant or linked to an outcome?
NIA Health Disparities Framework, 2015	United States Federal Agency	Research The framework organizes factors examined in health disparities research related to aging. There are 3 stated objectives: 1) To determine priority populations for health disparities research, identifying race, ethnicity, socioeconomic status, disability status and gender, sex identity as important to all levels of analysis 2) Provide organizational structure for tracking progress and identifying areas of need 3) the identification of factors at multiple levels of analysis provides the opportunity to better delineate causal pathways, linking environmental, sociocultural, behavioral, and biological factors to health and disease	The framework offers multiple levels of analysis provide a broad scope for scoping, searching, analysis, and interpretation of results in the evidence synthesis process. However, there is no explicit guidance for integration in the research or evidence synthesis process. As stated in the framework, it is slanted toward stimulating multidisciplinary approaches, evaluating research productivity and identifying opportunities for health disparities research related to aging that may ultimately achieve health equity.	The framework recognizes differences in health outcome by race and proposes that within the environmental domain, structural biases in race may influence geography, socioeconomic factors and health care. It further identifies race as a fundamental or core factor ie linked to health outcomes through multiple layers related to 3 other levels of analysis: sociocultural, behavioral, and biological. The framework is informative in helping to shape how researchers think through questions and pathways for intervention addressing racial health equity.
NIMHD Framework, 2019	United States Federal Agency	Research The framework was developed to convey NIMHD's philosophy and priorities for minority health and health disparities research. The framework emphasizes the necessity of conducting research across multiple domains and levels to address the cumulative and interactive effects of various determinants. It aims to encourage a comprehensive approach to health disparities research by focusing on both biological and social determinants and recognizing both risk and resilience factors.	The framework includes a systematic approach to coding determinants of health disparities. The process involves reviewing the specific aims and research strategies of competing grant applications to determine which determinants are included. This coding process ensures that research funded by the NIMHD incorporates a multidomain and multilevel perspective, thereby addressing equity by considering a wide array of health determinants and outcomes	The framework organizes determinants into various domains such as biological, behavioral, physical/built environment, sociocultural environment, and the health-care system. It includes demographic characteristics associated with health disparity populations like race/ethnicity, socioeconomic status, rural vs urban status, and sexual or gender minority status. These characteristics are fundamental in understanding unique health determinants and outcomes, thus highlighting the significance of race in health disparities research.
William's framework on race/racism on health, 2013	United States, University	Research This framework aims to analyze the scientific evidence demonstrating the negative health effects of racism on racial minorities in the United States.	The framework does not explicitly describe processes to ensure equity at any stage of the research synthesis. The article discusses how racism can negatively affect health outcomes in racial minorities but does not mention any methods to identify or address potential biases in how the research was conducted.	The framework positions race as a social construct that shapes health outcomes through various pathways. It emphasizes that race is not a biological determinant of health but rather a social factor influencing health. Specifically, race is described as the follows: Contextual Factor: Race shapes access to socioeconomic opportunities, quality education, and health care, impacting overall health.

(*Continued*)

Table 1. Continued

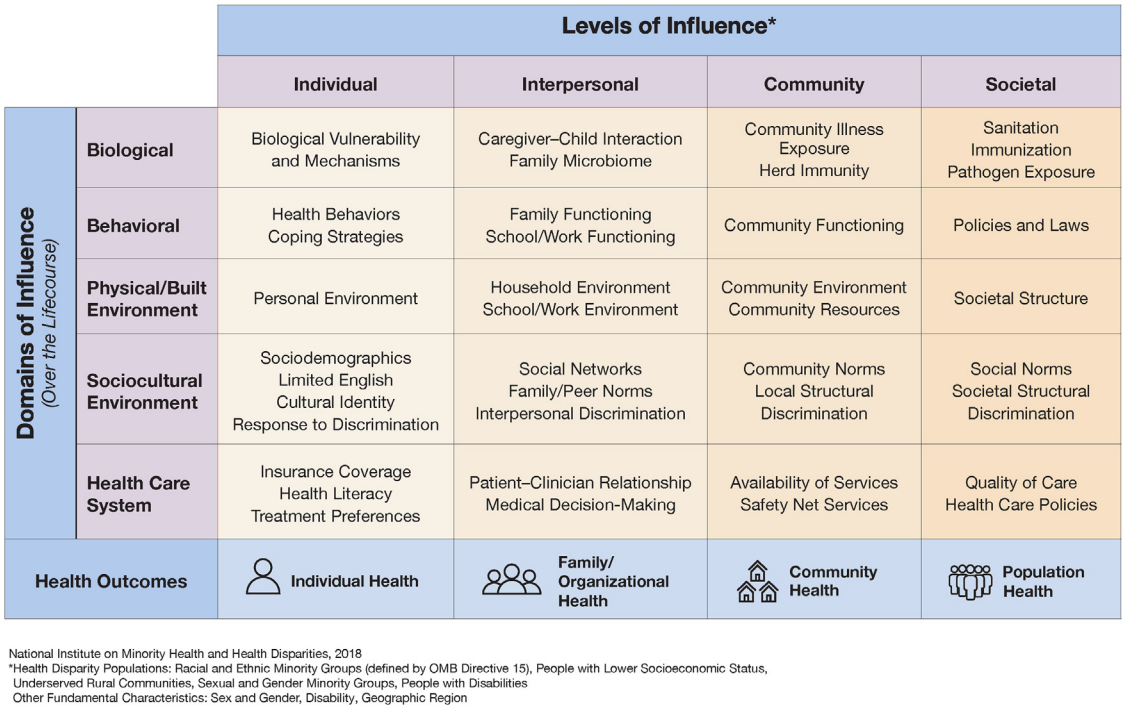
Name of framework, year of publication	Source	Stated purpose of the framework	Does the framework describe the evidence synthesis processes to ensure that equity is considered at one or more stages, if so, how?	How does the framework help organize knowledge around the significance of race and its role as a contextual factor, core determinant or linked to an outcome?
				Core Determinant: Racism itself, through its institutional and cultural forms, is considered a fundamental cause of health disparities. Linked to Outcomes: Experiences of racial discrimination, negative stereotypes, and internalized racism are directly linked to poorer health outcomes.
AHRQ Digital Healthcare Equity Guide, 2021	United States Federal Agency	Digital health-care solutions. The Digital Healthcare Equity Framework is designed to ensure that digital health-care solutions contribute to equity rather than exacerbate disparities. It is structured to assist stakeholders in assessing the equity of digital health-care technologies throughout their lifecycle.	The framework emphasizes evidence synthesis processes to ensure equity. These processes include: Environmental Scan and Technical Expert Panel Engagement: Gathering and analyzing data from various sources and engaging with experts to ensure comprehensive and equitable solutions. Real-World Examples and Feedback Cycles: Implementing methodologies like agile development to continuously refine solutions based on user feedback. Transparent Data Use: Ensuring that datasets used are representative and that the use of data is transparent and ethical.	The framework integrates the significance of race and other sociodemographic factors by: Incorporating Sociodemographic Characteristics: Explicitly considering race, ethnicity, and other relevant factors in the development and assessment of digital health-care solutions. Testing on Diverse Populations: Ensuring that digital health solutions are tested on diverse populations to avoid biases and inaccuracies, such as those seen in pulse oximeters working less accurately on dark-skinned individuals.
Commonwealth Fund REAP framework, 2022	United States Foundation	Racial Equity Framework for Health Policy To establish a conceptually nuanced, empirically informed, and practically useful framework for analyzing the racial equity implications of health policies.	The framework includes processes for synthesizing evidence to ensure that equity is considered at various stages. It emphasizes the need for comprehensive data collection and analysis that disaggregates information by race and ethnicity. This approach helps to identify specific disparities and their underlying causes. The framework advocates for the use of equity-focused metrics and benchmarks in the evaluation of health policies. By incorporating these elements, the framework ensures that policy assessments are informed by robust evidence that highlights racial disparities and the impact of policies on different racial groups.	The framework organizes knowledge around the significance of race by recognizing it as a core determinant of health outcomes and a critical contextual factor. It underscores the importance of understanding how structural racism and social determinants of health contribute to disparities. The framework categorizes race as both a contextual factor influencing health behaviors and access to care, and a determinant linked to health outcomes. This dual recognition helps in framing policies that address the root causes of racial health disparities and in developing interventions that are culturally and contextually appropriate.

(*Continued*)

Table 1. Continued

Name of framework, year of publication	Source	Stated purpose of the framework	Does the framework describe the evidence synthesis processes to ensure that equity is considered at one or more stages, if so, how?	How does the framework help organize knowledge around the significance of race and its role as a contextual factor, core determinant or linked to an outcome?
USPSTF Health Equity Framework, 2023	United States Federal Agency	Clinical Preventive Services To develop a health equity framework for incorporating a health equity lens that spans the entirety of the USPSTF recommendation-making process. This equity framework was used to organize a ''checklist'' of key items that could be considered at each phase of work underlying USPSTF guideline development: a) topic nomination, selection, and prioritization, b) development of the work plan, c) evidence review, d) evidence deliberation, e) development of the recommendation statement, and f) dissemination of recommendations.	The Health Equity Framework describes a multistage process for incorporating equity considerations throughout the recommendation development process. Equity is addressed at various stages, as described below: Topic Nomination, Selection, and Prioritization: Health equity is a criterion for selecting topics for review, meaning the USPSTF prioritizes conditions with significant disparities in prevalence or outcomes across different populations. Evidence Review: The framework emphasizes using inclusive language and living guidance for inclusive language throughout the review process. Key clinical questions addressing health equity are explicitly included and described in the Methods section. Data sources and searches are broadened to consider evidence beyond systematic reviews, including expert-identified sources, national reports, and gray literature, to address equity-related questions. The credibility of subgroup analyses is carefully assessed to ensure they are not misleading. Data synthesis considers stratification by population to identify potential differences in baseline risk and applicability of findings across racial, ethnic or other demographic groups. Expert Review and Public Comment: A high-level summary of comments related to health equity and how they were addressed is included in the final report.	The Health Equity Framework does not categorize race into specific roles (contextual factor, core determinant, or linked to an outcome) but rather recognizes race as a complex issue affecting health across all these areas simultaneously. Interconnectedness: Race interacts with social, economic, and environmental factors to shape health outcomes. Race cannot be isolated as just one factor. Cumulative Impact: Experiences of racism can happen throughout a person's life, and these can add up to have a significant impact on health. Social Context: Racism is embedded in social structures and institutions, limiting access to resources and opportunities that affect health.
WHO SDOH Framework, 2010	Global Organization	The framework aims to: 1. Identify the social determinants of health and health inequities. 2. Show how major determinants relate to each other. 3. Clarify mechanisms by which social determinants generate health inequities. 4. Provide a framework for evaluating which SDOH are most important to address. 5. Map specific levels of intervention and policy entry points for action on SDOH	The framework does not explicitly describe processes to ensure equity at any stage of the research synthesis.	The framework discusses race/ethnicity as a social determinant of health inequities. It classifies race/ethnicity as one of several structural determinants and socioeconomic factors that affect health. These factors create social stratification and assign individuals to different social positions. People of different races/ethnicities may experience different health outcomes due to their socioeconomic position.

NIA, National Institute on Aging; NIMHD, Institute on Minority Health and Health Disparities; AHRQ, Agency for Healthcare Research and Quality; REAP, Racial Equity Framework for Assessing Health Policy; USPSTF, United States Preventive Services Task Force; SDOH, social determinants of health.



		Levels of Influence*			
		Individual	Interpersonal	Community	Societal
Domains of Influence (Over the Lifecourse)	Biological	Biological Vulnerability and Mechanisms	Caregiver–Child Interaction Family Microbiome	Community Illness Exposure Herd Immunity	Sanitation Immunization Pathogen Exposure
	Behavioral	Health Behaviors Coping Strategies	Family Functioning School/Work Functioning	Community Functioning	Policies and Laws
	Physical/Built Environment	Personal Environment	Household Environment School/Work Environment	Community Environment Community Resources	Societal Structure
	Sociocultural Environment	Sociodemographics Limited English Cultural Identity Response to Discrimination	Social Networks Family/Peer Norms Interpersonal Discrimination	Community Norms Local Structural Discrimination	Social Norms Societal Structural Discrimination
	Health Care System	Insurance Coverage Health Literacy Treatment Preferences	Patient–Clinician Relationship Medical Decision-Making	Availability of Services Safety Net Services	Quality of Care Health Care Policies
Health Outcomes		Individual Health	Family/ Organizational Health	Community Health	Population Health

National Institute on Minority Health and Health Disparities, 2018
*Health Disparity Populations: Racial and Ethnic Minority Groups (defined by OMB Directive 15), People with Lower Socioeconomic Status, Underserved Rural Communities, Sexual and Gender Minority Groups, People with Disabilities
Other Fundamental Characteristics: Sex and Gender, Disability, Geographic Region

Figure 3. The National Institute on Minority Health and Health Disparities Research Framework ''Reprinted with permission'' [27].

determinants of inequities at various points across the review processes. For example, the structural determinants component informs the intersectionality of race/ethnicity with other factors like income, education, and employment, which may lead to disparities in health. Essentially, structural racism embedded in these determinants exacerbates health inequities. The conceptual framework does not address practical integration in the systematic review process.

Overall, existing health equity frameworks addressed equity in research including minoritized populations. These health equity frameworks offer broad guidance on addressing equity related to minoritized populations that could inform logic models for centering racial health equity in evidence syntheses. Almost one-third (2 out of seven explicitly reported guidance on the use of logic models and conceptual frameworks to inform conduct and dissemination of evidence syntheses addressing race/racism and health inequities.

4. Discussion

4.1. Summary of main findings

There is limited use of logic models in evidence syntheses of interventions addressing racial health equity for informing knowledge on race or the systematic review process. From the 153 included evidence syntheses only 1 scoping review and a systematic review explicitly reported use of logic models. The logic models were primarily used to describe characteristics or mechanisms of the intervention but had missing or unclear information on the logic model design, its role in informing the analysis, and providing methodological insights and contextual factors to strengthen the review conduct.

We also identified seven existing health equity frameworks that more commonly included visual models/conceptual frameworks that addressed broad equity concerns but were not specific to racial health equity.

4.2. Use of logic models and frameworks

The use of logic models and conceptual frameworks, though limited to two evidence syntheses was consistent with one of its most frequent purposes, which is describing components of the intervention and the complex interaction between the social determinants influencing pathways to outcomes such as reducing health disparities [11,29,30]. However, emerging literature on the importance of frameworks for conceptualization, measurement, and analysis of race and racism in health highlights the need for using equity-oriented logic models for centering racial health equity in evidence syntheses [31−34]. Such models should outline the multiple pathways by which racism affects health and identifies and unpacks how systemic and structural contributors can create race and other social status categories, such as socio-economic status, gender, age, or marital status, that are linked to health through several intervening mechanisms [24,35].

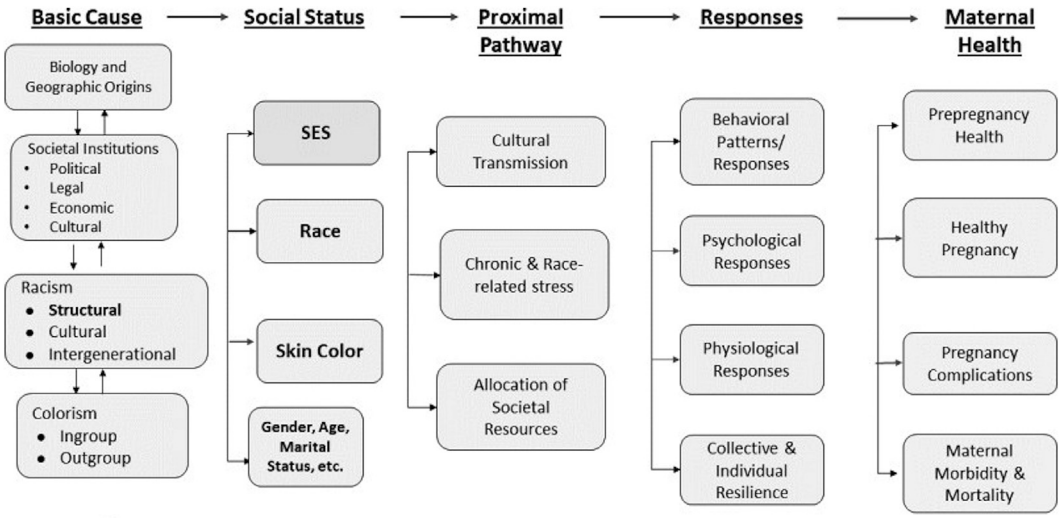


Figure 4. A Framework for the Study of Racism and Health ''Reprinted with permission'' [24].

Beyond their usefulness in outlining the *causal mechanism*, logic models are also useful at several other points of the evidence synthesis, including scoping the review, guiding the searching and identification stages, and during interpretation of the results. In addition, logic models provide visual benefits as a communication tool to present evidence synthesis in a transparent and translatable form for decision making [5,11]. Syntheses addressing racial health equity could consider these areas (searching, synthesis and analysis, and interpretation of findings), which a logic model methodology is well placed to address.

Our review of several health equity frameworks underscores the recognition placed on addressing health inequity, and more recently racial health inequities [36–39]. However, gaps remain in guidance on *how* to center racial health equity in evidence syntheses. Four out of seven included frameworks stated purpose included guidance for research [20–22,24] but provided limited guidance on how these frameworks can or should be integrated in the evidence synthesis process. Most of the frameworks elucidated the interconnectedness of race and racism to other social determinants of health which can inform the scoping or framing of review questions and approaches in addressing racial health equity [40,41]. In particular, the Williams framework for racism and health provides useful guidance the multiple pathways by which racism can affect health through a visual logic model for informing interventions to improve health outcomes and elucidate the interconnectedness between determinants linked to distal outcomes in racial health inequities [24].

Logic models have also been more widely applied to systems-based models or theory models that link theoretical constructs together to explain the underlying assumptions of a program [8]. The health equity framework for the USPSTF recognizes logic models as important to capture the complexity of interventions and more fully depict their causal pathways (mediators and moderators of intervention) and interactions between intervention and broader systems [22]. While outlining the usefulness of systems-based logic models and other explanatory models such as social determinants of health, the framework notes that a barrier for review authors would be understanding when to use specific approaches or a combination. The Center for Disease Control and Prevention racial and ethnic approaches to community health logic model is one such systems-based approach that visually depicts the theory of change for addressing health disparities in local communities [12]. Using such an approach in evidence syntheses addressing racial health equity may be advantageous in that it shows all the different pathways to change, even if they are not related to the immediate intervention and can help elucidate contextual factors as to how and why the health disparities are reduced.

4.3. Limitations

The findings of our review should be interpreted and used with consideration of limitations in the search methods, which was restricted to a 3 year-period (2020-23) inclusive of the COVID-19 pandemic. This limited search period may have had a consequential impact on the comprehensiveness of the findings of this review. Given the demand for rapid evidence syntheses for policy and practice, methodological approaches such as the use of logic models and frameworks may have been excluded for the purpose of rapid publication [42,43]. The search was also restricted to English language publications and focused on racial health equity in the context of the United States. Additionally, many framing tools or structural scaffolding that serve as a framework may not be labeled as such in the literature, which may have resulted in missing these publications.

We also recognize that by necessity this review was focused on race/ethnicity and may have omitted relevant publications both in terms of examples and guidance on social determinants of health at large. This is particularly relevant because our focus on racial health equity conceptualized race as a social risk factor and not a biological one.

5. Conclusion

There is limited evidence of the use of frameworks and logic models in reviews assessing interventions to improve racial health inequities. The availability of racial health equity-oriented frameworks and guidance on including logic model in reviews addressing racial health equity is also sparse. There is a need for more applied frameworks providing guidance for framing, conducting and interpreting findings of evidence syntheses addressing racial health equity.

CRediT authorship contribution statement

Damian K. Francis: Writing – review & editing, Writing – original draft, Validation, Methodology, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Ana Beatriz Pizarro:** Writing – review & editing, Methodology, Formal analysis, Data curation. **Nila A. Sathe:** Writing – review & editing, Project administration, Methodology, Data curation. **Omar Dewidar:** Writing – review & editing, Methodology, Data curation. **Meera Viswanathan:** Writing – review & editing, Project administration, Methodology, Funding acquisition, Data curation, Conceptualization. **Vivian Welch:** Writing – review & editing, Methodology, Funding acquisition, Data curation, Conceptualization. **Tiffany Duque:** Writing – review & editing, Project administration, Methodology, Funding acquisition, Data curation. **Patricia C. Heyn:** Writing – review & editing, Methodology, Conceptualization. **Elizabeth A. Terhune:** Writing – review & editing, Methodology, Data curation. **Rania Ali:** Writing – review & editing, Methodology, Formal analysis, Data curation. **Dru Riddle:** Writing – review & editing, Funding acquisition, Conceptualization.

Declaration of competing interest

There are no competing interests for any author.

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Supplementary data

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Data availability

Data will be made available on request.

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