Development and Testing of the Healthy Food Pantry Assessment Tool

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ABSTRACT

Objective: To develop and test an observational survey that quantifies food pantry environments (FPE).

Design: Best practices in FPE were identified through key informant interviews. The tool was pilot-tested, including a content review, and then field-tested for reliability.

Setting: Key informant phone interviews (n = 41); pilot and field test visits occurred at 45 pantries from multiple states.

Subjects: Food bank/pantry staff and nutrition educators were recruited for interviews through purposive and snowball sampling. Pilot and field test survey users (n = 65) were food pantry representatives and matched community partners who both rated the FPE using the tool.

Variables Measured: Pearson correlation was used to determine test-retest and interrater reliability.

Analysis: Qualitative data were coded for healthy FPE strategies. Quantitative data were calculated using descriptive statistics (significant at $P < .05$).

Results: Qualitative data were coded for observable FPE characteristics. Reliability scores were substantial to nearly perfect for 48 of 61 survey items (79%) for test-retest and 49 of 61 (80%) for interrater reliability (Pearson $r = .6-1.0$).

Conclusions and Implications: The Healthy Food Pantry Assessment Tool is research-tested and can be used to evaluate and quantify the healthfulness of FPE.

Key Words: Built environment, food assistance programs, food insecurity, healthy places (*J Nutr Educ Behav.* 2019; 51:578–588.)

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INTRODUCTION

In 2016, 15.6 million American households (12.3%) reported experiencing food insecurity during the previous 12 months.¹ A 2014 Feeding America study reported that food assistance programs (food banks and food pantries) were serving approximately 46.5 million low-income people per year, including 12 million children and 7 million seniors.² Earlier reports showed that adults from food-insecure households had a 21% higher risk for clinical hypertension and a 50%

higher risk for diabetes compared with adults in food-secure households.³ Current trends demonstrated that households are using private food assistance, including pantries and hot meal sites, to cope with chronic household food shortages.^{4,5} Food pantries were estimated to provide up to 25% of the total monthly food supply in low-income Americans' monthly diets.⁶ Cross-sectional data reflected a lower diet quality available from private food assistance to Americans accessing this food source.^{7,8} Foods offered at food pantries have a

reputation for being highly processed, high in sodium and fat, and shelf stable. These foods do not meet the recommendations of the 2015 Dietary Guidelines for Americans⁹ and generally do not promote health in pantry clients. Food assistance agencies have a growing demand for nutrient-dense foods such as fruits, vegetables, and lean protein^{10,11} because low-income Americans have limited purchasing power to acquire adequate amounts of these healthy foods.^{12–14}

Dietary patterns of communities and individuals are influenced by their food environments.^{15–17} Healthy food environments have proven difficult to access for low-income Americans, those living in rural areas,^{18,19} and racial minorities, which contributes to growing disparities in health.²⁰ Food pantries offer a venue for comprehensive ecological change that may improve the diets of low-income Americans.²¹ However, the stigma of accessing a food pantry or governmental nutrition assistance is known to prevent use of these resources to reduce

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Figure. Overview of the development and testing of the Healthy Food Pantry Assessment Tool.

food insecurity.^{18,22,23} Interpersonal relationships among pantry clients, volunteers, and staff have a role in addressing community food security.²⁴ Pantry clients may be considered vulnerable consumers because they experience food insecurity and actively seek food resources to address this dilemma.²⁵ Therefore, the emotional environment, or how individuals are treated within the physical space, may affect the use of pantry foods by potential clients. For example, a designated waiting area that is only outdoors (emotional environment) can affect the likelihood that clients will access food assistance when needed.²⁴ Previous interventions in pantry settings include client empowerment and the use of client choice models to encourage healthy behaviors and increase dignity while receiving food assistance.^{4,26} Evidence illustrated how environmental interventions based on behavioral economic theory can influence diet quality²⁷ and be employed within food assistance settings.^{25,28} Assessment tools (e-scans) were created to evaluate food environments in food retail

stores, restaurants, schools, worksites, and homes.^{29–32} The usefulness of such tools is limited by their validity and reliability. At the initiation of this study, food pantry environmental (FPE) assessment tools were emerging from unscored tools or formative evaluations that were state-specific.^{33–36} The purposes of this study were to develop a quantified observational survey of the physical and emotional environment that was appropriate for diverse food pantry settings, and to test the tool's reliability among distinct users.

METHODS

The development and testing of the Healthy Food Pantry Assessment Tool (HFPAT) involved multiple phases: (1) formative interviews and review of evidence, (2) tool construction, (3) pilot test, (4) field test for reliability; and (5) graphic design confirmation (Figure).^{33–35,37,38} The initial scope of this project was Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mex-

ico, Oregon, Utah, Washington, and Wyoming, referred to here as the National Institutes of Food and Agriculture (NIFA) western region. Sites in Delaware, Maryland, and New Hampshire were added for reliability testing.

Formative Interviews and Review of Evidence

The researchers conducted in-depth, semi-structured interviews to investigate ongoing strategies to improve the healthfulness of food assistance settings. Respondents were recruited through purposive and snowball sampling. Food banks and pantries in the NIFA western region were identified through an Internet search and potential respondents were contacted (purposive sampling). Those who agreed to be interviewed were recruited as key informants; they were interviewed and then asked to refer other potential contacts in the food assistance system (snowball sampling). The formative interview questions were cognitively tested with a sample of comparable key

informants who were outside the geographic NIFA western region. Trained research coordinators conducted all cognitive (n=9) and in-depth (n=41) phone interviews. Interview questions explored how respondents defined a healthy FPE and strategies or actions taken to achieve these descriptions. Interviews were audio-recorded, transcribed verbatim, and entered into ATLAS.ti software (version 7, ATLAS.ti Scientific Software Development GmbH; Berlin, Germany, 2013). A codebook was developed by the interviewer and first author (ABK) from interview notes and emergent topics. Then, 5 transcripts were coded following an *in vivo* approach and edits were made to the codebook until >80% agreement regarding codes was reached. A third research assistant double-coded interviews with the interviewer to establish intercoder agreement, calculated by a kappa (κ) of 0.77 including code overlap³⁹ and 72% agreement regarding code assignments. Once coder agreement was established, the interviewer (primary coder) coded 25 interviews and the research assistant (secondary coder) completed 16 interviews, respectively. Thematic content analysis of interview transcripts was conducted in an exploratory and emergent design^{40,41} because there were no preselected best practices for healthy food pantries that interviewers were investigating. Analysis aimed to elucidate observable characteristics of a healthy FPE. At the same time as the in-depth interviews, 3 researchers examined peer-reviewed and gray literature on interventions in food assistance settings. Environmental scans or observational surveys (Figure) used to assess food pantries were analyzed for common traits. Topics represented in all 3 areas of this triangulation were included as draft questions in the pilot survey tool.

Tool Construction

The content, format, and layout of the tool were established in phase 2. Results from the formative interviews were compared with e-scans in practice and research literature. The formatting of the tool reflected other pantry e-scans in practice.^{33–35} Visual

elements recommended by Dillman et al⁴² were used to design the layout and structure of questions and responses. Questions were grouped according to observable characteristics of the FPE. Alike items were grouped together and ordered in such a way that the survey could be completed during a tour of the food pantry (ie, beginning with the entrance and ending in the food storage area). The HFPAT was intended for use by food assistance agency staff and volunteers, with community nutrition education partners as secondary users. The initial pilot tool had 5 sections and 63 questions, 13 of which were unscored.

Pilot Test

Content review and face validity were achieved by pilot-testing the tool with food pantry representatives. Pilot tests included site visits and cognitive interviews with a sample of pantry representatives to assess the content, wording, response options, and graphic design of the tool. A convenience sample of pilot test sites (n=15) across 5 states (California, Colorado, Nevada, Oregon, and Wyoming) were selected through recruitment and referrals by key informants from phase 1. The HFPAT was completed by a representative of the participating pantry and the visiting researcher (ABK). Cognitive interviews (n=19 respondents) were conducted immediately after completion of the HFPAT, lasted 30–90 minutes, and were audio-recorded and transcribed. Content review was carried out by investigating each question's relevance and whether respondents agreed that each item reflected an improvement in the pantry's physical and emotional environment. Face validity was pursued by question probes that elucidated pilot-testers' interpretations of question items and survey graphic design. A standard form was used to record the internal rater's score to the visiting (external) rater's score and to note the differences; cognitive questions investigated how the internal rater decided on the selection and collected feedback for improvements to face validity. If >2 internal pilot testers recommended changes, these changes were made

and tested in the next iteration of the pilot survey. All participating pilot test sites were offered a grocery gift card to thank them for their time. When the pilot tests concluded, a social science research center, the Washington State University Social and Economic Sciences Research Center, reviewed the HFPAT for face validity and readability.

Field Test for Reliability

Based on the results from the pilot test, the field test was designed to assess the reliability of the HFPAT across distinct users. The field test tool included 72 items (52 scored and 20 unscored). Pantry representatives were recruited by their community partners from local *Supplemental Nutrition Assistance Program–Education* (SNAP-Ed) and/or *Expanded Food and Nutrition Education Program* (EFNEP) staff, forming dyads. A convenience sample of food pantries participated in the field tests from 7 states: California, Delaware, Maryland, Montana, New Hampshire, New Mexico, and Washington. Participating pantries (n=33 sites) received the instruction guide, implementation logs, and pre-stamped, preaddressed envelopes to return the surveys. A 2-hour webinar training on using the HFPAT was required at the initiation of the field test for all participants. Dyads were not required to implement FPE intervention strategies to receive the incentives. Initial assessments were completed by 30 dyads, because 3 pantries withdrew after the training owing to limited staff capacity. The field test was conducted from October, 2016 through August, 2017 and included 30 food pantry agencies and 50 raters. Community partners often matched themselves with their food pantry sites as part of a large program intervention and multiple sites were rated by the same community partner; 2 raters scored 2 pantries each and 4 raters scored 3 pantries each. Test-retest reliability was assessed by evaluating the level of agreement between repeated HFPAT assessments within a 7- to 14-day period.⁴³ Dyads, described earlier, were asked to meet at the pantry setting and complete the HFPAT individually. Then, they returned the HFPAT surveys (survey

1) and scheduled a second meeting within 7–14 days. The dyad individually completed the HFPAT again during the second meeting (survey 2). Dyads were asked to complete surveys 1 and 2 in the same month, because many food pantries experienced monthly fluctuations in donations, volunteers, and funding. They were asked not to communicate with each other until survey 2 was completed and mailed back. Some pantries did not change their offerings of food within a month and there was trait consistency. This warranted a survey that was reliable regarding how measures were scored across time points by the same user. Test-retest reliability was calculated for each item using Pearson correlation, r . Interrater reliability was calculated by 2 methods: (1) between the 2 raters for the entire survey using only survey 1 and intraclass correlation coefficients (ICC) for numeric data⁴⁴ and Cohen's κ for binary items;⁴⁵ and (2) using Pearson correlation, r , to assess agreement for unique raters across different settings between raters at surveys 1 and 2. Significance was established as $P < .05$ and relative agreement between scores of individual items was interpreted with the following classification scales for the coefficient: 0.0–0.20 = poor; 0.21–0.40 = fair; 0.41–0.60 = moderate; 0.61–0.8 = substantial; and 0.81–1.00 = nearly perfect.⁴⁶ Characteristics of the test sites, descriptive statistics, and ICC comparing survey 1 for interrater reliability were analyzed with IBM SPSS software (version 22, IBM Corporation, Somers, NY, 2017). R Statistical Software was used for the data analysis of Pearson correlations for each survey item (R Core Group, Vienna, Austria; 2018).

Graphic Design Confirmation

Implementation logs and preliminary data from the field test indicated a need to address the graphic design of skip logic questions. A subsample of field test respondents, both community partners and food pantries, was recruited to provide additional comments about the field draft of the tool. Cognitive interviews were conducted until saturation was reached when all respondents interpreted the graphic design and survey question

similarly. A second member of the Washington State University Social and Economic Sciences Research Center reviewed the HFPAT for face validity and readability during the final editing process. The study phases were deemed exempt by the Institutional Review Board of Washington State University.

RESULTS

The HFPAT was designed to measure the physical and emotional characteristics of healthy pantry environments including aspects of accessibility, maintenance of dignity, and food safety and storage. Its largest section was designed to assess the variety, quality, and promotion of healthy foods.

Formative Interviews and Review of Evidence

Key informants self-identified as working at a local food pantry ($n = 14$) or food bank distribution agency ($n = 16$) or as a community partner of a pantry or bank ($n = 7$) or anti-hunger advocate ($n = 2$), representing both urban and rural areas. Broadly, key informants defined a healthy pantry as one that offered healthy foods (primarily fruits and vegetables [FV]) in a variety of distribution methods, provided supportive services, presented opportunities for nutrition education, and treated clients and volunteers in a respectful, dignified manner. Strategies undertaken to achieve these descriptions were grouped into 3 code families: food distribution methods, food procurement methods, and strategies in place at the pantry. Aspects of a healthy FPE aligned with 2 environmental approaches identified in the literature review: behavioral economics in nutrition education⁴⁷ and the social ecological model of food and physical behaviors.^{17,47} These models were selected as the underlying framework for the construction of the pilot tool.

Tool Construction

Because the survey would assess the physical pantry environment, strategies in place were the focus of

question item development. Observable outcomes of food procurement were the variety and quality of foods available at the pantry. The remaining survey questions were based on food distribution methods, services offered (including nutrition education), and a culture of respect and dignity. The greatest overlap in the triangulation were themes of ensuring food pantry clients access to FV and the respect and dignity of clients. Survey scoring was designed to award points that aligned with these 2 themes. Characteristics of a healthy pantry that were measured in each section were designed to reflect dignity, which was determined by how similar a pantry experience was to a shopping experience. For example, wait time and location were assessed in Section A: Location and Entrance, where waiting indoors and for less time was awarded a higher score than a pantry that had waiting areas only outside or for > 30 minutes. The tool was designed to be administered using a paper and pencil. The HFPAT included a section to report pantry features such as pounds of food distributed, number of monthly clients, and type of food pantry (mobile, school, or neither). Section A: Pantry Location and Entrance included questions addressing walkability,⁴⁸ public transit access,³⁷ curb appeal and safety,⁴⁹ and check-in or wait time. Section B: Food Available to Clients was the largest section. Priority was given to variety and quality of FV, reflecting formative interview themes. Placement and promotion of FV were evaluated. Items referring to the quality of fresh FV were adapted from the CX3 Tier 2—Food Availability and Marketing Survey.⁴⁸ Section C: Policies of the Food Pantry assessed the institutionalization of nutrition standards for foods brought into the pantry and foods distributed to clients. Two items evaluated whether food safety training was required for pantry staff or volunteers.^{33,37} Section D: Frozen—Chilled—Dry Storage assessed handwashing;³³ temperature ranges for frozen, chilled, and dry storage;³³ cleanliness of the food receiving area;⁵⁰ and chilled transportation availability.⁵¹ Section E: Services and Supplementary Programs contained 3 scored

and 6 unscored items. The scored items were nutrition education, food demonstrations or recipes, and referrals to other social services. Unscored items unique to each agency's financial capacity and community support included backpack programs, federal child nutrition program participation, Registered Dietitian partnership, off-site pantry program, home delivery of foods, and provision of hot meals on-site. These supplementary programs were frequently reported in the formative interviews as methods food banks and pantries pursued to improve their clients' health. These items were not scored because they fell outside the physical and emotional environment. Question responses were either dichotomous (yes/no) or on a 3- or 4-point Likert scale that was used in unscored e-scans and similar tools reported in practice.^{33,35,49}

Pilot Test Results

The iterative process of testing each draft of the pilot tool resulted in 3 survey drafts being tested by 5 internal raters. Pilot testing continued until <2 edits were recommended for each question when there was disagreement regarding response selection between the pantry representative and visiting researcher. Two items were removed because pilot-testers reported that the items were not relevant to the environment: cubic chilled/frozen food storage and food bank inventory system. The question assessing the check-in procedure was divided into 2 questions reflecting the widespread practice of reducing paperwork burden for returning clients. Other changes included grouping questions according to respondent interpretation of like items; repeating scale descriptions; adding subtotal boxes for each page; and adding examples of protein, dairy, and grain foods. Section E was divided into 2 sections by scored or unscored items, which generated Section F: Supplementary Programs, which was tested in phase 4. Unscored items of Section F were dichotomous. Feedback from the first 5 pilot test visits indicated a need for detailed instructions to help users complete the tool effectively. An

instruction guide was created and provided to the remaining 10 pilot test participants before their scheduled visit. The field test tool was edited from pilot test results to contain 71 questions in 6 sections, 19 of which were unscored.

Reliability Results

Table 1 lists the characteristics of participating food pantries. Tables 2 and 3 describe the results of test-retest and interrater reliability by question item and survey section. Field testers anecdotally reported that the survey took 30–90 minutes to complete, depending on whether the pantry was currently serving clients. Kappa ranged from 0.53 to 1.00 and ICC was excellent (0.99 to 1.00) both for complete survey comparison, all significant at $P < .05$.⁴⁶ Correlations were calculated for the 52 scored HFPAT items within sections A–E and the 9 unscored items in section F. Two correlations were not significant for test-retest reliability: fresh fruit quality, $r = .19$ ($P = .26$) and temperature in dry storage, $r = .16$

($P = .79$). Most questions (48 of 61) had substantial to nearly perfect test-retest reliability indicated by $r > .61$ and 8 items had moderate test-retest reliability with $r = .41$ to $.60$.⁴⁶ Frozen lean protein variety and pest management had poor to fair correlations for test-retest reliability. Most items (49 of 61) had substantial to nearly perfect interrater reliability indicated by $r > .61$ and 7 items had moderate interrater reliability as indicated by $r = .41$ to $.60$. All items in section F (Table 3) had substantial test-retest and interrater reliability, measured by Pearson r . The following 5 items had poor to fair interrater reliability: (building) visual appeal, $r = .28$ ($P = .01$); frozen lean protein quality, $r = .34$ ($P \leq .01$); quality of canned foods, $r = .26$ ($P \leq .05$); cleanliness, $r = .24$ ($P \leq .05$); and pest management, $r = .38$ ($P \leq .001$). The scales for fresh FV quality were revised to reflect similar scales for FV variety. Low reliability of *temperature in dry storage* was attributed to the failure of skip logic. The question regarding pests was removed because it also had poor interrater reliability. The

Table 1. Participating Food Pantry Agency Characteristics (n = 30)

Characteristic	Frequency (%)
Type of pantry	
Single building, brick and mortar	24 (80)
Mobile, trailer, or recreational vehicle unit	3 (10)
School	3 (10)
Urbanicity	
Rural	20 (67)
Urban	10 (33)
Open, d/mo	
≤ 10	8 (27)
11–17	12 (40)
≥ 18	10 (33)
Average pounds of food distributed per mo ^a	
$\leq 3,000$	9 (30)
3,001–30,000	8 (27)
$\geq 30,001$	8 (27)
Average clients served per mo	
≤ 100	8 (27)
101–500	12 (40)
≥ 501	10 (33)

^aFive pantries did not report pounds of food distributed in the past month.

Notes: A single building pantry was considered a location where the food pantry operated out of permanent space that did not change addresses from month to month and was not located within a school. Urbanicity was characterized by the food pantry agency as being in a zip code with a population density > 50,000 people in 2010 census data.

Table 2. Reliability Coefficients for Scored Items of Healthy Food Pantry Assessment Tool Sections A–E

Field Test Item (n = 30 Sites)	Same Rater	Between Raters	
	Surveys 1 and 2 (n = 56 Matched Pairs) Test-Retest (Pearson <i>r</i>)	Surveys 1 and 2 (n = 56 Matched Pairs) Interrater (Pearson <i>r</i>)	Survey 1 Only (n = 30 Matched Pairs) Interrater (Intraclass Correlation Coefficient)
Section A: Location and entrance			
Average Section A	.85	.77	0.76
Walkability, pedestrian access	.85	.55	0.43
Bus access	.96	.97	1.00
Handicap access	.70	.49	0.45
Automobile access	1.00	1.00	1.00
Visual appeal	.59	.28	0.36
Location signage	.93	.83	0.86
Check-in type, first-time clients	.91	.83	0.91
Check-in type, returning clients	.86	.88	0.89
Wait time	.77	.89	0.94
Waiting location	.83	.79	0.73
Section B: Foods available to clients			
Average Section B	.65	.74	0.63
Garden or farmers' market	.88	.92	0.85
Distribution model	.95	.94	0.96
Accessibility: convenience, order of foods	.78	.53	0.72
Accessibility: convenience, eye level, easy to reach ^a	.69	.48	0.00 ^b
Accessibility: appeal ^a	.62	.66	0.24 ^b
Salience: visual prompts, nutritional benefits	.75	.85	0.78
Fresh fruit availability	.59	.83	0.77
Fresh fruit variety	.73	.85	0.69
Fresh fruit quality ^a	NS	.48	−0.01 ^b
Fresh vegetable availability	.76	.81	0.77
Fresh vegetable variety	.68	.82	0.69
Fresh vegetable quality ^a	.46	.44	0.13 ^b
Frozen fruit and vegetable variety	.55	.83	0.87
Frozen fruit and vegetable quality	.69	.56	0.64
Frozen lean protein variety	.40	.83	0.76
Frozen lean protein quality	.62	.34	0.33
Variety of canned foods	.80	.86	0.84
Quality of canned foods ^a	.57	.26	−0.04 ^b
Low-sodium canned food availability	.69	.84	0.81
Low-sugar canned food availability	.55	.73	0.64
Low-fat dairy variety	.63	.87	0.88
Availability of eggs	.87	.91	0.92
Availability of legumes	.60	.83	0.90
Variety of grain items	.49	.87	0.84
Availability of whole-grain items	.53	.65	0.64
Section C: Policies of pantry			
Average Section C	.83	.82	0.81
Guidelines for food accepted	.86	.85	0.84
Guidelines for food distributed	.67	.82	0.83
Documentation of respect policy	.92	.97	1.00
Display of respect policy	.77	.73	0.77
Food safety training for staff	.92	.89	0.84
Food safety training for volunteers	.77	.67	0.56

(continued)

Table 2. (Continued)

Field Test Item (n = 30 Sites)	Same Rater	Between Raters	
	Surveys 1 and 2 (n = 56 Matched Pairs) Test-Retest (Pearson <i>r</i>)	Surveys 1 and 2 (n = 56 Matched Pairs) Interrater (Pearson <i>r</i>)	Survey 1 Only (n = 30 Matched Pairs) Interrater (Intraclass Correlation Coefficient)
Section D: Food storage and safety (scored items only)			
Average Section D	.80	.73	0.77
Frozen storage available	.89	.82	0.79
Chilled storage available	1.00	1.00	1.00
Thermometer in dry storage	.69	.87	0.86
Temperature in dry storage	NS	1.00	LR
Handwashing signs	.78	.84	0.86
Cleanliness ^a	.70	.24	0.27 ^b
Food transportation	.96	.96	0.97
Pest management	.34	.38	0.62
Section E: Services			
Average Section E	.91	.85	0.79
Nutrition education available (classes)	.85	.81	0.72
Food demonstrations, recipes, or samples	.84	.86	0.85
Other social service referral	.89	.87	0.79

LR indicates low response; NS, not significant.

All correlations were significant at $P < .05$ unless noted.

^aIndicates questions with skip logic and fewer than 30 matched pairs, therefore intraclass correlation coefficient (ICC) calculation is not recommended; ^bIndicates that the ICC value was not statistically significant ($P > .05$).

question measuring handicap access was reworded to reflect accessibility by all persons. The questions regarding wait time and wait location were reordered to reflect the true movement of clients through a pantry. The visual appeal of the building question had a reverse scale that was

corrected and an additional detail about frozen protein was added. The scales of questions related to the variety of grains, legumes, and whole grains were updated to keep a consistent scale throughout section B. The questions about the variety and quality of canned foods were skewed

to the right and removed because they did not inform differences between pantries. Initial review of the submitted surveys (n = 172) of phase 4 revealed that respondents struggled with the graphic design by incorrectly completing question items. Data were coded to reflect a

Table 3. Reliability Coefficients for Non-scored Items of Healthy Food Pantry Assessment Tool Section F

Field Test Item	Same Rater	Between Raters	
	Surveys 1 and 2 (n = 56 Matched Pairs) Test-Retest (Pearson <i>r</i>)	Surveys 1 and 2 (n = 56 Matched Pairs) Interrater (Pearson <i>r</i>)	Survey 1 Only (n = 30 Matched Pairs) Interrater (Intraclass Correlation Coefficient)
Section F: Supplementary Programs			
Average Section F	.85	.81	0.77
Backpack program	.89	.79	0.64
Federal Child Nutrition Program	1.00	.79	0.72
Registered Dietitian volunteer	1.00	.92	0.90
Nutritional training	.83	.83	0.82
Mobile or school pantry	.66	.73	0.75
Home delivery	.87	.86	0.75
Hot meals	1.00	1.00	1.00
Special dietary needs foods	1.00	.72	0.75
Volunteer appreciation	.71	.62	0.56

All correlations were significant at $P < .05$.

Table 4. Skip Logic Questions Completed Incorrectly by >5% Respondents in Phase 4

Survey Item	Frequency (%)	Pearson <i>r</i>	
		Test-Retest (n = 56)	Interrater (n = 81)
Accessibility: convenience, order of foods ^a	50 (29)	.78	.53
Accessibility: convenience, eye level, easy to reach ^a	49 (28)	.69	.48
Accessibility: appeal ^a	50 (29)	.62	.66
Fresh fruit variety	12 (6.9)	.73	.85
Fresh vegetable variety	15 (9.7)	.68	.82
Fresh vegetable quality	13 (7.5)	.46	.44
Frozen fruit and vegetable quality	22 (13)	.69	.56
Display of respect policy ^a	21 (12)	.77	.73
Temperature in dry storage ^a	37 (22)	.16	1.00

^aIndicates that the graphic design of the question was updated in the final survey.
n = 172 submitted surveys. All correlations were significant at $P < .05$.

failure of skip logic and the percentage of respondents incorrectly answering questions was calculated. Edits were considered if >5% of surveys in that question item were returned with mistakes and if 1 of the 2 correlations was <0.60 (Table 4). For instance, the faulty skip logic interpreted similarly across time points and between users would result in higher correlations and incorrect survey logic application, as was the case with the 3 accessibility questions.

Cognitive Retesting With Subsample

Additional changes to the layout and question details were made after cognitive testing of a subset of field test participants (n = 10) to improve the survey. Final edits included clarification of client choice in the food distribution model question, improvement in the skip logic design, and expansion of the response options for the variety of legumes and types of eggs. The final HFPAT had a Flesch-Kincaid reading level of 8.7 and 69 total questions.⁵²

DISCUSSION

The HFPAT had appropriate face validity and demonstrated good reliability in a test of 30 different pantry agencies in 7 states. The reliability scores were substantial for the majority of HFPAT items, 48 items for test-retest and 49 for interrater reliability, as indicated by Pearson correlation coefficients of 0.6–1.0. Items with

moderate or fair reliability were edited and items with poor reliability were removed. Differing perspectives of pantry representatives and community partner respondents may have contributed to the fair interrater reliability of items on frozen lean protein quality and pantry cleanliness. Interrater reliability may also have been affected by the bias of the respondents because pantry representatives might have viewed their environments more positively, thus scoring them higher than their external community partners.⁴³

These results were comparable to those of other food environment e-scans. Glanz et al³⁰ tested their Nutrition Environment Measures Survey in Stores e-scan in 85 stores and reported high interrater and test-retest reliability for food availability measures, with κ values ranging from 0.84 to 1.00 and 0.73 to 1.00, respectively; the quality of fresh produce had moderate reliability in the Nutrition Environment Measures Survey in Stores, indicated by κ values of 0.44–1.00. Ghirardelli et al⁴⁸ tested their CX3 food retail e-scan in 26 stores in low-income areas in California and reported good interrater reliability, with κ scores ranging from 0.37 to 0.70 and ICC ranging from 0.47 to 0.89.⁴⁹ Hosler and Dharssi⁵³ tested their Food Retail Outlet Survey Tool e-scan in 39 urban stores in Albany, NY and reported high interrater reliability with κ ranging from 0.59 to 1.00. The environments between food pantries and retail grocery stores might differ in the consumer type served, because pantries

are designed to alleviate hunger in the community. It has been suggested that food pantry clients represent vulnerable consumers when they obtain food from pantries.²⁵ However, many retail studies investigating healthy food availability and access focused on the same low-income communities that were served by pantries.^{53–57} Previous retail store e-scan studies reported the need for standardized, validated tools to measure the healthfulness of community nutrition environments.^{15,30,49,53} To the authors' knowledge, this study led to the creation of a scored food pantry e-scan, the first to be tested across multiple states. The HFPAT may be applicable to a wider audience than might other tools tested in only 1 state.^{33,34,48} A resource guide was developed to accompany the HFPAT to increase the usability of the survey in FPE interventions. Continuous cognitive testing with intended HFPAT users was completed during the third and fourth phases of the study. Overall, the high interrater and test-retest reliability indicated that the HFPAT generated consistent scores regardless of who completed the assessment.

This study relied on 3 convenience samples in which respondents were recruited through SNAP-Ed and EFNEP networks. Snowball sampling may generate a group of respondents who are more homogeneous compared with those in studies using other convenience sampling methods. This potentially limits the types of community partners who may seek

to use the HFPAT because results reflect the perspectives of food pantry insiders and SNAP-Ed or EFNEP. The reliability of the HFPAT is limited by the sample size and the seasonality of food available to pantries. Test-retest reliability was determined over 14 days and some pantry environments may have shifted during this time, especially during a period of high need such as the holidays. Ranking of content by a formal expert panel was not conducted. Questions were removed and wording and design were revised in the final adaptation of the HFPAT, which merits future reliability testing. The HFPAT is limited by a lack of criterion validity. Many environmental assessments lack validity owing to a missing standard to compare observable changes.⁵⁸ Laboratory settings for food pantry clients were recommended to test other effects of environment on consumer food behavior because the pantry provides a unique setting in which money is not exchanged for goods.²⁵

IMPLICATIONS FOR RESEARCH AND PRACTICE

Future research might evaluate the content validity of the HFPAT in an adapted content validity index suggested by Lynn.⁵⁹ Further evaluations might assess the use of this tool for the Healthy Eating Index related to inventory, client take-home, and diet quality.

Public health interventions require valid and sensitive tools to measure the effectiveness of environmental interventions in a wide range of community nutrition settings. The HFPAT, a tool for the food assistance setting, was designed as a comprehensive assessment of the physical and emotional space within the pantry and the nutritional quality of the food offered. The tool can be completed by the pantry staff or a community partner in consultation with the pantry. The results can focus community coaching from SNAP-Ed, EFNEP, or other extension or public health professionals to support pantry change. A readiness tool may complement the environmental assessment of food pantries.⁶⁰ Testers of the

HFPAT described using their scores to report changes through the SNAP-Ed Evaluation Framework.⁶¹ This survey demonstrated a satisfactory level of test-retest and interrater reliability. Results were consistent with food retail e-scan research.^{30,48,53} This study resulted in the creation of a multicomponent toolkit containing the HFPAT, instruction guide, resource guide, and training webinar. The toolkit can be used in FPEs to generate numeric scores that allow pantries and their community partners to identify areas for improvement and evaluate the effectiveness of interventions. The final survey, containing 61 scored items and 8 descriptive questions, was formatted to print as a booklet and is available for download.⁶² Additional research might evaluate criterion validity and how food pantry environment changes affect the diet quality of their clients.

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