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PROTOCOL

Culinary competencies assessment tool in the Spanish adult population: A protocol for development and assessment of validity and reliability

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KEYWORDS

Culinary Competencies;

Assessment;

Validation study;

Food literacy;

Adult.

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ABSTRACT

Introduction: Culinary competencies encompass a set of factors that integrate knowledge, skills, and behaviors, which form the basis of food literacy. Recent research has shown a positive association between culinary competencies and the nutritional quality of the diet. Interventions aimed at improving culinary competencies have demonstrated positive health outcomes. The objective of this study is to describe the protocol designed for the development and validation of a tool to measure culinary competencies in Spanish adults and to assess their impact on the nutritional quality of their diets.

Methodology: This protocol includes six phases: (1) First phase: a scoping review will be conducted to explore key concepts and definitions related to culinary competencies, and existing items for the initial questionnaire development will be identified; (2) Second phase: an initial set of items will be generated, adapted to the Spanish context, in collaboration with a panel of experts, including culinary professionals, culinary technique experts, and dietitians-nutritionists; (3) Third phase: the expert committee will evaluate the content validity using the Content Validity Index (CVI) to assess the relevance of the items; (4) Fourth phase: a pilot study will be conducted with 30 participants from the target population to assess cognitive validity, ensuring the items are comprehensible and relevant; (5) Fifth phase: the first version of the tool will be implemented in a larger sample of the target population, and reliability will be assessed through internal consistency (Cronbach's Alpha) and test-retest analyses; a factorial analysis and Rasch analysis will be performed to validate the construct structure; (6) Sixth phase: criterion validity will be evaluated by comparing the results of the questionnaire with other previously validated tools identified in the scoping review. Statistical analysis will be conducted using SPSS Statistics 20 for the data collected throughout all study phases.

Discussions and expected results: The design, development, and validation of a culinary competencies questionnaire for the Spanish population will provide the scientific community with a new standardized measurement tool for diet-health studies.

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Instrumento de evaluación de competencias culinarias en población adulta española: Protocolo de desarrollo y evaluación de validez y fiabilidad

PALABRAS CLAVE

Competencias Culinarias;

Evaluación;

Estudio de Validación;

Alfabetización Alimentaria;

Adultos.

RESUMEN

Introducción: Las competencias culinarias son un conjunto de factores que se integran en el andamiaje de conocimientos, habilidades y comportamientos que configuran la alfabetización alimentaria y que en investigaciones recientes se han asociado positivamente con la calidad nutricional de la dieta. Las intervenciones dirigidas a mejorar las competencias culinarias han demostrado cambios positivos en el estado de salud. El objetivo del presente trabajo es describir el protocolo diseñado para el desarrollo y validación de una herramienta que permita medir las competencias culinarias en adultos españoles y valorar el impacto de éstas en la calidad nutricional de sus dietas.

Metodología: Este protocolo contempla seis fases: (1) Primera fase: se realizará una revisión panorámica (*scoping review*) sobre conceptos clave y definiciones asociadas a las competencias culinarias, y se identificarán ítems existentes para el desarrollo inicial del cuestionario; (2) Segunda fase: se generará el conjunto inicial de ítems, adaptado al contexto español, con la colaboración de un panel de expertos que incluirá profesionales culinarios, expertos en técnicas culinarias y dietistas-nutricionistas; (3) Tercera fase: el comité de expertos evaluará la validez de contenido, empleando el índice de validez de contenido (CVI) para determinar la relevancia de los ítems; (4) Cuarta fase: se realizará un estudio piloto con 30 participantes de la población objetivo para evaluar la validez cognitiva y asegurar la comprensibilidad y pertinencia de los ítems; (5) Quinta fase: se implementará la primera propuesta de la herramienta en una muestra ampliada de la población objetivo, y se evaluará la confiabilidad mediante análisis de consistencia interna (*Cronbach's Alpha*) y test-retest; se llevará a cabo un análisis factorial y un análisis de Rasch para validar la estructura del constructo; (6) Sexta fase: se examinará la validez de criterio comparando los resultados del cuestionario con otras herramientas validadas previamente identificadas en la *scoping review*. El análisis estadístico utiliza SPSS Statistics 20 para los datos recopilados en todas las fases del estudio.

Discusión y resultados esperados: El diseño, elaboración y validación de un cuestionario de competencias culinarias para la población española permitirá ofrecer a la comunidad científica una nueva herramienta estandarizada de medición en los estudios dieta-salud.

KEY MESSAGES

1. Culinary competencies have recently been positively associated with healthy eating behaviour.
2. Interventions targeting the improvement of culinary competencies have demonstrated positive changes in health status, dietary intake of fats, fibre, and sodium, and culinary self-efficacy, attitudes, and behaviours.
3. Despite the importance of culinary skills, no universally accepted assessment questionnaire exists for these competencies.

CITATION

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INTRODUCTION

Dietary behaviour is a crucial aspect of lifestyle influencing individuals' health in the short, medium, and long term. Unhealthy eating habits, such as consuming low-nutrient-density foods or skipping meals, contribute to nutritional imbalances associated with various health outcomes. Conversely, a healthy diet can contribute to maintaining individuals' physical well-being and mental health[1].

Various factors, both individual and societal, influence dietary behaviour. These include personal preferences, physical and emotional health status, lifestyle, physical activity, food environments, food policies, exposure to food marketing, and accessibility to healthy and unhealthy foods[2]. Within this framework, culinary competencies- identified as a subset of food literacy, play a crucial role[3,4]. Food literacy is defined as the set of interconnected knowledge, skills, and behaviours that enables individuals to manage their food (plan, select, prepare, and consume food) to meet their needs and maintain individual and environmental health[5,6]. Culinary competencies have recently been positively associated with healthy eating behaviour[7].

Interventions targeting the improvement of culinary competencies have demonstrated positive changes in health status, dietary intake of fats, fibre, and sodium, as well as improvements in culinary self-efficacy, attitudes, and behaviours[8,9]. The inquiry regarding one's ability to cook and the self-assessment of culinary skills holds significance beyond mere triviality. The responses to such queries can exert a notable impact on the quality of an individual's or a collective entity's (e.g., a family's) dietary choices and, consequently, their overall health[10].

Extensive scientific studies underscore the pivotal role of culinary competencies in the realm of health promotion. Cooking is a reflective practice where scientific knowledge of culinary processes and the nutritional composition of foods mutually enhance the ability to create healthy, appetizing, and culturally accepted diets, fostering the subjective perception of a rewarding gastronomic experience[11–13]. Engaging in culinary activities involving the utilization of fresh or minimally processed ingredients, coupled with adept application of appropriate cooking techniques, has been consistently linked to favourable health outcomes[14]. The acquisition and refinement of culinary competencies, specifically those contributing to heightened perceptions of health and improved nutritional quality, increasing fruits and vegetables consumption, and diminished unhealthy fats intake, are further associated with positive health outcomes[15].

Despite the importance of culinary skills, there is no universally accepted assessment questionnaire for these competencies. A systematic review identified numerous instruments developed to measure culinary skills in adults, but highlighted significant variability in their methodological quality[16]. Among 12 studies reviewed, only four demonstrated adequate internal consistency reliability, and just one showed adequate test-retest reliability. Content validity was not adequately rated in any study, and only four studies showed satisfactory results for at least one type of construct validity. Additionally, the only study reporting criterion validity did not meet adequate quality standards[16].

These findings indicate a critical need for a validated tool with robust psychometric properties to accurately assess culinary competencies. The aim of this paper is to describe the protocol designed for the development and validation of a tool to measure cooking skills in Spanish adults.

METHODOLOGY

A collaborative team was established between the *Universidad Complutense de Madrid* (Complutense University of Madrid) and the *Academia Española de Nutrición y Dietética* (Spanish Academy of Nutrition and Dietetics) to define objectives and delimit the construct of interest.

Study design

This project requires a combination of different research phases and study designs for the development and validation of a tool to assess culinary competencies related to food quality in the Spanish adult population, commonly established as necessary for this purpose[17–21].

The design of the multi-stage protocol development is established to:

- Identify the culinary competences linked to the nutritional quality of the diet.
- Develop a tool for the assessment of culinary competences.
- To Validate the culinary competencies questionnaire tailored for the Spanish population.

Phase 1: Key concepts clarification, definitions and items already available related with culinary competencies

A scoping review will be conducted to clarify key concepts, definitions, and to identify existing items associated with culinary competencies[22]. This review will address components such as knowledge, skills, behaviors, and attitudes towards culinary competencies, aiming to define or complement them. The

literature search will also focus on identifying potential items for each component or facet from existing tools, whether validated or not.

This scoping review will follow the methodological guidelines proposed by Peters MDJ *et al*. in 2020[23]. The preparation and registration of a specific protocol will precede the review's execution, and the review will be reported according to the PRISMA Extension for Scoping Reviews international standards[24]. In brief, we will conduct a comprehensive search across multiple databases (e.g., PubMed, Scopus, Web of Science) and sources of grey literature (e.g., theses and dissertations, conference proceedings) to identify relevant studies. The search strategy will be developed following the three-step search strategy recommended by the JBI Manual. Titles and abstracts of identified studies will be screened against the inclusion and exclusion criteria, followed by full-text screening to finalize the list of studies to be included in the review. Key information from the selected studies, will be extracted using a standardized data extraction form to ensure consistency. The extracted data will be analyzed and summarized to identify key concepts, definitions and potential items related to culinary competencies, and the findings will be presented in a narrative format, supported by tables and charts as appropriate.

Phase 2: Development of the initial set of items

The initial set of items will be derived from prior research retrieved a través de la scoping review of phase 1. These items will be adapted to the Spanish context and reviewed to ensure cultural and linguistic relevance. Subsequently, this initial selection will be complemented by generating new items in collaboration with experts to cover areas not addressed by existing tools. New questions or items, if needed, will follow general recommendations for their generation[17], and in the case of item translation, the process will involve translation and retro-translation methods[25]. In brief, the development of new items will involve workshops and meetings with 15-20 culinary professionals, culinary technique experts, and dietitians-nutritionists. These experts will provide specialized knowledge to create items that comprehensively cover the defined competencies. In this stage, the questionnaire format (self-administered or interviewer-administered), types of questions or items (open or closed), and response scales (multiple choice, Likert scales) will be defined. The ideal number of items will be determined, prioritizing well-evaluated items in existing tools.

The eligibility criteria for selecting experts will include the following: experts will be selected from three main categories: culinary professionals (such as chefs), culinary technique experts, and dietitians-nutritionists. Each expert should have a minimum of 10 years of professional experience in their respective field to ensure that they have substantial practical knowledge and insight into the competencies being evaluated. Culinary professionals should have formal education or certification in culinary arts, while dietitians-nutritionists should have relevant academic degrees (master and doctorate) and be registered or certified by recognized professional bodies. Additionally, experts should have a proven track record of excellence in their field, such as awards, publications, or leadership roles in professional organizations. The selection of experts will be conducted through purposive sampling to ensure that the most knowledgeable and experienced individuals are included.

Phase 3: Expert Committee evaluation for content validity

The methodology for conducting content validity will begin with a detailed consultation with a panel of 15-20 experts to ensure that the items comprehensively cover the intended competencies[26,27], leveraging the experts recruited in phase 2 or using purposive sampling and the eligibility criteria described in the previous phase if more experts are needed or those from the previous phase are unavailable. The Expert Committee will evaluate the relevance and relative importance of each item, adjusting or reformulating elements to ensure better understanding by the target population. Initially, these experts will individually review the draft items to assess their relevance, clarity, and representativeness. Each item will be rated on a scale, typically ranging from "not relevant" to "very relevant," and experts will provide qualitative feedback on potential improvements. This feedback will be used to refine the items iteratively.

Following the initial review, the Content Validity Index (CVI) will be calculated to quantify the proportion of experts who consider each item relevant. The CVI will be determined by dividing the number of experts who rate an item as "quite relevant" or "very relevant" by the total number of experts. Items with a CVI of 0.78 or higher are generally considered acceptable[21]. Based on the CVI scores and the qualitative feedback, items will undergo a process of review and refinement. Items that do not meet the threshold for relevance or that receive significant critical feedback will be adjusted to improve clarity and relevance or may be eliminated if they are deemed unsuitable. This iterative process will ensure that the final set of items is comprehensive, and provide a robust foundation for subsequent phases of validation.

Phase 4: Cognitive validity with a pilot study in a target sample of population

Following this, the refined set of items will be subjected to a pilot test for cognitive validation, initially involving 30 participants from the target population, ensuring that the items

are comprehensible and appropriately challenging, following methodological recommendations[26]. If the tool contains a significant number of items (>35-40 items) or is estimated to take more than 15 minutes to complete, the option of dividing the questionnaire into facets or components, testing each separately, will be considered. The eligibility criteria for the target population in this phase will include Spanish adults, ensuring representation from various age groups, educational levels, and socioeconomic backgrounds, as well as both men and women. Additionally, participants should have a basic level of culinary interest or experience to provide relevant feedback. Ensuring a mix of urban and rural residents can also provide insights into different culinary practices and access to resources. This diverse sample will help ensure that the tool is applicable and relevant across the entire population.

The pilot test aims to identify potential confusion items and offer suggestions for clarity improvement. This will gather quantitative data on item performance and qualitative feedback from participants about the clarity and relevance of each item. Analysis of the pilot test data will help identify any items that are confusing, misunderstood, or not adequately capturing the intended competencies. Based on this analysis, further refinements will be made. The questionnaire's feasibility will be assessed, and response variability, crucial for planning the main pilot test with a larger sample, will be verified. Diverse responses from the target population will contribute to ensuring optimal internal consistency, establishing apparent validity from the target population's perspective.

A comprehensive review of the questionnaire will follow, with relevant modifications to initial items, resulting in the formulation of the tool's first proposal.

Phase 5: Tool reliability assessment and construct validity assessment

In this stage, the first version of the tool will be implemented in an expanded sample of the target population. A substantial sample size, generally 60 individuals per set of 15 questions (equivalent to 4 people per question), will be used[26].

Based on responses obtained in this test, an evaluation of reliability will be conducted through internal consistency analysis. The Cronbach's Alpha coefficient will be used to quantify this level of internal consistency[28]. Additionally, intra-rater reliability evaluation will be performed using the test-retest method[29]. This analysis assesses the extent to which individuals provide relatively consistent responses across repeated administrations of the same questionnaire, employing Cohen's Kappa statistic, Kendall's Tau, or Pearson correlation based on the variable type (nominal, ordinal, or metric, respectively). An adequate time interval between time 1 and 2 will be established to prevent participants from recalling their responses without being excessively prolonged to avoid reflecting genuine changes in their culinary competencies.

To further strengthen the construct validity, an exploratory factorial analysis (EFA) will be performed. This analysis will help identify underlying structures within the data, ensuring that the items of the tool group correctly into factors or dimensions that represent the different aspects of culinary competencies, such as knowledge, skills, behaviors, and attitudes. If the dimensions identified through EFA align with the theoretical constructs defined in the earlier phases, this will provide evidence supporting the validity of the tool's structure. In case the dimensions do not align, items may be refined or redefined to better represent the construct. Additionally, a Rasch analysis will be conducted to assess the functionality of individual items within the tool. This model ensures that the items follow a logical progression in terms of difficulty or competency level, providing insights into whether the tool measures the competencies on a consistent scale across various subgroups of the target population. The Rasch model will also help identify items that may not be functioning as intended (e.g., items that are too difficult or too easy for the majority of respondents) and will guide further refinement of the tool[29].

Both analyses will contribute significantly to refining the assessment tool, ensuring that it robustly measures culinary competencies in the target population, and will guide decisions on which items should be incorporated into the final version of the tool and which might be discarded based on their performance in these analyses.

Phase 6: Criterion validity assessment

In the conclusive phase, a correlation test for the final tool will be conducted, comparing it with other tools. All selected individuals for testing will respond to at least two different tools, aiming to establish the correlation of scores between them (using Pearson's "r" correlation). This approach, known as criterion validity, aims to assess how accurately the new tool measures the same phenomenon compared to other validated tools recognized in the literature.

The selection of comparison tools will be based on the findings of the scoping review conducted in Phase 1, where various existing tools related to culinary competencies will be identified and evaluated. The decision on which tool(s) to use for the comparison will depend on the quality and level of validation reported in the literature. Preference will be given to tools that have demonstrated robust psychometric properties, such as high reliability, validity, and widespread use in similar populations. The aim is to select the tool(s) that best align with the objectives and structure of the newly developed tool, ensuring a meaningful comparison.

This comparison process will not only determine the criterion validity of the final tool but also understand its accuracy in relation to other established tools. The application of statistical methods, especially the Pearson correlation coefficient, will provide a quantitative analysis of the relationship between scores obtained in the new tool and those derived from other reference tools. This analysis will offer a critical perspective on the criterion validity of the newly developed tool, contributing to its overall validation and providing substantial evidence of its usefulness and applicability in the context of assessing culinary competencies in the target population.

Statistical analysis

The statistical analysis will be based on the data collected during the different stages of the study for the development and validation of the culinary competencies assessment tool in the Spanish adult population, using the SPSS Statistics 20 statistical package.

For content validity, a descriptive analysis based on the level of agreement among subjects regarding the different questions will be performed, counting the frequency of agreement on the relevance and importance of items. The goal is an agreement index of 75%. A qualitative content analysis of the provided feedback will also be conducted, grouping common comments to identify areas for improvement and refinement of the tool.

For reliability assessment, the Cronbach's Alpha coefficient to quantify the internal consistency of the tool will be used. A robust Cronbach's Alpha (>0.70) suggests consistent interrelation between items, supporting the tool's reliability. Intra-rater reliability evaluation using Cohen's Kappa, Kendall's Tau, or Pearson correlation based on variable type (nominal, ordinal, or metric, respectively) between responses obtained in the first and second administration of the questionnaire will be conducted. An adequate time interval to avoid biases from response memorization will be established.

For construct validity assessment, an exploratory factorial analysis (EFA) will be performed to identify the underlying factor structure of the tool. This analysis will help confirm if the items group together as expected based on the theoretical framework of culinary competencies (e.g., knowledge, skills, behaviors, attitudes). Factors will be extracted using principal components analysis, and the number of factors will be determined based on eigenvalues greater than 1 and the scree plot. Items that do not load strongly onto a factor (e.g., loadings <0.40) or that cross-load onto multiple factors may be considered for removal or revision. Additionally, a Rasch analysis will be conducted to evaluate item functionality, focusing on item difficulty and the progression of responses across competency levels. This analysis will ensure that the tool maintains consistent measurement properties across different subgroups of the population.

For criterion validity assessment, a correlation test of the final tool's score with other validated tools using the Pearson correlation coefficient will be performed. This analysis will not only evaluate the criterion validity of the final tool but also provide a quantitative analysis of the relationship between scores obtained in the new tool and those derived from other recognized tools.

Ethical considerations

This research will adhere to the ethical standards established by the *Comité de Ética de la Investigación* (CEI) de la *Universidad Complutense*, which will review and approve the research protocol prior to the start of the study. All phases of the study, including the development of the tool, content validity assessment, reliability assessment, and criterion validity assessment, will follow the principles of ethical conduct to ensure the protection and rights of participants.

Informed consent will be obtained from all participants after providing comprehensive information about the study's objectives, procedures, potential benefits, and risks. Participants will be fully informed about their rights to withdraw from the study at any point without facing any negative consequences. This voluntary participation will be safeguarded by clearly outlining the process for revoking consent.

Confidentiality and privacy will be ensured through strict data protection measures, in compliance with the current General Data Protection Regulation (GDPR) and national legislation. All personal information and data collected will be anonymized before analysis to protect participant identities. Data will be stored securely, with access limited to authorized research personnel, and will be retained only for the duration necessary for the study purposes. Afterward, all identifiable data will be properly deleted in accordance with the data protection policies of the Universidad Complutense and applicable regulations.

Participants will be informed about the potential benefits and risks associated with their participation. Although the risks involved are minimal, they will be explained in detail to ensure that participants are aware of any potential discomforts or inconveniences. Benefits, including the contribution to the scientific understanding of culinary competencies and potential improvements in dietary practices, will also be communicated.

The research team is committed to maintaining scientific integrity throughout the study. This includes ensuring the accuracy, transparency, and honesty of all data collection and analysis processes. Any form of fabrication, falsification, or manipulation of data will be strictly avoided. Contributions of others will be properly credited, and any potential conflicts of interest will be disclosed in a transparent manner. The avoidance of plagiarism and the adherence to rigorous ethical standards are central to the integrity of this research.

Each phase of the study will be carried out following the specific guidelines and protocols established by the CEI to ensure that the study remains in full compliance with ethical standards at every step.

Financing aspects

The design of the protocol presented in this paper has not been specifically funded.

DISCUSSION

There is no universally accepted individual assessment questionnaire for measuring cooking competences. A 2021 systematic review[16] identified 12 studies, of which 10 developed tools to measure culinary skills in adults and 2 adapted cross-cultural instruments. However, none of the tools presented adequate measures for each aspect of reliability and validity, highlighting the need for a universally validated tool for the Spanish population.

Consequently, the design, development and validation of a cooking skills questionnaire for the Spanish population will provide the scientific community with a new standardised measurement tool for diet-health studies.

AUTHORS' CONTRIBUTIONS

Conceptualization and methodology E.B., B.B.dM., C.C.V., S.dP.dIC. and M.Mñ.; writing-original draft preparation, E.B., B.B.dM., C.C.V. and S.d.P.; writing-review and editing E.B., B.B.dM., C.C.V., S.dP., M.Mñ., G.R. and M.Mñ. All authors have read and agreed to the published version of the manuscript.

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COMPETING INTERESTS

The authors declare no conflict of interest.

REFERENCES

(1) Jayedi A, Soltani S, Abdolshahi A, Shab-Bidar S. Healthy and unhealthy dietary patterns and the risk of chronic disease: an umbrella review of meta-analyses of prospective cohort studies. Br J Nutr. 2020; 124(11): 1133-4. doi: 10.1017/S0007114520002330.

(2) Marcone MF, Madan P, Grodzinski B. An Overview of the Sociological and Environmental Factors Influencing Eating Food Behavior in Canada. Front Nutr. 2020;7.

(3) Truman E, Lane D, Elliott C. Defining food literacy: A scoping review. Appetite. 2017; 116: 365-71. doi: 10.1016/j.appet.2017.05.007.

(4) EFAD European Specialist Dietetic Network for Public Health. Food Literacy: an added value for health. European Federation of Associations of Dietitians (EFAD); 2018. https://www.efad.org/wp-content/uploads/2021/11/efad-food-literacy-fact-sheet.pdf.

(5) Sainz Garcia P. Estudio de las competencias culinarias y su relación con el tipo de alimentación y la adherencia a la dieta mediterránea en estudiantes universitarios. http://purl.org/dc/dcmitype/Text, Universitat Ramon Llull, 2018.

(6) Buckley NH. Culinary Competence: Skills and Knowledge Assessment for Dietetic Students. Graduate Theses and Dissertations. https://scholarworks.uark.edu/etd/1701.

(7) Metcalfe JJ, Leonard D. The relationship between culinary skills and eating behaviors: Challenges and opportunities for parents and families. Physiol Behav. 2018; 191: 95-9. doi: 10.1016/j.physbeh.2018.04.013.

(8) Farmer N, Touchton-Leonard K, Ross A. Psychosocial Benefits of Cooking Interventions: A Systematic Review. Health Educ Behav. 2018; 45(2): 167-80. doi: 10.1177/1090198117736352.

(9) Reicks M, Trofholz AC, Stang JS, Laska MN. Impact of cooking and home food preparation interventions among adults: outcomes and implications for future programs. J Nutr Educ Behav. 2014; 46(4): 259-76. doi: 10.1016/j.jneb.2014.02.001.

(10) Mills S, White M, Brown H, Wrieden W, Kwasnicka D, Halligan J, et al. Health and social determinants and outcomes of home cooking: A systematic review of observational studies. Appetite. 2017; 111: 116-34. doi: 10.1016/j.appet.2016.12.022.

(11) McGowan L, Caraher M, Raats M, Lavelle F, Hollywood L, McDowell D, et al. Domestic cooking and food skills: A review. Crit Rev Food Sci Nutr. 2017; 57(11): 2412-31. doi: 10.1080/10408398.2015.1072495.

(12) Sharkey JR, Smith A. Cooking with the Seasons for Health (CwS4H): An Innovative Intervention That Links Nutrition Education, Cooking Skills, and Locally Grown Produce to Increase Vegetable Intake among Limited-Resource Parent–Child Dyads in Rural Washington. Nutrients. 2023; 15(22): 4851. doi: 10.3390/nu15224851.

(13) Brasington N, Bucher T, Beckett EL. Frequency of use of convenience cooking product is associated with cooking confidence and creativity and markers of vegetable intake. Proceedings of the Nutrition Society. 2023; 82(OCE2): E154. doi: 10.1017/S0029665123001635.

(14) Raber M, Chandra J, Upadhyaya M, Schick V, Strong LL, Durand C, et al. An evidence-based conceptual framework of healthy cooking. Prev Med Rep. 2016; 4: 23-8. doi: 10.1016/j.pmedr.2016.05.004.

(15) Asher RC, Jakstas T, Lavelle F, Wolfson JA, Rose A, Bucher T, et al. Development of the Cook-EdTM Matrix to Guide Food and Cooking Skill Selection in Culinary Education Programs That Target Diet Quality and Health. Nutrients. 2022; 14(9): 1778. doi: 10.3390/

nu14091778.

(16) Teixeira AR, Bicalho D, Slater B, Lima T de M. Systematic review of instruments for assessing culinary skills in adults: What is the quality of their psychometric properties? PLoS One. 2021; 16(8): e0235182. doi: 10.1371/journal.pone.0235182.

(17) Tsang S, Royse CF, Terkawi AS. Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine. Saudi J Anaesth. 2017; 11(Suppl. 1): S80-9. doi: 10.4103/sja.SJA_203_17.

(18) Sperber AD. Translation and validation of study instruments for cross-cultural research. Gastroenterology. 2004; 126: S124-8. doi: 10.1053/j.gastro.2003.10.016.

(19) Fenn J, Tan C-S, George S. Development, validation and translation of psychological tests. BJPsych Advances. 2020; 26(5): 306-15. doi: 10.1192/bja.2020.33.

(20) Kozanhan B, Yildiz M. Questionnaire translation and questionnaire validation are not the same. Int J Obstet Anesth. 2021; 45: 165. doi: 10.1016/j.ijoa.2020.12.001.

(21) Boateng GO, Neilands TB, Frongillo EA, Melgar-Quiñonez HR, Young SL. Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer. Front Public Health. 2018; 6: 149. doi: 10.3389/fpubh.2018.00149.

(22) Munn Z, Peters MDJ, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. BMC Med Res Methodol. 2018; 18(1): 143. doi: 10.1186/s12874-018-0611-x.

(23) Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil, H. Chapter 11: Scoping Reviews (2020 version). Aromataris E, Munn Z, editors. JBI Manual for Evidence Synthesis. JBI; 2020. Available from https://synthesismanual.jbi.global. https://doi.org/10.46658/JBIMES-20-12.

(24) Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. 2018; 169(7): 467-73. doi: 10.7326/M18-0850.

(25) Sperber AD. Translation and validation of study instruments for cross-cultural research. Gastroenterology. 2004; 126: S124-8. doi: 10.1053/j.gastro.2003.10.016.

(26) Gunawan J, Marzilli C, Aungsuroch Y. Establishing appropriate sample size for developing and validating a questionnaire in nursing research. Belitung Nurs J. 2021; 7(5): 356-60. doi: 10.33546/bnj.1927.

(27) Setia MS. Methodology Series Module 5: Sampling Strategies. Indian J Dermatol. 2016; 61(5): 505-9. doi: 10.4103/0019-5154.190118.

(28) Tavakol M, Dennick R. Making sense of Cronbach's alpha. Int J Med Educ. 2011; 2: 53-5. doi: 10.5116/ijme.4dfb.8dfd.

(29) Matheson GJ. We need to talk about reliability: making better use of test-retest studies for study design and interpretation. PeerJ. 2019; 7: e6918. doi: 10.7717/peerj.6918.