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Cultural Adaptations of Behavioral Health Interventions: A Progress Report

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Abstract

Objective—To reduce health disparities, behavioral health interventions must reach subcultural groups and demonstrate effectiveness in improving their health behaviors and outcomes. One approach to developing such health interventions is to culturally adapt original evidence-based interventions. The goals of the paper are to (a) describe consensus on the stages involved in developing cultural adaptations, (b) identify common elements in cultural adaptations, (c) examine evidence on the effectiveness of culturally enhanced interventions for various health conditions, and (d) pose questions for future research.

Method—Influential literature from the past decade was examined to identify points of consensus.

Results—There is agreement that cultural adaptation can be organized into five stages: information gathering, preliminary design, preliminary testing, refinement, and final trial. With few exceptions, reviews of several health conditions (e.g., AIDS, asthma, diabetes) concluded that culturally enhanced interventions are more effective in improving health outcomes than usual care or other control conditions.

Conclusion—Progress has been made in establishing methods for conducting cultural adaptations and providing evidence of their effectiveness. Future research should include evaluations of cultural adaptations developed in stages, tests to determine the effectiveness of cultural adaptations relative to the original versions, and studies that advance our understanding of cultural constructs' contributions to intervention engagement and efficacy.

Keywords

cultural adaptation; tailoring; ethnic minorities; health interventions; disparities

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Health disparities among racial and ethnic groups present a complex national issue (Satcher & Higginbotham, 2008). The Healthy People 2000, 2010, and 2020 reports proposed progressively higher aspirations for eliminating health disparities in a nation of growing diversity, challenging researchers and practitioners to integrate evidence-based interventions (EBIs) into community systems of care. To help guide this research, a three-stage framework was proposed: (a) detecting disparities in health and health care, (b) understanding the conditions that account for disparities, and (c) developing interventions to reduce these disparities (Kilbourne, Switzer, Hyman, Crowley-Matoka, & Fine, 2006). In addition to ongoing mandates to monitor the status of health disparities and to identify factors accounting for these inequities (Vega, Rodríguez, & Gruskin, 2009), there is a pressing need to develop effective behavioral health intervention and prevention programs for subcultural groups, especially those groups and diseases (e.g., type 2 diabetes) for which health disparities are known to exist.

Public health researchers have long believed that, to be effective, health-behavior interventions must be responsive to the cultural practices and worldviews of the subcultural groups for whom these interventions are intended (Resnicow, Baranowski, Ahluwalia, & Braithwaite, 1999). Nonetheless, certain questions persist. Under what conditions are cultural adaptations justified? How might such adaptations be achieved? What intervention activities should be added or modified in the development of cultural adaptations? Are culturally adapted interventions effective? Particularly in the past decade, health researchers have proffered thoughtful discussions of these issues (Domenech Rodríguez, Baumann & Schwartz, 2011). The goals of the paper are to: (a) describe consensus on the stages that can be followed in developing cultural adaptations, (b) identify common elements of cultural adaptations, (c) examine evidence on the effectiveness of culturally enhanced interventions for a variety of health conditions, and (d) identify questions that could be examined in future research.

Definitions of Basic Terms

Culture

Culture is a complex and multi-dimensional construct. Cohen (2009) observed that, a half century ago, prominent anthropologists Kroeber and Kluckhohn (1952) categorized 164 definitions of culture. Fiske (2002, p. 85) captured points of consensus:

> A culture is a socially transmitted or socially constructed constellation consisting of such things as practices, competencies, ideas, schemas, symbols, values, norms, institutions, goals, constitutive rules, artifacts, and modifications of the physical environment.

Culture may be viewed as the totality of a subcultural group's knowledge, transmitted from elders to children, which includes observable entities (patterned behaviors, symbols, and artifacts) and cognitive entities (shared beliefs, schemas, and norms). Cultural knowledge also changes to accommodate a subcultural group's efforts to adapt to environmental conditions. Health is influenced by culture-linked behaviors, such as food selection and food preparation, as well as culture-linked cognitive schemas that are constructed to explain bodily functions and disease processes (Kazarian & Evans, 2001). Accordingly, the cultural adaptation of an original intervention should incorporate observable aspects of a local culture into treatment media and activities, and infuse cognitive aspects of that culture into intervention content.

A subcultural group

This term refers to a distinct subgroup that exists within a larger racial/ethnic population. It consists of a smaller and more homogeneous unit of social organization that is bound by shared life experiences that can include historical ties to a native cultural niche. These common experiences produce cultural customs and traditions that promote a mutual sense of belonging, and which are maintained within a new host mainstream culture. As noted by many (e.g., Castro, Barrera, & Holleran Steiker, 2010; Wilson & Miller, 2003), difficulties arise when equating "culture" with "racial/ethnic minority group status" because many subcultural groups will typically exist within a given U.S. racial/ethnic group (e.g., Asian Americans), such that subgroups might exhibit a diversity of lifeways and health-related needs. The term *subculture* offers a greater level of differentiation and specificity beyond an "ethnic gloss" (Trimble, 1995), where such differentiation is crucial for adapting an intervention to meet the needs of a subcultural group that exists within a larger racial/ethnic minority group.

Intervention Development Approaches and Terminology

A number of approaches can be taken to create interventions having cultural elements to boost program appeal, appropriateness, and efficacy (Barrera, Castro, Holleran Steiker, 2011; Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003). Barrera, Castro et al. (2011) identified four major approaches to developing prevention programs for subcultural groups: (a) a sequential research-driven process that begins with basic (generative) studies to understand risk factors for a defined population and then proceeds to intervention design, outcome research, and dissemination (e.g., DPP Research Group, 2002a, 2002b), (b) an investigator-initiated approach in which investigators provide the fundamental theory-based structure for the intervention and community members play an active role in adding cultural elements (e.g., Resnicow et al., 2005), (c) community-initiated indigenous frameworks in which community members and their organizations create interventions that are evaluated subsequently by researchers (see Miller & Shinn, 2005), and (d) cultural adaptations of evidence-based interventions (e.g., Toobert, Strycker, Barrera, Osuna, King, & Glasgow, 2011), which are the focus of this paper.

Cultural adaptation has been defined as "the systematic modification of an evidence-based treatment (EBT) or intervention protocol to consider language, culture, and context in such a way that it is compatible with the client's cultural patterns, meanings, and values" (Bernal, Jimenez-Chafey, & Domenech Rodríguez, 2009, p. 362). In a sense, it is the middle ground between two extreme positions: (a) a universal approach (a "top-down" approach) that views an original intervention's content as applicable to all subcultural groups and not in need of alterations, and (b) a culture-specific approach (a "bottom-up" approach) that emphasizes culturally grounded content consisting of the unique values, beliefs, traditions, and practices of a particular subcultural group (Falicov, 2009). Some purported "cultural adaptations" have been essentially "top down" intervention modifications without meaningful input from subcultural group members themselves. A critical point that is developed in this paper is that exemplary cultural adaptation procedures integrate both "top-down" and "bottom-up" approaches through a series of adaptation stages.

Falicov (2009) used the term *cultural attunement* to describe additions to evidence-based therapies that are intended to boost engagement and retention of subcultural group members. Such additions might include providing services in clients' native language, utilizing bicultural staff, and incorporating familiar cultural traditions. *Attunement* involves changes to increase reach and engagement, but does not modify core treatment components. Other terms, such as culturally sensitive, culturally enhanced, culturally appropriate, *culturally informed*, *culturally grounded*, *culture specific*, and *culturally focused*, have been used to

describe deliberate efforts to increase the appeal and effectiveness of interventions that are used with subcultural groups (Mier, Ory, & Medina, 2010; Wilson & Miller, 2003).

The term *culturally tailored* is often used as a synonym for culturally adapted interventions. However, Kreuter and colleagues advocated for a distinction between *targeted* and *tailored* interventions (Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003; Kreuter, & Skinner, 2000; Kreuter & Wray, 2003). They contended that defining features of a tailored intervention are "(1) its collection of messages or strategies ... intended for a particular person rather than a group of people and (2) these messages or strategies are based on individual level factors that are related to the health or behavioral outcome of interest" (Kreuter & Skinner, 2000, p. 1). In this view, true culturally tailored approaches identify cultural dimensions relevant to health (e.g., religiosity, racial pride), measure individual differences on those dimensions, and deliver individualized health promotion messages matching an individual's endorsement of cultural dimensions. As an illustration, Kreuter et al. (2003) offered the following tailored message for an African American woman in a cancer prevention program:

> If a woman is age 40 years or older, has not had a mammogram in the past year, and agrees with the statement, "When I am ill, I pray for healing," her magazines would include a story built around the following general concept: "The Lord has given us a powerful tool for helping find cancer before it's too late. Getting a mammogram, together with the power of prayer, will give you the best chance to live a long and healthy life" (pp. 139-140).

By contrast, Kreuter and Skinner (2000) reserved the term *targeted* for a single intervention designed for a particular subcultural group based on characteristics common to subcultural group members. Elaborating, Kreuter et al. (2003, p. 137) wrote, "But importantly, there would be only one version of the program or materials, and it would be the same for all members of the group ... targeting also implicitly assumes that there is sufficient homogeneity within the target population to justify using one common approach to reach all its members."

Some culturally targeted interventions assume subgroup homogeneity, but in other cases culturally targeted interventions explicitly provide for individual variation in the expression of culture. As an example, problem solving (e.g., Nezu, Nezu, Felgoise, McClure, & Houts, 2003) has been incorporated into health interventions for subcultural groups (e.g., Toobert et al., 2011). Problem solving is commonly taught in a standardized way to groups of participants as a uniform sequence of steps, although the problems and solutions participants identify are individualized expressions of cultural influences and personal characteristics. For instance, a uniform problem-solving framework permits a deeply religious African American woman to select prayer as a solution for overcoming the problem of insufficient motivation for physical activity while allowing another African American woman who is not religious to elect a secular strategy. Other standardized interventions give participants choice in selecting barriers to behavior change, goals, and action plans (e.g., Glasgow, Christiansen, Smith, Stevens, & Toobert, 2009; Kristal, Shattuck, & Patterson, 1999), and can be adapted into culturally targeted programs that do not assume homogeneity within a subcultural group.

Stages in the Cultural Adaptation of Evidence-based Interventions

A decade ago, the literature provided little guidance for determining when and how EBIs should be culturally adapted. As recently as 2006, McKleroy et al. (2006, p. 60) wrote: "Currently, there is no CDC-recommended process or set of agreed-upon best practices for adapting EBIs to conditions different from those present in the original research. As a result,

there is increasing concern that insufficient guidance may limit the effectiveness of EBIs under these new conditions." Fortunately, more recently, several models to guide cultural adaptations have been proposed (Barrera & Castro, 2006; Domenech Rodríguez, & Wieling, 2004; Kumpfer et al., 2008; McKleroy et al., 2006; Wingood & DiClemente, 2008). Although these models appear to have been developed independently, they exhibit considerable consensus (also see Table 2 in Castro et al., 2010). In one of the early stage models, Barrera and Castro (2006) proposed a sequence of four intervention adaptation stages consisting of (a) information gathering, (b) preliminary adaptation design, (c) preliminary adaptation tests, and (d) adaptation refinement. Table 1 integrates health intervention adaptation activities delineated in systematic stage models (Barrera & Castro, 2006; Kumpfer, Pinyuchon, Melo, & Whiteside, 2008, McKleroy et al., 2006, Wingood & DiClemente, 2008). HIV/AIDS has been the subject of more stage models for the cultural adaptation of interventions than any other health condition (Card, Solomon, & Cunningham, 2011; Dévieux, Malow, Rosenberg, & Dyer, 2004; Dworkin, Pinto, Hunter, Rapkin, & Remien, 2008; Kelly et al., 2000; McKleroy et al., 2006; Solomon, Card, & Malow, 2006; Tortolero et al., 2005; Wainberg et al., 2007; Wingood & DiClemente, 2008), in part because of NIH directives that called for such adaptations (Bell et al., 2007).

A critical aspect of cultural adaptation stage models is that they integrate "top-down" and "bottom-up" approaches. The models have the theory and procedures from initial efficacy trials as starting points ("top-down" elements), but then subject the original intervention to scrutiny by subcultural group members who provide input at various stages ("bottom-up" elements) to shape an adapted version that is ultimately evaluated quantitatively and qualitatively.

Stage one: Information gathering

This phase has the dual purpose of determining if an adaptation is justified and, if so, which intervention components might be modified. Lau (2006) advocated a theory- and data-driven approach for determining when conditions justify a cultural adaptation and, if so, which treatment elements should be modified. She argued that cultural adaptations might be warranted when a subcultural group exhibits differences in the risk or resilience factors related to a health outcome. Rather than attending to mean differences between groups, the emphasis is on group differences in correlations between risk factors and outcomes such as health, illness, or their precursors. This recognizes the possibility that subcultural groups can differ in the theoretical mechanisms (e.g., self-efficacy, risk perception) that explain health outcomes and in mechanisms targeted for change in interventions. Culturally specific mechanisms suggest the need for unique intervention components that differ from the original intervention's core components. Literature searches done during this phase are focused on identifying studies that show subcultural group differences (August & Sorkin, 2011; Steers, Elliott, Nemiro, Ditman, & Oscamp, 1996) or similarities (Sarkar, Fisher, & Schillinger, 2006) on health mechanisms relevant for a particular intervention.

Clearly, comparative outcome research that tests for subcultural group differences in intervention engagement or efficacy provides a direct method for assessing the merit of a cultural adaptation. For example, the Diabetes Prevention Program included sizable subsamples of African Americans, Asian Americans, Hispanics, Native Americans, and non-Hispanic Caucasians (DPP Research Group, 2002a, 2002b). Despite indications of racial/ethnic group differences in responsiveness to different recruitment strategies (DPP Research Group, 2002a), analyses of the primary outcomes showed that the intervention had comparable efficacy across these racial/ethnic groups (DPP Research Group, 2002b). Thus, there was little evidence from that study to support the need for a cultural adaptation of the basic DPP intervention procedures. In the Women's Health Trial Feasibility Study in Minority Populations, which was conducted in multiple sites with non-Hispanic Whites,

African Americans, and Hispanics (Kristal, Shattuck, & Patterson, 1999), the intervention was modified by adjusting written materials to sixth-grade reading level, adding foods and preparation methods familiar to those of Cuban heritage residents and southern Blacks, and translating materials into Cuban Spanish. Subcultural group differences were not found in reductions of total dietary fat, but notable subcultural group differences were observed regarding the manner in which the reductions were achieved. Subcultural groups tended to make greatest reductions in areas where they were elevated at baseline, likely reflecting different subcultural group traditions in food choices and methods of food preparation. Those differences were identified as potential targets for additional cultural adaptations of the nutrition intervention.

Formative studies to determine how well an original intervention would fit the needs and preferences of a subcultural group are common in adaptation efforts (Crawford et al., 2004; Osuna et al., 2011; Rosal, Goins, Carbone, & Cortes, 2004; Stanton et al., 2005; Strolla, Gans, & Risica, 2006). One study used focus groups and key informant interviews with 120 Latinos to assess the value of culturally adapting a breast and cervical cancer intervention originally designed for African American women (Erwin, Johnson, Trevino, Duke, Feliciano, & Jandorf, 2006). Attitudes towards cancer and spiritual beliefs were similar across African-American and Latino participants, but group differences were found such that male partners had a greater influence on health-care utilization for Latinas than for African American women. Results suggested that the intervention for Latinas would be strengthened with an additional component to allay Latino men's concerns about breast and cervical cancer screening methods.

During this phase, quantitative studies can be conducted to determine whether cultural adaptations are warranted. For example, in telephone survey research with 288 Mexican-American adults with type 2 diabetes (Davis, Peterson, Rothschild, & Resnicow, 2011), the investigators found a relationship between low acculturation and a preference for religious content such as the use of prayer. Quantitative and qualitative methods and behavioral observations can be combined to inform modifications, as in the development of culturally-relevant nutrition education programs (Ayala, Elder, Campbell, Engelberg, Olson, Moreno, & Serrano, 2001; Buller et al., 2001; Strolla, Gans, & Risica, 2006). In a review of randomized controlled trials on diet and exercise interventions with Hispanics, Mier et al. (2010) reported that 44% of the studies used focus groups, literature searches, or surveys to guide culturally sensitive intervention design.

Stage two: Preliminary adaptation design

In this stage, information gathered in the first stage is integrated to inform preliminary modifications of the original intervention. Core components of the original intervention should not be altered unless there is convincing countervailing evidence from stage one (Card et al., 2011; Kumpfer et al., 2008; McLeroy et al., 2006). However, it is not always apparent which elements of an intervention are “core” and which are discretionary (Elliott & Mihalic, 2004). The essential components of behavioral health interventions are typically identified by theory, but are infrequently confirmed empirically.

Also, there are no simple solutions when key stakeholders find original intervention components unacceptable. As an illustration, the adaptation of a sexual-risk-reduction intervention that had been effective for urban African American youth (Stanton et al., 2005) was less successful for youth living in rural West Virginia when physical display of condoms and discussion of protected sex were minimized in deference to the concerns raised in focus groups with West Virginia parents and other community residents. It is possible that material found objectionable by focus group participants was essential for sexual risk reduction.

For many cultural adaptations, original intervention materials require language translation or reading-level adjustments. Translations and back-translations are common, yet can be complicated, particularly when a subcultural group (e.g., Latino immigrants) is heterogeneous in nationality, regional dialects, and acculturation. Also, literal translations of culture-specific idioms might not be possible, which then require challenging translations that attempt to preserve the original meaning. Non-equivalent translations can have a profound effect on results (Viruell-Fuentes, Morenoff, Williams, & House, 2011). In this stage, focus groups or advisory panels should review preliminary versions of the adaptation to identify translation shortcomings or other potentially problematic features of the revisions. Although translations are considered surface structure changes, they are critically important aspects of cultural adaptations.

This stage also includes usability testing with subcultural group members to identify and address issues arising from technological components of the intervention (e.g., interactive voice response systems, touchscreen computer kiosks, web-based programs, smart phones) (Zimmerman, Akerelrea, Buller, Hau, & Leblanc, 2003). The “think aloud” method, in which participants verbalize their thoughts as they interact with technology procedures, can be useful (Glasgow, Christiansen, Smith, Stevens, & Toobert, 2009).

Stage three: Preliminary adaptation tests

After drafting a preliminary version of a cultural adaptation, pilot testing is recommended (Barrera & Castro, 2006; Kumpfer et al., 2008; McLeroy et al., 2006). Continuous feedback from staff members who implement the pilot intervention can be particularly valuable (Barrera, Toobert, Strycker, & Osuna, in press-a). During the pilot testing phase of a culturally adapted intervention for Latinas with type 2 diabetes, weekly meetings between the investigators and staff, as well as audiotaped weekly group sessions with program participants, helped researchers assess participants’ reactions (Osuna et al., 2011).

During this stage, measures to be used in the full efficacy trial can also be piloted. This is an opportunity to evaluate the quality of measure translations, and the clarity of instructions, items, and response scales. Data collected from these measures provide an initial assessment of the intervention's ability to change putative mediators and outcomes (Osuna et al., 2011). Exit interviews also may be used with participants and staff to determine ways of improving the adaptation (Barrera, Toobert et al., in press-a).

Stage four: Adaptation refinement

In this relatively focused stage, feedback from the pilot is used to make changes to the preliminary adaptation (Barrera & Castro, 2006; McKleroy et al., 2006; Wingood & DiClemente, 2008). As in stages one and two, deviations from the original intervention should be based on compelling quantitative or qualitative data. Decisions made at this stage require informed judgments from a leadership team that could include investigators and staff, a community advisory panel, and subcultural group members.

Stage five: Cultural adaptation trial

This stage provides an empirical trial of the cultural adaptation produced in the prior stages. Those concerned that excessive intuition, personal impressions, and idiosyncratic preferences might have shaped the adaptation can be reassured by this quantitative outcome research phase. Often these tests are two-armed studies in which the cultural adaptation is compared to a control condition; samples often consist of members of one subcultural group (e.g., Toobert et al., 2011). Such studies can determine if the cultural adaptation is more effective than usual care, no intervention, or some other control condition. Few studies have directly compared the original intervention to its culturally adapted version (for exceptions,

see Newton & Perri, 2004; Yanek, Becker, Moy, Gittelsohn, & Koffman, 2001). If a study does not include such a direct comparison, intervention effect sizes may be compared between the cultural adaptation and the original EBI (Barrera, Toobert, Strycker, Osuna, King, & Glasgow, 2011; Stanton et al., 2005).

In addition to testing the effectiveness of the cultural adaptation in engaging participants and changing health outcomes, finer-grained analyses may be conducted to evaluate the strengths and weaknesses of the adaptation. These may include moderator analyses that examine interactions between intervention conditions and participant background characteristics, such as acculturation, education, health literacy, and health numeracy. One challenge for culturally targeted adaptations is to accommodate within-ethnic-group variation in acculturation and other individual-difference variables. Often, the goal is to produce adaptations that are effective for the full spectrum of subcultural group members. For example, a study of 280 Latinas diagnosed with type 2 diabetes found no acculturation-by-intervention interactions on putative mediators or outcomes, indicating that the effective, culturally adapted intervention was robust across all levels of acculturation (Barrera, Toobert, Stryker, & Osuna, in press-b). The inclusion of acculturation or other cultural individual difference variables are seldom evaluated as potential moderators of culturally adapted interventions, a notable limitation of the literature.

What Is Changed in Cultural Adaptations?

Cultural-adaptation phase models address the process of infusing culture into interventions, or what might be termed the “How?” of adaptation. Several reviewers have analyzed the extant literature to organize current knowledge about the “What?” of adaptation, or the specific ways cultural considerations are manifested in adapted health interventions (Kreuter et al., 2003; Mier et al., 2010; Resnicow et al., 1999; Wilson & Miller, 2003). There has been considerable agreement regarding the features incorporated into cultural adaptations and how those communalities can be categorized. Table 2 merges several useful frameworks (Kreuter et al., 2003; Mier et al., 2010; Resnicow et al., 1999; Wilson & Miller, 2003). The table is divided into a two-category classification system that distinguishes surface-structure from deep-structure intervention components (Resnicow et al., 1999). In their review of culturally grounded HIV prevention programs, Wilson and Miller (2003) used the parallel terms “presentation strategies,” or the visual/audible intervention characteristics (surface structure), and “content strategies,” or the integration of cultural elements into intervention activities and messages (deep structure).

Specific examples in the body of Table 2 are from a more comprehensive table in a review by Mier et al. (2010), who sought to identify the “principles and components” of culturally sensitive interventions. Although Mier et al. (2010) was restricted to nutrition and physical activity interventions for Hispanics, the table contents apply to many subcultural groups and health behaviors. A separate organizational scheme proposed by Kreuter et al. (2003), which maps onto much of the table contents, contained the following categories: (a) *Peripheral strategies* that modify the observable properties of intervention materials by “using certain colors, images, fonts, pictures of group members, or declarative titles (e.g., “A guide for African Americans”) that overtly convey relevance to the group,” (b) *Linguistic strategies* that alter the language used in intervention materials to make them comprehensible, (c) *Constituent-involving strategies* that utilize the cultural knowledge and experience of members of the subcultural group, (d) *Sociocultural strategies* in which a subcultural group's “cultural values, beliefs, and behaviors are recognized, reinforced, and built upon,” and (e) *Evidential strategies* that use “evidence” such as epidemiological data for a specific subcultural group or experiences from individuals with similar backgrounds to increase the perceived relevance of information in health communication and health education

interventions (p. 136). The framework by Kreuter et al. (2003) also was used to organize culturally sensitive intervention activities in literature reviews on Hispanics with type 2 diabetes (Whittemore, 2007) and on African American cancer survivors Hamilton , Agarwal, Song, Moore, & Best, in press).

Are Cultural Adaptations Effective?

A number of reviews have concluded that culturally enhanced behavioral health interventions for ethnic minority participants are effective. The reviews covered a diversity of illnesses and health behaviors, including asthma (Bailey, Cates, Kruske, Morris, Brown, & Chang, 2009), diabetes (Glazier, Bajcar, Kenne, & Wilson, 2006; Hawthorne, Robles, Cannings-John, & Edwards, 2010; Sarkisian, Brown, Norris, Wintz, & Mangione, 2003; Whittemore, 2007), HIV/AIDS (Darbes, Crepaz, Lyles, Kennedy, & Rutherford, 2008), mammography use (Han, Lee, Kim, Hedlin, Song, & Kim, 2009), nutrition (Eyles & Mhurchu, 2009), and nutrition and exercise (Mier et al., 2010). These reviews, including quantitative meta-analyses and qualitative narrative analyses, were not restricted to studies that used sequential stages for the cultural adaptations. In fact, some reviewers had broad criteria for “cultural tailoring” that included very limited modifications (e.g., Darbes et al., 2008).

A systematic review of 17 studies that focused on “socially disadvantaged adults” with type 1 or type 2 diabetes included 10 studies with culturally enhanced interventions (Glazier et al., 2006). Adaptation efforts such as conducting needs assessments, focus groups, and pilot studies to check on the cultural appropriateness of the intervention were reported in the studies reviewed. The authors concluded that cultural enhancement was one of the features associated with positive intervention outcomes such as improvements in hemoglobin A1c, weight/body mass index, lipids, blood pressure, dietary intake, and physical activity. In a second review of diabetes interventions that analyzed 12 randomized controlled trials conducted with ethnic minority groups (Hawthorne et al., 2010), the culturally appropriate health education interventions “had been tailored to the cultural or religious beliefs and linguistic and literary skills of the community being studied” (p. 614). The reviewers found that culturally appropriate health education was more effective than usual health education in improving hemoglobin A1c and diabetes knowledge. Reviews focusing on Latino adults (Whittemore, 2007) and older African American and Latino adults with diabetes (Sarkisian et al., 2003) also concluded that cultural adaptation was a characteristic of effective diabetes interventions.

In a meta-analysis of 38 randomized controlled trials of HIV interventions for heterosexual African Americans, Darbes et al. (2008) concluded that cultural enhancement (broadly defined) was a factor associated with intervention efficacy. In contrast, an earlier review of HIV prevention by Wilson and Miller (2003) found little support for the efficacy of cultural adaptations. They analyzed 17 studies (nine of which also were reviewed by Darbes et al., 2008) that evaluated interventions with an explicit goal of addressing cultural issues. Seven of the studies evaluated the hypothesis that culturally adapted interventions were more effective than those that were not adapted. Results provided little evidence that culturally adapted interventions were superior on measures of risk of exposure to HIV. However, Wilson and Miller (2003) criticized the adapted interventions for lacking sound theoretical foundations that might have guided more effective interventions. Poor statistical power for detecting between-group differences and very modest cultural adaptations (such as only matching ethnicity of group leaders to ethnicity of group members) also contributed to the lack of significant differences between adapted and unadapted interventions.

A unique review of culturally sensitive nutrition and exercise interventions for Hispanics covered features of studies that were not included in other reviews: theoretical foundations of the interventions, operationalizations of ethnicity and culture, main intervention components, recruitment strategies, and influence of cultural factors on intervention outcomes (Mier et al., 2010). The review found that 13 of 18 studies produced significant effects for culturally adapted interventions on outcome measures of nutrition or exercise. Furthermore, three intervention features appeared to be associated with intervention success: involvement of family or social support, literacy-level appropriateness, and cultural values.

Conclusions and Directions for Future Research

Health researchers have addressed the challenge of health disparities by developing interventions designed to reach, engage, and improve the health of subcultural groups. Thus far, two important conclusions have emerged.

First, distinct progress has been made in specifying stages to guide efforts to culturally adapt interventions. Confidence in the validity and utility of stage models is bolstered not only by the considerable agreement that they show (Barrera & Castro 2006; Domenech Rodríguez, & Wieling 2004; Kumpfer et al., 2008; McKleroy et al., 2006; Wingood & DiClemente, 2008), but also by the effectiveness of the stage-developed culturally adapted interventions. The ADAPT-ITT model by Wingood and DiClemente (2008) was illustrated with applications for African American women in Atlanta and Zulu-speaking adolescent women in Africa. Kumpfer et al. (2008) reported empirical evaluations of the cultural adaptation of the Strengthening Families Program in Canada, The Netherlands, Spain, and other countries. The value of Barrera and Castro's (2006) model was illustrated in a cultural adaptation of lifestyle intervention for Latinas with type 2 diabetes including the early adaptation phases (Barrera, Toobert et al., in press-a; Osuna et al., 2011) and from a formal efficacy trial (Barrera et al., 2011; Toobert et al., 2011).

Second, reviewers dealing with a variety of health topics have concluded almost uniformly that culturally appropriate health interventions were more effective than usual care or other control conditions. Such positive findings are impressive considering that many reviews (e.g., Sarkisian et al., 2003; Wilson & Miller, 2003) analyzed studies that were conducted well before there was much guidance on the stages that could be followed to culturally adapt an evidence-based intervention. When reviews failed to find much support for the benefits of culturally enhanced interventions (Whitt-Glover & Kumanyika, 2009; Wilson & Miller, 2003), there were often explanations such as poor statistical power (e.g., Newton & Perri, 2004; Yanek et al., 2001) or minimal adjustments to increase cultural sensitivity (e.g., Jemmott, Jemmott, Fong, & McCaffree, 1999). Overall, the results of these reviews offer hope that future cultural adaptations will be even more effective if they learn from the lessons of others.

There are important limitations to past research. Because culturally adapted interventions are rarely compared directly to the original interventions, we do not know with certainty that culturally adapted features add significant efficacy. This type of comparative research is difficult and costly to conduct. In some cases, it is hard to imagine providing unaltered interventions to subcultural groups without making basic adaptations such as language translations or delivery by bilingual staff. Also, it would be costly to launch an adequately powered study comparing an original intervention, a culturally adapted intervention, and a control condition, particularly if differences between the original and adaptation are expected to be modest.

Among the many reviews of cultural enhancement efficacy, almost all were based on very few studies—some as few as four (Bailey et al., 2009; Eyles & Mhurchu, 2009; McManus &

Savage, 2010). The small number of studies greatly limited the use of meta-analytic methods for finding statistical relations between features of culturally enhanced interventions and health outcomes. With the possible exception of HIV/AIDS, more evaluations are needed of systematic cultural adaptations on all health topics and on interventions directed at children. In general, research on culturally adapted health interventions lags somewhat behind research on culturally adapted psychotherapies for mental health concerns, which has supported several in-depth meta-analyses (Benish, Quintana, & Wampold, 2011; Griner, & Smith, 2006; Huey & Polo, 2008). Also, there is value in evaluating the effects of culturally adapted interventions not only on proximal health outcomes, but also on measures of reach, engagement, adoption by health care providers, and maintenance of effects (see Glasgow, Vogt, & Boles, 1999). Cultural adaptations that show short-term health outcome effects comparable to those of the original intervention might still show better (or worse) effects on measures of agency adoption, and participants' willingness to take part in interventions and sustain their involvement.

Toward an understanding of "culture" in culturally adapted interventions

Researchers could do more to better understand how any of several cultural variables (Castro & Hernandez-Alarcon, 2002) might be incorporated into adapted interventions and the mechanisms by which those variables might contribute to intervention efficacy. Several reviewers were critical of cultural adaptations that lacked theoretical frameworks involving cultural concepts (Castro et al., 2010; Mier et al., 2010; Wilson & Miller, 2003). Intervention outcome research can be used not only to evaluate the efficacy of an intervention, but also to test theory (Howe et al., 2002). When cultural adaptations are explicitly designed to influence a cultural construct that could operate as a mediator of change (e.g., enhancing cultural identity), studies could inform culturally relevant theory by evaluating whether the intervention succeeded in changing that construct and whether that change affected the outcome (Castro et al., 2010). Towards this important aim, the designers of culturally relevant health interventions should be explicit about the hypothesized roles of specific cultural variables and should design evaluation research that tests theoretical assertions.

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Table 1

Stages in the Cultural Adaptation of Evidence-based Interventions: An Integration of Several Models

Stage	Possible Adaptation Activities
Information Gathering	Search literature for evidence of subcultural group differences in modifiable risk factors, particularly those risk factors addressed in core components of evidence-based interventions. Search literature to determine whether previous applications of evidence-based interventions with subcultural groups show deficient engagement or efficacy. Determine whether there are sizable mismatches between features of original intervention's efficacy research and the features of intended application with subcultural groups on three domains: (a) participant characteristics, (b) program delivery staff, and (c) administrative/community factors. Conduct quantitative surveys to assess needs and intervention preferences of potential subcultural group participants. Conduct formative (qualitative) research with potential participants and key informants who are experienced in working with targeted subcultural groups to assess likes and dislikes of the original intervention materials and procedures; gather suggestions for additions and improvements to original intervention; assess community's capacity to implement intervention. Based on information gathered at this stage, determine whether evidence-based intervention should be adapted.
Preliminary Adaptation Design	Integrate the input of relevant stakeholders (potential participants, program developers, agency staff) into draft treatment adaptation. Preserve core elements of original intervention unless there is good evidence that a core element should be dropped (e.g., evidence does not support modifiable risk factors). Translate and back-translate materials from original language into language appropriate for subcultural group. Conduct qualitative research to gather opinions from potential participants and community experts on draft materials and descriptions of intervention activities. For technology-mediated interventions, conduct usability tests (e.g., “think aloud” method) to determine how well participants can navigate equipment and procedures; useful for identifying training needs.
Preliminary Adaptation Tests	Train staff to deliver preliminary version of the adaptation. Conduct case studies and/or pilot studies using the preliminary version of the adaptation. During treatment and at the end of treatment, assess participants and intervention staff with quantitative measures and interviews to determine: (a) implementation difficulties, (b) difficulties with program content or activities, (c) satisfaction with treatment elements, including cultural features, and (d) suggestions for improvements.
Adaptation Refinement	Use feedback from case studies or pilot studies to revise intervention.
Cultural Adaptation Trial	Conduct full trial of revised intervention procedures to determine whether the adaptation had the desired effects on engagement, putative mediators, and health outcomes. Test for interactions between intervention condition and participant characteristics such as acculturation, education, literacy. Test for mediation to determine whether the adapted intervention affected the putative mediators (including cultural mechanisms such as decreasing acculturative stress) and whether those mediators affected outcomes. Conduct in-depth interviews of participants and interventionists to inform possible further modifications.

Table 2

Common Features of Culturally Sensitive Health Interventions: An Integration of Several Organizational Schemes

Categories from Resnicow et al. (1999) and Wilson and Miller (2003)	**Common Features** **Examples from Mier et al. (2010); terms in parentheses from Kreuter et al. (2003)**
Surface Structure Features (or "Presentation Strategies")	Bilingual and bicultural materials and staff (Linguistic strategies, Constituent-involving strategies) Translation/back-translation of materials (Linguistic strategies) Inclusion of ethnic lifestyle elements, such as foods, music (Peripheral strategies) Use of community health workers, such as promotoras (Constituent-involving strategies) Delivery of the intervention in group settings Siting the intervention in safe locations familiar to participants Provision of hands-on activities, fun activities Incorporation of culturally familiar formats and activities, such as novela format, loteria game, Salsa dancing (Peripheral strategies) Inclusion of same-race/ethnicity role models (Peripheral strategies)
Deep Structure Features (or "Content Strategies")	Incorporation of cultural values in intervention design or implementation, such as familism, confianza, simpatia, fatalism (Sociocultural strategies) Involvement of the family in interventions Adjustment of materials to literacy level of participants (Linguistic strategies) Use of social support and networks