Evaluation of Factorial Validity and Reliability of a Food Behavior Checklist for Low-Income Filipinos

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ABSTRACT

Objective: To examine factorial validity, test–retest reliability, and internal consistency of a Tagalog-language food behavior checklist (FBC) for a low-income Filipino population.

Methods: Participants (n = 160) completed the FBC on 2 occasions 3 weeks apart. Factor structure was examined using principal component analysis. For internal consistency, Cronbach α was calculated. For test–retest reliability, Spearman correlation or intraclass correlation coefficient (ICC) was calculated between scores at the 2 points.

Results: All but 1 item loaded on 6 factors: fruit and vegetable quantity, fruit and vegetable variety, fast food, sweetened beverage, healthy fat, and diet quality. Cronbach α was .75 for the total scale (range, .39–.76 for subscales). Spearman correlation was 0.78 (ICC, 0.79) for the total scale (range, 0.66–0.80 [ICC, 0.68–0.80] for subscales).

Conclusions and Implications: The FBC demonstrated adequate factorial validity, test–retest reliability, and internal consistency. With additional testing, the FBC may be used to evaluate the US Department of Agriculture's nutrition education programs for Tagalog speakers.

Key Words: survey, validity, reliability, Filipino, Tagalog, food behavior (*J Nutr Educ Behav*. 2017;49:593-598.)

INTRODUCTION

The number of Asian American people in the US has been increasing, including Filipino individuals.[1,2] Filipino people are the third largest ethnic group among Asian American populations and grew from 3.4 million in 2011 to 3.9 million in 2015.[2,3] Data spanning 2009 to 2013 show that 1.6 million people speak Tagalog, the official national language of the Philippines.[4] Of the total population of Tagalog speakers in the US, 32.8% speak English at a level classified as less than very well, which indicates that these individuals may be helped with translation services, education, or assistance in accessing government services.[4]

A systematic review of overweight and obesity among Asian American populations between 1988 and 2009 showed that Filipino individuals had the highest body mass index, at 26.8 kg/m^2.[5] A second literature review revealed that Filipino American people were at high risk for cardiovascular disease, hypertension, type 2 diabetes, and metabolic syndrome even at lower body mass index levels.[6] Recent research also indicated that Filipino people were the only Asian American group that had higher rates of hypertension than white American people.[7] Similarly, another study showed that Filipino American people in northern California had the highest hypertension prevalence compared with other minority groups.[8] In addition, Filipino American individuals had the second highest odds of prevalent type 2 diabetes, followed by other Asian, Chinese, and white people.[9]

Encouraging healthy dietary habits and healthy weight is the important for preventing diet-related chronic disease. Research demonstrated that community programs run by the US Department of Agriculture (USDA), such as the *Supplemental Nutrition Assistance Program–Education* (SNAP-Ed) and the *Expanded Food and Nutrition Education Program* (EFNEP), had an effect on positive diet-related behavior changes.[10] In addition, a community-based study in low-income Filipino people with cardiovascular disease risk factors in Hawai'i reported that providing a curriculum using appropriate cultural and bilingual tools improved outcomes.[11] Evaluation of such programs using tools appropriate for the target group is an essential step in determining program effectiveness

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Table 1. Demographic Characteristics of Low-Income Filipino People in Oʻahu, Hawaiʻi (n = 160)

Variable	Mean ± SD (range) or n (%)
Age, y (mean ± SD [range])	56.9 ± 19.8 (18–90)
Children in house, n	
0	66 (41)
1	25 (16)
2	25 (16)
3	21 (13)
≥4	20 (12)
No response	3 (2)
Sex	
Male	48 (30)
Female	112 (70)
Education, y (mean ± SD [range])	11.2 ± 3.5 (1–18)
Highest level of education	
Did not complete high school	31 (19)
Completed high school	35 (22)
Completed post–high school training or some college	33 (21)
Graduated from 4-y college or university	46 (29)
Attended and/or completed graduate school	5 (3)
Other	10 (6)
Employment	
Employed for wages	68 (43)
Self-employed	9 (6)
Out of work and looking for work	19 (12)
Out of work but not currently looking for work	3 (2)
Retired	52 (33)
Other	9 (6)
Birthplace	
US	4 (3)
Philippines	156 (98)

Note: Percentages may not add up to 100 owing to rounding.

in diverse populations.[12] However, valid and reliable tools in Tagalog are lacking to evaluate such programs in low-income Filipino groups.

A food behavior checklist (FBC) is a tool that may be used to evaluate the impact of nutrition education on dietary intake in low-income populations. This tool is a brief questionnaire containing items on intake of fruits and vegetables, dairy, sweetened beverages, and fried food, as well as food security and overall diet quality.[13,14] A previous study examined the face validity of a Tagalog-language version of this tool in the Filipino population in the US. Face validity was deemed adequate based on: (1) approval of text and photographs by members of the target population via cognitive interviews; (2) approval of text and photographs by a panel of professionals

using a team-based approach; and (3) achievement of a readability score appropriate for a low-literacy audience.[15]

The objective of this study was to examine the factorial validity, test-retest reliability, and internal consistency of the Tagalog-language FBC for low-income Filipino people.

METHODS

The Institutional Review Board of the University of Hawaiʻi at Manoa provided approval for this study.

Sample

A researcher fluent in Tagalog recruited Filipino subjects in Oʻahu, Hawaiʻi who spoke Tagalog as a first language (n = 160), were aged >18

years, and met income eligibility for SNAP-Ed[16] from the Filipino Center, churches, low-income housing complexes, and other community sites.

Measures

Participants provided sociodemographic information and completed the 22-item Tagalog-language FBC on 2 occasions 3 weeks apart. Sociodemographic information included age, sex, number of children in the house, education, employment status, and birth place.

Data Analysis

The researchers performed analyses using SAS 9.4 for Windows (SAS Institute, Cary NC). All responses on the FBC were recoded on a 4-point scale ranging from 1 to 4, with higher scores indicating more desirable behavior.

For item analysis, mean responses and SDs were calculated for each item to determine potential of items to reflect behavior change as the result of an intervention. Dichotomous (yes/no) items with a mean of >2.6 and all other items with a mean of >3 were considered to have little potential to reflect behavior change.[17]

For factor validity, the researchers first segregated items by predetermined categories: fruits and vegetables, milk and dairy, food security, and remaining items. Factor validity was examined using principal component analysis (PCA) with varimax rotation for each category with at least 2 items at the first point. To assess the numbers of factors, Kaiser criterion (eigenvalues > 1.0), scree plot, and parallel analysis were initially used. Any item with a factor loading > 0.50 was considered to load on the given factor,[18] in conjunction with review of the content of the individual items. Based on the results of the Kaiser criterion and parallel analysis, the researchers requested factor solutions with different numbers of factors and selected the solution that generated the most comprehensible factor structure.[19]

To assess internal consistency, Cronbach α was calculated for each subscale and total scale at the first time point. The researchers considered α > .70 to be acceptable.[20]

To assess test-retest reliability, Spearman correlation with 95% confidence