Health promotion for a multiethnic population: the case of weight-gain prevention among a multiethnic population of mothers living in Amsterdam South-East

Hartman, M.A.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

*UvA-DARE is a service provided by the library of the University of Amsterdam (http://dare.uva.nl)*
CHAPTER 3

Effectiveness of cultural adaptations of Interventions that Target Smoking Cessation, Physical Activity, and/or diet among Ethnic Minorities.

A Systematic Review

Vera Nierkens, Marieke A Hartman, Mary Nicolaou, Charlotte Vissenberg, Erik JAJ Beune, Karen Hosper, Irene G. van Valkengoed, Karien Stronks

Provisionally accepted
Abstract

Background: The importance of cultural adaptations in behavioral interventions targeting ethnic minorities in high-income societies is widely recognized. Little is known, however, about the effectiveness of specific cultural adaptations in such interventions.

Aim: To systematically review the effectiveness of specific cultural adaptations in interventions that target smoking cessation, diet, and/or physical activity and to explore features of such adaptations that may account for their effectiveness.

Methods: Systematic review using MEDLINE, PsycINFO, Embase, and the Cochrane Central Register of Controlled Trials registers (1997-2009). Inclusion criteria: a) effect study of a lifestyle intervention targeted to ethnic minority populations living in a high income society; b) interventions included cultural adaptations and a control group that was exposed to the intervention without the cultural adaptation under study; c) primary outcome measures included smoking cessation, diet, or physical activity.

Results: Out of 44904 hits, we identified 17 studies, all conducted in the United States. In 5 studies, specific cultural adaptations had a statistically significant effect on primary outcomes. The remaining studies showed no statistically significant effects on primary outcomes, but some presented trends favorable for cultural adaptations. We observed that interventions incorporating a package of cultural adaptations, cultural adaptations that implied higher intensity and these incorporating family values were more likely to report statistically significant effects. Adaptations in smoking cessation interventions seem to be more effective than adaptations in interventions aimed at diet and physical activity.

Conclusion: This review indicates that culturally targeted behavioral interventions may be more effective if cultural adaptations are implemented as a package of adaptations, the adaptation include family level, and where the adaptation implies a higher intensity of the intervention. More systematic experiments are needed in which the aim is to gain insight in the best mix of cultural adaptations among diverse populations in various settings, particularly outside the US.
Introduction

There is a high prevalence of chronic diseases among ethnic minorities in high-income societies. For example, hypertension and diabetes are highly prevalent among populations of African and South Asian origin in the United States and Europe, particularly compared to populations of European origin in those regions [1, 2]. Important preventable risk factors for these diseases are health-related behaviors that include smoking, diet and physical activity (PA). Hence, interventions to promote healthier behaviors are crucial to a reduction in these diseases. Often, however, interventions targeted to the general population do not reach ethnic minorities. In addition, there are indications that such interventions have limited effects on health behavior [3-5].

Increasing the cultural sensitivity of lifestyle interventions is generally expected to enhance their appropriateness and effectiveness [3]. Cultural sensitivity can be described as the extent to which a target population's ethnic and/or cultural characteristics, experiences, norms, values, behavioral patterns, and beliefs as well as relevant historical, environmental, and social forces are incorporated into the design, delivery, and evaluation of targeted health promotion materials and programs [6]. This can be done through cultural adaptations such as matching materials to group characteristics or targeting cultural values of the population [6]. Examples of these cultural adaptations include the use of prevalence rates of diseases from the target population or using cultural values in the health promoting message or involving health educators matched on the ethnic background of the target population.

Increasing numbers of studies and reviews have examined the effectiveness of a broad range of culturally adapted interventions targeted at a variety of diseases (i.e. diabetes, asthma, or stroke) or health-related behaviors such as physical activity (PA) [7-11]. However, none of them make clear whether the reported effectiveness can be attributed to particular cultural adaptations. More importantly, in most of the studies included in previous reviews, different types of interventions were used for the control and intervention groups. For example, a group intervention with discussion and active learning as important strategies in the intervention group compared to a control group that received written materials. These differences in the design of such studies do not allow us to draw conclusions on the effectiveness of specific cultural adaptations. Instead, a study design in which the only variation between the intervention and control group is the cultural adaptation under study, is precisely what is needed to gain more insight into the effectiveness of specific cultural adaptations, and to determine which adaptations are really necessary and which are not.

This paper aims to fill this gap by systematically reviewing randomized and non-randomized studies that evaluate health interventions aimed at smoking cessation, diet and/or PA targeted to ethnic minorities in which the intervention without a particular cultural adaptation is compared to the intervention with a particular cultural adaptation. Our specific objectives were: 1) to systematically review the effectiveness of cultural adaptations in interventions...
that targeted smoking cessation, diet and/or PA among ethnic minorities in high income societies; and 2) to explore those features of cultural adaptations that may account for their effectiveness.

Methods

We conducted a systematic review of the effectiveness of culturally sensitive interventions that targeted smoking cessation, diet and / or PA among adults from ethnic minorities in high income societies. We based our review methodology on the Guidelines for Systematic Reviews of Health Promotion and Public Health Interventions [12]. The protocol included the aim, the search strategy and the selection procedure. For the selection procedure, we developed a registration sheet in which the studies were registered and in which the reason for selection or non-selection was registered.

We developed, tested, adjusted, and retested the search strategy to ensure it was as sensitive as possible. We searched for controlled studies with no language restrictions in MEDLINE, PsycINFO, Embase (all from January 1997-September 2009), and the Cochrane Clinical Trial Database (January 1997-April 2010). We choose to include papers that were written in the context of increased refinement of culturally sensitive interventions as defined by Resnicow in his landmark paper in 1999 [6]. The year 1997 was chosen as the starting point to minimize the chance for missing important studies.

To ensure the consistency of the search strategy across the three different domains (smoking, diet and PA), the strategy consisted of two parts: a basic search strategy aimed at finding intervention studies among ethnic minority populations, and a behavior-specific supplement aimed at the three behaviors. Both MeSH terms and free-text words were used (Appendix 1).

Subsequently, the publications from each database were cross-checked manually and duplicates were removed. At least two reviewers per lifestyle domain (smoking, diet and PA) screened the titles and abstracts of the identified publications and excluded all publications that clearly did not meet our inclusion criteria. For all the other articles, full texts were obtained and two reviewers independently assessed eligibility. If there was uncertainty about inclusion, consensus was achieved by discussion.
Targeting interventions towards ethnic minorities

Criteria for inclusion in our review:

- The study described the effect evaluation of a lifestyle intervention culturally adapted to a specific adult, ethnic minority population living in a high-income society.
- The study included a control group (randomized or non-randomized) that was exposed to the basic intervention without the cultural adaptation under study. Our inclusion allowed studies in which the basic intervention made use of culturally adaptations other than the specific cultural adaptation under study.
- One of the primary outcome measures was behavior change regarding smoking cessation, diet, or PA.

Two reviewers per lifestyle domain used a pretested form to independently summarize the data, including study characteristics, intervention characteristics, details about the intervention and cultural adaptations, study design, and intervention effects of the included articles. To define cultural adaptations we used the definition of Resnicow et al. [6] for surface structure and deep structure adaptations. We considered surface structure adaptations as those adaptations that match materials or messages to observable, superficial characteristics of the target population. Deep structure adaptations were those adaptations that address core cultural values or those ethnic, cultural, historical, social or environmental factors that may influence specific health behaviors.

For the included articles, the Effective Public Health Practice Project (EPHPP) quality assessment tool for quantitative studies was used to assess the individual studies’ risk of bias [13]. This tool rates design, selection bias, allocation bias, confounding, blinding, data-collection methods, withdrawals and dropouts (attrition bias), with ‘strong,’ ‘moderate,’ or ‘weak’. Based on the number of strong, moderate, or weak scores, the study was given an overall score. Studies were rated as strong if there were no weak ratings, as moderate if there was 1 weak rating, and as weak if there were more than two weak ratings. Each of the two reviewers rated the quality independently. If there was disagreement, the results were discussed and a final decision was made. We e-mailed all authors of the included studies to retrieve missing information, and completed the quality assessment using the information they provided. We assessed whether we could find an association between studies with statistically effect or no effect and the quality of the studies or whether publication bias could affect the results.

We found a large variety in outcome measures, which made a detailed analysis of effect sizes impossible. Therefore, a narrative synthesis was conducted describing the study design, the intervention and cultural adaptations of the effective and non-effective studies, target population, setting, attrition rates, and reported effect of the intervention. Nevertheless, to provide detailed information about the results of the studies, we present the effect sizes in the tables. Effect sizes were described in terms of differences in mean and percentage, depending on the outcome measures of the studies. To answer research question 2, we compared the characteristics of the adaptations for effective and non-effective interventions.
Results

Study selection

The search across the four databases yielded 19222 publications for smoking cessation, 10294 publications for diet, and 15388 publications for PA (Figure 3.1). Full texts were obtained for 32 studies on smoking, 72 on diet, and 51 on PA. Of these studies, 132 (27 on smoking, 62 on diet, and 43 on PA) were excluded because the intervention and control groups received different types of interventions. Within the 132 excluded studies was one study where the control group spontaneously took over the cultural adaptations, so that it no longer differed from intervention group [14]. We decided to include studies that investigated the effectiveness of additional cultural adaptations to an intervention that already included one or more cultural adaptations. Six studies were found in both the search strategy for diet and the

Figure 3.1 Flowchart of search strategy

![Flowchart of search strategy](chart.png)
search strategy for PA. This left 17 studies that met all the inclusion criteria: 4 on smoking cessation [15-18], 4 on diet [19-22], 2 on PA [23, 24], 6 on PA and diet combined [25-30], and 1 on all three behaviors [31, 32].

**Description of included studies**

All of the included studies were conducted in the United States. Table 3.1 summarizes their characteristics. Fifteen of the 17 studies were Randomized Controlled Trials (RCT’s). Two studies used a quasi-experimental design. All studies with effect were RCT’s. Eleven studies were targeted to African Americans [15, 16, 19, 21, 22, 24, 25, 27-29], 5 to a Latino population [17, 18, 20, 26, 30] and 1 study to Chinese Americans [23]. Response rates varied from 96.5% [16] to 31% [22]. Six studies did not report response rates [21, 23–25, 28]. Follow-up rates were generally higher than 65%.

Outcome measures in all of the smoking cessation studies were self-reported abstinence. Three studies validated these outcomes with CO levels [15, 16, 18]. Follow-up time varied between 4 weeks [15, 17] and 5 years [31, 32]. Primary outcomes varied widely in studies targeting diet and/or PA. For example, Babamoto et al. [26] measured if participants were physically active at least three times a week, while Keyserling et al. [29] measured the PA increase to 30 minutes per day and Fitzgibbon et al. [28] measured energy expenditure as indicator of PA. Outcome measures of studies targeting diet included fruit and vegetable intake and/or fat intake and in one study percent calories from fat and grams of fiber intake [20]. Each study used different follow-up time. In the one study that targeted all three health behaviors, outcome measures for diet and PA were BMI, LDL cholesterol, energy expenditure and metabolic equivalent [31, 32].

**Quality assessment**

Of the 17 included studies 10 authors responded to our questions on clarifications regarding quality assessment. 5 studies were assessed as strong, 11 as moderate, and 1 as weak (Table 3.1). Moderate and weak studies mostly had problems with attrition rates or lacked information about response or attrition rates. This implies that there might be a chance of selection bias in these studies, namely if the intervention had a different effect in that part of the study population that did not respond. Other problems identified were insufficient blinding, not reporting information about reliability of data collection tools or not controlling for possible confounders. The strong and moderate studies reported both negative and positive outcomes: some found that cultural adaptation(s) were effective, while others did not find effects. Hence, we could not find a clear association between quality of the studies and effectiveness.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Design</th>
<th>Setting and target population</th>
<th>Characteristics participants</th>
<th>Response</th>
<th>Follow up rate</th>
<th>Outcome measure</th>
<th>Quality assessment score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Wetter et al.     | RCT    | Texas (Houston, San Antonio, El Paso, Rio Grande Valley) Latino smokers calling CIS with request for smoking cessation help in Spanish, living in Texas, >18 years | n=149  
Age: 41.4 (SD 11.1)  
Men: 55.7%  
Years of education: 10.9 (4.1)  
Household income < 20,000: 56.6% | 84%  
Week 5: 87%  
Week 12: 80% | 6 months: 36.6%  
12 months: 16%  
Attrition = 84%  
No significant differences between both groups | Self reported 7-day abstinence from smoking after 5 weeks and 12 (from baseline measurement) | Strong |
|                   |        |                                |                              |          |               |                                                                                 |                        |
| Orleans et al.    | RCT    | USAfrican Americans ≥18 years | n=733  
For both groups:  
88% aged 20 – 49  
Female: 63.3%  
High school education or more: 84% | 96.5% agreed to follow up and study participation | 6 months: 36.6%  
12 months: 16%  
Attrition = 84%  
No significant differences between both groups | Self reported one week abstinence at 6 months and 12 months (from baseline measurement) | Moderate  
A higher follow-up rate would have resulted in a rating as strong |
|                   |        |                                |                              |          |               |                                                                                 |                        |
| Woodruff et al.   | RCT    | California Latino smokers who intent to quit | n=132 (longitudinal sample)  
Age: 43 (SD 13.7)  
Female: 52%  
Education (mean): 11-13 years  
Income (mean category): $1100 - $1400 | Not reported | 84.6% | 95.5% | Self reported 7 day abstinence, CO validated at post treatment (3 months from baseline) | Moderate |

Table 3.1 Characteristics of the studies included
<table>
<thead>
<tr>
<th>Reference</th>
<th>Design</th>
<th>Setting</th>
<th>Target Population</th>
<th>Characteristics</th>
<th>Response</th>
<th>Follow up rate</th>
<th>Outcome Measure</th>
<th>Quality assessment</th>
<th>Intervention group</th>
<th>Control group</th>
<th>Intervention group</th>
<th>Control group</th>
<th>Outcome</th>
<th>Quality assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetter et al. 2007 [17]</td>
<td>RCT</td>
<td>Texas (Houston, San Antonio, El Paso, Rio Grande Valley)</td>
<td>Latino smokers calling CIS with request for smoking cessation help in Spanish, living in Texas, &gt;18 years</td>
<td>n=149 Age: 41.4 (SD 11.1) Men: 55.7% Years of education: 10.9 (4.1) Household income &lt; 20,000: 56.6%</td>
<td>84% Week 5: 87% Week 12: 80%</td>
<td>Self reported 7-day abstinence from smoking after 5 weeks and 12 (from baseline measurement)</td>
<td>Strong</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orleans et al. 1998 [16]</td>
<td>RCT</td>
<td>USA</td>
<td>African Americans ≥18 years</td>
<td>n=733 For both groups: (88% aged 20 – 49 Female: 63.3% High school education or more: 84%</td>
<td>96.5% agreed to follow up and study participation</td>
<td>6 months: 36.6% 12 months: 16% Attrition = 84%</td>
<td>No significant differences between both groups</td>
<td>Moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woodruff et al. 2002 [18]</td>
<td>RCT</td>
<td>California</td>
<td>Latino smokers, who intent to quit</td>
<td>n=132 (longitudinal sample) Age: 43 (SD 13.7) Female: 52% Education (mean): 11-13 years Income (mean category): $1100 - $1400</td>
<td>Not reported 84.6%</td>
<td>95.5%</td>
<td>Self reported 7 day abstinence, CO validated at post treatment (3 months from baseline)</td>
<td>Moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nollen et al. 2007 [15]</td>
<td>RCT</td>
<td>Southeastern United States</td>
<td>Self identifying African Americans, &gt;18 years, in contemplation stage of change, smoking &gt; 10 cigarettes a day, had to weigh more &gt; 100 lbs</td>
<td>n=250 Mean Age: 42.8 (SD 11.0) Female: 55.2% Monthly income &lt; $1200: 68.8% &lt; high school diploma: 56.7</td>
<td>63.5% 4 weeks: 68% 6 months: 62.8%</td>
<td>4 weeks: 65.2% 6 months: 68.4%</td>
<td>Self reported 7-day abstinence from smoking, CO validated at 4 weeks and 6 months</td>
<td>Strong</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Babamoto et al. 2009 [26]</td>
<td>RCT with three arms</td>
<td>Inner-city family health centres in Los Angeles, USA</td>
<td>Hispanic men and women 18 years and older with type 2 diabetes</td>
<td>CHW n=75 Age: 51.0 Female: 64% education &lt; 6th grade: 67% income $&lt;25,000: 55%</td>
<td>68%</td>
<td>50% at 6 month</td>
<td>PA – exercise at least three times per week Diet – fruit and vegetable intake, frequency of fatty foods eaten daily at six months from baseline. Other outcomes BMI and A1C</td>
<td>Moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Targeting interventions towards ethnic minorities**
<table>
<thead>
<tr>
<th>Reference</th>
<th>Design</th>
<th>Setting and target population</th>
<th>Intervention group</th>
<th>Control group</th>
<th>Response</th>
<th>Follow up rate</th>
<th>Outcome measure</th>
<th>Quality assessment score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keyserling et al</td>
<td>RCT with 3 arms</td>
<td>Central North Carolina, USA; African-American women aged ≥40 years with type 2 diabetes, defined as diagnosis of diabetes at ≥20 years with no history of ketoacidosis</td>
<td>n=67, Mean Age: 58.5, Mean Years education: 11.1</td>
<td>n=67, Mean Age: 59.2, Mean Years educ: 11.0</td>
<td>219 patients screened, 200 randomised (19 did not complete baseline measures)</td>
<td>6m: 89.5%, 12m: 89%</td>
<td>Primary outcome: PA</td>
<td>Strong</td>
</tr>
<tr>
<td>Ard et al.</td>
<td>Quasi-experiment</td>
<td>USA, Baltimore (Maryland), Durham (North Carolina), and Baton Rouge (Louisiana); African American aged ≥25 years BMI ≥25 - 45 kg/m², taking prescription medication for either dyslipidemia or hypertension.</td>
<td>n=271, Mean Age: 51.6 (SD 9.3), Female: 73.4%, Annual household income &lt; $29.9 15.7%, Education - High school or some college 43.9%</td>
<td>n=106, Mean Age: 51.8 (SD 9.2), Female: 66.3%, Annual household income &lt; $29.9 8.7%, Education - High school or some college 37.9%</td>
<td>NA</td>
<td>91%</td>
<td>Primary outcome: - Weight change (in kg) Secondary outcomes: - Adherence to diet recommendations - Adherence to PA recommendations [accelerometer]</td>
<td>Moderate</td>
</tr>
<tr>
<td>Study Authors</td>
<td>Study Type</td>
<td>Study Setting</td>
<td>Target Population</td>
<td>Characteristics (Participants)</td>
<td>Intervention</td>
<td>Control</td>
<td>Intervention</td>
<td>Control</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>------------------------------</td>
<td>-------------</td>
<td>---------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>Keyserling et al 2002 [29]</td>
<td>RCT with 3 arms</td>
<td>Central North Carolina, US</td>
<td>African-American women aged ≥40 years with type 2 diabetes, defined as diagnosis of diabetes at ≥20 years with no history of ketoacidosis</td>
<td>n=67&lt;br&gt;Mean Age: 58.5&lt;br&gt;Mean Years education: 11.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ard et al. 2008 [25]</td>
<td>Quasi-experiment</td>
<td>USA, Baltimore (Maryland), Durham (North Carolina), and Baton Rouge (Louisiana)</td>
<td>African Americans&lt;br&gt;Age ≥ 25 years&lt;br&gt;BMI 25 - 45 kg/m² Taking prescription medication for either dyslipidemia or hypertension.</td>
<td>n=271&lt;br&gt;Mean Age: 51.6 (SD 9.3)&lt;br&gt;Female: 73.4%&lt;br&gt;Annual household income &lt;$29.9: 15.7%&lt;br&gt;Education- High school or some college: 43.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fitzgibbon et al. 2005 [28]</td>
<td>RCT USA, Chicago (Illinois)&lt;br&gt;Self-identified as African-American or Black Female&lt;br&gt;Age ≥21 years&lt;br&gt;BMI ≥ 25 kg/M2</td>
<td>Samples</td>
<td></td>
<td>n=30&lt;br&gt;Mean Age: 47.8 (SD 10.3)&lt;br&gt;Income ($, median): 20,500&lt;br&gt;Work full-time outside home (%): 43%&lt;br&gt;Employed: 40%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.K. Staten et al 2004 [30]</td>
<td>RCT USA - Arizona&lt;br&gt;Hispanic women 55 years and older</td>
<td></td>
<td></td>
<td>n=67&lt;br&gt;Mean Age: 57 years&lt;br&gt;Completed high school: 43%&lt;br&gt;Employed: 67%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.K. Campbell et al 2004 [27]</td>
<td>RCT USA, North Carolina&lt;br&gt;12 African American churches&lt;br&gt;All church members aged 18 or older.</td>
<td></td>
<td></td>
<td>n=176&lt;br&gt;Age %: &gt;50=49.1&lt;br&gt;Female: 74.0%&lt;br&gt;Education &lt;high school: 15.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Design</td>
<td>Setting and target population</td>
<td>Characteristics participants</td>
<td>Response</td>
<td>Follow up rate</td>
<td>Outcome measure</td>
<td>Quality assessment score</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
<td>------------------------------</td>
<td>-----------------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-----------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td>Kreuter <em>et al</em> 2005 [21, 35]</td>
<td>RCT</td>
<td>USA, St. Louis</td>
<td>African Americans Women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n-BCT + CRT: 228</td>
<td>n-BCT: 311</td>
<td>n-CRT: 309</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Age: 35.4 (SD 11.7)</td>
<td>Mean Age: 35.8 (SD 11.5)</td>
<td>Mean Age: 35.4 (SD 11.2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean Education (years): 12.4 (SD 1.8)</td>
<td>Mean Education (years): 12.2 (SD 1.9)</td>
<td>Mean Education (years): 12.2 (SD 1.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pre-tax household income &lt; $20,000/year: 65.0%</td>
<td>Pre-tax household income &lt; $20,000/year: 71.2%</td>
<td>Pre-tax household income &lt; $20,000/year: 68.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intervention group</td>
<td>Control group</td>
<td>Intervention group</td>
<td>Control group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fruit &amp; vegetable intake at 1, 6 and 18 month follow-up</td>
<td>Strong</td>
<td>Moderate</td>
<td>1-month follow-up: 80.6%</td>
<td>1-month follow-up: 83.8%</td>
<td></td>
</tr>
<tr>
<td>Elder <em>et al</em> 2005 [20, 33]</td>
<td>RCT</td>
<td>USA, San Diego</td>
<td>Latino women</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>n-Promotora (and tailored print): 120</td>
<td>n-Tailored print (only): 118</td>
<td>70% (Elder <em>et al</em> 2006)</td>
<td>12-week follow-up: 89.2%</td>
<td>12-week follow-up: 89.9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Age: NA</td>
<td>Age: NA</td>
<td>Not reported</td>
<td>12-months (M1-M4) attrition rate 23% (Elder <em>et al</em> 2006)</td>
<td>12-months (M1-M4) attrition rate 24% (Elder <em>et al</em> 2006)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Education 0-6 years: 29.2%</td>
<td>Education 0-6 years: 30.5%</td>
<td></td>
<td>12-months (M1-M4) attrition rate 24% (Elder <em>et al</em> 2006)</td>
<td>12-months (M1-M4) attrition rate 24% (Elder <em>et al</em> 2006)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Income ($ per month) ≤1,000 or 1001-2000: 60.4%</td>
<td>Income ($ per month) ≤1,000 or 1001-2000: 57.1%</td>
<td></td>
<td>12-months (M1-M4) attrition rate 24% (Elder <em>et al</em> 2006)</td>
<td>12-months (M1-M4) attrition rate 24% (Elder <em>et al</em> 2006)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fruit and vegetable consumption at 3-month follow-up</td>
<td>Moderate</td>
<td></td>
<td>Primary outcomes: Percent calories from fat and grams of fiber at 12 weeks, six and 12 months</td>
<td>Moderate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Secondary outcomes: Total energy intake, total fat, saturated fat and carbohydrate intake.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Design (Cluster randomized)</td>
<td>Setting (churches)</td>
<td>Population</td>
<td>Intervention group</td>
<td>Control group</td>
<td>Intervention group</td>
<td>Control group</td>
<td>Follow up rate</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------</td>
<td>-------------------</td>
<td>------------</td>
<td>-------------------</td>
<td>---------------</td>
<td>-------------------</td>
<td>---------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Kreuter et al 2005 [21, 35]</td>
<td>RCT</td>
<td>USA, St. Louis</td>
<td>African Americans</td>
<td>Women</td>
<td>n-BCT+CRT: 288</td>
<td>Mean Age: 35.4 (SD 11.7)</td>
<td>Mean Education (years): 12.4 (SD 1.8)</td>
<td>Pre-tax household income &lt; $20,000/year: 65.0%</td>
</tr>
<tr>
<td>Elder et al 2005 [20, 33]</td>
<td>RCT</td>
<td>USA, San Diego</td>
<td>Latino women</td>
<td>n-Promotora (and tailored print): 120</td>
<td>Age: NAEducation 0-6 years: 29.2%</td>
<td>Income ($ per month) ≤ 1,000 or 1,001-2,000: 60.4%</td>
<td>Not reported</td>
<td>79% (Elder et al 2006)</td>
</tr>
<tr>
<td>Campbell et al 1999 [19]</td>
<td>RCT (Cluster randomized)</td>
<td>USA, eastern North Carolina</td>
<td>African Americans</td>
<td>n=108</td>
<td>Female: 73.0%</td>
<td>Age: 18-37: 25 (20.1%)</td>
<td>38-50: 29 (28.9%)</td>
<td>51-65: 28 (28.4%)</td>
</tr>
<tr>
<td>Rescinow et al 2009 [22]</td>
<td>RCT</td>
<td>USA, Detroit Metro area &amp; Atlanta Metro area</td>
<td>Home environment Self-identifying as Black or African-American, living at least half of one lifetime in the United States</td>
<td>n=372</td>
<td>Female: 73%</td>
<td>Mean age: 49 years</td>
<td>≥ high school education: 69%</td>
<td>≥ $40,000/year: 60%</td>
</tr>
<tr>
<td>Reference</td>
<td>Design</td>
<td>Setting and target population</td>
<td>Characteristics participants</td>
<td>Response</td>
<td>Follow up rate</td>
<td>Outcome measure</td>
<td>Quality assessment score</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>--------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
<td>----------</td>
<td>----------------</td>
<td>-----------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Physical Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chiang CY et al. 2009[23]</td>
<td>Pretest and posttest quasi-experimental design (non probability sample &gt; convenience sampling)</td>
<td>USA, Massachusetts Chinese churches, community centre and Chinese outpatients clinics Older (≥ 66 year), Chinese American immigrants (birth foreign to US) with minimum of 6 continuous months of hypertension</td>
<td>n=58 Mean age: 73.8 (SD 5.7) Female: 63.8% Household income &lt; 10,000: 63.8% Education: &lt; High-school 51.7%</td>
<td>n=70 Mean age: 73.1 (SD 6.5) Female: 65.6% Household income &lt; 10,000: 65.7% Education: &lt; High-school: 50%</td>
<td>N.A.: Convenience and snowball sampling</td>
<td></td>
<td>Weak</td>
<td></td>
</tr>
<tr>
<td>Newton RL et al. 2004 [24]</td>
<td>RCT Setting not reported</td>
<td>Sedentary African American adults</td>
<td>n=20 Mean Age: 45 (SD 7.8) Female: (81%) Mean Years of education: 15.3 (SD 2.2) Household income &lt; 24,999: 27.8%</td>
<td>n=10 Physician Advise (PA) Mean Age: 47.3 (SD 7.4) Female: Not reported Mean Years of education: 14 (SD 1.4) Household income &lt; 24,999: 25.0%</td>
<td>n=22 Standard Behavioral Exercise Counselling (SB) Mean Age: 44 (SD 7.0) Female: not reported Mean Years of education: 14.9 (SD 2.1) Household income &lt; 24,999: 23.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>The proband is the first affected family member who seeks medical attention for a genetic disorder</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*LDL-C = low-density lipoprotein cholesterol, BMI = body mass index, MET = metabolic equivalent*
<table>
<thead>
<tr>
<th>Reference</th>
<th>Design</th>
<th>Setting</th>
<th>Target Population</th>
<th>Characteristics</th>
<th>Response</th>
<th>Follow up</th>
<th>Outcome Measures</th>
<th>Quality Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiang CY et al. 2009[23]</td>
<td>Pretest and posttest quasi-experimental design</td>
<td>USA, Massachusetts Chinese churches, community centre and Chinese outpatient clinics</td>
<td>Older (≥ 66 year), Chinese American immigrants (birth foreign to US) with minimum of 6 continuous months of hypertension</td>
<td>n=58 Mean age: 73.8 (SD 5.7) Female: 63.8% Household income &lt; 10,000: 63.8% Education: &lt; High-school 51.7%</td>
<td>n=70 Mean age: 73.1 (SD 6.5) Female: 65.6% Household income &lt; 10,000: 65.7% Education: &lt; High-school: 50%</td>
<td>93.5%</td>
<td>Duration, intensity, frequency of exercises (exercise promotion outcomes monitor)</td>
<td>Weak</td>
</tr>
<tr>
<td>Newton RL et al. 2004[24]</td>
<td>RCT</td>
<td>Sedentary African American adults</td>
<td></td>
<td>n=20 Mean Age: 45 (SD 7.8) Female: 81% Mean Years of education: 15.3 (SD 2.2) Household income &lt; 24,999: 27.8%</td>
<td>n=10 Mean Age: 47.3 (SD 7.4) Female: Not reported Mean Years of education: 14 (SD 1.4) Household income &lt; 24,999: 25.0%</td>
<td>N.A. (diverse recruitment strategies used)</td>
<td>80%</td>
<td>PA 100%</td>
</tr>
<tr>
<td>Becker et al., 2005 / Cene et al. 2008[31, 32]</td>
<td>RCT</td>
<td>Baltimore, Maryland, USA African American men and women (siblings or probands) of heart patients who participated in the John Hopkins family heart study*</td>
<td></td>
<td>n=196 Age: 47.6 (SD 6.7) Years of education: 12.5 (SD 2.4) Female: 61% Employed: 80%</td>
<td>n=167 Age: 47.9 (SD 5.7) Years of education: 13.0 (SD 2.4) Female: 66% Employed: 77%</td>
<td>95.3%</td>
<td>5 years 84.2%</td>
<td>5 years 85%</td>
</tr>
</tbody>
</table>

* The proband is the first affected family member who seeks medical attention for a genetic disorder

LDL-C = low-density lipoprotein cholesterol, BMI = body mass index, MET = metabolic equivalent
**Overall effectiveness of interventions per behavior**

Five out of 17 studies that tested one or more cultural adaptations found statistically significant results on the effectiveness of cultural adaptations. Regarding smoking cessation, 3 (of 4) studies reported statistically significant decrease in smoking [16-18] and 1 (of 6) study regarding diet and PA [26] found effect primary outcomes. No studies aimed at only diet or only PA reported effects [19-24, 28, 33]. The study that was aimed at all three behaviors reported an effect on smoking cessation and energy expenditure [31, 32]. The interventions and the cultural adaptations that were tested (with or without effect) are described below.

**Cultural adaptations that were reported to be effective**

Table 3.2 shows the content of the five intervention studies with cultural adaptations that reported effects on primary outcomes. Four studies targeted smoking cessation [16-18, 34] and one targeted diet and PA [26]. The study by Cene et al. [31, 32] which targeted smoking, diet and PA, reported an effect on smoking behavior and energy expenditure [31, 32]. All studies [16-18, 26, 32] incorporated a package of adaptations.

**Smoking cessation.** The content of the package of adaptations varied greatly. The adaptations were all added to standard telephone counseling and had been adapted for language and culture. Wetter et al. [17] provided proactive telephone calls in the adapted intervention. These focused on practical counseling and social support as well as Hispanic values like culture of respect’ and pleasant and agreeable family’ (deep structure adaptations). The adapted intervention resulted in higher abstinence rates after 12 weeks (27.4% vs. 20.5%) after controlling for demographic and tobacco related variables. Orleans et al. [16] adapted standard telephone counseling and a self help guide. Telephone counseling was tailored to motives and barriers specific for African Americans (deep structure adaptations). The self help guide used African American models and provided information about smoking among African Americans (surface structure adaptations) as well as incorporating African American values (deep structure adaptations). At 12 months follow up abstinence in intervention group was higher (25% vs 15.4%). Woodruff et al. [18] replaced three of the six standard telephone consultations by four home visits. In the sessions the communication style was adapted and social cognitive principles were congruent with Latino smokers. In addition they focused on family concerns (deep and surface structure adaptations). At 3 months, 7 day abstinence rates were higher in the intervention group (20.5% vs. 8.7%).

**Three behaviors** In the study of Cene [32] the basic intervention consisted of consultations with a healthcare provider in a clinical setting and free pharmacotherapy. In the adapted intervention a community health worker (CHW) provided consultations in a non-clinical community setting (surface structured adaptations). At 1 year follow up smoking prevalence decreased significantly more in the intervention group (decrease of 6% vs. 3% ). Energy
expenditure increase was statistically higher in the intervention group. Regarding BMI, LDL cholesterol and metabolic equivalent [31,32] no significant effects were found on these outcomes at one year follow-up.

**Diet and PA** The intervention of Babamoto [26] had three intervention arms: 1) counseling by a healthcare provider, using Spanish-language materials culturally adapted to the local population; 2) counseling by healthcare provider plus a professional case manager (who used standardized clinical protocols, was trained to be culturally sensitive, and was able to communicate in Spanish) and written materials; and 3) an enhanced counseling intervention which consisted of the healthcare provider plus cultural tailoring by a culturally competent trained CHW, family educational sessions and the written materials (deep structure adaptations). At 6 months follow-up more respondents reported increasing their fruit and vegetable intake in the CHW and the case manager group compared with the standard care group. Fat intake was lower in the CHW group only (13% decrease vs 2% and 9% decrease respectively).

**Interventions with cultural adaptations that were reported not to be effective**
Twelve of the 17 studies found no statistically significant effects of the cultural adaptation on primary outcomes (Table 3.3): 1 (of 4) on smoking [15], 5 (of 6) on diet and PA combined [25, 27-30], 4 (of 4) on diet only [19-22], and 2 (of 2) on PA only [23, 24]. Eight (of 12) studies tested the effects of one type of adaptation [19-22, 25, 27-30] and 4 a package of adaptations [15, 23, 24, 29].

**Smoking cessation.** One study evaluated the cultural adaptation of a self help guide and videotaped education sessions designed for the general population [15]. Cultural adaptations consisted of surface structure adaptations such as the use of African American role models and deep structure adaptations by incorporating socio-cultural values into the self help guide and video. Smoking cessation rates, although lower in experimental group, did not differ significantly between groups.

**Diet and PA combined.** One study [29] compared standard clinic-based counseling which already included some culturally specific written materials to an intervention condition that employed group sessions and monthly telephone contact with a lay health advisor as additional adaptations. Both the group sessions and contact with the lay health advisor were adapted to the socio-cultural values of the target group (deep and surface structure adaptations). This study was not powered enough to demonstrate differences between the two conditions.

Three studies investigated one adaptation. One study [25] investigated whether group composition (ethnically mixed versus homogenous groups) in a group intervention influenced weight loss among African Americans (surface structure adaptation) and found no
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Smoking cessation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wetter et al. 2007[17]</td>
<td>Basic intervention plus 3 additional proactive counseling calls at 1, 2 and 4 weeks after the initial call. The counseling approach focuses on practical counseling and on intra- and extra treatment social support. Motivational techniques were also included. The counseling was delivered in Spanish and tailored to Hispanic values such as culture of respect, pleasant and agreeable family and positive social relationships.</td>
<td>Single CIS telephone counseling call and offer of Spanish language self help materials (if preferred): - Guía Para Dejar de Fumar (Guide to Quit Smoking) - Datos y Consejos Para Dejar de Fumar (Facts and Advice to Quit Smoking) - Usted Puede Dejar de Fumar (You Can Quit Smoking) - Cancer Facts.</td>
<td>All calls: 83%, 3 of 4 calls: 92% Single Call: 100% Abstinence rates after 5 weeks IG 20.3% vs. CG 11.7% Abstinence rates after 12 weeks IG 27.4% vs. CG 20.5% After controlling for demographic and tobacco related variables treatment effect significant (OR=3.8; p: 0.048)</td>
</tr>
<tr>
<td>Orleans et al. 1998[16]</td>
<td>A self help guide (pathways to freedom) targeted to African Americans (use AA models, use geared to smoking patterns of AA) Personal tailored counseling with special attention to motives and barriers more common among AA (deep structure adaptations)</td>
<td>A copy of the NCI’s generic quit smoking guide ‘Cleaning the Air’. CIS telephone counseling by trained smoking cessation specialists used.</td>
<td>Reading guide: 58.2% (IG). Reading guide and 54.7%</td>
</tr>
<tr>
<td>Woodruff et al. 2002[18]</td>
<td>Three culturally adapted telephone calls in combination with four home visits in Spanish. Intervention was delivered by trained specialists in a proactive manner. It arranged follow up sessions according to the probability of relapse. There were up to 6 calls.</td>
<td>Mean participation in sessions: 3.44 (sd 3.25) Self reported: % called helpline, in last three months: 24% IG 20.5% vs. CG 8.7% (CO validated) (p &lt; 0.005) Including missing cases: IG 17.3% vs CG: 8.3% (CO validated) (p&lt;0.05)</td>
<td>Abstinence rates at 6 months IG 74 (16.2%) vs. CG 62 (14.4%) (n.s.) 12 months: IG 36 (25%) vs. CG 18 (15.4%) (p&lt;0.05)* *Non-respons coded as ‘still smoking’.</td>
</tr>
<tr>
<td>Reference</td>
<td>Description of intervention</td>
<td>Dose received</td>
<td>Effect</td>
</tr>
<tr>
<td>-----------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Wetter</td>
<td>Basic intervention plus 3 additional proactive counseling calls at 1, 2 and 4 weeks after the initial call. The counseling approach focuses on practical counseling and social support. Tailoring to Hispanic values such as culture of respect, simpatico, familismo, personalismo.</td>
<td>Single CIS telephone counseling call and offer of Spanish language self-help materials (if preferred): Guia Para Dejar de Fumar (Guide to Quit Smoking), Datos y Consejos Para Dejar de Fumar (Facts and Advice to Quit Smoking), Usted Puede Dejar de Fumar (You Can Quit Smoking), Cancer Facts. All calls: 83%, 3 of 4 calls: 92%</td>
<td>Single CIS telephone counseling call and offer of Spanish language self-help materials (if preferred): Guia Para Dejar de Fumar (Guide to Quit Smoking), Datos y Consejos Para Dejar de Fumar (Facts and Advice to Quit Smoking), Usted Puede Dejar de Fumar (You Can Quit Smoking), Cancer Facts. All calls: 83%, 3 of 4 calls: 92%</td>
</tr>
<tr>
<td>Orleans</td>
<td>A self help guide (pathways to freedom) targeted to African Americans (use AA models, use geared to smoking quit). Tailored counseling with special attention to motives and barriers more common among AA. Incorporating values in self help guide.</td>
<td>A copy of the NCI’s generic quit smoking guide Cleaning the Air. CIS telephone counseling by trained smoking cessation specialists used. Reading guide: 58.2% (IG). Reading guide and 54.7%</td>
<td>Reading guide: 58.2% (IG). Reading guide and 54.7%</td>
</tr>
<tr>
<td>Woodruff</td>
<td>Three culturally adapted telephone calls in combination with four home visits in Spanish. Intervention was delivered by lay advisors (promotores) according to a curriculum in Spanish. All sessions were culturally adapted. Communication style and value congruent with Latino culture. Intervention based on social-cognitive principles, congruent with findings among Latino smokers. Focus was on social and family concerns. Intervention was based on cognitive principles and focus was on social and family concerns.</td>
<td>Standard telephone helpline in Spanish. Every caller received a six minute screening interview assessing smoking history, dependence, self-efficacy, and readiness to quit. After first call, structured telephone sessions were initiated by a trained counselor in a proactive manner. It arranged follow up sessions according to the probability of relapse. There were up to 6 calls.</td>
<td>Mean participation in sessions: 3.44 (sd 3.25)</td>
</tr>
</tbody>
</table>
**Table 3.2** Studies that reported effect on adaptations tested (continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Becker et al., 2005 / Cene et al. 2008 [31, 32]</td>
<td>Consist of same elements and individual tailored to individual risk score. Care took place at a non-clinical site in the community. Physical assessment, education, pharmacotherapy and monitoring adherence done by nurse practitioner. Smoking cessation and exercise counselling by community health worker. All siblings received pharmacy card for free pharmacotherapy.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Adaptations tested</td>
<td>Physical assessment, education, pharmacotherapy and adherence monitoring. Individually tailored recommendations specific to the individual's risk factor status. Risk information sent to primary care physician, who provided control patients with usual care, including office visits, education pharmacotherapy and adherence monitoring. Control patients were instructed to ask GP for pharmacy card for free pharmacotherapy.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Diet and physical activity combined</td>
<td>Case management</td>
<td>Standard care</td>
</tr>
<tr>
<td></td>
<td>Standard care</td>
<td>Standard care by physician and/or nurse practitioners: Standardized diabetic education materials in Spanish and English tailored for the local population provided at initial clinic visit.</td>
</tr>
<tr>
<td></td>
<td>Case management group:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.2: Studies that reported effect on adaptations tested (continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Becker et al., 2005 &amp; Cene et al., 2008 [31, 32]</td>
<td>Consist of same elements and individual tailored to individual risk score. Care took place at a nonclinical site in the community. Counseling by community health worker (also deep structure). Easy access to free pharmacotherapy.</td>
</tr>
<tr>
<td>Babamoto et al., 2009 [26]</td>
<td>Community health worker (CHW): Standard care plus highly trained CHW. CHWs were lay people who had diabetes or had experienced it through family or friend. They were paid clinical staff and underwent an extensive training course in diabetes standards but also self-management strategies incorporating patient cultural and spiritual beliefs and health behavior change theory. During 6 month intervention CHWs conducted tailored individual and family educational sessions based on ADA guidelines and culturally appropriate materials based on stages of change. CHWs also made follow-up phone calls to monitor progress. Adapations tested: Deep structure adaptations: • Cultural tailoring by CHW • Family educational sessions • Use of culturally adapted materials</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
difference between the groups. Fitzgibbon et al. [28] evaluated incorporation of faith in a weight loss intervention. This deep structure cultural adaptation showed no significant effects. In the study of Staten et al. [30] the cultural adaptation consisted of extra contacts with a CHW who communicated with patients, provided information, organized group walks and encouraged participants to find walking partners (deep and surface structure adaptations). There were no significant differences between groups at follow-up except that the intervention group had a slightly higher fruit intake. Finally, Campbell et al. [27] tested the contribution of a lay health advisor (LHA) (surface structure adaptation) in an intervention where the LHA provided the same information to respondents as they received at home, in the form of tailored printed materials (TPV). In this study the TPV only condition was effective on fruit intake and percentage that meet the recommendations of five servings a day implying that the adaptation was not.

Diet. The studies of interventions aimed to change diet all assessed one type of cultural adaptation in stead of a package. Kreuter et al. [35] studied the effect of cultural tailoring and behavioral tailoring using magazines (deep structure adaptations). At 6 months follow-up African American women receiving a combination of both behaviorally tailored as well as culturally tailored magazines had greater increases in daily fruit and vegetable consumption although this was not statistically significantly different from the group receiving behaviorally tailored magazines only. Elder et al. [20, 33] assessed the effect of weekly home visits and / or telephone calls from LHA in addition to tailored print materials. LHA provided the same information as the print materials (surface structured adaptation). No effects on primary outcomes were found at 12 weeks and effects on other outcomes disappeared at 6 months follow-up. The study by Campbell et al. [19] tested whether a behaviorally tailored bulletin incorporating health messages with a spiritual orientation (deep structure adaptations) were more effective when the source was the pastor versus an expert (surface structure adaptation). No differences on fruit and vegetable consumption were found between the two conditions. Finally, Rescinow et al. [22] tested the effectiveness of targeting messages to the ethnic identity of respondents by using untailored, ethnically neutral graphics versus newsletters with information targeted at ethnic identity in a study population of African Americans. Significant increase in fruit and vegetable intake was only found for a subpopulation of participants with Afro-centric identity but not for the total group.

Physical activity. The two culturally adapted interventions aimed at increasing PA with no treatment effect tested a package of cultural adaptations. Chiang et al. [23] investigated the incorporating of cultural values in the messages and the involvement of family members in a standard 8-week walking program with translated written materials for Chinese Americans and weekly telephone monitoring. At follow-up walking duration was not significantly different between the two study arms. In the study of Newton et al. , deep and surface structure adaptation...
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nollen et al. [15]</td>
<td>Basic intervention with adaptation of video and self help guide: The Harlem Health Connection’s 'Kick-It' video incorporated core African American cultural value (communalism, religion/spiritualism, connection to ancestors and history, storytelling). 'Pathways To Freedom: Winning the Fight Against Tobacco' addresses issues specific to African Americans (AA role models, stronger smoking norm, AA specific smoking pattern, AA targeted advertising, cultural and socioeconomic influences).</td>
<td>4 weeks of 21 mg/day transdermal nicotine patches. 48-min videotape 'How to quit' and the American Lung Association's 'Freedom From Smoking' guide (designed for general population) containing lectures by specialists on nicotine control, nutrition and stress management. 'Freedom from smoking' self help guide served as the take home reading material for the control patients.</td>
<td>Read most or all of the written guide 172 (68.8%) Read most or all of the written guide 149 (59.6%) No sign. differences in 7-day abstinence at month 6 between the intervention and control groups: IG 18.0% (45/250) vs. CG 14.4% (36/250); p=.27. Secondary outcomes: no significant differences - 7-day Abstinence at week 4: 25.6% in both groups - Reduction in cigarettes per day week 4: IG -9.44; CG -9.40 - Reduction in cigarettes per day, month 6: IG -6.30; CG -6.77</td>
</tr>
</tbody>
</table>
### Table 3.3 Description intervention and outcomes of studies that didn’t report an effect of cultural adaptation (continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention group (Adapted intervention)</strong></td>
<td><strong>Control group (Basic intervention)</strong></td>
<td><strong>Intervention group</strong></td>
<td><strong>Control group</strong></td>
</tr>
<tr>
<td><strong>Diet and Physical activity combined</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keypserling et al. [29]</td>
<td>A: Clinic (4) + community based (2 group sessions and monthly telephone contact with (lay) community DM advisor)</td>
<td>Clinic counseling augmented with group sessions and telephone contact. Designed to address issues related to cultural translation (i.e., to make it relevant to the cultural context of participants). DM advisor is a non-professional peer advisor. Role is to provide social support and feedback, reinforce personal diet and activity goals and to assist with group sessions. Group sessions were designed to promote readiness to change and to provide social support. Topics included demonstration and taste testing of modified recipes, role modeling (within group)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adaptations tested</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deep and surface structure adaptations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Community based group sessions including cultural adaptation to participants</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Monthly telephone contact with lay community health advisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B: Clinic only – 4 clinic visits</td>
<td>Counseling based on tailored advice regarding diet and PA, focus on behavioral change strategies. Simple language used in back-up written materials, Southern-style cookbook with low cost recipes. Tip sheets addressing general themes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C: Minimal intervention</td>
<td>Participants received a number of written pamphlets regarding diabetes, healthy eating and PA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group sessions: 1: 28 (58%) 2: 26 (49%) 3: 30 phone calls (9.7 per participant)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group session 3: 35 (59%) 261 phone calls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>Clinic attendance did not differ between groups A and B</td>
</tr>
<tr>
<td>Reference</td>
<td>Description of intervention Dose received</td>
<td>Effect</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td><strong>Intervention group (Adapted intervention)</strong></td>
<td><strong>Control group (Basic intervention)</strong></td>
<td><strong>Intervention group</strong></td>
<td><strong>Control group</strong></td>
</tr>
<tr>
<td>Diet and Physical activity combined</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keyserling et al. [29]</td>
<td>A: Clinic (4) + community based (2 group sessions and monthly telephone contact with (lay) community DM advisor)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clinic counseling augmented with group sessions and telephone contact. Designed to address issues related to cultural translation (i.e. to make it relevant to the ... provide social support. Topics included demonstration and taste testing of modified recipes, role modeling (within group)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adaptations tested</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Deep and surface structure adaptations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Community based group sessions including cultural adaptation to participants</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Monthly telephone contact with lay community health advisor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B: Clinic only – 4 clinic visits</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Counseling based on tailored advice regarding diet and PA, focus on behavioral change strategies. Simple language used in back-up written materials, Southern-style cookbook with low cost recipes. Tip sheets addressing general themes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C: Minimal intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Participants received a number of written pamphlets regarding diabetes, healthy eating and PA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ard et al. [25]</td>
<td>All African-American intervention groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Weekly sessions as in the control group</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Adaptation tested</strong></td>
<td><strong>Surface structure adaptations</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Group composition</td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Description of intervention</td>
<td>Dose received</td>
<td>Effect</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------</td>
<td>--------------</td>
<td>--------</td>
</tr>
<tr>
<td>Fitzgibbon et al. [28]</td>
<td>Faith-based component added to the culturally tailored weight loss intervention as in the control group. - Addressed in addition faith/spirituality issues in a structured and systematic manner (each week a scripture from the Bible was incorporated into the content of the intervention). - Delivered by a woman with experience conducting health risk reduction interventions with minority populations and knowledge of the Bible and scripture readings.</td>
<td>Attending ≥ 75% of the classes: 50%</td>
<td>No statistically significant differences between IG and CG in changes in BMI (difference IG-CG = -0.34 in weight (difference -0.95 kg), fat consumption (difference -0.25 % kcal), and energy expenditure in PA (difference -0.25 kcal/kg/day). IG and CG both exhibited some pre-post weight loss. IG and CG both exhibited some pre-post lower fat consumption. Total energy expenditure increased only statistically significant in the control group.</td>
</tr>
<tr>
<td>L.K. Staten et al. [30]</td>
<td>PC+HE+CHW (community health worker): Group received the same as the PC + HE group but also communicated on a regular basis (semi-weekly to monthly) with community health workers. The CHW provided information and support and organized bi-monthly walks. CHWs also encouraged participants to find walking partners and support each other in health improvement goals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M.K. Campbell et al. [19]</td>
<td>Combined intervention (TPV+LHA): Participants received TPV materials at home and had a LHA at the church.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Description of intervention</td>
<td>Dose received</td>
<td>Effect</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------</td>
<td>--------------</td>
<td>--------</td>
</tr>
<tr>
<td><strong>L.K. Staten et al. [30]</strong></td>
<td><strong>PC+HE+CHW (community health worker):</strong> Group received the same as the PC + HE group but also communicated on a regular basis - semi weekly to monthly with community health workers. The CHW provided information and support and organized bi-monthly walks. CHWs also encouraged participants to find walking partners and support each other in health improvement goals.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td><strong>Adaptations tested</strong> Deep and surface structure adaptation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>• Contact with CHW</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PC+HE (Health Education):</strong> In addition, this group were offered 2 health education classes and monthly newsletter for 12 months.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>HE classes based on social-cognitive theory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>PC (provider counseling) only:</strong> Participants received brochures and nurse practitioner discussed benefits of and barriers to increasing PA and F&amp;V consumption. This advice was tailored to individual. Tailored materials based on current behavior. PC based on patient-provider communication model.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fitzgibbon et al. [28]</strong></td>
<td>Faith-based component added to the culturally tailored weight loss intervention as in the control group - Addressed in addition faith/spirituality issues in a structured and systematic manner [each week a scripture from the Bible was incorporated into the content of the intervention] - Delivered by a woman with experience conducting health risk reduction interventions with minority populations and knowledge of the Bible and scripture readings</td>
<td>Attending ≥ 75% of the classes: 50%</td>
<td>Attending ≥ 75% of the classes: 52%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No statistically significant differences between IG and CG in change in BMI (difference IG-CG = -0.34 in weight (difference -0.95kg), fat consumption (difference -0.25 % kcal), and energy expenditure in PA (difference -0.25 kcal/kg/day)</td>
<td></td>
</tr>
<tr>
<td><strong>L.K. Staten et al. [30]</strong></td>
<td><strong>PC+HE+CHW (community health worker):</strong> Group received the same as the PC + HE group but also communicated on a regular basis - semi weekly to monthly with community health workers. The CHW provided information and support and organized bi-monthly walks. CHWs also encouraged participants to find walking partners and support each other in health improvement goals.</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td><strong>Adaptations tested</strong> Deep and surface structure adaptation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>• Contact with CHW</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>PC+HE (Health Education):</strong></td>
<td>In addition, this group were offered 2 health education classes and monthly newsletter for 12 months.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>HE classes based on social-cognitive theory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>M.K. Campbell et al. [19]</strong></td>
<td><strong>Combined intervention (TPV+LHA):</strong> Participants received TPV materials at home and had a LHA at the church.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Adaptations tested</strong> Surface structure adaptations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>• Use of LHA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>LHA:</strong> Theory based training for the LHA to disseminate information and promote interactions and activities. LHA used same theoretical constructs as TPV but dispersed by LHA who would also support changes among church members (social support model).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>TPV:</strong> theory based material sent to individuals home. Tailoring based on stage of change, social cognitive theory, health belief model. 4 personalized computer-tailored newsletters and four targeted videos mailed at 2, 4, 6, 9 months after baseline. Newsletters tailored to appeal to AA, included church-specific messages, from the pastor and testimonials from church members – these were also featured in the videos made for each of the churches.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Majority of participants reported having heard about cancer prevention in the past year; this was greatest in the TPV group (70%).</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>TPV intervention was most effective in increasing number of servings F&amp;V:</strong> Combined=3.7 vs. TPV=3.9 vs. LHA=3.5, (p=0.02) And TPV was most effective in increasing % meeting 5-a-day recommendation for F&amp;V: Combined=26.4% vs TPV=21.7%, vs. LHA=15.4%, (p=0.04)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>No differences between all groups in intake of % calories from fat and in recreational activity (MET hrs/week):</strong> Combined=9.7% vs. TPV = 9.7 vs. LHA=10.6, or in meeting PA recommendations: Combined=45.9% vs. TPV=46.3% vs. LHA=43.9%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.3 Description intervention and outcomes of studies that didn’t report an effect of cultural adaptation (continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Diet</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kreuter et al [21, 35]</td>
<td>Behaviorally and culturally tailored magazines (BCT+ CRT)</td>
<td>- 6 Tailored magazines as in the BCT and CRT group, however consisting of culturally relevant stories as well as behaviorally concept stories as in the control groups (equally divided)</td>
<td>BCT + CRT Attention: 1-month: 3.73 (SD 1.5) 6-month: 4.00 (SD 1.27)</td>
</tr>
<tr>
<td></td>
<td>Culture relevant magazines (CRT)</td>
<td>- 6 Tailored magazines as in the BCT group, however in CRT magazines stories were tailored on 2 of the 4 cultural constructs religiosity, collectivism, social pride, and/ or time orientation.</td>
<td>BCT Attention: 1-month: 3.78 (SD 1.38) 6-month: 3.99 (SD 1.27)</td>
</tr>
<tr>
<td></td>
<td>Clinically relevant stories</td>
<td>- 6 Tailored magazines as in the BCT group, however in CRT magazines stories were tailored on 2 of the 4 cultural constructs religiosity, collectivism, social pride, and/ or time orientation.</td>
<td>CRT Attention: 1-month 3.57 (SD 1.49) 6-month 3.88 (SD 1.31)</td>
</tr>
<tr>
<td>Elder et al [20, 33]</td>
<td>Promotora-tailored print material condition</td>
<td>- Tailored print newsletters and activity inserts as in the tailored print condition. In addition: weekly home visits or telephone calls from sequentially assigned promotora over a 12-week period.</td>
<td>Promotora: 2.2% vs. tailored print: 0,6% vs. usual care: 1.5%</td>
</tr>
<tr>
<td></td>
<td>Adaptation tested</td>
<td>- Use of promotora’s Tailored print condition 12 weeks of tailored print newsletters (based on baseline data) and activity inserts mailed to their homes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deep structure</td>
<td>Materials provided feedback, opportunity for personalized goal setting, and for dealing with barriers.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Adaptation of culturally relevant stories</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graphics and text developed with participation from AA community.

Adaptations tested

- Adaptation of culturally relevant stories
Table 3.3 Description intervention and outcomes of studies that didn’t report an effect of cultural adaptation (continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention group (Adapted intervention)</strong></td>
<td><strong>Control group (Basic intervention)</strong></td>
<td><strong>Intervention group</strong></td>
<td><strong>Control group</strong></td>
</tr>
<tr>
<td>Kreuter et al. [21, 35]</td>
<td>Behaviorally and culturally tailored magazines (BCT+CRT)</td>
<td>- 6 Tailored magazines as in the BCT and CRT group, however consisting of culturally relevant stories as well as behaviorally concept stories as in the control groups (equally divided)</td>
<td>Magazines for all three conditions: the front cover featured artwork from local AA artists. Graphics and text developed with participation from AA community.</td>
</tr>
<tr>
<td>Kreuter et al. [21, 35]</td>
<td>Deep structure</td>
<td>Adaptation of culturally relevant stories</td>
<td>Cultural relevant magazines (CRT) - 6 Tailored magazines as in the BCT group, however in CRT magazines stories were tailored on 2 of the 4 cultural constructs religiosity, collectivism, racial pride, and/or time orientation.</td>
</tr>
<tr>
<td>Elder et al. [20, 33]</td>
<td>Promotora-tailored print material condition</td>
<td>Tailored print newsletters and activity insert as in the tailored print condition. In addition: weekly home visits or telephone calls from sequentially assigned promotoras over a 12-week period. Promotoras were Spanish-language dominant, naturally empathetic, able to develop rapport and to be neutral and nonjudgmental, perceived as a role model in the community, and interested in helping women change lifestyle behaviors. Promotoras used the skills acquired in the program, as well as their natural ability to provide support (informational, instrumental, and emotional) and encouragement to negotiate behavioral change goals. Rely on the participant’s weekly tailored newsletters to guide discussions and suggest opportunities for skill development.</td>
<td>A much larger percentage (29.3) of participants in the promotora condition returned all activity inserts; only 14.6% returned none</td>
</tr>
</tbody>
</table>
Table 3.3 Description intervention and outcomes of studies that didn’t report an effect of cultural adaptation (continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
</table>
| Campbell et al. [27] | The spiritually oriented bulletin                                                           | 72.9% recalled receiving a bulletin | F &V consumption (servings per day) increase:  
Spiritual: 0.6 vs. expert: 0.7  
The IG group consumption did not differ significantly from the CG, controlling for baseline consumption, education, age, and study effects |
|                 | - received a bulletin like in the expert oriented condition, however with religious language and messages from the church pastor  
- Bulletins began with a message “From the pastor’s desk” that was written by the pastor of the participant’s church and included a photograph of the pastor, and ended with a “Five-a-Day-Grace” written by the pastor  
- Tailored messages about perceived social support and the top three perceived barriers to eating F&V were written with spiritual language and biblical allusions  
- Church-oriented artwork created by an African American community member was included  
- An article “why God wants you to eat healthy” was also included  
- A bookmark was attached to the back of the bulletin that featured a passage from the Book of Genesis about F&V | 64.6% recalled receiving a bulletin |                                                                       |
| Rescinow et al. [22] | Newsletters targeted at ethnic identity                                                      | 61% reported receiving 3 newsletters (25%, 2) | Increase in daily mean Fruit and vegetable intake:  
IG: 1.1 servings per day vs CG: 0.8 servings per dag. (n.s.)  
Only among the subpopulation with an Afrocentric identity a significantly larger increase in fruit and vegetable intake was reported:  
IG: 1.4 servings per day vs. CG: 0.43 servings per day; p < 0.05. | | | | | |
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campbell et al. [27]</td>
<td>The spiritually oriented bulletin received a bulletin like in the expert oriented condition, however with religious language and messages from the church pastor. Bulletins began with a message &quot;From the pastor's desk&quot; that was written by the pastor of the participant's church and included a photograph of the pastor, and ended with a &quot;Five-a-Day-Grace&quot; written by the pastor. Tailored messages about perceived social support and the top three perceived barriers to eating F&amp;V were written with spiritual language and biblical allusions. Church-oriented artwork created by an African American community member was included. An article &quot;why God wants you to eat healthy&quot; was also included.</td>
<td></td>
<td>72.9% recalled receiving a bulletin</td>
</tr>
<tr>
<td></td>
<td>Tailored messages about perceived social support and the top three perceived barriers to eating F&amp;V were written with spiritual language and biblical allusions. Church-oriented artwork created by an African American community member was included. An article &quot;why God wants you to eat healthy&quot; was also included.</td>
<td>Increase: Spiritual: 0.6 vs. expert: 0.7</td>
<td>The IG group consumption did not differ significantly from the CG, controlling for baseline consumption, education, age, and study effects.</td>
</tr>
<tr>
<td>Rescinow et al. [22]</td>
<td>Newsletters targeted at ethnic identity - Newsletters as in the control group, but targeted at one of the 16 ethnic identities (the 16 types were based on various combinations of five core types: assimilated, Black Americans, Afrocentric, Bicultural, and Multicultural, with cultural mistrust as subtypes of the Black American and Afrocentric identity types). E.g. risks of Black Americans on chronic diseases were specified for participants with a Black American EI. Graphics depicting eating and social scenes were used to tailor the graphics by EI type, gender, age, marital status and children living in the home. E.g. the Black American newsletters featured images of almost exclusively Black Americans, while the assimilated newsletters primarily featured images of individuals of other cultures with ethnically indistinct clothing, hair, and jewellery. Participants with a dual Afrocentric EI type received Afrocentric images mixed with images from their second EI type, etc. All other factors of the photos were constant. Adaptations tested Deep structure adaptations - Information targeted at ethnic identity</td>
<td>General targeted newsletters for a Black American audience with a slight Untailored, ethically neutral graphics accomplished by generally featuring images without people or other racial or ethnic cues. Slight ethnocentric focus. - 3 Newsletters by mail (once a month) - Each newsletter included two recipe cards accompanied by small bags of spices and either a magnetized refrigerator notepad or a magnet with F&amp;V serving size information - Text contained intermittent use of the participant's name and tailoring on F&amp;V intake, sociobehavioral variables (e.g. preferences, dietary limitations, social roles for shopping and cooking, barriers, outcome expectations, and demographics) - Draft newsletter text, layout and messages were tested and refined by AA and, among others, experts in Black identity theory. Target reading level was approximately sixth grade.</td>
<td>61% reported receiving 3 newsletters (25%, 2)</td>
</tr>
<tr>
<td></td>
<td>Increase in daily mean Fruit and vegetable intake: IG: 1.1 servings per day vs CG: 0.8 servings per day. (n.s.) Only among the subpopulation with an Afrocentric identity a significantly larger increase in fruit and vegetable intake was reported: IG: 1.4 servings per day vs. CG: 0.43 servings per day; p &lt; 0.05.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.3  Description intervention and outcomes of studies that didn’t report an effect of cultural adaptation (continued)

<table>
<thead>
<tr>
<th>Reference</th>
<th>Description of intervention</th>
<th>Dose received</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chiang CY et al. [23]</td>
<td>Similar 8-week walking program plus culturally sensitive monitor by phone every week including:</td>
<td>8-week walking program, all materials translated to Chinese. Monitor by phone every week</td>
<td>Duration of walking was not significantly different between the IG and CG. No figures about effect available.</td>
</tr>
<tr>
<td></td>
<td>• Emphasize Chinese cultural value of authority (opinions of people whom they respect).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Family member involvement (signing informed consent by one of family members).</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Harmony and balance (harmony with the natural environment, social environment, and family is a way of life and will promote health and prevent illness)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptations tested</td>
<td>Deep structure adaptations</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Incorporating cultural values</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Involvement family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reference</td>
<td>Description of intervention</td>
<td>Dose received</td>
<td>Effect</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------</td>
<td>---------------</td>
<td>--------</td>
</tr>
<tr>
<td>Chiang CY et al. [23]</td>
<td>Similar 8-week walking program plus culturally sensitive monitor by phone every week including: • Emphasize Chinese cultural value of authority (opinions of people whom they respect). • Family member involvement (signing informed consent by one of family members). • Harmony and balance (harmony with the natural environment, social environment, and family is a way of life and will promote health and prevent illness)</td>
<td>Adaptations tested</td>
<td>Deep structure adaptations</td>
</tr>
<tr>
<td>Newton et al. [24]</td>
<td>Culturally Sensitive Exercise Counseling (CS), identical to SB except for 4 culture specific key elements (surface &amp; deep structure): 1) all group members were African American 2) the sessions were led by African American counselors 3) sessions were conducted at site located in the African American community 4) materials were designed to address socio-cultural concerns of African Americans regarding exercise (beliefs, worldview &amp; history, depictions of African Americans)</td>
<td>Adaptations tested</td>
<td>Surface structure adaptations</td>
</tr>
<tr>
<td></td>
<td>Control group 2: Standard Behavioral Exercise Counseling (SB). 10 group intervention sessions over 6 months, weekly during month 1, biweekly during month 2 to 3 and monthly during months 4 to 6</td>
<td>Control group 1: Physician Advise (PA), a minimal treatment corresponding to the exercise guidelines that a healthcare provider would typically give to a sedentary individual.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control Group without basic intervention not reported in table</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control Group without basic intervention not reported in table.
adaptations were made to an intervention consisting of ten group sessions [24]. In the adapted intervention, all group members and the counselor were African American, the location was preferred by the target population and socio-cultural values regarding exercising were incorporated. There were no differences in cardio respiratory fitness and exercise frequency between the adapted and basic intervention group.

**Are there features of the adaptations that may explain their effectiveness?**

We could distinguish five broad categories of adaptations: level of adaptation (surface- vs. deep-structure); cultural values vs. interventions involving community health workers or lay health advisors; incorporating family vs. religious values; interventions employing intensive vs. non-intensive strategies; and use of a package of adaptations vs. one type of adaptation (Table 3.4).

*Surface- vs. deep-structure adaptations*

We found no indication that the level of adaptations influenced effectiveness. Deep structure adaptations were used both by studies reporting effect (n=4) as well as those reporting no effects (n=10). The same applies to surface structure adaptations.

*Adaptations based mainly on cultural values vs. involvement of lay health advisors / community health workers*

We also observed no pattern of effectiveness when we distinguished the studies on the basis of adaptations that involved community health workers or lay health advisors versus adaptations mainly based on incorporating cultural values into intervention materials or in the counseling conducted by professionals.

*Distinguishing incorporating family versus religious values*

We found that we could distinguish topics used in the cultural adaptations, i.e. religious values, family values and/ or family involvement and other cultural values which were not further specified. Three (of 4) interventions that incorporated family values and/ or involving family members found effects on primary outcomes and 1 intervention (of 5) that incorporated religious values.

*Intensity of the adaptation*

In 9 of the 17 studies, the cultural adaptation implied an increase of the intervention’s intensity (e.g. extra sessions with a lay health advisor). This applies to all studies that reported effects on primary outcomes.
Number of adaptations tested
It appeared that 5 (of 7) studies that incorporated a package of adaptations, e.g.; additional proactive calls together with tailoring to cultural values [17] report effects. Studies using one type of adaptation, e.g. use of homogeneous groups, [25] didn’t show effects (n=10).

Discussion
To our knowledge, this is the first review that investigated the effectiveness of cultural adaptations in interventions for ethnic minorities targeted at smoking cessation, diet, and or increasing PA. We identified 17 studies that evaluated the effect of one or more cultural adaptations. The adaptations tested ranged from incorporating socio-cultural values of the target population to involving community health workers or lay health advisors, from one adaptation to a package or adaptations and from deep structure adaptations to surface structure adaptations. In 5 studies the adapted intervention had a positive statistically significant effect on the primary outcomes. These were mainly interventions that targeted smoking cessation. Twelve studies showed no statistically significant effects on primary outcomes, although some studies presented trends favorable for cultural adaptations. We observed that interventions incorporating a package of cultural adaptations, cultural adaptations that implied a higher intensity and these incorporating family values were more likely to report statistically significant effects.

Limitations
Before interpreting the results, the limitations of our review need to be considered. Like in all systematic reviews, publication bias (e.g. because studies were small or non-effective) may have limited the number of studies to be found. However, as our search did yield several small non-effective studies, we do not expect that this would have changed our results.
Second, the studies show heterogeneity in design and quality. Outcome measures vary too much to conduct a detailed analysis of effect sizes. In addition, follow-up time varied between studies. It may be expected that studies with a short follow-up interval would be more likely to report effects; however we did not find such a pattern. A similar argumentation can be followed for the quality of the studies. It may be that particularly the studies that have a strong design found effects compared to those studies with a moderate or weak quality score. However, we found no such association. The conclusions of our review with regard to which adaptations are effective and which not, are therefore not likely to be affected by differences in the quality of the studies.
**Interpretation of results**

We found that studies that reported effects had tested a whole package of adaptations. Furthermore, the adaptations were more likely to be infused through the intervention as a whole and at several levels. For example, beside the individual, also the level of the family was included. Thus, in line with evidence about behavioral interventions in general, it seems that interventions at multiple levels result in larger effect than single interventions [36].

The finding that cultural adaptations are likely to result in a more intense intervention may reflect that enhancement of the intervention is an important aspect of the cultural adaptations. Most study populations in studies incorporating cultural adaptations have lower educational levels and are living in disadvantaged circumstances (e.g. [17, 21, 29]). Probably, more time and attention may be needed to make the information understandable in these groups [37]. So, it might be that the effects of the included studies are also the result of the adaptation to lower health literacy and that adaptations to characteristics other than norms and values should also be taken into account when developing interventions.

One striking result of our review is that the effectiveness of specific cultural adaptations was seen mainly in studies on smoking cessation and less often in studies on diet and PA. Regarding PA, this is in line with another review [38]. In addition to the above-mentioned reasons, this finding may be associated with deeply rooted cultural values and personal identity related to certain behaviors, like diet. These behaviors may therefore be less changeable, as suggested by several studies [39-41]. As a result, changing these habits – including what, when, and how food is eaten – may take more than adapting an intervention.

**Implications for future research**

This review indicates that the current knowledge about the effectiveness of cultural adaptations is limited. To date most studies have been conducted in the United States among African Americans and Hispanics, which may not be generalizable to other population groups or to other countries. Therefore, future research needs to be conducted among other ethnic minority groups with different migration histories or local circumstances.

The results of this review provide useful input for further research. We recommend, firstly, that the design of future studies should include a standard care arm with regular care as provided by general population without any extra interventions. Examples can be seen in Babamoto et al., Keyserling et al., and Newton et al. [22, 24, 29]. With this design we are better able to assess the effect of the basic intervention and the adaptations tested.

Second, although a broad mix of cultural components appears most effective, it remains important to identify the specific cultural adaptations that are most effective within this mix. This calls for more experimental designs in which well-defined adaptations or combinations of adaptations are tested. Examples of studies that tested one type of adaptations are studies done by Resnicow et al. [22] on assessing the incorporation of ethnic identity and by Ard et al. [25] on assessing the effect of group composition. However, in these studies the basic...
### Table 3.4 Features of the cultural adaptations

<table>
<thead>
<tr>
<th>Cultural adaptation</th>
<th>Cultural values vs lay health advisors</th>
<th>Categories of cultural values adaptations</th>
<th>Cultural adaptation imply higher intensity</th>
<th>Number of adaptations tested</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Surface structure</td>
<td>Deep structure</td>
<td>Both</td>
<td>Cultural values</td>
</tr>
<tr>
<td>Cultural values</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Family values</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Cultural adaptation</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

#### Effective studies

**Smoking cessation**

- Wetter et al., [17]
- Orleans et al., [16]
- Woodruff et al., [18]

**Diet and PA**

- Babamoto et al., [26]

**All three behaviors**

- Cene et al./Becker et al.[31, 32] ¹

#### Studies not reporting effect of adaptation

**Smoking cessation**

- Nollen et al., 2007 [15]

**Diet and PA**

- Keyeseling et al.,[29]
- Arnd, [25]
- Fitzgibbon et al., [28]
- Staten et al., [30]
- Campbell et al., [27]

**Diet only**

- Kreuter et al., [21]
- Eldert et al., [20]
- Campbell et al., [19]
- Resnicow et al., [22]

**PA only**

- Chiang et al[23]
- Newton et al., [24]

¹ This was however, not the adaptation tested.

² Control group received same information via printed materials.
intervention was already culturally adapted which may have limited the potential effect of these adaptations. To assess the potential effect of one-adaptation studies can be designed similar to pharmacological trials. Adaptations that are considered for use could be tested in first- or second-phase studies solely and combined [42]. If effective, they could subsequently be included in larger controlled trials to provide insight into the package of adaptations that is most effective.

Finally, there are other characteristics of cultural adaptations that might be worth studying in more detail. The process of developing the cultural adaptation (e.g. was the target population involved in this development?), the way the adaptation was executed (e.g. related to the competences of the executers) and the types of determinants addressed by the adaptations (e.g. enabling or cognitive factors) are all examples of factors that may affect the effectiveness of cultural adaptations. More insight into these characteristics of cultural adaptations might help to select whether or not a cultural adaptation will contribute to the effectiveness of an intervention.

**Conclusion**

The results of our review indicates that: 1) Culturally targeted interventions may be more effective if cultural adaptations are implemented as a package of adaptations, the adaptation addresses family influences, and where the adaptation implies a higher intensity of the intervention; 2) Adaptations in smoking cessation interventions seem to be more likely to be effective than adaptations in interventions aimed at diet and PA; 3) More systematic experiments are needed in which the aim is to gain insight in the best mix of cultural adaptations among diverse populations in various settings, particularly outside the US.
References


### Appendix 3.1 Search strategies

<table>
<thead>
<tr>
<th>Embase</th>
<th>Medline</th>
<th>PsychInfo</th>
<th>Cochrane CT</th>
</tr>
</thead>
</table>
| **Basic search** | 1. exp 'ethnic, racial and religious groups'/ or exp 'ethnic or racial aspects'/ or exp minority group/ or racial group*.ti,ab or minority group*.ti,ab or ethnic*.ti,ab or Moor*.ti,ab or Turk*.ti,ab or Surinam*.ti,ab or Antill*.ti,ab or exp Minority Groups/ or minority.ti,ab or exp eastern hemisphere/ or exp oceanic regions/ or exp western hemisphere/ or culture*.ti,ab.  
2. health education.ti,ab or exp health education/ or health promotion.ti,ab or exp disease control/ or prevent*.ti,ab or interven*.ti,ab.  
1. exp emigrants and immigrants'/ or exp 'transients and migrants'/ or exp Minority.ti,ab or migrant*.ti,ab or minority group*.ti,ab or minority group*.ti,ab or Moor*.ti,ab or Turk*.ti,ab or Surinam*.ti,ab or Antill*.ti,ab or exp eastern hemisphere/ or exp oceanic regions/ or exp minority group*.ti,ab or exp minority groups/ or migrant*.ti,ab or minority group*.ti,ab or Moor*.ti,ab or Turk*.ti,ab or Surinam*.ti,ab or Antill*.ti,ab or health promotion.ti,ab.  
2. health education.ti,ab or exp health education/ or health promotion.ti,ab or exp disease control/ or prevent*.ti,ab or interven*.ti,ab.  | 1. exp ethnic and minority groups'/ or exp minority group/ or migrant*.ti,ab or minority group*.ti,ab or migrant*.ti,ab or minority group*.ti,ab or Moor*.ti,ab or Turk*.ti,ab or Surinam*.ti,ab or Antill*.ti,ab or health promotion.ti,ab.  
2. health promotion.ti,ab or exp Health Promotion/ or health education.ti,ab or exp Preventive Health Services/ or interven*.ti,ab or prevent*.ti,ab.  | #1 MeSH descriptor Emigrants and Immigrants explode all trees  
#2 MeSH descriptor Population Groups explode all trees  
#3 MeSH descriptor Transients and Migrants explode all trees  
#4 exp emigrant*.ti,ab  
#5 exp immigrant*.ti,ab  
#6 exp health education.ti,ab  
#7 exp health promotion.ti,ab  
#8 MeSH descriptor Minority Groups explode all trees  
#9 exp minority*.ti,ab  
#10 MeSH descriptor Geographic Locations explode all trees  
#11 (surinam*:ti,ab,kw)  
#12 (Turk*:ti,ab,kw)  
#13 (Antill*:ti,ab,kw)  
#14 (migrant*:ti,ab,kw)  
#15 MeSH descriptor Culture explode all trees  
#16 exp culture*.ti,ab  
#17 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14 OR #15)  
#18 MeSH descriptor Health Education explode all trees  
#19 exp health education.ti,ab  
#20 exp health education.ti,ab  
#21 MeSH descriptor Health Promotion explode all trees  
#22 MeSH descriptor Preventive Health Services explode all trees  
#23 (prevent*:ti,ab,kw)  
#24 (interven*:ti,ab,kw)  
#25 (#18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24)  
#26 (#17 AND #25)  
#27 (#26), from 1997 to 2009  |

<table>
<thead>
<tr>
<th><strong>Search strategies</strong></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4. 3 and 1 and 2</td>
<td>5. limit 4 to year='1997 - 2009'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior specific supplement</td>
<td>Smoking</td>
<td>Physical activity</td>
<td>Diet</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------</td>
<td>------------------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>3. exp’smoking and smoking related phenomena/* or exp smoking cessation/ or exp nicotine replacement therapy/ or exp smoking cessation program/ or smok*.ti,ab. or tobacco.ti,ab.</td>
<td>3. exp Physical Exertion/ or Physical Fitness/ or exp Physical Education and Training/ or exp Sports/ or exp Dancing/ or exp Exercise Therapy/ or (exercise5 adj5 (fitness or train5 or activ5 or endur5)).tw. or (exercise5 adj5 (train5 or physical5 or activ5)).tw. or (exercise5 adj5 aerobic5).tw. or ((lifestyle or life-style) adj5 activ5).tw. or ((lifestyle or life-style) adj5 physical5).tw.</td>
<td>3. nutrition*.ti,ab. or exp Body Weight/ or exp Weight Loss/ or weight.ti,ab. or exp Diet Therapy/ or exp Diet/ or diet*:ti,ab. or diabet*:ti,ab. or exp Food Intake/ or exp Nutritional Status/ or exp Food Preference/</td>
</tr>
<tr>
<td></td>
<td>3. exp Smoking/ or smok*.ti,ab. or exp Smoking Cessation/ or exp ‘Tobacco Use Cessation/’ or tobacco.ti,ab.</td>
<td>3. exp Physical Exertion/ or Physical Fitness/ or exp Physical Education and Training/ or exp Sports/ or exp Dancing/ or exp Exercise Therapy/ or (exercise5 adj5 (fitness or train5 or activ5 or endur5)).tw. or (exercise5 adj5 (train5 or physical5 or activ5)).tw. or (exercise5 adj5 aerobic5).tw. or ((lifestyle or life-style) adj5 activ5).tw. or ((lifestyle or life-style) adj5 physical5).tw.</td>
<td>3. nutrition*.ti,ab. or exp Body Weight/ or exp Weight Loss/ or weight.ti,ab. or exp Diet Therapy/ or exp Diet/ or diet*:ti,ab. or diabet*:ti,ab. or exp Food Intake/ or exp Nutritional Status/ or exp Food Preference/</td>
</tr>
<tr>
<td></td>
<td>3. smoking cessation.mp. or exp smoking cessation/</td>
<td>3. exp Physical Exertion/ or Physical Fitness/ or exp Physical Education and Training/ or exp Sports/ or exp Dancing/ or exp Exercise Therapy/ or (exercise5 adj5 (fitness or train5 or activ5 or endur5)).tw. or (exercise5 adj5 (train5 or physical5 or activ5)).tw. or (exercise5 adj5 aerobic5).tw. or ((lifestyle or life-style) adj5 activ5).tw. or ((lifestyle or life-style) adj5 physical5).tw.</td>
<td>3. nutrition*.ti,ab. or exp Body Weight/ or exp Weight Loss/ or weight.ti,ab. or exp Diet Therapy/ or exp Diet/ or diet*:ti,ab. or diabet*:ti,ab. or exp Food Intake/ or exp Nutritional Status/ or exp Food Preference/</td>
</tr>
<tr>
<td></td>
<td>#28 MeSH descriptor Tobacco Use Cessation explode all trees</td>
<td>#28 MeSH descriptor Physical Exertion explode all trees</td>
<td>#28 (nutrition):ti,ab,kw</td>
</tr>
<tr>
<td></td>
<td>#29 (smoking cessation):ti,ab,kw</td>
<td>#29 (smoking cessation):ti,ab,kw</td>
<td>#29 (nutrition):ti,ab,kw</td>
</tr>
<tr>
<td></td>
<td>#30 (#28 OR #29)</td>
<td>#30 (Physical Exertion):ti,ab,kw</td>
<td>#30 (#28 OR #29)</td>
</tr>
<tr>
<td></td>
<td>#31 (#27 AND #30)</td>
<td>#31 (#27 AND #30)</td>
<td>#31 (#27 AND #30)</td>
</tr>
</tbody>
</table>

Time limit included in basic search

#27 AND #40

#41 (#27 AND #40)