ABSTRACT

Objective: The internet is a primary source of nutrition information in the US. Minorities and non-English speakers face a digital divide when accessing such information. We aimed to report on the reach of social media dissemination of the cultural adaptation of the evidence-based Kid’s Healthy Eating Plate to Spanish-speaking Latinos and of previous versions.

Methods: The adaptation was based on the Framework for Reporting Adaptations and Modifications-Expanded and was disseminated through social media platforms (116 days). Outcomes were impressions, shares, website link clicks, number of viewers, and access country.

Results: The kids’ culturally adapted version had 288,773 impressions and 1,227 shares on social media; the website was linked 9,763 times, predominantly through Facebook (Meta Platforms, Inc). User engagement and pageviews were mostly from Spain, Latin American countries, and the US.

Conclusions and Implications: The cultural adaptation of healthy eating guidelines for Spanish-speaking children was accessed in the US and worldwide. Promotion through social media had a significant impact on its reach. Cultural adaptation and paid dissemination of evidence-based materials may help close the digital divide and promote health literacy in diverse populations.

Key Words: cultural adaptation, healthy eating, social media promotion, Latino populations (J Nutr Educ Behav. 2022;54:863–871.)

INTRODUCTION

Health care disparities in ethnic and racial minorities are a widely recognized problem in public health.\(^1,6\) Culturally tailored health services, outreach materials, and interventions can help reduce inequalities by improving their effectiveness and ensuring that the needs of the population in which they are implemented are met.\(^1,3–6\) Cultural adaptation is complex and varied according to the original material and the population of interest.\(^7\) It ranges from simple translation to deep cultural optimization, although cultural adaptation can still be made in the original language.\(^8\) Modifications at a surface-level match the content to the characteristics of the target population, increasing engagement and acceptability of the messages, as they are in accordance with the culture and context of the intended audience.\(^9,10\) Deep structure adaptations require an understanding of the socio-environmental factors that affect behavior in a specific population, which impacts the desired outcome.\(^1,5,9,10\) There are few descriptions that detail the decision making process, degree of modifications, reasons for the adaptation, and evaluation of results.\(^3,7\) Standardization of the process is missing, and publications report cultural adaptations in diverse ways. In particular, little has been reported about multicultural tailoring, which acknowledges the heterogeneity of cultural perspectives.\(^10\) A comprehensive framework for cultural adaptation is the Framework for Reporting Adaptations and Modifications-Expanded (FRAME).\(^6,11\) It serves as a guide to reporting modifications when conducting cultural adaptation.\(^12\)

The internet is a popular source of health and nutrition information. More than 70% of US adults use it as the primary means to obtain information about medical and nutrition topics.\(^13–17\) Nonetheless, technological inequities are present in health websites, as minorities and individuals who are not proficient in English face a digital divide, including a lack of language-appropriate evidence-based content.\(^14,18\) Social media platforms have become a ubiquitous communication channel through which people are exposed, share, and interact with health-related information (not all of which is evidence-based), including content created by consumers themselves.\(^19\) Social media platforms may be considered in efforts to disseminate information by trusted institutions and organizations. This is particularly relevant given that an individual is exposed to great amounts of information.
Cultural adaptation of materials and programs is necessary but insufficient to impact minorities. Active promotion of adaptations from evidence-based sources is needed to reduce disparities related to information access and exposure. In response, we culturally adapted the Kid’s Healthy Eating Plate (HEP), an evidence-based guide for healthy eating for children, to Latinos residing in the US and internationally (creating El Plato para Comer Saludable para Niños [PCS-Niños]) and disseminated it through social media. This article aimed to report on the reach and impact of dissemination efforts of this cultural adaptation and other adaptations created before this study. We explained the adaptation process using FRAME’s categories while describing the impact through user engagement metrics collected by social media channels and the website analytics data. For this work, Latinos refer to people of all genders from Latin American countries, with a specific focus on Spanish speakers.

METHODS
Original Materials

The HEP provides visual and written guidance about healthful eating choices. Nutrition experts from the Harvard T.H. Chan School of Public Health developed it and made it available on The Nutrition Source website in 2011. The HEP was intended for US adults and was published in English, with foods commonly found in the US. A version for children (Kids HEP) was created in 2016 to meet children’s needs and communicate dietary recommendations in an appealing format to them. Other versions of the HEP were developed, and to date, there are more than 30 translations available. These surface-level adaptations were an iterative process in which nutrition experts fluent in the target language discussed the wording and visuals of each version to communicate recommendations for healthful eating to audiences from different countries. Experts decided to adopt both a Latin American version (El Plato para Comer Saludable [PCS-LatAm]) and a Spain version (El Plato para Comer Saludable [PCS-Sp]) because of the cultural differences across Hispanic and Latino ethnic heritages. Both adult Spanish versions of the PCS were published on The Nutrition Source website in 2015.

For the present study, we conducted a structured cultural adaptation of the Kids HEP for children of Latin American culture (PCS-Niños) to convey dietary guidelines to children from Latin American heritage and monitor the impact and reach that the adaptation had after dissemination strategies. The adaptation was made in both the webpage text and visual representation, following the same approach as previous HEP versions. Figure 1 shows the visual guides from the original Kids HEP and this cultural adaptation.

Cultural Adaptation

The methodology we used to culturally adapt the Kids HEP to Latin American populations is illustrated in Figure 2, based on FRAME components. The adaptation—which took 2 months—occurred during the maintenance stage since the original HEP was created 8 years prior, and the Kid’s version had been circulated since 2015. The PCS-Niños was posted online in 2019. The adaptation was proactive as the result of careful planning to maximize the reach of the material. We evaluated The Nutrition Source’s website analytics to identify countries from which Spanish-language users most frequently accessed the original versions (HEP and Kids HEP). People from Latin American countries visited the website, and we decided to culturally adapt it to that region. The adaptation took place while dissemination of the original Kids HEP...
continued as usual. The goals were (1) to communicate evidence-based healthy eating information for children to Latin American Spanish speakers, (2) to increase the reach and impact of US healthy eating guidelines to the target population and to nutrition professionals who work with these populations, and (3) to achieve the first 2 goals in an effective, culturally appropriate way.

For the first Spanish adaptations (PCS-Sp and PCS-LatAm) of the HEP adult version, 4 Spanish-speaking professionals from Spain and diverse Latin American countries only conducted the changes to the wording. For the present adaptation, a similar process ensued after approval from The Nutrition Source Editorial Team. Two authors (J.M. and A.M.R.) are native Spanish speakers from 2 different Latin American countries and took the lead in adapting the text, keeping the original graphical design. During this iterative process, we held regular meetings to discuss progress and make decisions. We consulted with Spanish-speaking colleagues and community members to resolve specific words and phrasing.

Cultural adaptation efforts should be planned, purposeful and collaborative. Using a framework helps guide and report modifications.

We modified the content to reflect food choices relevant to Latin American diets. To make the content more appealing to children, part of the scale-up and implementation of the PCS-Ninos involved a black and white version to print and color. For contextual modifications, the main factor that played a role was the target population, which was different than the original. Hence, the level of delivery was for an entire group or community (Spanish-speaking Latinos) and not to specific ethnic groups (each culture individually).6,11

After translating to Latin American Spanish, the following modifications took place:

1. Food items: All food items were translated to commonly used Latin American words. Some food items required multiple Spanish words to encompass the terminology from different Latin American cultures for a deeper adaptation.
2. Text and wording: Literal translation was inaccurate, and the writing style of some sentences had to be tailored to Spanish grammatical rules. Because Spanish is a gender-based language, appropriate pronouns had to be added.
3. Addressing the reader: There are 2 possible translations of you in Spanish—an informal one (tú) and an informal one (tú). The use depends on the country, audience, message, and communicator. We agreed on using the formal version to make the content relevant to a broader audience without being disrespectful. The word children in English encompasses all genders; however, there are words to distinguish male or female children in Spanish. Because inclusive language usages vary greatly by country, we agreed on the masculine term (niños) and a note was added to explain that it was used to encompass all genders. Table 1 lists the types of modifications, original wording,
rationale, and examples of changes made. All modifications were fidelity-consistent with the core messages of the original version.11

Dissemination Strategies

The PCS-Niños was published on The Nutrition Source website on March 20, 2019. It was then shared through social media (Facebook [Meta Platforms, Inc], Instagram [Meta Platforms, Inc], and Twitter) for a wider reach to the intended audience. Social media posts were disseminated immediately following the PCS-Niños’s publication, and final metrics were collected after 92 days. On Facebook, the PCS-Niños was posted and promoted over 10 days with a budget of $150. Afterward, the post remained available and received additional engagement organically. Promotion through Instagram and Twitter was not paid. On Instagram, the resource was shared through the stories feature, in which segments of the PCS-Niños were displayed across 6 slides. On Twitter, 3 tweets featured the PCS-Niños, shared through the @HSPHNutrition and @HarvardChanSPH accounts. For Facebook and Twitter, the Harvard Chan School of Public Health profiles were used because The Nutrition Source does not manage accounts on those platforms.

Table 1. Details and Examples of Modifications During the Cultural Adaptation of the El Plato para Comer Saludable para Niños

<table>
<thead>
<tr>
<th>Context Change</th>
<th>Rationale</th>
<th>Description</th>
<th>Original</th>
<th>Example of Adaptation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food items and meals</td>
<td>Cultural nuances should be considered. Thus, multiple common words for Latin American foods were used as examples of food categories.</td>
<td>Traditional foods were exemplified using the most common Spanish word, as well as other ethnically specific terms for the same food item.</td>
<td>Choose beans and peas</td>
<td>Elija leguminosas (legumbres, lentejas, garbanzos, habichuelas, frijoles), guisantes y chicharos</td>
</tr>
<tr>
<td>Text and wording</td>
<td>Literal translations may lose meaning. Thus, style changes were made to keep an accurate meaning of the core messages and guidance.</td>
<td>Male or female nouns were used, or a gender-neutral noun was substituted. The direct translation of catchy English phrases into Spanish was avoided, and instead, appropriate colloquial language was used.</td>
<td>Avoid sugary drinks like sodas</td>
<td>Evite bebidas azucaradas como refresco/soda</td>
</tr>
<tr>
<td>Tone for addressing the reader</td>
<td>In Spanish, the pronoun you can be translated into an informal or formal version. In English, verb conjugation is less dependent on the pronoun, but in Spanish, pronouns determine verb endings; thus, the formal and informal conjugation of verbs looks different.</td>
<td>Countries in Latin America use the formal and informal you differently. The formal version of you made the adaptation more relevant to a broader audience.</td>
<td>Kid’s Healthy Eating Plate Water should be the drink of choice</td>
<td>El Plato de Comer Saludable para Niños El agua debe ser la bebida principal</td>
</tr>
<tr>
<td>Gender-based words</td>
<td>Nouns in English are gender-neutral, but in Spanish, they are gender-specific. The word children would require different endings to encompass all genders.</td>
<td>There are different guidelines for inclusive language in Spanish (ie, adding a/o; e; x; or @). However, to maintain the flow of the webpage text, the consensus was reached to use the general male noun and clarify that the word was used for all children of any sex or gender.</td>
<td>Eat plenty of fruits of all colors</td>
<td>Consuma muchas frutas de todos los colores (informal version would be consume)</td>
</tr>
</tbody>
</table>

NA indicates not applicable.

*The term niños is generally used and refers to all sex and genders.*
Evaluation of Users’ Engagement

We developed a monitoring plan to assess the reach of the original versions of the HEP and Kids HEP and their corresponding adaptations (PCS-LatAm, PCS-Sp, PCS-Niños) for 4 months (116 days) after being published. We tracked passive and active engagement from social media users through (1) impressions or reach (times that users were exposed to the content regardless of engagement), (2) link clicks (times users clicked the link within the post to access The Nutrition Source webpage), and (3) shares (times users forwarded or shared the post).

For further evaluation of engagement with the PCS-Niños, we used Google Analytics to monitor (1) the number of first-time and returning viewers to the page, (2) the number of total page viewers, and (3) the country from which a viewer accessed the page. These metrics were compared with previous versions of the HEP. Because of advances in social media and tools to monitor user engagement, there were new metrics to assess the PCS-Niños that previously did not exist. For user engagement with promoting posts, data were obtained from the Harvard Chan School of Public Health, @HSPHNutrition, and @HarvardChanSPH Facebook, Instagram, and Twitter accounts, respectively. Google Analytics (Google) was used to obtain user engagement data directly from the HEP website in an aggregate and anonymous manner. This study was exempted from revision by the Institutional Review Board at Harvard T.H. Chan School of Public Health because it did not involve research with human participants.

RESULTS

Considering engagement metrics for social media promotions, paid Facebook posts led to the highest numbers: PCS-Niños posts had 288,773 impressions (221,158 from Facebook posts, 66,090 from Twitter, and 1,525 from Instagram stories); 1,227 shares (1,111 from Facebook, 109 from Twitter, and 7 from Instagram); and its website was linked 9,763 times (9,664 from Facebook, 69 from Twitter, and 30 from Instagram).

Table 2 shows the intended audience and engagement metrics of 5 different versions of the HEP during the 116 days after each was launched. The English version of the HEP received the most pageviews (117,533). El Plato para Comer Saludable received 1,351 fewer pageviews than PCS-LatAm. When comparing the Kids HEP vs PCS-

<table>
<thead>
<tr>
<th>Version</th>
<th>Intended Audience and Launch Date</th>
<th>Total Pageviews During the First 116 d After Publication</th>
<th>Total Pageviews</th>
<th>Unique Pageviews</th>
<th>Returning Visitors (%)</th>
<th>Top 5 Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEP (English)</td>
<td>Adults in the US March 20, 2014</td>
<td>117,533</td>
<td>44,571</td>
<td>37,290</td>
<td>22</td>
<td>US, India, Italy, Canada, United Kingdom</td>
</tr>
<tr>
<td>PCS-Sp (Spanish–Spain)</td>
<td>Spanish-speaking adults of Spaniard origin April 27, 2015</td>
<td>2,166</td>
<td>483</td>
<td>399</td>
<td>31</td>
<td>Spain, Mexico, Argentina, US, El Salvador</td>
</tr>
<tr>
<td>PCS-LatAm (Spanish–Latin America)</td>
<td>Spanish-speaking adults of Latin American origin April 27, 2015</td>
<td>3,517</td>
<td>6,145</td>
<td>5,029</td>
<td>22</td>
<td>Spain, Mexico, Argentina, US, Colombia</td>
</tr>
<tr>
<td>Kid’s HEP (English)</td>
<td>Children in the US January 12, 2016</td>
<td>14,391</td>
<td>4,116</td>
<td>3,460</td>
<td>19</td>
<td>US, India, Philippines, United Kingdom, Australia</td>
</tr>
<tr>
<td>PCS-Niños (Spanish)</td>
<td>US Spanish-speaking children; focused on Latin America March 20, 2019</td>
<td>20,530</td>
<td>1,049</td>
<td>894</td>
<td>22</td>
<td>Spain, Mexico, Argentina, Colombia, Chile</td>
</tr>
</tbody>
</table>

HEP indicates Healthy Eating Plate; PCS-Sp, El Plato para Comer Saludable para España; PCS-LatAm, El Plato para Comer Saludable para América Latina; PCS-Niños, El Plato para Comer Saludable para Niños.

*aIn addition to the specific demographics mentioned in this table, all versions of the HEP are intended for health professionals as a tool to guide them when providing diet-related counsel to individuals from these populations. Kids’ Plates are also positioned as tools for caregivers to use alongside children; *bEarliest available data: it does not correspond to the actual launch date of September 14, 2011. Data are presented from the following 116 days after March 20, 2014.
Niños, the latter received more than 6,000 pageviews.

Table 2 also compares engagement metrics between different versions of the HEP during August, 2019 and the top countries with more pageviews in that same month. The original HEP was the most accessed webpage with 44,571 views mostly from the US, India, and Italy. The PCS-LatAm version had more views (5,029 vs 399) but fewer returning visitors (22 vs 31%) than the PCS-Sp version. The Kids HEP had more total viewers (4,116 vs 1,049) but a lower percentage of returning visitors (19 vs 22%) than the PCS-Niños.

Although the top 5 countries with more pageviews for the Spanish HEP versions were Spanish-speaking, users from the US also accessed these versions. From March 20, 2019 to July 14, 2019, 2,510 views of PCS-LatAm were from the US, vs only 258 for the PCS-Sp. Figure 3, A, shows that in most countries, the PCS-LatAm had a higher percentage of pageviews than the Spain version, including in Latin American countries that were part of the intended audience (8.7 vs 0.7% in Mexico). Figure 3, B, compares the percentage of pageviews from the total views of the Kids HEP and PCS-Niños in different countries. In Spanish-speaking countries, the Spanish version was more accessed than the English version (14 vs 0.3% in Argentina). However, the opposite was true for the English version, as most pageviews were from the US.

**DISCUSSION**

Engagement metrics showed that the PCS-Niños was highly accessed in the US and worldwide. Social media platforms were an effective channel to share health and nutrition information, as promotion efforts reached nearly 289,000 social media users in 92 days, translating into more than 17,000 unique pageviews on the PCS-Niños website. This is likely influenced by the multichannel promotion efforts because many users arrived on the PCS-Niños webpage by clicking through Facebook posts, Instagram stories, or tweets.

A budget assigned to the active dissemination of evidence-based online materials increases their reach and impact on intended audiences.

The outcome of the promotion post through Facebook highlights the potential advantages of assigning a relatively low budget to promotion. This is particularly relevant because of the high percentage of US adults who use the internet and social media as sources of health and nutrition information. Latinos living in the US have increased their internet use from home connections and mobile devices, and 90% of Latinos aged < 50 years use the internet. Although lower in US-residing Latinos with low annual household income (vs > $50,000) and exclusive Spanish speakers (vs English speakers or bilingual), ≥ 75% of these groups report using the internet. An exploratory study revealed that Latinos recognize the web as a helpful source to find health information; however, compared with non-Hispanic White individuals, a lower proportion of Latinos use it to seek health information, mostly because of differences in health and computer literacy, language barriers and cultural factors.

Regarding the impact of the PCS-Niños, the present cultural adaptation had the second largest number of total and unique page viewers, following the original version. Caution should be exerted when looking at these results, as internet use has changed since the initial adaptations of the HEP were launched, and there are numerous complexities and

![Figure 3](image-url)
variables related to tracking user engagement.

El Plato para Comer Saludable para Niños reached more viewers than the PCS-Sp and the PCS-LatAm. However, not all versions were adapted simultaneously, and a few years can make a difference in how people interact and use online resources.14–17 Other considerations when comparing engagement metrics include differences in the period between the original launch date of each version and the date when the metrics were assessed. Search Engine Optimization—a technique that affects how high a particular website appears in the results list of specific searches—could play an important role, as the longer a webpage is posted and accessed, the higher it may rank in a list of search results, which is typically associated with more access.

El Plato para Comer Saludable para Niños had fewer unique viewers than other versions, including the Kids HEP; however, the percentage of returning users was higher for the PCS-Niños, suggesting that viewers found the content relevant and useful to prompt them to return to the site. As expected, both English versions (HEP and Kids HEP) were primarily accessed by users from 3 different countries in which English is an official language. In contrast, the 3 Spanish versions were primarily accessed by users from Spanish-speaking countries on 2 different continents. Although the content of the PCS-Niños was tailored to Latin American Spanish only, Spain topped the list of countries with the most access to these webpages, and it also had the greatest share of access to the PCS-LatAm than the PCS-Sp. These results could be due to Search Engine Optimization, such that when users in Spain searched for specific terms, they were directed to the prioritized Latin American version. The PCS-LatAm had a more prominent position on the website, making PCS-Sp harder to access.

There was also engagement from US-based viewers with the 3 Spanish versions of the HEP, which could be related to the prevalence of Latinos in the US, the greatest minority in the country.25 Other engagement metrics would need to be collected to better understand the demographics of website viewers. Differences in user engagement between Spain and Latin American adaptations are noteworthy. Because these were the only adaptations that were launched simultaneously, this strengthens the importance of translating material to multiple vernaculars and conducting deep cultural adaptation to capture nuances in language from the intended audience.26

A strength of our research is that it presents a novel and comprehensive description of cultural adaptation and dissemination of a healthy eating guide, in combination with metrics that measure its impact. Although cultural adaptation is being recognized as a health priority, the results highlight the potential for significant impact when promotion efforts are applied through social media platforms. Identifying populations that would benefit from cultural adaptations of existing evidence-based materials was key in the adaptation process to guarantee that these resources are available to all who need them. Despite increases in internet-based research and health education evaluation,27 to the authors’ knowledge, there are no previous reports of other cultural adaptations of nutritional guidelines that detailed the adaptation process and monitored viewer engagement, domestically and internationally.

It is imperative that evidence-based content from credible and trusted sources is easily available on the internet, and organizations should ensure that their online health and nutrition information is relevant to diverse populations. Another strength of the present cultural adaptation was that it provided valuable lessons when modifying content from trusted sources to adapt it to other audiences. A key lesson learned was the value of using social media platforms to promote institutional websites containing evidence-based information, which would help users navigate the increasing information available on the web, which is not always scientifically sound.29

A limitation of our study related to comparing the children’s versions of the HEP is the promotion strategy. Unlike other adaptations, when the PCS-Niños became available on the website, a more intentional social media strategy increased its impact on the desired audience. Nonetheless, these results seem to support the hypothesis that culturally adapted content elicits an active community response.30

Another limitation of this study relates to the pageviews metrics. Although these provide a useful estimate of how audiences become aware of health information, it is difficult to capture all factors influencing a user’s journey to the webpage and their engagement with the content.

IMPLICATIONS FOR RESEARCH AND PRACTICE

The results from this study help demonstrate the impact that structured cultural adaptations to existing resources can have, both nationally and internationally. This study contributes to the advancement of current knowledge related to reasons, patterns, and effects of cultural adaptation of evidence-based information, particularly that which targets large groups of individuals at an international level. It also reinforces the use of the internet as an effective channel to share nutrition education information with the potential to reach worldwide audiences.25 Furthermore, these results support the idea that social media can be a useful communication channel to promote health information to broad audiences. Allocating a small budget to promote new, culturally adapted materials is an effective and feasible strategy that health organizations and institutions may consider to increase the reach of culturally adapted materials. This adaptation and promotion may increase health knowledge and reduce health disparities in specific populations. Our study supports future research to evaluate comprehension, knowledge gained, acceptability, and application
of the materials by the intended audience, which we were unable to evaluate.

In addition, results from this study support the recommendation that cultural adaptation endeavors dedicate some time and resources to understanding which networks and platforms are utilized by their intended audience. Keeping up with social media and internet use changes is fundamental in effectively sharing evidence-based information with different populations. The development and dissemination of culturally relevant evidence-based information is necessary and should be a priority for trusted health institutions.

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REFERENCES


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