



Reliability of the Food Literacy Assessment Tool (FLAT) in Low-Income Adults

Audrey Hemmer, MS,¹ Carmen Fightmaster, RN,¹ Youn Seon Lim, PhD,² Melinda Butsch Kovacic, MPH, PhD,¹ Seung-Yeon Lee, PhD¹

Department of Rehabilitation, Exercise, and Nutrition Sciences, College of Allied Health Sciences, University of Cincinnati¹

College of Education, Criminal Justice, Human Services and Information Technology, University of Cincinnati, Cincinnati, OH, USA²



BACKGROUND

- Low-income populations are vulnerable to diet-related chronic disease, inadequate dietary quality, and food insecurity.^{1,2}
- In recent years, food literacy has been identified as a viable avenue to address these disparities due to its associations with positive dietary behavior,³ food security,⁴ and socioeconomic status.⁵
- Food literacy is the inter-related knowledge, skills, and behaviors required to plan & manage, select, prepare, and eat food to meet needs and support personal health.⁶
- The Food Literacy Assessment Tool (FLAT) was developed using the Vidgen's framework.⁶ Face validity and content validity were previously tested.

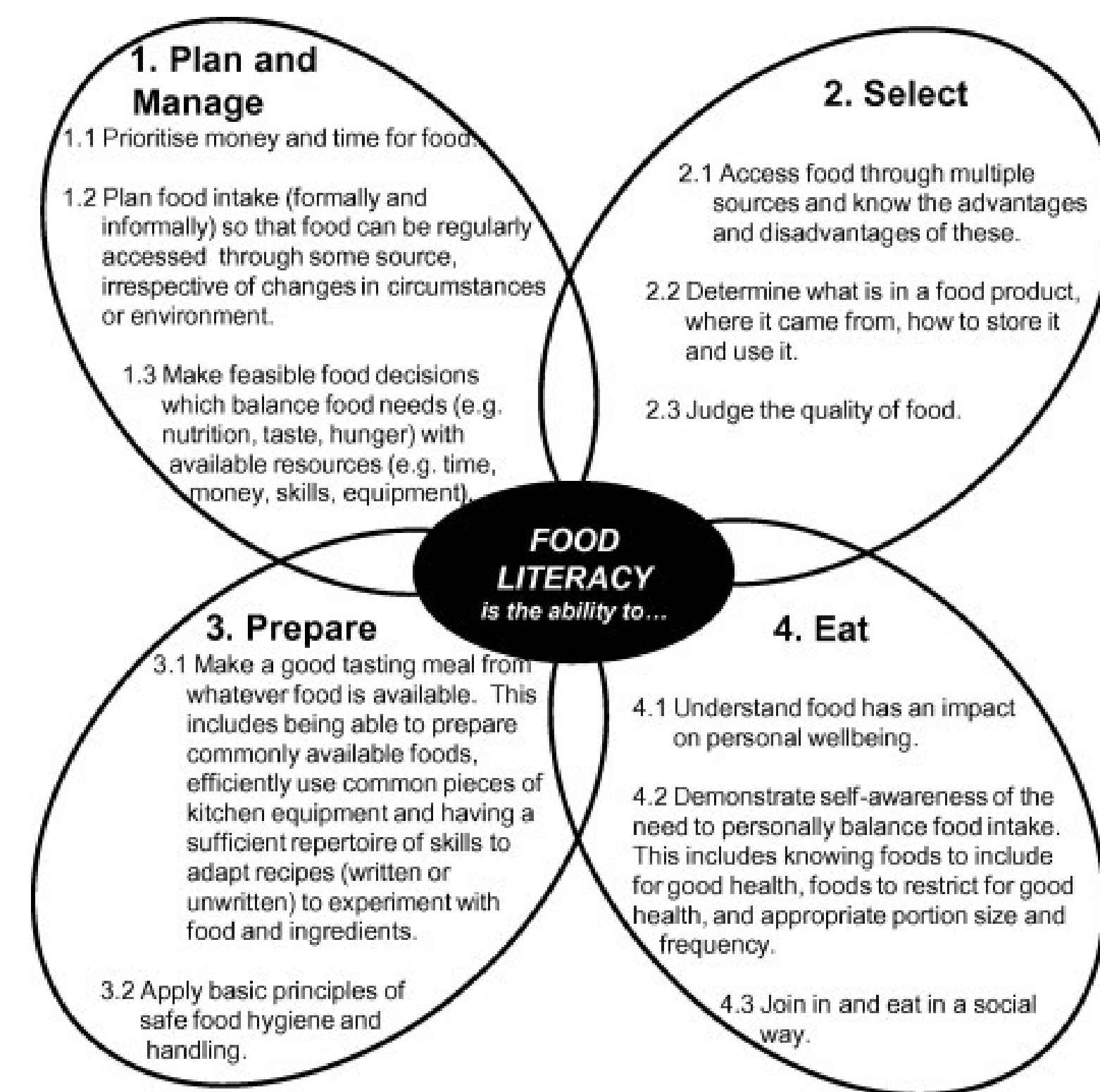


Fig 1. Food Literacy by Vidgen & Gallegos Appetite 76 (2014) 50–59

OBJECTIVE

To test the reliability of the Food Literacy Assessment Tool (FLAT) in low-income adults.

METHODS

PARTICIPANTS

Ninety-eight low-income adults completed the first self-administered FLAT and 75 of them completed the same survey an average of 10.3 days after the first survey at St. Vincent de Paul, a resource offering emergency essentials to residents of Cincinnati, Ohio.

FOOD LITERACY ASSESSMENT TOOL (FLAT)

The initial FLAT contained 64 items and was revised based on the findings from face validity and content validity. The revised FLAT is composed of 76 items categorized into 4 subscales.

Table 1. Description of Food Literacy Assessment Tool (FLAT)

Subscale	Description
Food Consumption Frequency	15 items on consumption of food groups, sugar sweetened beverages, processed foods, and frequency of behaviors such as dining out, skipping meals, and consuming breakfast
Nutrition Knowledge	15 items on knowledge based on Dietary Guidelines for Americans 2015, including food groups, nutrition label reading, and unit price comprehension
Behavior	22 items on frequency of behaviors related to “planning/managing,” “selecting,” “preparing,” and “eating”
Self-efficacy	24 items on confidence in ability related to “planning/managing,” “selecting,” “preparing,” and “eating”

DATA ANALYSIS

- IBM SPSS V25.0 was used for data analysis.
- Descriptive statistics (frequencies) were conducted to summarize the characteristics of participants.
- For internal consistency reliability, Cronbach's α was calculated for subscales and domains with with Likert Scale response options and Kuder-Richardson Formula 20 (KR-20) for subscales with dichotomous response options.
- Test-retest reliability was assessed by calculating intraclass correlation coefficient (ICC) of subscales and domains.

RESULTS

Table 2. Characteristics of Participants Completed the 1st -survey (N=98)

Characteristics	N (%)
Gender	
Male	48 (49.0%)
Female	48 (49.0%)
Prefer not to answer	2 (2.0%)
Age	
18-24	3 (3.1%)
25-34	3 (3.1%)
25-44	14 (14.3%)
45-54	34 (34.7%)
55-64	33 (33.7%)
65+	11 (11.2%)
Racial/ethnic background	
Black or African American	83 (84.7%)
White	9 (9.2%)
Other	4 (4.1%)
Prefer not to answer	1 (1.0%)
Highest level of education	
High school graduate, GED, equivalent, or less	63 (64.3%)
Attended at least some higher education	35 (35.7%)
Job status	
Employed	21 (21.4%)
Not employed	77 (78.6%)
Current food assistance use	
Yes	58 (60.2%)
No	40 (40.8%)
Marital status	
Not married	86 (87.8%)
Married or domestic partner	12 (12.2%)
Health Conditions	
High blood pressure	55 (56.1%)
High cholesterol	24 (24.5%)
Diabetes	18 (18.4%)

Table 3. Internal Consistency Reliability (n=98) and Test-Retest Reliability (n=75)

Subscale/Domain	Cronbach's α (n=98)	KR-20 (n=98)	ICC (n=75)
Food Consumption Frequency	-	-	0.81
Knowledge	-	0.51	0.86
Behavior			
Total	0.90	-	0.93
Plan/Manage	-	-	0.82
Select	0.82	-	0.84
Prepare	0.81	-	0.79
Eat	-	-	-
Self-Efficacy			
Total	0.92	-	0.70
Plan/Manage	0.76	-	0.68
Select	0.84	-	0.52
Prepare	0.80	-	0.50
Eat	-	-	0.74

- indicates not calculated

KR-20 calculated for subscales with dichotomous response options

Cronbach's α not calculated for subscales with < 5 items

CONCLUSIONS

- Internal consistency reliability of the FLAT was acceptable, except for the knowledge subscale.
- Test-retest reliability of the FLAT was acceptable.
- The FLAT is the first valid and reliable assessment of food literacy for low-income populations within the United States

IMPLICATIONS

- Internal consistency reliability of the knowledge subscale may need to be improved
- The FLAT may need validation in additional populations
- Assessment of food literacy in low-income populations can serve as a foundation for developing and evaluating interventions to improve food literacy.

KEY REFERENCES

- Oates GR, Jackson BE, Partridge EE, Singh KP, Fouad MN, Bae S. Sociodemographic Patterns of Chronic Disease: How the Mid-South Region Compares to the Rest of the Country. *Am J Prev Med.* 2017;52:S31-S39.
- Coleman-Jensen A, Rabbitt MP, Gregory CA, Singh A. Household Food Security in the United States in 2018. 2019.
- Poelman MP, Dijkstra SC, Sponselee H, et al. Towards the measurement of food literacy with respect to healthy eating: The development and validation of the self perceived food literacy scale among an adult sample in the Netherlands. *International Journal of Behavioral Nutrition and Physical Activity.* 2018;15:1-12.
- Begley A, Paynter E, Butcher LM, Dhaliwal SS. Examining the Association between Food Literacy and Food Insecurity. *Nutrients.* 2019;11:445.
- Ware LM, Cameron CM, Davis NJ, et al. Food literacy of New Zealand schoolchildren. *Journal of Nutrition & Intermediary Metabolism.* 2017;8:76.
- Vidgen HA, Gallegos D. Defining food literacy and its components. *Appetite.* 2014;76:50-59.

ACKNOWLEDGEMENTS

The project described was supported by the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant 8 UL1 TR000077-05. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

