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Use of cultural appropriateness strategies and behavioral frameworks in behavioral interventions for black and hispanic cancer survivors: a systematic review

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Abstract

Background Black and Hispanic cancer survivors experience significant inequities in supportive cancer care. Incorporating cultural appropriateness strategies and behavioral frameworks into supportive care interventions can improve cancer outcomes of Black and Hispanic survivors. This review evaluated behavioral oncology trials for Black and Hispanic cancer survivors to assess their use of cultural appropriateness strategies and behavioral frameworks.

Methods A systematic search was conducted across seven databases with a cutoff date of November 15, 2023: 1) PubMed, 2) Cochrane Central Register of Controlled Trials, 3) Embase, 4) Cumulative Index of Nursing and Allied Health Literature, 5) APA PsycInfo, 6) Scopus, and 7) Web of Science. Studies with Black or Hispanic cancer survivors, with or without a comparator, were included.

Results Thirty-seven trials met the inclusion criteria. Most focused on Black survivors ($n = 19$, 51.4%) and breast cancer survivors ($n = 32$, 86.5%). Most were psychosocial interventions addressing quality of life or distress ($n = 20$, 54.1%). Culturally appropriate strategies were reported in 86.5% ($n = 32$) of trials, with the most common being sociocultural ($n = 30$, 81.1%;), constituent-involving ($n = 27$, 73.0%;), and linguistic ($n = 20$, 54.1%;). Behavioral frameworks were reported in 56.8% ($n = 21$) of trials, with Social Cognitive Theory ($n = 10$, 52.6%) and Stress and Coping Theory ($n = 3$, 15.8%) being the most frequent. Less than half combined cultural adaptation strategies and a behavioral framework ($n = 18$, 48.6%).

Conclusion While most trials incorporated cultural appropriateness strategies, fewer utilized behavioral frameworks, and even fewer used both. Future research should integrate these approaches to improve cancer outcomes and address disparities.

Keywords Cancer survivors, Racial and ethnic minorities, Health disparities, Cultural appropriateness, Behavioral framework

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Background

Despite substantial reductions in cancer incidence, mortality, and related symptomatic toxicities, cancer disparities continue to persist, particularly among Black and Hispanic individuals [1]. Black and Hispanic individuals face significant disparities in cancer outcomes and survivorship care compared to non-Hispanic Whites (NHWs), with Black individuals experiencing higher mortality rates, later-stage diagnoses, and reduced access to supportive care due to systemic biases [2–4], socioeconomic barriers [5–8], and limited healthcare access [8, 9], while Hispanic individuals face similar challenges, further exacerbated by language barriers [10, 11]. Black and Hispanic cancer survivors are also more likely to have worse cancer-related fatigue and quality of life compared to NHW cancer survivors [8]. These inequities in supportive care may stem from several factors, including a lack of trained translators [12] and insufficient culturally or linguistically inappropriate interventions for managing side effects [13]. Additionally, discrimination [14] and under-engagement of caregivers and family members by the healthcare team [15] further exacerbate these inequities.

Interventions, in general, designed to be culturally and linguistically appropriate are crucial in addressing health inequities by incorporating unique cultural values, beliefs, and experiences [7]. Cultural appropriateness ensures research aligns with the values, beliefs, and experiences of the studied population, while linguistic appropriateness ensures research materials and communication are accessible by providing translations, plain language, and culturally appropriate terminology [16].

For Black and Hispanic populations, cultural appropriateness can enhance the relevance of interventions by incorporating language, customs, and health practices [17]. It can also address disparities rooted in systemic racism, such as mistrust of healthcare systems, by building trust and engagement through culturally sensitive care [18]. For example, interventions that recognize the importance of family [19], spirituality [20], and community [21]—core values often shared by these groups—can improve study accrual, adherence, and outcomes. A meta-analysis found that culturally appropriate interventions targeting a specific cultural group (e.g., Hispanic individuals) are four times more effective than those provided to groups containing various cultural backgrounds [22]. Moreover, studies where interventionists speak the same non-English language as participants had greater improvements in the measured outcome (effect size $=0.49$) than studies that did not have language matching (effect size $=0.21$) [23]. By prioritizing cultural appropriateness, healthcare providers can create more effective and inclusive interventions that better serve the needs of Black and Hispanic populations.

Behavioral frameworks play a crucial role in designing effective and sustainable interventions by providing a structured approach to understanding behavior change. Examples such as the Health Belief Model or Social Cognitive Theory help explain how individuals perceive health risks, make decisions, and adopt healthier behaviors [24]. These frameworks are particularly important in behavioral oncology interventions, as they inform the development of behavioral strategies tailored to patient populations. Evidence suggests that clinical trials incorporating behavioral frameworks are more effective than those lacking a theoretical base [24]. Integrating these frameworks into culturally appropriate interventions for Black and Hispanic populations guides the development of content, strategies, and delivery methods to align with their cultural norms, values, and lived experiences [25]. This approach leads to greater engagement and improved health outcomes. Nevertheless, despite their importance, behavioral oncology clinical trials have yet to incorporate both cultural appropriateness strategies and behavioral frameworks in interventions for Black and Hispanic cancer survivors.

In this systematic review, we reviewed the literature for behavioral oncology clinical trials for Black and Hispanic cancer survivors to assess their use of cultural appropriateness strategies and behavioral frameworks. This review helps highlight gaps in existing research and notes the importance of developing more culturally and behaviorally informed interventions.

Methods

Protocol and registration

This systematic review was conducted and reported per the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [26]. The protocol for this review was registered in the PROSPERO repository before commencing the review. Its registration number is CRD42023472076. Clinical trial number: not applicable.

Eligibility criteria

Studies were selected based on the following inclusion criteria: 1) Population: Black/African American (AA) or Hispanic/Latino cancer survivors of any age; eligible trials were required to have a sample of either 100% Black/AA or 100% Hispanic participants. Due to the complexities of designing culturally appropriate interventions for multiple racial/ethnic groups in one trial, we focused on trials with either 100% Black or 100% Hispanic participants; 2) Interventions: Behavioral, clinical trial interventions (e.g., physical activity, nutrition, psychosocial, complementary and complementary and alternative medicine interventions); 3) Comparators: Studies with

and without a comparator or usual care were included. Usual care means the participant receives expected, relevant, or standard treatment and does not receive the intervention under study; 4) Outcomes: Any outcome; 5) Study Design: Empirical behavioral quantitative studies, including randomized or nonrandomized clinical trials with any number of study arms; 6) Language: Publications written in the English language; 7) Publication Date: Articles published from the inception of the databases to November 15, 2023. Exclusion criteria were: 1) Non-human studies; 2) Studies published in non-English languages; 3) Abstracts without full text.

Information sources

A comprehensive literature search was conducted on November 15, 2023, in seven databases: 1) PubMed (NLM), 2) Cochrane Central Register of Controlled Trials (CENTRAL) (Wiley), 3) Embase (Elsevier), 4) Cumulative Index of Nursing and Allied Health Literature (CINAHL) (EBSCO), 5) APA PsycInfo (Ovid), 6) Scopus (Elsevier), and 7) Web of Science (Clarivate). The search was conducted from the databases' inception to the date of searching. No filters were applied. EndNote 21 was used to store all the search results and to remove duplicate references before the two screening phases were initiated.

Search strategy

A comprehensive search strategy was developed by a health sciences librarian (YZ) who also searched all the included databases. Medical subject headings, Emtree terms, CINAHL and APA PsycINFO subject headings, and keywords were harvested for these major concepts: Hispanic or Latino, Black or African Americans, cancer survivors, behavior therapies or interventions. The search strategy for PubMed was repeatedly tested based on the reviewers' evaluation and feedback. After it was validated and finalized for PubMed, the search strategy was translated to search the other databases. A complete table detailing the search strategies used for all the databases is provided as a supplementary file.

Study selection

All the search results were exported into EndNote 21 for citation management. Duplicate references were removed by EndNote and by hand. The remaining references were exported into Rayyan [15], a screening tool developed for systematic reviews and independent screening at the title and abstract level by two reviewers (EAC and ACI). The references included after the title and abstract screening were exported into EndNote, and the full texts of potentially eligible studies were retrieved manually and by batch. The retrieved PDFs were then uploaded into Rayyan for full-text screening. Discrepancies were resolved through discussion between EAC and ACI. There were no disagreements when resolving discrepancies; thus, a third arbitrator was unnecessary.

Data extraction

The data extraction from the included trials was carried out independently by two reviewers (EAC and ACI) using a prespecified Excel file. The data extracted included authors, year of publication, study design, sample size, race or ethnicity of participants (e.g., Black or Hispanic participants), health outcome (e.g., fatigue, quality of life), cancer type, behavioral intervention type (e.g., physical activity, diet), behavioral framework used (if any) and cultural appropriateness strategies used (if any). Any disagreements were resolved by consensus between the two authors extracting this data. There were no disagreements when resolving discrepancies; thus, a third arbitrator was unnecessary.

Data synthesis

Eligible trials were examined using the five *Common Strategies for Enhancing Cultural Appropriateness* model [16] to identify cultural appropriateness strategies. This model presents five strategies that can be utilized separately or combined to create culturally appropriate interventions or programs: 1) evidential statements (data specific to the target group regarding a particular health condition), 2) peripheral (design, images, colors of materials), 3) linguistic (materials in dominant language); we have modified this strategy to include appropriate reading literacy level of study materials), 4) constituent-involving (interventionists and staff of same race/ethnicity and same language), and 5) sociocultural (infusion of cultural values and beliefs). Moreover, eligible trials were reviewed for the incorporation of a behavioral framework [24]. To be considered as utilizing a cultural appropriateness strategy and a behavioral framework, eligible trials were required to reference such cultural appropriateness strategies and behavioral frameworks explicitly within their manuscripts. Two authors (EAC and ACI) independently reviewed each eligible trial to verify whether cultural appropriateness strategies and behavioral frameworks were explicitly reported in the manuscript.

Results

The total number of search results from the seven databases searched was 1,582. Six hundred fifty-one ($n = 651$) duplicate references were removed by EndNote and by hand. The remaining 931 references were screened at the title and abstract level, and 874 were eliminated. The number of references included for full-text screening was 57, among which 5 were abstracts only, and 15 others did

not meet the inclusion criteria. Figure 1 below illustrates the flow of study selection.

Study characteristics

Just over half of the eligible trials were interventions for Black cancer survivors (n = 19, 51.4%; Table 1), most of the trials were for breast cancer survivors (n = 32, 86.5%), and most were psychosocial interventions addressing quality of life (QOL) and/or distress (n = 20, 54.1%). Over half of the eligible trials were pilot RCTs (62.2%). Most trials reported incorporating at least one cultural appropriateness strategy in their manuscript (Table 2, n = 32, 86.5%), and just over half reported incorporating a behavioral framework (n = 21, 56.8%).

Cultural appropriateness strategies

The included trials varied in their use of cultural appropriateness strategies (Table 2, ✓= cultural appropriateness strategy was reported in the manuscript). The median number of strategies implemented was three. Three trials implemented all five strategies (8.1%), 21.6% implemented at least four strategies (n = 8), 62.2% implemented at least three strategies (n = 23), 75.7% implemented at least two strategies (n = 28), 86.5% (n = 32) implemented at least one strategy, and 13.5% (n = 5) did not implement any strategies. The most utilized strategies included sociocultural (81.1%; n = 30), constituent-involving (73.0%; n = 27), and linguistic (54.1%; n = 20; Fig. 2). These three strategies were combined across 48.6% (n = 18) of trials. The least used methods included peripheral (21.6%; n = 8) and evidential (24.3%; n = 9).

Moreover, all trials (100%) for Hispanic cancer survivors incorporated some cultural appropriateness strategies compared to 83.7% of trials for Black cancer survivors. Trials designed for Black cancer survivors incorporated more evidential strategies than trials for Hispanic cancer survivors (27.8% vs 15.8%, respectively). Trials designed for Hispanic cancer survivors

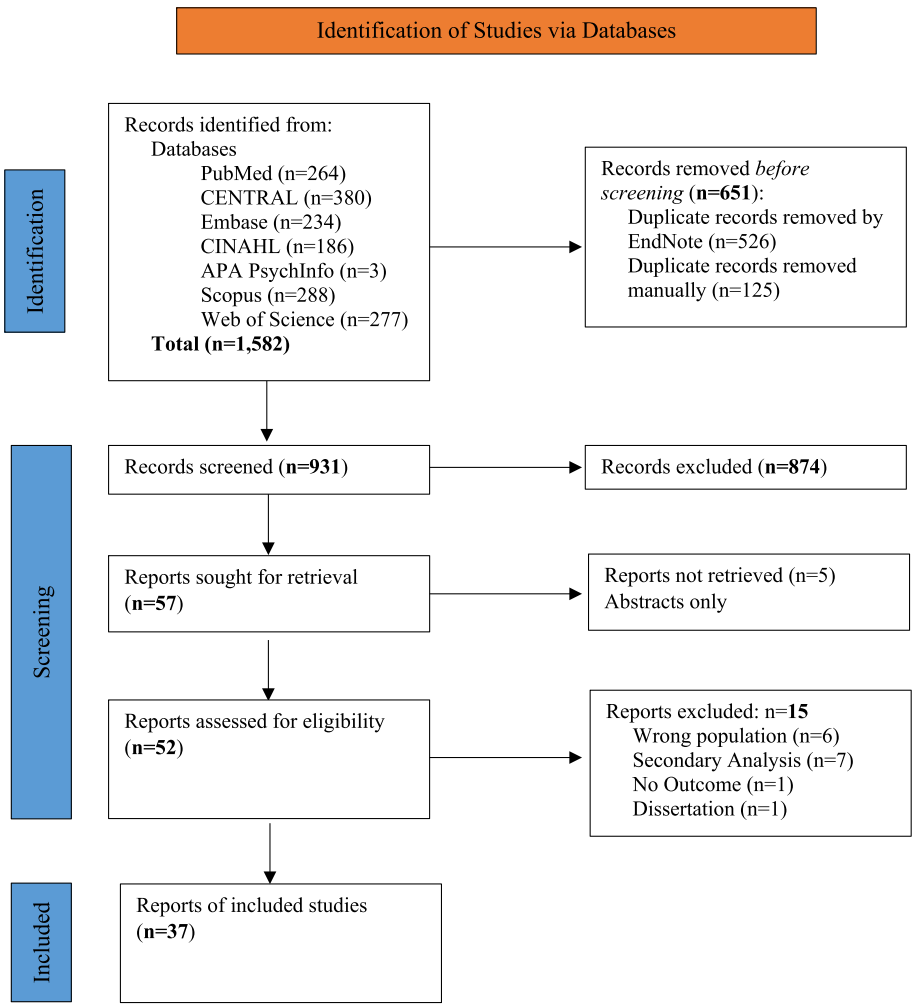

Fig. 1 PRISMA flow diagram of study selection of black and hispanic cancer survivors

Table 1 Characteristics of the studies included in this systematic review ($n = 37$)

Author	Year	Design	Participants	Intervention type	Cancer type	Outcome measures	Behavioral Framework Used
Adams-Campbell et al. [27]	2023	Pilot RCT ($n = 30$)	Black individuals	Physical activity	Breast	Fatigue, Quality of Life	Theory of Planned Behavior and Ecological Framework Neighborhood
Allicock et al. [28]	2021	Pilot RCT ($n = 22$)	Black individuals	Physical activity and diet	Breast	Fruit and Vegetable intake, sedentary time	Social Cognitive Theory and Control Theory
Ashing-Giwa [29]	2008	Pilot RCT ($n = 23$)	Hispanic individuals	Telephone-based psycho-educational intervention	Cervical cancer	Health-related Quality of Life	Contextual Model of Survivorship and Cognitive-Behavioral Framework
Ashing & Miller [30]	2016	Pilot RCT ($n = 123$)	Black individuals	Telephone-based psycho-educational intervention	Breast	Health-related Quality of Life	Contextual Model of HRQOL and Cognitive-Behavioral Framework
Ashing & Rosales [31]	2014	RCT ($n = 199$)	Hispanic individuals	Telephone-based psycho-educational intervention	Breast	Health-related Quality of Life	Contextual Model of HRQOL and Cognitive-Behavioral Framework
Badger et al. [32]	2020	Dyad RCT ($n = 230$ dyads)	Hispanic individuals	Telephone Interpersonal Counseling	Breast	Quality of Life	Stress Process Model
Campbell et al. [33]	2006	Pilot RCT ($n = 40$ dyads)	Black individuals	Telephone-based coping skills training	Prostate	Quality of Life	Cognitive-Behavioral Theoretical Approaches to Symptom Management
Ceballos et al. [34]	2015	Pilot RCT ($n = 29$)	Hispanic individuals	Cancer support groups	All cancers	Distress and Quality of Life	None reported
Conley et al. [35]	2021	Pilot RCT ($n = 52$)	Hispanic individuals	Psychoeducational intervention for uptake of genetic counseling and testing	Breast	Uptake of genetic counseling/genetic testing	None reported
Crane et al. [36]	2021	Pilot RCT ($n = 45$ dyads)	Hispanic individuals	Symptom management and lifestyle intervention"Nuestra Salud"	Solid tumor cancers	Diet and Physical activity	Social Cognitive Theory
Davis et al. [37]	2014	Pilot RCT ($n = 71$)	Black individuals	Cancer survival skills training	Breast	Distress and Quality of Life	None reported
Djuric et al. [38]	2009	Pilot RCT ($n = 31$)	Black individuals	Spirituality Counseling	Breast	Weight Loss	Social Cognitive Theory
Elimimiam et al. [39]	2020	One-arm trial ($n = 33$)	Hispanic individuals	Mindfulness-based stress reduction	Breast	Quality of Life	None reported
Ferrante et al. [40]	2020	Pilot RCT ($n = 35$)	Black individuals	eHealth weight loss program	Breast	Weight loss	Social Cognitive Theory
Greenlee et al. [41]	2015	RCT ($n = 70$)	Hispanic individuals	Dietary Intervention	Breast	Fruit/vegetable intake, Fat Intake	Social Cognitive Theory, Transtheoretical Model
Hoogland et al. [42]	2018	RCT ($n = 240$)	Hispanic individuals	Stress management	All cancers	Anxiety, depression, distress, emotional, spiritual well-being	None reported

Table 1 (continued)

Author	Year	Design	Participants	Intervention type	Cancer type	Outcome measures	Behavioral Framework Used
Juarez et al. [43]	2013	Pilot RCT ($n=52$)	Hispanic individuals	Survivorship educational intervention "Nueva Luz"	Breast	Quality of Life	Model of QOL in Cancer Survivorship
Kiplagat et al. [44]	2022	Pilot RCT ($n=30$)	Black individuals	Lifestyle and Acceptance-Based Therapy	Breast	Physical well-being, physical activity, weight loss	None reported
Lechner et al. [45]	2014	RCT ($n=114$)	Black individuals	Cognitive-behavioral stress management	Breast	Quality of Life, mood disturbance, intrusive thoughts, perceived stress	None reported
Meneses et al. [46]	2018	Pilot RCT ($n=40$)	Hispanic individuals	Survivorship self-management	Breast	Physical and emotional well-being, fatigue, pain, depressive symptoms	None reported
Mollica et al. [47]	2014	Proof of concept ($n=4$)	Black individuals	Peer navigation survivorship program	Breast	Quality of Life	Dynamic Social Impact Theory
Napoles et al. [48]	2015	RCT ($n=151$)	Hispanic individuals	Stress-management intervention—Nuevo Amanecer	Breast	Health-related quality of Life	Social Cognitive Theory
Napoles et al. [49]	2020	RCT ($n=153$)	Hispanic individuals	Stress management intervention—Nuevo Amanecer II	Breast	Health-related quality of Life	Social Cognitive Theory
Nock et al. [50]	2013	One-arm trial ($n=19$)	Black individuals	Exercise and support group intervention	Breast	Weight loss, cancer-related biomarkers	None reported
Ortiz et al. [51]	2021	RCT ($n=89$)	Hispanic individuals	Project Viva-Exercise intervention	Breast	Physical fitness	None reported
Oswald et al. [52]	2022	Pilot RCT ($n=30$)	Hispanic individuals	Cognitive Behavioral Therapy-Insomnia	Breast	Insomnia	None reported
Ramirez et al. [53]	2020	RCT ($n=288$)	Hispanic individuals	Patient Navigator LIVESTRONG Intervention	Breast, prostate, and colorectal	Health-related quality of life	Social Cognitive Theory, Stress and Coping Theory, Health Behavior Change Theory
Ramirez et al. [54]	2020	RCT ($n=120$)	Hispanic individuals	Staying Health Patient Navigation Program	Breast	Quality of Life	None reported
Rust et al. [55]	2015	Pilot RCT ($n=48$)	Black individuals	Medication Adherence Skills Training	Breast	Medication adherence	None reported
Schover et al. [56]	2011	RCT ($n=300$)	Black individuals	SPIRIT (Sisters Peer Counseling in Reproductive Issues after Treatment)	Breast	Reproductive health knowledge, distress, and sexual function	None reported
Sheppard et al. [57]	2016	Pilot RCT ($n=22$)	Black individuals	Diet and exercise intervention—Stepping STONE	Breast	Physical activity, weight loss	Theory of Planned Behavior and Social Cognitive Theory

Table 1 (continued)

Author	Year	Design	Participants	Intervention type	Cancer type	Outcome measures	Behavioral Framework Used
Stolley et al. [58]	2017	RCT ($n = 246$)	Black individuals	Weight loss—Moving Forward Intervention	Breast	Weight, body composition, physical activity, dietary intake	Socioecological model
Taylor et al. [59]	2003	RCT ($n = 73$)	Black individuals	Support group	Breast	Mood, psychological functioning	None reported
Taylor et al. [60]	2018	Pilot RCT ($n = 33$)	Black individuals	Yoga intervention	Breast	Depression	None reported
Thompson et al. [61]	2021	RCT ($n = 228$)	Black individuals	Storytelling	Breast	Quality of Life	Social Cognitive Theory and Transportation Theory
Valle et al. [62]	2017	Pilot RCT ($n = 35$)	Black individuals	Self-regulation intervention—The WELL program	Breast	Weight gain prevention	Self-Regulation Theory
Yanez et al. [63]	2020	Pilot RCT ($n = 80$)	Hispanic individuals	Symptom burden reduction mobile application	Breast	Health-related Quality of Life	Models of Stress and Coping

Table 2 Cultural appropriateness strategies used for eligible clinical trials ($n = 37$)

Author	Peripheral[a]	Evidential[b]	Linguistic[c]	Constituent-involving[d]	Sociocultural[e]
Adams-Campbell et al.	-	-	-	-	-
Allicock et al.	-	-	-	-	-
Ashing-Giwa	-	-	✓	✓	✓
Ashing & Miller	-	✓	-	-	✓
Ashing & Rosales	-	✓	✓	✓	✓
Badger et al.	-	-	✓	✓	✓
Campbell et al.	-	✓	-	✓	✓
Ceballos et al.	-	-	✓	✓	✓
Conley et al.	✓	✓	✓	✓	✓
Crane et al.	-	-	✓	✓	✓
Davis et al.	-	-	-	-	-
Djuric et al.	-	-	-	-	✓
Elimimiam et al.	-	-	✓	✓	✓
Ferrante et al.	-	-	-	-	-
Greenlee et al.	-	-	✓	✓	✓
Hoogland et al.	✓	-	✓	✓	✓
Juarez et al.	-	-	✓	✓	✓
Kiplagat	-	-	-	-	✓
Lechner et al.	-	-	✓	✓	✓
Meneses et al.	-	-	✓	✓	✓
Mollica et al.	-	✓	-	✓	✓
Napoles et al.	✓	✓	✓	✓	✓
Napoles et al.	✓	✓	✓	✓	✓
Nock et al.	-	-	-	✓	✓
Ortiz et al.	-	-	✓	-	✓
Oswald et al.	-	-	✓	✓	-
Ramirez et al.	-	-	✓	✓	✓
Ramirez et al.	-	-	✓	✓	✓
Rust et al.	-	-	-	-	-
Schover et al.	✓	-	✓	✓	✓
Sheppard et al.	-	✓	-	✓	✓
Stolley et al.	✓	✓	-	✓	✓
Taylor et al.	-	-	-	✓	✓
Taylor et al.	-	-	-	✓	-
Thompson et al.	✓	-	-	✓	✓
Valle et al.	-	-	-	-	✓
Yanez et al.	✓	-	✓	✓	✓

[a] Peripheral (design, images, colors of materials)

[b] Evidential statements (data specific to the target group regarding a particular health condition)

[c] Linguistic (materials in dominant language and appropriate reading literacy level)

[d] Constituent-involving (interventionists and staff of same race/ethnicity and same language)

[e] Sociocultural (infusion of cultural values and beliefs)

incorporated more linguistic (100% vs. 10.5%), constituent-involving (94.4% vs. 52.6%), and sociocultural (94.4% vs. 68.4%) strategies than trials for Black cancer survivors (Fig. 3).

Incorporation of a behavioral framework

Of the 37 studies included in this review, $n = 21$ (56.8%) reported applying a behavioral framework to their study (47.6% of Hispanic trials; 52.4% of Black trials). The most commonly reported behavioral framework was the Social

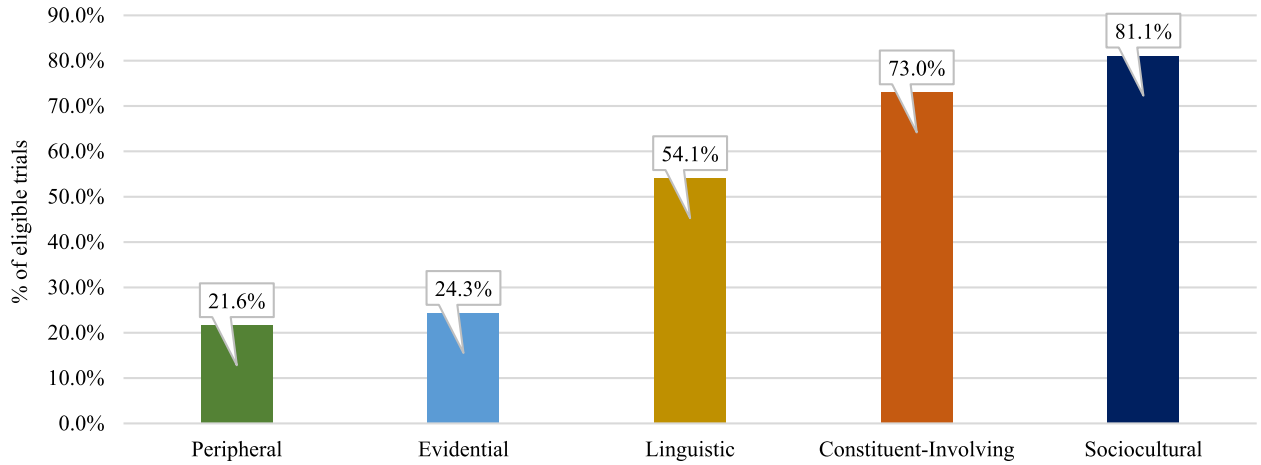

Fig. 2 Incorporation of cultural adaptation strategies among eligible trials ($n = 37$)

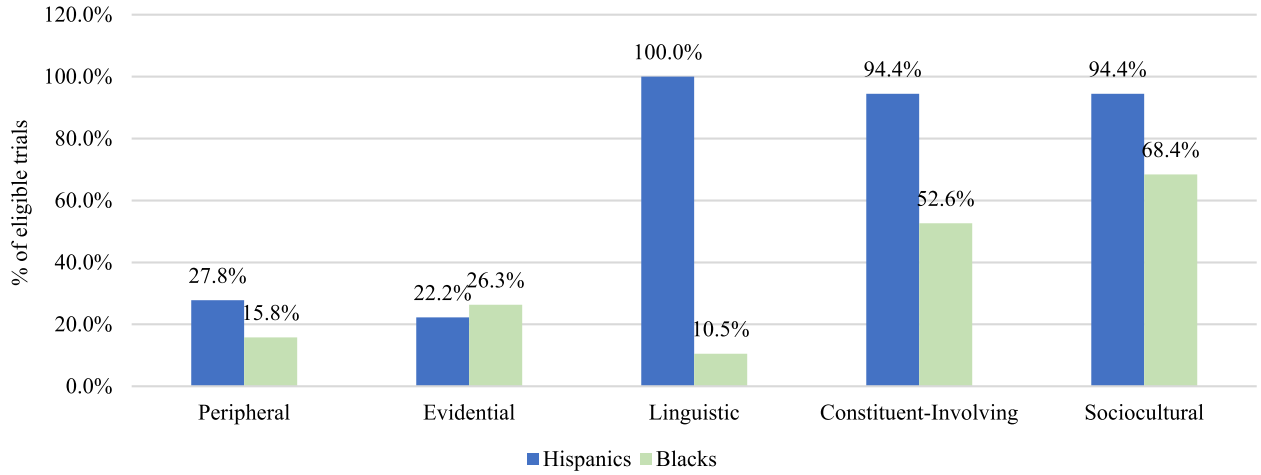

Fig. 3 Incorporation of cultural adaptation strategies stratified by trials targeting Blacks or Hispanic cancer survivors

Cognitive Theory ($n = 10$, 52.6%), followed by Stress and Coping Theory ($n = 3$, 15.8%), Cognitive Framework Theory ($n = 2$, 10.5%), Theory of Planned Behavior ($n = 2$, 10.5%), Self-regulation Theory ($n = 1$, 5.3%), Dynamic Social Impact Theory ($n = 1$, 5.3%), Transtheoretical Model ($n = 1$, 5.3%), and Transportation Theory ($n = 1$, 5.3%). These numbers are not mutually exclusive as $n = 7$ (18.9%) trials incorporated more than one behavioral framework. Eighteen trials incorporated cultural appropriateness strategies and a behavioral framework (48.6%).

Discussion

This systematic review sought to explore the incorporation of cultural appropriateness strategies and behavioral frameworks in behavioral oncology clinical trials for Black and Hispanic cancer survivors. While most trials incorporated at least one cultural appropriateness strategy (86.5%), fewer utilized behavioral frameworks (56.8%), and even fewer combined both (48.6%). Five trials did not incorporate either a behavioral framework or cultural appropriateness strategies. Most of the included trials were pilot RCTs, indicating a need to implement more fully powered behavioral oncology RCTs for Black and Hispanic cancer survivors. Additionally, the majority of trials targeted breast cancer survivors, likely due to its high prevalence and greater availability of research funding [64].

Most eligible trials have incorporated at least one cultural appropriateness strategy. Interventions can substantially impact marginalized populations more if they are culturally appropriate to increase cultural and contextual relevance [17]. Furthermore, culturally appropriate interventions boost recruitment and retention rates, improve outcomes, and improve satisfaction [17]. As the U.S. Hispanic and Black population continues to grow – by roughly 60% and 30%, respectively, by 2050 [53] – so

does the call for culturally appropriate interventions for these populations. However, medical mistrust rooted in historical injustices, socioeconomic barriers such as financial constraints and, limited access to healthcare, and systemic discrimination continue to deter Black and Hispanic individuals from participating in clinical trials [65–67]. Addressing these structural inequities through tailored interventions can not only result in higher enrollment of Black and Hispanic cancer survivors, but it can also result in the recruitment of our most vulnerable cancer survivors who have multiple marginalized identities (e.g., low-income, low education) into oncology clinical trials [68].

Of note, none of the eligible trials in this review incorporated critical theories [69–71]. These theories aim to understand how specific groups might be unfairly disadvantaged (e.g., feminist theory, queer theory, stereotype threat, minority stress, critical race theory) in their research. The absence of critical theories in the reviewed trials represents a missed opportunity to address the structural and systemic factors that contribute to health disparities among Black and Hispanic cancer survivors [69, 71, 72]. These theories provide valuable frameworks for understanding how racism, discrimination, and intersecting marginalized identities shape health outcomes and access to care [69, 70]. For example, an oncology trial evaluating psychosocial support for women with breast cancer could apply Feminist Theory by recognizing and addressing gendered power dynamics, healthcare biases, and societal expectations that may impact women's experience with cancer care. As another example, an oncology trial incorporating Critical Race Theory could examine how systemic racism impacts Black and Hispanic cancer patients' access to timely diagnosis and treatment, integrate community-based participatory research (CBPR) to co-design the study and/or intervention with patients, and train providers on racial bias in symptom management.

Moreover, incorporating an intersectionality lens into behavioral oncology research may help us develop a deeper understanding of multiple marginalized identities and the influences these have on cancer outcomes [73]. Intersectionality asserts that social identities like gender and race are deeply interconnected, influencing an individual's lived experience in complex and unique ways [73]. Research in cancer outcomes has primarily focused on analyzing individual marginalized identities in isolation (e.g., race *or* gender). These intersecting identities frequently encounter barriers to cancer care (e.g., limited access to health resources, systemic discrimination, culturally insensitive care practices), affecting every stage of the cancer spectrum, from cancer screening to cancer survivorship [73]. Strategies to integrate intersectionality into behavioral oncology trials include diversifying recruitment, incorporating stratified and intersectional analyses to assess how multiple identities impact cancer care, and ensuring culturally tailored interventions address barriers like language access and transportation. Moreover, mixed-methods approaches, such as qualitative interviews, can further reveal barriers and challenges, ensuring more equitable, patient-centered cancer care. Applying an intersectionality lens as a framework for future research will enable a more holistic approach to cancer patient care and aid in reducing cancer inequities.

In this review, more trials for Hispanic cancer survivors incorporated cultural appropriateness strategies compared to trials for Black cancer survivors. This is likely in part due to structural barriers and the diverse cultural and historical backgrounds within Black communities. While Hispanic populations often share common cultural and linguistic traits that facilitate targeted program development, the Black population in the U.S. comprises individuals from various African, Caribbean, and African American backgrounds, each with distinct traditions and healthcare experiences [74, 75]. This diversity complicates the creation of interventions that are culturally appropriate for Black populations. Additionally, historical medical mistrust, inequitable healthcare access, and underrepresentation in clinical trials further hinder the development of culturally appropriate interventions for Black populations. Future research must prioritize structural competency, community engagement, and intersectionality approaches to ensure culturally relevant interventions for Black cancer survivors.

Moreover, researchers must be aware that linguistic strategies extend beyond the translation of study materials to include adjustments for appropriate reading literacy levels of study materials. The American Medical Association recommends that patient healthcare materials be written at a 6th-grade reading level or below [76]. Additionally, most eligible trials in this review did not incorporate peripheral or evidential cultural appropriateness strategies or did not report it in their manuscript. Such strategies can be incorporated into recruitment materials or community presentations. These findings underscore the critical need for researchers to prioritize culturally tailored strategies that address the unique characteristics of diverse populations, ensuring equitable and effective interventions that resonate with the communities they aim to serve.

Just over half of the eligible trials in this review reported using a behavioral framework in their studies, and less than half reported using both a behavioral framework and cultural appropriateness strategies. Research has shown that using a behavioral framework

can increase the likelihood of intervention effectiveness [77]. Yet, a study by Bluethmann et al. [77] found that while a behavioral framework was incorporated into most clinical trials of physical activity in cancer, its application was insufficient [77]. They note that most behavioral interventions are merely theory-*informed* (i.e., vaguely describing theory use) rather than theory-*driven* (i.e., integrating theory throughout all the research components). Effective use of theory involves identifying key behavioral determinants, applying appropriate theoretical change methods to address them, and ensuring these methods align with the theory's principles to optimize intervention effectiveness [78, 79]. A structured, problem-focused approach, such as the Theoretical Domains Framework [80], can improve the design and documentation of theory application while providing evidence to support effective behavior change strategies. Future research should examine the extent of behavioral theory use in behavioral oncology studies and its impact on study outcomes. Additionally, future research should examine the association between incorporating behavioral frameworks and cultural tailoring on intervention effectiveness.

Our findings have significant policy implications for funding, clinical trial design, and community engagement. To promote inclusive research for Black and Hispanic cancer survivors, policy changes should prioritize funding for research studies that integrate and report culturally appropriate strategies and behavioral frameworks, ensuring behavioral oncology trials are responsive to these populations' needs. Clinical trial design policies should require standardized cultural adaptation frameworks, mandate the inclusion of community stakeholders in intervention development, and use intersectional methodologies to account for the overlapping effects of multiple marginalized identities on health outcomes. Moreover, funding agencies should incentivize community-based participatory research approaches, fostering trust and engagement with Black and Hispanic cancer survivors. By implementing these policy changes, oncology trials can enhance inclusivity, improve participant engagement, and generate more effective, culturally responsive interventions that address cancer disparities among Black and Hispanic survivors.

Additionally, we must acknowledge that recent shifts in diversity, equity, and inclusion federal policies and reductions in federal research funding could hinder efforts to develop culturally appropriate interventions and limit opportunities for underrepresented populations to participate in clinical trials. To sustain progress in health equity, advocating for continued investment in culturally competent research and policies supporting inclusive clinical trial participation is crucial.

Study limitations

Several limitations of the current review include 1) limiting searches to the English language only, 2) not assessing the association between the use of cultural appropriateness strategies and a behavioral framework on recruitment, retention, satisfaction, or intervention effectiveness, as this was beyond the scope of this review, 3) it is possible that some participants in the included studies identified as both Black and Hispanic. The majority of trials in this review did not collect data on race *and* ethnicity, thus making it difficult for us to assess the integration of these identities in our review. The lack of data on participants identifying as both Black and Hispanic limits the ability to assess intersectional impacts and may lead to interventions that fail to address the unique needs of individuals with multiple marginalized identities, reducing their effectiveness and cultural relevance. Additionally, the absence of comprehensive racial and ethnic data undermines the generalizability of study findings. Going forward, researchers should strive to collect both race and ethnicity data to enhance the inclusivity and applicability of interventions, and 4) there is a possibility that trials in this review used cultural appropriateness strategies and/or behavioral frameworks that were not reported in their manuscript. Future research should establish reporting standards requiring explicit cultural appropriateness strategies and behavioral framework documentation. Researchers can adopt the Framework for Reporting Adaptations and Modifications-Expanded (FRAME) framework [81], which documents cultural adaptations made to interventions. Furthermore, researchers can adopt the Theoretical Domains Framework to document the documentation of theory application in their research [80].

Despite these limitations, our review highlights the gaps in using cultural appropriateness strategies and behavioral frameworks in behavioral oncology clinical trials for Black or Hispanic individuals. Future research in behavioral oncology should consider incorporating these in combination to make research more relevant, effective, and impactful, which may ultimately improve cancer outcomes and reduce disparities.

Clinical implications

These findings underscore the clinical significance of integrating cultural and behavioral frameworks in cancer care to improve outcomes for Black and Hispanic cancer survivors. Culturally appropriate approaches, such as linguistic accommodations and sociocultural sensitivity, enhance patient-provider communication, ensuring more effective symptom management and adherence to treatment. Embedding behavioral frameworks into cancer care strategies supports sustainable behavior change,

leading to improved treatment response, reduced symptom burden, and enhanced survivorship outcomes. Prioritizing these evidence-based measures can help clinicians deliver more patient-centered care, ultimately improving cancer prognosis and fostering health equity across diverse populations.

Conclusion

This review's findings highlight gaps in the use of cultural appropriateness strategies and behavioral frameworks in oncology clinical trials for Black and Hispanic cancer survivors. While most eligible trials incorporated some cultural appropriateness strategies, only half used a behavioral framework. Even fewer trials incorporated behavioral theory and cultural adaptation in combination. Future studies should integrate these approaches with an intersectionality lens to enhance behavioral oncology research's relevance, effectiveness, and overall impact. Doing so could lead to improved cancer outcomes and reduce cancer disparities.

Supplementary Information

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Supplementary Material 1.

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Data availability
Data used for this review is available from the first author with a reasonable request.

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Not applicable.

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The authors declare no competing interests.

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