

Original Article

Assessing the Alignment Between Food Preparation and Nutritional Awareness Among Senior High School Students: A Mixed-Method Study

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Abstract. A disconnect may exist between students' food-preparation competence and their ability to apply nutritional awareness to daily food choices. This study examined the food preparation skills and nutritional awareness of senior high school students at Hadji Butu School of Arts and Trades. Using a sequential explanatory mixed-methods design, the study involved 150 students classified by sex, grade level, and strand. Quantitative data were collected through a 20-item nutritional awareness survey with high internal consistency (Cronbach's $\alpha = .874$) and a rubric-based assessment of food preparation skills. Qualitative data from focus group discussions were analyzed thematically. Results showed moderately high food preparation skills ($M = 3.32$) and high nutritional awareness ($M = 3.46$). Spearman's correlation indicated a significant moderate positive relationship between the two variables ($\rho = .387$, $p = .001$), suggesting that practical cooking competence may support, but does not necessarily guarantee, nutrition-informed food choices. Qualitative findings showed that budget limitations, time constraints, family food practices, peer influence, food availability, and gaps in technical knowledge influenced students' application of food knowledge. The findings highlight the need for TVL instruction to integrate cooking performance with nutrition reasoning, food safety, meal planning, budgeting, and context-based food decision-making.

Keywords: Food preparation skills; Nutritional awareness; Food literacy; Senior High School; Mixed-methods study.

The Technical-Vocational-Livelihood (TVL) track plays an increasingly vital role in equipping senior high school students with practical skills essential for both immediate employment and lifelong personal development. Globally, TVL programs have been recognized for their contributions to enhancing food literacy, which encompasses the knowledge, skills, and behaviors necessary to make informed food choices and prepare nutritious meals (Gervacio, 2025). The development of food preparation competencies within TVL tracks not only supports economic empowerment but also promotes health and well-being by fostering the ability to prepare safe, balanced, and culturally appropriate meals (Sisnorio, 2025). In the Philippine educational landscape, where TVL tracks are integral to senior high school curricula, the emphasis on food-related skills aligns with national goals to improve public health outcomes and address nutritional challenges prevalent among youth populations (Baker et al., 2024).

Despite the acknowledged importance of technical skills in food preparation, a persistent gap exists between these practical abilities and students' nutritional awareness, particularly in vocational settings. While students may demonstrate proficiency in cooking techniques, their understanding of essential nutritional principles often remains limited or fragmented (De Tomas et al., 2021). This disconnect can result in food choices that do not support optimal health, undermining the potential benefits of acquired culinary skills. Previous studies have highlighted that vocational education tends to prioritize technical mastery over comprehensive nutrition education, leading to an imbalance that limits students' ability to apply their skills to promote healthy eating habits (Watson et al., 2026). Addressing this gap is crucial for ensuring that food literacy encompasses both the 'how' and the 'why' of food preparation, thereby enabling students to make informed decisions that positively influence their dietary behaviors and long-term health.

The Hadji Butu School of Arts and Trades (HBSAT) provides a unique context for examining this issue due to its distinctive socio-cultural and educational environment. Located in a region characterized by diverse cultural traditions and varying levels of access to nutritional resources, HBSAT serves a student population that reflects these complexities. The school's TVL track offers specialized courses in food preparation and related trades, positioning it as a critical setting for investigating the interplay between technical skills and nutritional knowledge. Socioeconomic factors, cultural food practices, and educational approaches at HBSAT help shape students' experiences and competencies in this domain, underscoring the need for context-sensitive research that captures these dynamics (Pasquito & Singzon, 2025).

This study aims to bridge the identified gap by employing a mixed-method approach to analyze senior high school students' food preparation skills alongside their nutritional awareness at HBSAT. The integration of quantitative and qualitative data is essential for providing a comprehensive understanding of both measurable competencies and the contextual factors that influence students' knowledge and attitudes. Quantitative assessments will evaluate proficiency in food preparation and the extent of nutritional knowledge. At the same time, qualitative insights will explore students' perceptions, motivations, and challenges in applying these skills in daily life. By combining these methods, the research seeks to uncover nuanced relationships between technical ability and nutritional understanding that may not be evident from a single methodological approach (Amoah et al., 2024). The findings are expected to inform targeted educational interventions and policy recommendations that enhance the effectiveness of TVL programs in fostering holistic food literacy among senior high school students.

Ultimately, bridging the gap between food preparation skills and nutritional awareness is imperative for empowering students at HBSAT to make health-conscious decisions that support their well-being and academic success. This study contributes to the broader discourse on vocational education and health promotion by providing evidence-based insights tailored to the specific needs of a culturally diverse and technically skilled student population. The results will offer valuable guidance for educators, curriculum developers, and policymakers striving to optimize the impact of TVL tracks on youth nutrition and lifelong healthy eating practices.

Adolescence is a pivotal developmental stage during which dietary habits are formed, yet many students continue to make suboptimal food choices that affect long-term health (Joshi et al., 2023). While approximately 65% of students report familiarity with healthy eating principles, there is an uncritical, heavy reliance on social media and digital influencers for nutritional guidance rather than on formal education (Bacheva et al., 2024). This reliance often overshadows structured learning, contributing to a global challenge where over 22% of adolescents consume excessive amounts of sugary beverages and processed foods (Mehrjoan et al., 2025). In particular, gender-specific patterns emerge during this stage: female adolescents are more likely to be underweight, while males are more likely to be overweight, a pattern further complicated by increased autonomy and decreased vegetable consumption during late adolescence (Lupu et al., 2025).

Central to addressing these dietary behaviors is the development of food preparation skills. Current research indicates that while adolescents recognize the importance of cooking, they frequently experience a "confidence gap" regarding their practical abilities (Gaston et al., 2024). This gap is most evident in specialized areas such as kitchen safety and food hygiene. In the Philippines, research involving cookery teachers has highlighted a significant disconnect: while educators demonstrate high competency, students often lack exposure to standardized safety policies and technical skills, such as precise temperature control and safe cold storage (Gamiao et al., 2025). Hands-on training has proven to be the most effective bridge for these gaps; participation in programs

like "Food Literacy Boot Camps" has yielded statistically significant improvements in practical safety skills, including cross-contamination prevention and proper sanitation (Sullivan et al., 2025).

The relationship between these skills and nutritional outcomes is well-documented. High-school students with superior food literacy and cooking skills consume significantly more fruits and vegetables (LeBlanc et al., 2022). Conversely, low self-perceived cooking ability is a strong predictor of higher consumption of ultra-processed foods, particularly sweets (Hermosa-Bosano & López-Gil, 2025). Interestingly, the COVID-19 pandemic catalyzed some adolescents to improve their culinary skills, which was directly linked to healthier dietary patterns (Eisenberg, 2023; Hermosa-Bosano & López-Gil, 2025). Practical culinary education, therefore, acts as a bridge between theoretical knowledge and actual behavior change, empowering students to navigate barriers such as time and financial constraints (Amoah et al., 2024; Gaston et al., 2024).

School-based programs, particularly the Technology and Livelihood Education and Cookery tracks in the Philippines, are critical for developing this nutrition literacy. Integrating specialized workbooks into the curriculum has been shown to improve both dietary behavior and creative problem-solving (Yu et al., 2022). While school-based feeding programs in the Philippines address short-term hunger, long-term sustainability depends on parental involvement and the ability of trained teachers to address the aforementioned technical gaps in food hygiene (Corpuz & Bantulo, 2023; Gamiao et al., 2025; Sahagun, 2022). Despite these educational efforts, several environmental and psychological factors continue to hinder progress. Peer influence and food trends account for over 70% of reasons for food selection in some groups, while the high density of fast-food outlets near schools and the low cost of unhealthful foods serve as persistent barriers (Devine et al., 2023; Louey et al., 2024; Nafilla et al., 2023). Furthermore, fatigue, stress, and time constraints often drive students toward "convenience" foods rather than nutritious meals (Louey et al., 2024; Lupu et al., 2025).

Despite the high level of competency among Filipino cookery teachers, a critical research gap remains regarding how this professional knowledge translates into the technical proficiency of Senior High School students. While educators understand the standards, students remain vulnerable to technical errors in hygiene and food safety (Gamiao et al., 2025). Furthermore, the interplay between socioeconomic constraints and the ability to apply culinary knowledge in everyday settings remains underexplored in the local context (Gaston et al., 2024). This study aims to bridge this gap by examining the relationship between food preparation skills and the nutritional awareness of Senior High School students, providing a basis for more effective, student-centered culinary interventions.

Methodology

Research Design

This study employed a sequential explanatory mixed-methods design to examine the alignment between food preparation skills and nutritional awareness among Senior High School students. The design followed a quantitative-to-qualitative sequence (QUAN → qual). The quantitative phase first measured students' food preparation skills and nutritional awareness, and then examined the statistical relationship between them. The qualitative phase then explained and expanded on the quantitative findings by exploring students' lived experiences, challenges, and contextual conditions that affect their food preparation and nutrition-related decisions.

This design was warranted because the study sought not only to determine whether food preparation skills and nutritional awareness were statistically related. It also sought to explain why the relationship may be strong, weak, or moderate in actual student experiences. A purely quantitative design would identify the levels and relationships among the variables. However, it would not explain the household, school, economic, peer, and time-related factors affecting students' application of food knowledge. Conversely, a purely qualitative design would provide rich explanations but would not establish the measurable levels of skills and awareness, or the direction and strength of their relationship. Therefore, the sequential explanatory design was appropriate for connecting statistical patterns with qualitative explanations.

The conceptual basis of the study was anchored on the idea that food literacy includes both practical food preparation competence and nutrition-informed decision-making. In this study, food preparation skills refer to students' ability to perform basic cooking-related tasks, including tool use, hygiene, measuring, cooking, and food storage. Nutritional awareness refers to students' understanding of a balanced diet, healthy food choices, food

safety, and the health effects of poor eating habits. The study assumed that food preparation skills may support nutritional awareness because cooking exposes students to ingredients, portions, cooking methods, cleanliness, and food safety. However, this relationship may be influenced by contextual factors such as budget, time, food availability, family food practices, peer influence, and technical knowledge gaps. This conceptual position justified both the statistical testing of the relationship and the qualitative exploration of mediating conditions.

Participants and Sampling

The quantitative phase of the study involved 150 Senior High School students from Hadji Butu School of Arts and Trades. The adequacy of the sample size was established through power analysis using G*Power 3.1, a widely used statistical power analysis program for behavioral, educational, and social science research. The computation was aligned with the study's main inferential analysis, which examined the relationship between students' food preparation skills and nutritional awareness. Specifically, the power analysis was based on a two-tailed correlation test, an alpha level of .05, a desired statistical power of .80, and an expected moderate effect size. The resulting minimum required sample size was lower than the final sample of 150 respondents. Therefore, the final sample was considered sufficient for the study's descriptive and correlational objectives, while recognizing that the findings are context-specific to the participating Senior High School students and are not intended to generalize beyond the research setting.

Stratified random sampling was employed to ensure that important student classifications were represented in the quantitative phase. The official Senior High School enrolment list served as the sampling frame. The population was first divided into non-overlapping strata based on sex, grade level, and strand. After the strata were identified, proportional allocation was used to determine the number of respondents to be selected from each subgroup. The allocation followed the formula:

$$n_h = \frac{N_h}{N} \times n$$

where n_h represents the required number of respondents from a given stratum, N_h represents the number of students in that stratum, N represents the total Senior High School population, and n represents the final sample size of 150. After the proportional sample for each stratum was computed, respondents were randomly selected from the corresponding class or enrolment lists. This procedure ensured that the sample reflected the distribution of students according to sex, grade level, and strand, thereby improving the representativeness of the quantitative data within the school context.

For the qualitative phase, 15 students were purposively selected from among the quantitative respondents. The selection followed a maximum-variation logic to capture diverse student experiences and explanations regarding food preparation skills and nutritional awareness. Students were selected to represent variation in grade level, sex, strand, level of food-preparation experience, and nutritional awareness. This procedure enabled the focus group discussion to provide deeper explanations of the quantitative results and clarify how students learned, practiced, and applied food preparation and nutrition-related knowledge in their school and home contexts.

Instrumentation

The study used three data-gathering instruments: a nutritional awareness questionnaire, a food preparation skills rubric, and a focus group discussion guide. The nutritional awareness questionnaire consisted of Likert-scale items measuring students' understanding of balanced diet, healthy food choices, food safety, hydration, protein intake, fruit and vegetable consumption, and the health risks associated with excessive sugar, salt, oily food, junk food, and soft drinks. To establish content validity, the instrument was evaluated using item-level relevance ratings. The ratings were coded for Content Validity Index computation, with scores of 3, 4, and 5 treated as content-valid or relevant, and scores of 1 and 2 as not content-valid or not relevant.

Content validity was quantified using the Content Validity Index. The Item-Level Content Validity Index was computed by determining the proportion of ratings that classified each item as content-valid. In contrast, the Scale-Level Content Validity Index, using the average method, was computed as the average of the I-CVI values across all items. The nutritional awareness questionnaire obtained I-CVI values ranging from .813 to .913, with an S-CVI/Ave of .863. These results indicate that all items met the minimum item-level acceptability criterion of approximately .78 or higher. However, since the S-CVI/Ave was below the commonly recommended .90

benchmark for strong scale-level content validity, selected items were reviewed and revised for clarity, appropriateness, readability, and alignment with the study objectives before final administration.

The food preparation skills rubric assessed students' practical performance in hygiene and sanitation, safe use of tools and equipment, measuring ingredients, preparation techniques, time management, safety practices, and final food presentation. The rubric was likewise subjected to expert review to ensure that the criteria were observable, measurable, and appropriate for the learners' level. The focus group discussion guide was also reviewed for relevance, clarity, sequencing, and alignment with the quantitative findings. Revisions were made to improve wording, sequencing, and clarity of questions.

The reliability of the nutritional awareness questionnaire was established using Cronbach's alpha. The instrument obtained a reliability coefficient of $\alpha = .874$, indicating high internal consistency. To strengthen the credibility of the performance assessment, two trained raters used the same food preparation skills rubric to assess student performance. Before the actual rating, the raters reviewed the criteria and scoring descriptors to establish a common understanding of the assessment standards, thereby reducing scoring inconsistency.

Development of the Focus Group Discussion Guide

The focus group discussion guide was developed based on the study objectives, the conceptual link between food preparation skills and nutritional awareness, and the preliminary quantitative findings. The questions were designed to explain the numerical results by asking students about their experiences in preparing food, their understanding of nutrition, the barriers they encountered, and the factors that helped or limited their application of food knowledge.

The guide focused on five areas:

1. students' experiences in learning food preparation;
2. their understanding of nutrition and healthy eating;
3. Challenges in applying food preparation and nutrition knowledge;
4. the role of home, school, peers, and food availability; and
5. Students' views on the connection between food preparation skills and nutritional awareness.

The FGD questions were aligned with the sequential explanatory design because they were intended to explain the quantitative findings rather than produce a separate qualitative strand. For example, because the quantitative results measured levels of food preparation skills and nutritional awareness, the FGD explored why students felt confident in some areas but less confident in others. Since the correlation tested the relationship between the two variables, the FGD examined the practical conditions that facilitated or hindered students' application of nutrition knowledge during food preparation.

Focus Group Discussion Procedure

The qualitative phase was conducted after the quantitative data had been analyzed. Fifteen students were invited to participate in the focus group discussion based on purposive selection criteria. Participants were selected to provide varied perspectives related to food preparation skills, nutritional awareness, grade level, sex, and strand.

Before the FGD, the researcher explained the purpose of the discussion, the voluntary nature of participation, and the confidentiality of responses. Participants were informed that there were no right or wrong answers and that they could withdraw at any time. With permission, the discussion was documented for transcription and analysis.

The FGD used semi-structured questions, allowing the researcher to ask follow-up questions when clarification was needed. The discussion focused on students' actual food preparation experiences, nutrition-related understanding, household and school influences, food availability, budget limitations, peer influence, time pressure, and technical difficulties in cooking, food storage, and meal planning.

Data Collection Procedure

The data collection process was conducted in sequential phases to maintain the explanatory structure of the mixed-methods design.

First, the researcher secured approval from the appropriate school authorities, including the school head,

department coordinators, and other relevant institutional offices. After approval was obtained, the researcher identified eligible participants based on the study's inclusion criteria. Informed consent was obtained from the participants, and parental consent or assent procedures were followed when required for minors.

Second, the quantitative phase was conducted. The validated Likert-scale survey questionnaire was administered to the selected senior high school students. The researcher explained the purpose of the study, the instructions for answering the instrument, and the importance of honest responses. After the survey, the food preparation skills assessment was conducted using the validated performance-based rubric. Students were observed while performing a food-preparation task, and their performance was rated according to established criteria.

Third, the quantitative data were encoded, organized, and analyzed. The results of the survey and rubric assessment were reviewed to identify general trends, significant patterns, and notable relationships between food preparation skills and nutritional awareness. These findings served as the basis for designing the qualitative phase.

Fourth, participants for the qualitative phase were selected based on the quantitative results. Students representing different levels of nutritional awareness and food preparation skills were invited to participate in the focus group discussion. The discussion explored the reasons behind the quantitative patterns, including students' learning experiences, household influences, access to food preparation resources, attitudes toward nutrition, and challenges in applying knowledge of food preparation and nutrition.

Finally, the qualitative data were transcribed, coded, and analyzed. The qualitative findings were then integrated with the quantitative results to provide a more complete interpretation of the relationship between students' food preparation skills and nutritional awareness.

Data Analysis

Quantitative data from the 150 Senior High School student respondents were analyzed using descriptive and inferential statistics. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to determine the overall level of students' nutritional awareness and food preparation skills. These measures summarized the distribution of responses from the structured survey questionnaire and the performance ratings obtained through the food preparation skills rubric.

Prior to inferential analysis, the assumption of normality was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Results showed that the distribution of the overall food preparation skills score was significant under the Kolmogorov-Smirnov test ($D = .092$, $df = 150$, $p = .003$), although it was not significant under the Shapiro-Wilk test ($W = .989$, $df = 150$, $p = .319$). For the overall nutritional awareness score, the Kolmogorov-Smirnov test was not significant ($D = .070$, $df = 150$, $p = .066$); however, the Shapiro-Wilk test was significant ($W = .980$, $df = 150$, $p = .025$). Since the Shapiro-Wilk result for nutritional awareness was below the .05 level of significance, the assumption of normality was considered violated for one of the main study variables.

Accordingly, the study used Spearman's rank-order correlation to examine the relationship between students' food preparation skills and nutritional awareness. Spearman's correlation was appropriate because it is a nonparametric test that does not assume a normal distribution. It was used to determine the strength and direction of the association between the two variables.

For the qualitative phase, data gathered from the focus group discussion with 15 purposively selected participants were analyzed using thematic analysis. The process involved familiarization with the FGD responses, generation of initial codes, identification of recurring patterns, review and refinement of themes, naming of themes, and interpretation of findings. The analysis focused on students' practical experiences in food preparation, perceived importance of nutrition, barriers to healthy food preparation, family and community influences, and the role of school-based instruction in developing food preparation skills and nutritional awareness.

The integration of quantitative and qualitative findings was conducted during the interpretation stage. The quantitative results provided the general patterns regarding students' nutritional awareness and food preparation skills, while the qualitative findings explained the reasons, experiences, and contexts behind these patterns. This integration allowed the study to produce a more comprehensive understanding of how Senior High School

students developed and applied food preparation skills and nutritional awareness.

Ethical Considerations

The study observed established ethical standards in educational research. Prior to data collection, the researcher secured institutional approval from Hadji Butu School of Arts and Trades and other relevant approving bodies. The purpose, procedures, benefits, and possible risks of the study were clearly explained to all participants.

Participation was voluntary, and informed consent was obtained before students took part in the study. For participants below the legal age, parental consent and student assent were secured as required. Participants were informed that they could withdraw from the study at any time without penalty or negative consequences.

The researcher ensured anonymity and confidentiality by assigning codes instead of using participants' real names in survey forms, rubrics, transcripts, and reports. All collected data were used solely for research purposes and were stored securely. Only the researcher and authorized research personnel had access to the raw data.

During focus group discussions, participants were also reminded to respect the confidentiality of shared responses. The findings were reported in aggregated or anonymized form to prevent the identification of individual students. These ethical safeguards helped ensure that the study was conducted with respect, fairness, and responsibility toward all participants.

Results and Discussion

Table 1. *Thematic Classification of Students' Experiences, Challenges, and Practices in Food Preparation*

Category	Major Theme	Initial Codes	Participants	Representative Quote
Experiences	Home-based and family-influenced learning	Home-based learning; household responsibility; family food practices	P1, P2, P4, P9	"My experience in food preparation started at home because I often help my parents prepare simple meals."
Experiences	School-based hands-on learning	School activities; hands-on learning; school-based skill development	P2, P7, P12, P14	"Food preparation in school helped me improve my confidence because we practiced actual cooking tasks."
Experiences	Increased confidence and independence	Confidence in tool use; confidence in simple cooking; independence; food autonomy	P2, P5, P9, P12, P14	"My experience in cooking made me more independent because I can prepare food for myself and my siblings."
Experiences	Learning nutrition through cooking experience	Ingredient awareness; awareness of cooking methods; experiential nutrition learning	P7, P10, P12, P15	"When I cook, I notice the amount of oil, salt, sugar, or seasoning I use."
Challenges	Limited knowledge in meal planning and food storage	Difficulty in meal planning; lack of food storage knowledge; need for nutrition guidance	P2, P3, P9	"I still find it difficult to plan a balanced meal."
Challenges	Time and convenience barriers	Time constraints, convenience food preference, and quick food preparation	P6, P15	"When I am busy with schoolwork, I prefer food that is quick to cook, like instant noodles or canned goods."
Challenges	Budget and resource limitations	Budget constraints, cost of healthy food, lack of	P1, P8, P13, P15	"Sometimes healthy food like fruits, vegetables, or meat is

		resources, and ingredient availability		expensive, so we choose cheaper food."
Challenges	Family, peer, and environmental influences	Family food practices, traditional cooking habits, peer influence, and school food environment	P4, P11, P15	"Sometimes my friends buy junk food or soft drinks, and I also join them."
Challenges	Technical difficulties in preparation	Measurement difficulty, unfamiliar ingredients, recipe-following difficulty	P5	"When the recipe requires exact measurements or unfamiliar ingredients, I get confused."
Practices	Basic meal preparation	Simple cooking, preparing rice, eggs, noodles, and vegetables, cooking for the family	P1, P5, P9	"I can cook rice, eggs, noodles, and sometimes vegetables."
Practices	Hygiene and sanitation practices	Washing ingredients, cleaning the cooking area, cleaning utensils, handwashing	P3, P7, P13, P15	"I always try to keep my hands, utensils, and ingredients clean."
Practices	Safe and proper use of kitchen tools	Safe tool use, correct use of tools, and kitchen safety	P2, P7, P9	"I became more confident in using kitchen tools and following simple steps in cooking."
Practices	Health-conscious cooking practices	Using less oil, adding vegetables, ingredient awareness, and healthy cooking choices	P7, P10, P15	"Food preparation is not only about cooking delicious food. It is also about making wise choices, such as using less oil, adding vegetables, and preparing clean food."
Practices	Practical decision-making in food preparation	Budget-based preparation, available ingredients, and food autonomy	P1, P8, P14	"I usually prepare food depending on our budget."

Table 1 presents the thematic findings on students' experiences in food preparation. The results show that students developed their food preparation skills through both home-based experiences and school-based instruction. At home, students were introduced to basic cooking practices through observation, family routines, and participation in meal preparation. In school, these informal experiences were strengthened through more structured instruction in hygiene, kitchen safety, nutrition, and proper food-preparation procedures. This discovery aligns with the literature on food literacy, which highlights that food-related skills are cultivated across various learning settings, including the home, educational institutions, and broader social environments. Food literacy encompasses not just the technical aspects of cooking but also involves understanding, planning, decision-making, and the ability to implement food-related practices in daily life (Thompson et al., 2022). It is noted that childhood and adolescence are crucial periods for developing food literacy skills, as young individuals gain the cognitive abilities, skills, and experiences necessary to navigate complex food environments (Ares et al., 2023).

The results also support the importance of school-based food and nutrition education, particularly Technology and Livelihood Education and cookery-related courses, in improving students' practical competence. School instruction appears to have transformed students' informal home exposure into more systematic knowledge of hygiene, safety, and proper food preparation. This is supported by studies showing that adolescent cooking ability is associated with better nutrition-related behaviors and stronger confidence in food preparation. For example, research indicated that teenagers with advanced cooking skills tended to have improved nutritional outcomes, such as increased consumption of fruits and vegetables (Leblanc et al., 2022).

The findings also indicate that students' ability to prepare nutritious food was affected by practical barriers. Although many students demonstrated basic knowledge, willingness, and awareness of healthy food preparation, they were constrained by limited budget, lack of ingredients, time pressure, and the convenience of processed food. These challenges suggest that students' food choices were shaped not only by personal preferences and motivations but also by socioeconomic and environmental conditions. This finding confirms socioecological perspectives on adolescent nutrition, which argue that food behavior is shaped by the interplay among individual knowledge, household resources, school practices, food availability, family routines, and community food environments. Thus, students may understand the value of healthy food preparation but still struggle to apply this knowledge when healthier ingredients are costly, unavailable, or less convenient than processed alternatives.

Students' practices further show an emerging sense of responsibility in food-related decisions. Their attention to hygiene, safe tool handling, meal preparation, and practical decision-making suggests they were beginning to develop independence in managing their food practices. However, this independence remained influenced by family resources, school instruction, peer influence, media exposure, and available food choices. Thus, students' decision-making reflected both the development of competence and adjustment to the realities of their food environment. This finding aligns with adolescent development and food literacy literature, which view adolescence as a formative period for establishing dietary habits, identity, autonomy, and health-related decision-making. As previously mentioned, the adolescent years are crucial for developing the skills and experiences necessary to make healthier and more sustainable food choices (Todd et al., 2025).

Overall, the findings suggest that the combined influence of household participation, school-based learning, and everyday social and economic conditions shaped students' food preparation experiences. While students acquired basic culinary and nutrition-related competencies, their ability to apply these skills was limited by the resources available to them, time, and access to food. From a Home Economics and Public Health Nutrition perspective, food preparation education should therefore move beyond teaching recipes and safety rules. It should also help students make realistic, healthy, and resource-sensitive food decisions that they can apply in their daily lives. The findings affirm the need for school-based food preparation instruction to be contextualized within students' household realities, economic limitations, and community food access conditions.

Table 2. *Thematic Prevalence of Students' Experiences, Challenges, and Practices in Food Preparation*

Overarching Category	Major Theme	Participants Who Mentioned the Theme	Frequency
Experiences	Home-based and family-influenced learning	P1, P2, P4, P9	4
Experiences	School-based hands-on learning	P2, P7, P12, P14	4
Experiences	Increased confidence and independence	P2, P5, P9, P12, P14	5
Experiences	Learning nutrition through cooking experience	P7, P10, P12, P15	4
Challenges	Limited knowledge in meal planning and food storage	P2, P3, P9	3
Challenges	Time and convenience barriers	P6	1
Challenges	Budget and resource limitations	P1, P8, P13	3
Challenges	Family, peer, and environmental influences	P4, P11, P15	3
Challenges	Technical difficulties in preparation	P5	1
Practices	Basic meal preparation	P1, P5, P9	3
Practices	Hygiene and sanitation practices	P3, P7, P13, P15	4
Practices	Safe and proper use of kitchen tools	P2, P7, P9	3
Practices	Health-conscious cooking practices	P7, P10, P15	3
Practices	Practical decision-making in food preparation	P1, P8, P14	3

Table 2 presents the thematic prevalence of students' experiences, challenges, and practices in food preparation. The most frequently reported experience was increased confidence and independence in food preparation ($f = 5$), followed by home-based and family-influenced learning ($f = 4$), school-based hands-on learning ($f = 4$), and learning nutrition through cooking experience ($f = 4$). These findings indicate that students' food preparation skills were developed through combined exposure at home and in school. Home served as the initial site where students learned basic cooking routines through observation, family participation, and repeated household practice. At the same time, school-based activities strengthened these experiences through structured instruction and practical application. This discovery aligns with the literature on food literacy, which highlights that food-related skills are cultivated across various learning settings, including family, school, and everyday social interactions. It is noted that childhood and adolescence are pivotal stages for developing food literacy, as individuals gain the knowledge, practical skills, and decision-making capabilities necessary to navigate complex food environments (Ares et al., 2023).

The findings also show that direct involvement in cooking contributed to students' nutritional awareness. Participants associated food preparation with attention to ingredients, portion sizes, cooking methods, and healthier food choices. This suggests that food preparation served not only as a practical skill but also as a meaningful context for strengthening understanding of nutrition. This finding aligns with earlier research indicating that adolescents with cooking skills tend to engage in healthier eating habits, including better nutritional profiles and a higher likelihood of eating fruits and vegetables. It was observed that teenagers with advanced cooking skills were more inclined to exhibit favorable nutrition-related behaviors, suggesting that hands-on cooking experience can promote healthier dietary choices (Gaston et al., 2024).

Despite these positive experiences, students reported challenges that limited the consistent application of food preparation skills. The most commonly mentioned barriers were limited knowledge in meal planning and food storage ($f = 3$), budget and resource limitations ($f = 3$), and family, peer, and environmental influences ($f = 3$). Less frequently mentioned challenges included time and convenience barriers ($f = 1$) and technical difficulties in preparation ($f = 1$). These findings show that students' food practices were shaped not only by individual knowledge and competence but also by practical and contextual constraints, particularly the availability of ingredients, household resources, family food routines, peer influence, and access to convenient food options. This interpretation aligns with socioecological views on adolescent nutrition, which highlight that the interplay of individual, familial, educational, peer, and environmental influences shapes food choices. Similarly, it has been noted that family habits can promote or hinder healthy eating among adolescents. At the same time, peer pressure may influence their food preferences and eating habits during this developmental stage (Braune et al., 2024).

In terms of practices, students most frequently reported hygiene and sanitation practices ($f = 4$), followed by basic meal preparation ($f = 3$), safe and proper use of kitchen tools ($f = 3$), health-conscious cooking practices ($f = 3$), and practical decision-making in food preparation ($f = 3$). These practices indicate that students demonstrated functional food preparation skills, particularly in cleanliness, safety, simple meal preparation, and resource-based decision-making. However, the relatively similar frequencies across several themes suggest that these practices were present but not uniformly developed among all participants. This finding supports the view that school-based culinary and nutrition activities can improve cooking skills and food-related confidence. However, that skill development may vary depending on learners' prior exposure, home support, resources, and opportunities for repeated practice. Reviews of school-based culinary interventions have shown that cooking programs can improve children's and adolescents' food preparation skills. However, outcomes depend on the design, duration, and contextual relevance of the intervention.

Overall, Table 2 shows that students' food preparation skills and nutritional awareness were shaped by home learning, school instruction, and personal cooking experiences. However, their ability to consistently apply these skills was hindered by practical barriers, including limited resources, insufficient knowledge of meal planning and food storage, time constraints, and social influences. These findings suggest the need to strengthen food preparation instruction by integrating practical competencies in meal planning, budgeting, food storage, hygiene, safety, and healthy decision-making within realistic household and school contexts. From a Home Economics and Public Health Nutrition perspective, food preparation education should move beyond teaching isolated cooking tasks. It should instead develop students' broader food literacy, including their ability to plan meals, manage resources, evaluate food choices, and make healthy decisions despite economic and environmental constraints.

Table 3 presents the relationship between students' food preparation skills and nutritional awareness across participants. The findings indicate that students generally possessed basic cooking skills, but these skills did not always translate into consistently healthy food choices. The relationship was shaped by specific mediating factors, including ingredient availability, budget constraints, meal-planning knowledge, food storage knowledge, family cooking habits, peer influence, time pressure, and school-based instruction. This finding is consistent with food literacy literature, which emphasizes that cooking skills alone are insufficient unless learners also develop planning, resource management, nutrition knowledge, and decision-making skills within real food environments (Thompson et al., 2022).

Table 3. *Relational Analysis of Food Preparation Skills and Nutritional Awareness*

Participant	Food Preparation Skill/ Experience	Nutritional Awareness/ Perception	Mediating Factor	Explanation of Relationship
P1	Can prepare simple meals such as rice, eggs, noodles, and vegetables	Recognizes that available food is not always healthy	Ingredient availability	Cooking skills are present, but food choices depend on what is available at home.
P2	Learned food preparation through school activities and household tasks	Finds it difficult to plan a balanced meal	Limited meal-planning knowledge	Practical skills need to be supported by nutrition-based meal planning
P3	Practices washing ingredients and cleaning the cooking area	Understands that food safety affects health	Food storage knowledge gap	Hygiene practices are evident, but knowledge of safe storage still needs improvement.
P4	Follows family cooking practices	Knows that salty and oily food can affect health	Family food culture	Nutrition awareness is limited by established household cooking habits
P5	Confident in preparing simple dishes	Needs guidance when using exact measurements or unfamiliar ingredients	Technical difficulty	Skill is stronger in simple cooking than in accurate and health-oriented preparation.
P6	Can prepare quick meals	Knows instant or canned foods are not always healthy	Time pressure and convenience	Awareness does not always lead to healthy practice because quick food is easier.
P7	Learned cleanliness, safety, and correct tool use in school	Understands that cooking methods affect nutritional value	School-based instruction	Practical cooking lessons help connect food preparation with nutrition awareness
P8	Prepares food depending on the household budget	Understands the importance of healthy foods like fruits, vegetables, and meat	Budget constraint	Healthy choices are limited by the cost of nutritious ingredients.
P9	Can prepare food for self and siblings	Wants meals to be filling and nutritious	Need for nutrition guidance	Cooking independence becomes more beneficial when paired with nutrition knowledge.
P10	Notices the amount of oil, salt, sugar, and seasoning used while cooking	Realizes that ingredients should be consumed in moderation	Ingredient awareness	Cooking makes nutrition concepts visible and practical
P11	Can prepare healthier food at home	Still joins peers in buying junk food or soft drinks	Peer influence and food environment	Social surroundings affect whether nutrition awareness is applied
P12	Improved confidence through school cooking activities	Believes hands-on cooking helps students understand nutrition better	Hands-on learning	Food preparation strengthens nutrition awareness through actual practice.
P13	Practices cleanliness with hands, utensils, and ingredients	Understands that unsafe preparation can affect health	Lack of materials/resources	Good practices may be limited by inadequate ingredients or equipment.
P14	Believes cooking gives more control over food choices	Says students need both cooking lessons and healthy food explanations	Integrated instruction	Cooking skills and nutrition awareness should be taught together
P15	Practices using less oil, adding vegetables, and preparing clean food	Sees food preparation as wise decision-making, not only cooking delicious food	Budget, time, and family preferences	Healthy preparation is possible, but is affected by practical and social barriers.

Several participants demonstrated a gap between skill and application. For instance, P1 could prepare simple meals but depended on the food available at home, while P6 recognized that instant or canned food may be unhealthy yet still relied on quick meals due to time pressure and convenience. Similarly, P8 understood the value of nutritious food but reported that budget limitations affected access to healthier ingredients. These responses show that nutritional awareness was present, but household resources, time, and food availability limited its application. This aligns with studies showing that adolescents' food choices are strongly affected by affordability, accessibility, convenience, school food environments, and family resources, even when they possess basic knowledge of healthy eating (Devine et al., 2022).

The table also shows that school-based, hands-on learning strengthened the connection between food preparation and nutrition. Participants such as P7, P10, P12, P14, and P15 linked cooking activities with cleanliness, safe tool use, ingredient awareness, moderation in oil, salt, and sugar, and healthier food choices. These responses suggest that practical cooking experiences made nutrition concepts more concrete and applicable for students. This supports previous studies showing that school-based cooking and nutrition education can improve students' food literacy, cooking confidence, food preparation skills, and healthier food-related decision-making (Choi & Andaloro, 2024).

Table 3 indicates that food preparation skills can support nutritional awareness when students are given adequate instruction, resources, and opportunities for practice. However, the relationship remains influenced by economic, social, instructional, and environmental conditions. These findings support the need for food preparation education that integrates cooking skills with meal planning, budgeting, food safety, ingredient selection, and realistic, healthy decision-making (Asher et al., 2022). This is consistent with socioecological views of adolescent nutrition, which recognize that healthy food behavior is shaped by the interaction of individual knowledge, family practices, peer influence, school instruction, and broader food environments (Mukhdi, 2024).

Table 4. *Mediating Factors Affecting the Relationship Between Food Preparation Skills and Nutritional Awareness*

Mediating Factor	Participants	Explanation
Budget constraints	P1, P8, P13, P15	Students may know which foods are nutritious, but ingredient costs, household budgets, and limited resources limit their choices.
Time pressure and convenience	P6, P15	Students may have food preparation skills and nutritional awareness, but when they are busy with schoolwork, they choose quick foods such as instant noodles or canned goods.
Family food culture and household practices	P4, P15	Students often follow cooking practices at home, including meals that may be salty, oily, or tailored to family preferences.
Peer influence	P11	Students may understand healthy eating, but still follow friends who buy junk food, soft drinks, or less nutritious snacks.
Food availability and accessibility	P1, P8, P11	Students' food choices depend on which ingredients are available at home, at school, or at nearby food stalls.
Technical knowledge gaps	P2, P3, P5, P9	Students may know how to cook simple meals but still need guidance in meal planning, food storage, precise measurements, following recipes, and balanced food preparation.
School-based instruction	P2, P7, P12, P14	Hands-on cooking lessons help students connect food preparation skills with nutrition concepts, food safety, and healthier meal choices.
Ingredient awareness	P7, P10, P15	Cooking helps students notice the amount of oil, salt, sugar, seasoning, and vegetables used, making nutrition more practical and visible.
Food safety and hygiene awareness	P3, P7, P13, P15	Students understand that nutritious food must also be prepared safely through cleanliness, sanitation, and proper handling.
Personal confidence and independence	P2, P5, P9, P12, P14	Students who feel confident in their cooking skills are more likely to prepare food for themselves or their families, giving them greater control over their food choices.

Table 4 emphasizes the mediating factors that shape the relationship between students' food preparation skills

and nutritional awareness. The findings show that students' ability to prepare food did not automatically result in consistently healthy food choices. Instead, their practices were influenced by economic, social, environmental, instructional, and personal factors. The most frequently reported mediating factors were budget constraints (P1, P8, P13, P15), technical knowledge gaps (P2, P3, P5, P9), school-based instruction (P2, P7, P12, P14), food safety and hygiene awareness (P3, P7, P13, P15), and personal confidence and independence (P2, P5, P9, P12, P14). This finding is consistent with food literacy literature, which explains that healthy food behavior requires not only cooking ability but also planning, resource management, nutrition knowledge, and decision-making skills within real-life food environments (Clement, 2023).

The results indicate that several factors limited students' application of nutritional awareness. Budget constraints restricted access to healthier ingredients, while time pressure encouraged reliance on quick foods such as instant noodles or canned goods. Family food practices, peer influence, and food availability also shaped students' choices, showing that food decisions were affected by household routines and the immediate food environment. This aligns with studies showing that adolescents' food choices are strongly influenced by family practices, socioeconomic conditions, food availability, convenience, and peer-related social norms (Shaw et al., 2023).

The table also identifies specific knowledge gaps that affected the quality of students' food preparation. Although students could prepare simple meals, some still needed guidance in meal planning, food storage, accurate measurement, recipe use, and balanced preparation. These findings suggest that basic cooking skills should be strengthened through explicit instruction in nutrition, food safety, and practical meal planning. This supports the view that food literacy education should develop practical competencies such as preparing available foods, using kitchen equipment, adapting recipes, applying food hygiene principles, and making balanced food decisions (Martin et al., 2022).

Conversely, school-based instruction, ingredient awareness, hygiene practices, and personal confidence served as enabling factors. Hands-on cooking lessons helped students connect food preparation with nutrition concepts, safe food handling, and healthier choices. Students who became more aware of ingredients such as oil, salt, sugar, seasoning, and vegetables were also better able to recognize the nutritional implications of their cooking practices. This is consistent with studies showing that school-based culinary and nutrition education can improve adolescents' food skills, nutrition knowledge, cooking confidence, and healthy food decision-making (Policastro et al., 2023).

Hence, Table 4 shows that food preparation skills and nutritional awareness are related but mediated by practical conditions. Some factors constrained healthy food preparation, particularly cost, time, availability, and social influence. Others supported it, especially school instruction, hygiene awareness, ingredient awareness, and confidence. These findings provide a focused basis for identifying variables to be examined in the quantitative phase of the study. They also support a socioecological interpretation of adolescent nutrition, in which food behavior is shaped by the interaction among individual competence, family practices, school instruction, peer influence, and broader food environments (Mukhdi, 2024).

Table 5. *Level of Food Preparation Skills Among Senior High School Students*

Indicator	N	Mean	SD	Verbal Description
I can prepare simple meals without much help from others.	150	3.27	0.87	Moderately High
I know how to properly wash, peel, and cut ingredients before cooking.	150	3.29	0.83	Moderately High
I can follow a simple recipe correctly.	150	3.32	0.85	Moderately High
I know how to measure ingredients accurately.	150	3.34	0.90	Moderately High
I can safely use basic kitchen tools such as knives, pans, and measuring cups.	150	3.41	0.85	High
I know how to cook basic dishes such as rice, eggs, vegetables, or simple viands.	150	3.37	0.82	Moderately High
I practice cleanliness while preparing food.	150	3.29	0.83	Moderately High
I know how to store leftover food properly.	150	3.24	0.81	Moderately High
I can determine whether food is properly cooked.	150	3.33	0.83	Moderately High
I feel confident in preparing food for myself or my family.	150	3.30	0.82	Moderately High
Grand Mean	150	3.32		Moderately High

Note. Scale interpretation: 4.21–5.00 = Very High; 3.41–4.20 = High; 2.61–3.40 = Moderately High; 1.81–2.60 = Low; 1.00–1.80 = Very Low.

Table 5 shows that the students had a moderately high level of food preparation skills, as indicated by the grand mean score ($M = 3.32$). This indicates that the respondents were generally capable of performing basic food preparation tasks, including preparing simple meals, following recipes, measuring ingredients, cooking basic

dishes, practicing food safety, and determining whether food was properly cooked. However, most indicators remained within the moderately high range, suggesting that students' skills were present but not yet consistently advanced.

This finding is consistent with studies showing that school-based cooking and nutrition education can improve students' cooking skills, food-related confidence, and practical food-preparation competence. However, the extent of skill development may vary with exposure, practice, and instructional support (Oliveira et al., 2023).

The highest-rated indicator was the safe use of basic kitchen tools ($M = 3.41$, $SD = 0.85$), which was interpreted as High. This suggests that students were relatively more confident in handling common kitchen tools such as knives, pans, and measuring cups. The result indicates strength in basic procedural and hands-on aspects of food preparation. This supports food literacy literature, which emphasizes that practical cooking competence includes the ability to use kitchen tools safely, follow basic preparation procedures, and apply food skills in everyday contexts (Thompson et al., 2022).

The lowest-rated indicator was proper storage of leftover food ($M = 3.24$, $SD = 0.81$), although it was still interpreted as Moderately High. This suggests that students had comparatively less confidence in post-preparation practices, particularly those related to food storage and safe handling after cooking. Since food storage is closely linked to sanitation, spoilage prevention, and food safety, this area may require further emphasis in instruction. This finding is supported by the food safety education literature, indicating that young people need stronger instruction in safe food-handling practices, including handling leftovers, storage, reheating, and preventing foodborne illness (Bulochova et al., 2024).

Moreover, the findings suggest that students possessed functional food preparation skills, particularly in tool use and basic cooking tasks. However, the lower rating for leftover food storage indicates the need to strengthen students' knowledge of food safety, hygiene, storage, and post-cooking management. These results support the need for Home Economics instruction that balances hands-on cooking performance with practical lessons on safe, clean, and responsible food handling (Ejeabukwa, 2022). This aligns with the emphasis on food safety education in the Philippine K to 12 curriculum, where food purchasing, preparation, cooking, serving, and storage are recognized as important competencies for learners (Limon, 2021).

Table 6. *Level of Nutritional Awareness Among Senior High School Students*

Indicator	N	Mean	SD	Verbal Description
I understand the importance of eating a balanced diet.	150	3.48	0.91	High
I know that fruits and vegetables are important for good health.	150	3.48	0.86	High
I am aware that too much sugar can be harmful to the body.	150	3.43	0.87	High
I know that drinking enough water is important for staying healthy.	150	3.48	0.75	High
I understand the importance of eating protein-rich foods.	150	3.50	0.80	High
I am aware that eating too much salty and oily food can affect my health.	150	3.43	0.86	High
I check or consider the nutritional value of the food I eat.	150	3.45	0.89	High
I know the importance of limiting junk food and soft drinks.	150	3.46	0.86	High
I understand that poor eating habits can lead to health problems.	150	3.53	0.92	High
I try to choose healthier food options whenever possible.	150	3.33	0.90	Moderately High
Grand Mean	150	3.46		High

Note. Scale interpretation: 4.21–5.00 = Very High; 3.41–4.20 = High; 2.61–3.40 = Moderately High; 1.81–2.60 = Low; 1.00–1.80 = Very Low.

Table 6 shows that the students had a high level of nutritional awareness, as indicated by the grand mean score ($M = 3.46$). This suggests that the respondents generally understood key nutrition concepts, including balanced diet, hydration, protein intake, fruit and vegetable consumption, and the health risks associated with excessive sugar, salt, oily food, junk food, and soft drinks. This finding is consistent with food literacy literature, which emphasizes that adolescents' nutrition-related knowledge is an important foundation for making informed food choices and developing healthier eating habits.

The highest-rated indicator was "I understand that poor eating habits can lead to health problems" ($M = 3.53$, $SD = 0.92$), which was interpreted as High. This result indicates that students were aware of the possible health consequences of poor dietary practices. Other indicators related to a balanced diet, water intake, fruits and vegetables, protein-rich foods, and limiting unhealthy food choices were also rated High, indicating consistent awareness across most nutrition-related items. This supports public health nutrition guidance that emphasizes

balanced meals, adequate water intake, increased fruit and vegetable consumption, and reduced intake of foods high in sugar, salt, and unhealthy fats (Agostoni et al., 2023).

The lowest-rated indicator was “I try to choose healthier food options whenever possible” ($M = 3.33$, $SD = 0.90$), which was interpreted as Moderately High. This suggests that although students understood basic nutrition principles, their actual food choices may not always reflect this awareness. The lower rating points to a possible gap between knowing what is healthy and consistently choosing healthier food options. This is consistent with studies showing that adolescents’ dietary practices are influenced not only by knowledge but also by food availability, convenience, peer and family influence, and the broader food environment (Johnson-Kanda & Sibeko, 2025).

The findings indicate that students possessed strong nutritional awareness, particularly in recognizing the importance of healthy eating and the risks of poor dietary habits. However, the relatively low score for choosing healthier food options suggests a need to strengthen the practical application of nutrition knowledge. Instruction should therefore emphasize not only nutrition concepts but also realistic food decision-making, meal planning, food budgeting, and strategies for selecting healthier foods within students’ everyday contexts. This aligns with food literacy research, which argues that effective nutrition education should develop both knowledge and practical skills for planning, selecting, preparing, and evaluating food choices in real-life situations (O’Brien et al., 2024).

Table 7. Relationship Between Food Preparation Skills and Nutritional Awareness

Variables	Spearman’s ρ	p -value	N
Food Preparation Skills ↔ Nutritional Awareness	.387**	.001	150

Note. Correlation is significant at the 0.01 level (2-tailed).

Table 7 shows a statistically significant positive relationship between food preparation skills and nutritional awareness among Senior High School students ($\rho = .387$, $p = .001$, $N = 150$). This indicates that students with higher food-preparation skills tended to report greater nutritional awareness. This finding is consistent with previous research on adolescent food literacy, which has shown positive associations among cooking ability, food preparation behaviors, nutrition knowledge, and healthier dietary indicators (Mengi Çelik et al., 2023).

The correlation coefficient reflects a moderate positive association, suggesting that the two variables are related but not interchangeable. Students who are more engaged in food preparation may have greater exposure to ingredients, cooking methods, food safety practices, and meal quality considerations. Similarly, students with higher nutritional awareness may be more attentive to healthier preparation practices. This supports food literacy literature, which explains that cooking skills form part of a broader set of competencies that include food knowledge, planning, decision-making, and the ability to navigate everyday food environments (Mengi Çelik et al., 2023).

However, the moderate strength of the relationship also shows that food preparation skills alone do not fully explain nutritional awareness. Some students may know how to prepare food but may not consistently apply nutrition principles, while others may understand healthy eating but may not practice food preparation frequently. This finding supports the need to teach cooking skills and nutrition concepts together rather than as separate competencies. Systematic reviews similarly show that food literacy and dietary intake are generally related. However, the relationship may be mixed or limited when food skills are not supported by broader nutrition knowledge and practical application (George & Alexander, 2024).

The significant positive correlation suggests that Home Economics instruction should integrate hands-on food preparation with nutrition education, food safety, meal planning, and healthy food decision-making. Such integration may help students connect practical cooking tasks with informed dietary choices. This is aligned with evidence that school-based culinary and nutrition programs can improve food skills, cooking confidence, nutrition knowledge, and healthier eating patterns among adolescents (Lee et al., 2021).

Table 8. Joint Display Showing How Qualitative Themes Were Expanded Through Quantitative Findings

Research Area	Quantitative Finding	Qualitative Finding	Integrated Interpretation
Food preparation skills	Students demonstrated a Moderately High level of food preparation skills, with a grand mean of $M = 3.32$. The highest-rated indicator was safe use of basic kitchen tools ($M = 3.41$, High), while the lowest-rated indicator was proper storage of leftover food ($M = 3.24$, Moderately High).	Students reported that they could prepare simple meals such as rice, eggs, noodles, and vegetables. They also described gaining confidence through home responsibilities and school-based hands-on activities. However, they experienced difficulty with meal planning, food storage, precise measurements, and unfamiliar recipes.	Students possess functional food-preparation competence, particularly in basic cooking and tool use. However, their lower confidence in food storage, meal planning, and technical accuracy suggests the need to strengthen the scientific, safety-related, and planning aspects of food preparation.
Nutritional awareness	Students demonstrated a High level of nutritional awareness, with a grand mean of $M = 3.46$. The highest-rated indicator was understanding that poor eating habits can lead to health problems ($M = 3.53$, High), while the lowest-rated indicator was trying to choose healthier food options whenever possible ($M = 3.33$, Moderately High).	Students understood the importance of balanced meals, fruits and vegetables, protein, water, and limiting sugar, salt, oily foods, junk food, and soft drinks. However, they reported that healthy choices were affected by budget, time pressure, peer influence, family food practices, and food availability.	Students have strong cognitive awareness of nutrition, but this awareness does not always translate into consistent healthy food choices. The gap between knowing and doing is influenced by economic, social, environmental, and behavioral factors.
Relationship between food preparation skills and nutritional awareness	The correlation analysis showed a significant positive relationship between food preparation skills and nutritional awareness (Spearman's $\rho = .387$, $p = .001$, $N = 150$). The relationship was moderate in strength.	Students explained that cooking helped them notice ingredients, cooking methods, oil, salt, sugar, seasoning, cleanliness, and food safety. However, they also stated that practical barriers prevented them from always applying healthy food preparation practices.	Food preparation skills and nutritional awareness are meaningfully connected, but they are not identical competencies. Cooking experience helps make nutrition more visible and practical, but healthy application depends on mediating factors such as budget, time, family culture, peer influence, food availability, and technical knowledge.
Experiences in food preparation	Quantitative results showed that students had sufficient basic cooking competence, particularly in safe tool use and preparing basic dishes.	FGD results showed that students learned food preparation through both home-based experiences and school-based hands-on activities. They described increased confidence, independence, and responsibility in preparing food for themselves or their families.	Home and school jointly contribute to students' development in food preparation. Home experiences build familiarity and responsibility, while school-based activities strengthen confidence, safety practices, and structured learning.
Challenges in food preparation	The lower-rated food preparation indicators, especially proper food storage and cleanliness-related skills, indicate areas that require further instructional reinforcement.	Students identified challenges such as limited knowledge of meal planning, lack of awareness of food storage, budget constraints, time pressure, lack of ingredients, family food culture, peer influence, and technical difficulties.	Both knowledge-based and contextual barriers constrain students' food preparation skills. Improving food preparation competence requires not only hands-on practice but also instruction in food storage, meal planning, budgeting, and healthier food decision-making.
Food preparation practices	Students reported moderately high to high ratings in practical food preparation indicators, including washing and cutting ingredients, following recipes, measuring ingredients, and using tools safely.	Students commonly practiced basic meal preparation, hygiene and sanitation, safe use of kitchen tools, and practical decision-making based on available ingredients and budget. Some students also practiced health-conscious cooking, such as using less oil and adding vegetables.	Students' actual practices show a combination of functional cooking skills and emerging health-oriented behaviors. However, these practices remain inconsistent because they are shaped by household resources, food availability, and students' level of nutrition application.

Mediating factors between skills and awareness	The moderate correlation suggests that food preparation skills contribute to nutritional awareness but do not fully explain it.	FGD responses identified mediating factors such as budget constraints, time pressure, family food culture, peer influence, food availability, technical knowledge gaps, school instruction, ingredient awareness, hygiene awareness, and personal confidence.	The relationship between food preparation skills and nutritional awareness is mediated by personal, social, economic, and instructional factors. These factors explain why students may know how to cook and understand nutrition, yet still struggle to consistently prepare healthy meals.
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Table 8 integrates qualitative and quantitative findings on students’ food preparation skills, nutritional awareness, and their relationship. The joint display shows convergence between the datasets: the qualitative findings explain students’ experiences and barriers, while the quantitative results indicate the level and strength of these patterns among 150 respondents. This approach is consistent with mixed-methods integration, where qualitative findings are used to explain, contextualize, and deepen the interpretation of quantitative results (Amoah et al., 2024).

For food preparation skills, the quantitative findings indicated a moderately high level ($M = 3.32$), with the highest rating for safe use of kitchen tools ($M = 3.41$) and the lowest for proper storage of leftover food ($M = 3.24$). This pattern is supported by the qualitative findings, in which students reported confidence in preparing simple meals and using basic tools, but also identified difficulties with meal planning, food storage, precise measurement, and unfamiliar recipes. Together, the findings indicate that students had functional cooking skills but still needed reinforcement in food safety, planning, and technical accuracy. This aligns with food literacy literature, which emphasizes that cooking competence includes not only basic preparation skills but also planning, food safety, resource management, and decision-making in everyday food contexts (Mahmoud et al., 2020).

Regarding nutritional awareness, the quantitative results indicated a high level ($M = 3.46$), with the highest rating for understanding that poor eating habits can lead to health problems ($M = 3.53$). However, the lowest-rated indicator was choosing healthier food options whenever possible ($M = 3.33$). The qualitative findings clarify this gap by showing that students understood basic nutrition principles but faced barriers such as budget limitations, time pressure, peer influence, family food practices, and food availability. Thus, students’ nutritional knowledge was evident, but its application was affected by everyday constraints. This finding is supported by adolescent food literacy studies showing that knowledge alone does not always lead to healthier dietary behavior because adolescents’ food choices are also shaped by access, affordability, convenience, family routines, and social influences (Sehrawat, 2025).

The correlation result further showed a significant moderate positive relationship between food preparation skills and nutritional awareness (Spearman’s $\rho = .387$, $p = .001$). The qualitative data support this relationship by showing that cooking helped students notice ingredients, cooking methods, oil, salt, sugar, cleanliness, and food safety. However, the moderate strength of the correlation indicates that food preparation skills alone do not fully account for nutritional awareness or healthy food choices. This is consistent with previous research indicating that adolescent cooking ability is positively associated with better nutritional indicators, but that food preparation must be supported by broader nutrition knowledge and contextual opportunities for healthy choices (Mengi Çelik et al., 2023).

Overall, Table 8 shows that food preparation skills and nutritional awareness are connected but shaped by mediating factors. Students may know how to cook and understand nutrition, yet their actual practices remain influenced by resources, time, food availability, family habits, peer behavior, technical knowledge, and school instruction. These findings support the need for integrated Home Economics instruction that combines cooking practice with meal planning, food storage, budgeting, hygiene, ingredient awareness, and realistic, healthy food decision-making (Lee et al., 2025). This implication is consistent with evidence that school-based culinary and nutrition interventions can improve food skills, cooking confidence, nutrition knowledge, and healthier food-related behaviors when they connect practical cooking activities with broader food literacy outcomes (Policastro et al., 2023).

Conclusion

This study concludes that Senior High School students demonstrated moderately high food preparation skills and

a high level of nutritional awareness. The findings show that students were generally capable of preparing simple meals, using basic kitchen tools, practicing cleanliness, and recognizing the importance of balanced nutrition. However, the results also indicate that food preparation competence did not always lead to consistent nutrition-informed food choices. Students still needed stronger support in meal planning, food storage, budgeting, ingredient selection, and applying nutrition knowledge in everyday food decisions.

The significant positive relationship between food preparation skills and nutritional awareness suggests that students with stronger food preparation skills tend to report higher nutritional awareness. However, the moderate strength of the relationship shows that cooking ability alone is not enough. Students may know how to prepare food, but budget limitations, time pressure, family food practices, peer influence, food availability, and gaps in technical knowledge still shape their actual food choices. Thus, food preparation skills and nutritional awareness should be developed together rather than treated as separate learning outcomes.

The findings support the development of an integrated food agency among Senior High School students. In this study, the integrated food agency refers to students' ability to prepare food, understand its nutritional value, apply hygiene and safety practices, manage available resources, and make practical food decisions within real-life conditions. This concept is grounded in the study's findings, particularly the observed gap between knowing what is healthy and consistently choosing or preparing healthy food.

For TVL curriculum implementation, the study recommends that food preparation lessons not be limited to recipe execution and the use of kitchen tools. Instruction should directly integrate cooking performance with nutrition reasoning, food safety, meal planning, food budgeting, ingredient substitution, and proper food storage. Teachers may design performance tasks in which students prepare affordable, balanced meals; create meal plans using locally available ingredients; compare the nutritional value of common food choices; demonstrate proper leftover storage; and modify familiar recipes by reducing excessive oil, salt, or sugar.

TVL implementation may also be strengthened through contextualized learning activities. Lessons should reflect the actual food situations students encounter at home, in school, and in their community. For example, students may be asked to plan meals within a limited budget, select healthier alternatives from available ingredients, or explain the health implications of their cooking methods. Assessment rubrics should evaluate not only technical cooking skills but also hygiene, food safety, nutritional reasoning, resource management, and decision-making.

School administrators and curriculum planners should support this direction by ensuring that food preparation activities are provided with adequate tools, safe preparation spaces, food safety materials, and locally appropriate ingredients. Capacity-building activities for teachers may also focus on integrating nutrition education into practical food preparation tasks. These steps can help ensure that students learn not only how to cook, but also how to make safer, healthier, and more realistic food choices.

The study is limited by its context-specific setting and reliance on self-reported data on nutritional awareness. Future research may expand the sample across schools, strands, and socio-economic groups; include direct observation of students' food preparation practices; and test intervention programs that combine cooking performance, applied nutrition, budgeting, and food safety. Further studies may also examine whether integrated food preparation activities improve students' actual food choices over time. Overall, the study highlights the need to align food preparation skills with nutritional awareness so that students can apply both competencies in practical and health-oriented ways.

Contributions of Authors

Author 1: conceptualization, data gathering, data analysis

Author 2: data analysis, data gathering

Author 3: proposal writing, data gathering

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Conflict of Interests

The researcher declares that there is no conflict of interest in the conduct, analysis, interpretation, and reporting of this study. The findings and conclusions were presented objectively and were not influenced by any personal, financial, institutional, or professional interest.

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References

- Agostoni, C., Boccia, S., Graffigna, G., Joanne, S., & Szajewska, H. (2023). The evidence behind dietary guidelines: Evolution, consumers' trust and perceptions. In Preprints.org, MDPI AG. <https://doi.org/10.20944/preprints202311.0663.v1>
- Amoah, A.S., Twumwaa, N.A., Braimah, B.E., & Gadogbe, M. (2024). The role of culinary education in promoting nutritional awareness: A systematic review. *American Journal of Multidisciplinary Research and Innovation*, 3(1), 29–34. <https://doi.org/10.54536/ajmri.v3i1.2464>
- Ares, G., De Rosso, S., Mueller, C., Philippe, K., Pickard, A., Nicklaus, S., van Kleef, E., & Varela, P. (2023). Development of food literacy among children and adolescents: Implications for designing strategies to promote healthier, more sustainable diets. *Nutrition Reviews*, 82(4), 536–552. <https://doi.org/10.1093/nutrit/nuad072>
- Asher, R., Jakstas, T., Lavelle, F., Wolfson, J., Rose, A., Bucher, T., Dean, M., Duncanson, K., van der Horst, K., Schonberg, S., Slater, J., Compton, L., Giglia, R., Fordyce-Voorham, S., Collins, C., & Shrewsbury, V. (2022). Development of the Cook-EdTM matrix to guide food and cooking skill selection in culinary education programs that target diet quality and health. *Nutrients*, 14(9), 1778. <https://doi.org/10.3390/nu14091778>
- Bacheva, M., Todorova, D., Obreykova, M., & Andonova, A. (2024). Study of the eating habits and behavior of Bulgarian students and their impact on their health. *Journal of IMAB - Annual Proceeding (Scientific Papers)*, 30(3), 5664–5672. <https://doi.org/10.5272/jimab.2024303.5664>
- Baker, Y., Izidoro, D., Smyth, E., Jaffee, A., & Benskin, A. (2024). 15 Nutrition4Youngsters: Exploring the impact of equipping future generations with essential nutritional knowledge to improve health and wellbeing. *BMJ Nutrition, Prevention & Health*, 7(Suppl 1), A7.2-A7. <https://doi.org/10.1136/bmjnp-2024-nnedprosummit2023.15>
- Braune, T., Kudlek, L., Xiao, C., Tang, H., Demers-Potvin, É., Harris, H., Fitzsimons-West, E., Adams, J., & Winpenny, E. (2024). Interpersonal determinants of diet quality and eating behaviors in people aged 13–30 years: A systematic scoping review. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 26(1), e13835. <https://doi.org/10.1111/obr.13835>
- Brug, J., & Klepp, K.-I. (2020). *Children and adolescents. In Public Health Nutrition* (pp. 100–126). Cambridge University Press. <https://doi.org/10.4324/9781003116929-7>
- Bulochova, V., Evans, E., Haven-Tang, C., & Redmond, E. (2024). Methods and measures in food service food safety research: A review of the published literature. *Heliyon*, 10(4), e25798. <https://doi.org/10.1016/j.heliyon.2024.e25798>
- Choi, C., & Andaloro, J. (2024). A systematic review: The impact of school-based cooking classes on food literacy and healthy habits. *Journal of Student Research*, 13(3).
- Clement, E. (2023). Measuring food literacy among limited-resourced adults [Louisiana State University Libraries]. https://doi.org/10.31390/gradschool_dissertations.6161
- Corpuz, S., & Bantulo, J. (2023). Level of effectiveness, sustainability of school-based feeding program, nutritional status and academic performance of pupils amidst COVID-19 pandemic: Basis for a proposed Project Busog Talino Program. *European Journal of Education Studies*, 10(7). <https://doi.org/10.46827/ejes.v10i7.4880>
- de Tomás, I., Cuadrado, C., & Beltrán, B. (2021). Culinary nutrition in gastronomic sciences. A review. *International Journal of Gastronomy and Food Science*, 25, 100406. <https://doi.org/10.1016/j.ijgfs.2021.100406>
- Devine, L.D., Gallagher, A.M., & Hill, A.J. (2022). Current influences on adolescents' food choices within the school setting and opportunities for improvement: A qualitative study. *Proceedings of the Nutrition Society*, 81(OCE1). <https://doi.org/10.1017/s0029665122000349>
- Devine, L., Hill, A., & Gallagher, A. (2023). Improving adolescents' dietary behaviors in the school-setting: Challenges and opportunities [Review of *Improving adolescents' dietary behaviors in the school-setting: Challenges and opportunities*]. *Proceedings of the Nutrition Society*, 82(2), 172–185. Cambridge University Press. <https://doi.org/10.1017/s0029665123002197>
- Eisenberg, D. (2023). Teaching Kitchen Research Conference, October 18–19, 2022. *Journal of Integrative and Complementary Medicine*, 29(2), 63–68. <https://doi.org/10.1089/jicm.2023.0003>
- Ejeabukwa, A. (2022). Assessing the cooking skills of home economics students in colleges of education in Southeast Nigeria. Zenodo (CERN European Organization for Nuclear Research). <https://doi.org/10.5281/zenodo.6343822>
- Gamiao, S.K., Soriano, M.D., Salvador, R., Catacutan, I.M., Padua, H.J., Adviento, S.V.M., Sagucio, T.M., Malapit, A.K., & Limon, M. (2025). Assessing the self-reported level of food hygiene knowledge and practices among cookery teachers in Northern Philippines. *Hygiene*, 5(4), 57–57. <https://doi.org/10.3390/hygiene5040057>
- Gaston, M.E., Vaterlaus, J.M., & Wanago, N.C. (2024). Young adults' essential food skills and cooking perceptions: A mixed-method study. *Journal of Social Behavioral and Health Sciences*, 18(1). <https://doi.org/10.5590/jsbhs.2024.18.1.11>
- George, G., & Alexander, M. (2024). Accessible nutrition education for the food-insecure college student. *Journal of Family & Consumer Sciences*, 116(3), 26–33. <https://doi.org/10.14307/jfcs116.3.26>
- Gervacio, E. (2025). The role of technical vocational livelihood in poverty reduction. *STOCK KNOWLEDGE GAZETTE*, 1(1). <https://doi.org/10.64591/s7et8b36>
- Hermosa-Bosano, C., & López-Gil, J.F. (2025). Low self-perceived cooking skills are linked to greater ultra-processed food consumption among adolescents: The EHDLA study. *Nutrients*, 17(7), 1168–1168. <https://doi.org/10.3390/nu17071168>
- Johnson-Kanda, L., & Sibeko, L. (2025). Using social network analysis to understand peer relationships on dietary patterns in early adolescents: A systematic review. *Nutrition Reviews*. <https://doi.org/10.1093/nutrit/nuaf212>
- Joshi, S., Mardik, S., Verma, P., Rajagopalan, H., Siddiqui, M.H., & Lachyan, A. (2023). Variability in health impact: Examining lifestyle and dietary habits across different stages of adolescence: A comprehensive literature review. *European Journal of Nutrition & Food Safety*, 15(11), 41–47. <https://doi.org/10.9734/ejnf/2023/v15i111354>
- Leblanc, J., Ward, S., & Leblanc, C. (2022). The association between adolescents' food literacy, vegetable and fruit consumption, and other eating behaviors. *Health Education & Behavior*, 49(4), 603–612. <https://doi.org/10.1177/10901981221086943>
- Lee, S.G., Manker, G., Ghimire, N., Frost, L., & Buck, J. (2021). School pantry cook-off: An approach to educate youth on food insecurity. *Journal of Extension*, 59(Autumn 2021). <https://doi.org/10.34068/joe.59.04.09>
- Lee, S.J., Oh, J.E., & Lee, K.W. (2025). An exploratory study on the necessity and promoting strategies for school-based dietary education: Focus group interviews with home economics teachers. *Human Ecology Research*, 63(1), 41–55. <https://doi.org/10.6115/her.2025.004>
- Limon, M. (2021). Place of food safety education in the Philippine K to 12 curriculum. *Philippine Journal of Science*, 150(3).
- Louey, J., He, J., Partridge, S., & Allman-Farinelli, M. (2024). Facilitators and barriers to healthful eating among adolescents in high-income countries: A mixed-methods systematic review. *Obesity Reviews*, 25(11). <https://doi.org/10.1111/obr.13813>
- Lupu, C.E., Scafa-Udrishte, A., Matei, R.S., Licu, M., Stanciu, T.I., Stanciu, G., Hashemi, F., Mihai, A., Lupu, S., Ene, R., Cristache, R.E., Boroghina, S.C., Colita, A., Buda, O., & Mititelu, M. (2025). Adolescent nutritional patterns and health behaviors: A cross-sectional analysis. Preprints.org. <https://doi.org/10.20944/preprints202504.0514.v1>
- Mahmoud, S., Seabrook, J., Dworatzek, P., & Matthews, J. (2020). Using the Food Skills Questionnaire (FSQ) to evaluate a cooking intervention for university students: A pilot study. *Canadian Journal of Dietetic Practice and Research: A Publication of Dietitians of Canada (Revue Canadienne de La Pratique et de La Recherche En Dietetique: Une Publication Des Dietetistes Du Canada)*, 82(1), 41–44. <https://doi.org/10.3148/cjdp-2020-024>
- Martin, A., Eckert, K., Haines, J., & Fraser, E. (2022). *Food literacy, pedagogies, and dietary guidelines*. Routledge, (pp. 233–247). <https://doi.org/10.4324/9781003174417-24>
- Mehrjoian, N., Zarei, F., Ghofranipour, F., & Ahmadi, F. (2025). Development of a proposed solutions box for improving nutritional behaviors of female school students: Protocol of a mixed-method study. *PLOS One*, 20(9). <https://doi.org/10.1371/journal.pone.0329671>
- Mengi Çelik, Ö., Aytekin Şahin, G., & Gürel, S. (2023). Do cooking and food preparation skills affect healthy eating in college students? *Food Science & Nutrition*, 11(10), 5898–5907. <https://doi.org/10.1002/fsn3.3591>
- Mukhdi, F.A. (2024). Nutrition education for adolescents: Building healthy eating habits at a growing age. *Journal Nutrizione*, 1(2), 1–7.
- Nafilla, D., Dewi, Y.L.R., & Ellyas, I.S. (2023). Nutritional knowledge and food choices in relation to nutritional status among adolescent athletes of the special class. *International Journal of Physical Education, Sports and Health*, 10(3), 190–195. <https://doi.org/10.22271/kheljournal.2023.v10.i3c.2947>
- O'Brien, K., Macdonald-Wicks, L., & Heaney, S. (2024). A scoping review of food literacy interventions. *Nutrients*, 16(18), 3171. <https://doi.org/10.3390/nu16183171>
- Oliveira, L., Sousa, F., & da Silveira, M.G. (2023). Promotion of functional foods in a school context: Evaluation of food education sessions involving cooking skills. *Journal of Culinary Science & Technology*, 23(1), 144–156. <https://doi.org/10.1080/15428052.2023.2191877>
- Owen, D. (2023). Is the ability to cook enough to foster good eating habits in the future? Investigating how schools can empower positive food choices in adolescents. Routledge, (pp. 157–166). <https://doi.org/10.4324/978100329462-14>
- Pasquito, M., & Singzon, S. (2025). Guided demonstration as a pedagogical approach: Enhancing cooking skills in technical-vocational-livelihood education. *Psychology and Education: A Multidisciplinary Journal*, 51(4), 499–503. <https://doi.org/10.70838/pemj.510408>
- PolICASTRO, P., Brown, A., & Comollo, E. (2023). Healthy helpers: Using culinary lessons to improve children's culinary literacy and self-efficacy to cook. *Frontiers in Public Health*, 11, 1156716. <https://doi.org/10.3389/fpubh.2023.1156716>
- Sahagun, J.A. (2022). Operational practices of school program: An evaluation of the implementation of School-Based Feeding Program. *American Journal of Multidisciplinary Research and Innovation*, 1(1), 24–28. <https://doi.org/10.54536/ajmri.v1i1.152>
- Sehrawat, A. (2025). Nutritional awareness and dietary habits among college students. *International Journal of Humanities and Education Research*, 7(1), 591–595. <https://doi.org/10.33545/26649799.2025.v7.i1f.197>
- Shaw, S., Barrett, M., Shand, C., Cooper, C., Crozier, S., Smith, D., Barker, M., & Vogel, C. (2023). Influences of the community and consumer nutrition environment on the food purchases and dietary behaviors of adolescents: A systematic review. *Obesity Reviews: An Official Journal of the International Association for the Study of Obesity*, 24(7), e13569. <https://doi.org/10.1111/obr.13569>
- Sisnorio, C. (2025). Skilled to serve. *Education and Industry Review*, 1(1). <https://doi.org/10.62596/eir.268fyr96>

- Sullivan, A., Parsons, K., Therrien, M., & Yerxa, K. (2025). Cooking up knowledge: Empowering high school students through a food literacy boot camp. *American Journal of Lifestyle Medicine*, 20(2), 244–255. <https://doi.org/10.1177/15598276251319254>
- Thompson, C., Adams, J., & Vidgen, H.A. (2022). 2 Are we closer to international consensus on the term ‘food literacy’? A systematic scoping review of its use in the academic literature (1998–2019). *BMJ Nutrition, Prevention & Health*, 5(Suppl 2), A3.2-A3. <https://doi.org/10.1136/bmjnp-2022-summit2022.5>
- Todd, A., Dharmayani, P.N.A., Jia, S., Raeside, R., Mihrshahi, S., Champion, K., Farrell, P., Gibson, A., & Partridge, S. (2025). How are adolescents participating in the transformation of healthy food environments? A scoping review of empirical research. *Obesity Reviews*, 27(1), 1–19. <https://doi.org/10.1111/obr.70002>
- Watson, J., Sinley, R., & Jo, J. (2026). Transforming dietetics curriculum: A culinary nutrition certificate grounded in competency-based innovation. *Journal of Dietetic Education*, 4(1), 23–34. <https://doi.org/10.26890/aogp3215>
- Yu, N.-S., Park, M.J., Choi, S.-Y., & Jung, L.-H. (2022). Effectiveness of the ‘Food Safety and Health’ workbook for high-school students. *Family and Environment Research*, 60(4), 483–496. <https://doi.org/10.6115/fer.2022.032>