

Updating and Content Validation of the Healthy Food Entrepreneurship Module (RightDiet4U) for Food Vendors

(Pengemaskinian dan Kesahan Kandungan Modul Keusahawanan Makanan Sihat (RightDiet4U) untuk Pengusaha Makanan)

Yee Rou Qian¹, Siti Hajar Nor Hamizi², Mohd Khairuddin Noor Khalib² & Zahara Abdul Manaf^{1,2*}

¹Dietetics Programme, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.

²Healthy Ageing and Wellness Centre (H-CARE), Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia.

*Corresponding Author: Zahara Abdul Manaf
Email address: zaharamanaf@ukm.edu.my

Abstract

The increasing trend of eating out has contributed to the rise of non-communicable diseases (NCDs) in Malaysia, where food vendors play a vital role in shaping community eating habits. A training module to empower food vendors to offer healthy menus had been developed before the COVID-19 era. However, the foodservice landscape has since experienced significant changes, including the rise of food delivery services, evolving menu trends, and shifting food preferences. Furthermore, current training modules often lack integration between healthy eating principles, practical food preparation techniques, and essential entrepreneurship skills. This study aimed to update and validate the content of the pre-existing RightDiet4U module, ensuring its relevance for training food vendors to offer healthy menu options in the evolving foodservice landscape. A two-phase mixed-methods study was conducted. Phase 1 involved a needs assessment utilizing focus group discussions and semi-structured questionnaires with diverse stakeholders; food vendors, dietitians, chefs, and a business consultant. Phase 2 focused on module refinement and content validation using the Content Validity Index (CVI) by expert evaluators, including dietitians, chefs, and business professionals. The updated RightDiet4U Module Version 2.0 demonstrated strong acceptability in the needs assessment (average topic scores ranging from 3.64–3.91 out of 4.00). Furthermore, it featured strong content validity, with an overall S-CVI/Ave of 0.98 from the expert panels. The Modified Kappa (κ^*) values ranged from 0.85 to 1.00, indicating excellent agreement beyond chance. RightDiet4U Module Version 2.0 is a content-valid, relevant training tool to empower food vendors and promote healthy food entrepreneurship in Malaysia. It holds potential in enhancing the availability of healthy foods options and indirectly supporting national public health efforts in combating NCDs.

Keywords: content validity, food vendor, healthy food, training module, Malaysia

Abstrak

Trend pengambilan makanan luar yang kian meningkat telah menyumbang kepada peningkatan penyakit tidak berjangkit (NCD) di Malaysia, di mana pengusaha makanan memainkan peranan penting dalam membentuk corak pemakanan komuniti. Walaupun modul latihan untuk memperkasakan pengusaha makanan bagi menawarkan menu sihat telah dibangunkan sebelum era COVID-19, landskap perkhidmatan makanan sejak itu telah mengalami perubahan yang signifikan, termasuk peningkatan perkhidmatan penghantaran makanan, evolusi trend menu, dan perubahan pilihan makanan; lebih-lebih lagi, modul latihan sedia ada sering kurang integrasi antara prinsip pemakanan sihat, teknik penyediaan makanan praktikal, dan kemahiran keusahawanan yang penting. Oleh itu, kajian ini bertujuan untuk mengemaskini dan menentukan kandungan modul RightDiet4U yang sedia ada, bagi memastikan kerelevanannya untuk melatih pengusaha makanan menawarkan pilihan menu sihat dalam landskap perkhidmatan makanan yang sentiasa berubah, dengan menjalankan kajian kaedah campuran dua fasa. Fasa 1 melibatkan kajian keperluan menggunakan perbincangan kumpulan berfokus dan soal selidik separa berstruktur dengan pelbagai pihak berkepentingan, manakala Fasa 2 pula memfokuskan kepada penambahbaikan modul dan penentuan kandungan yang mantap menggunakan Indeks Kesahan Kandungan (CVI) oleh penilai pakar. RightDiet4U Modul Versi 2.0 yang dikemaskini menunjukkan penerimaan yang baik dalam kajian keperluan (purata skor topik antara 3.64–3.91 daripada 4.00) dan menampilkan kesahan kandungan yang kukuh, dengan S-CVI/Ave keseluruhan 0.98 daripada panel pakar. Nilai Modified Kappa (κ^*) berada dalam julat 0.85 hingga 1.00, menunjukkan persetujuan pakar yang cemerlang melebihi tahap kebetulan.

Kesimpulannya, RightDiet4U Modul Versi 2.0 adalah alat latihan yang sah dari segi kandungan dan relevan untuk memperkasakan pengusaha makanan dan mempromosikan keusahawanan makanan sihat di Malaysia, berpotensi untuk meningkatkan ketersediaan pilihan makanan sihat dan menyokong secara langsung usaha kesihatan awam negara dalam memerangi NCD.

Kata kunci: kesahan kandungan, makanan sihat, modul latihan, Malaysia, pengusaha makanan

INTRODUCTION

Food entrepreneurship, which includes the preparation, distribution, and sale of food (Kamaruddin 2023), is one of Malaysia's fastest-growing sectors. In 2022, there were 136,453 food and beverage (F&B) service establishments operating with a gross output value of RM99 billion, a substantial increase from the RM66.4 billion value recorded in 2015 (DOSM). This industry growth is fueled by changes in urban lifestyles. Urbanization, rapid economic development, and increased participation of women in the workforce have led to shifts in dietary patterns and a growing dependence on eating out (Ali & Abdullah 2012; Abd Rashid et al. 2021; Kim & Ahn 2020). This trend has been significantly amplified by the boom in online food delivery services over the last five years, which offer unparalleled convenience and accessibility, making external food consumption synonymous with modern life (Sahidi et al. 2022).

The reliance of Malaysians on food prepared outside the home is extensive. According to The Malaysia Food Barometer report, 76.6% of Malaysians prefer to eat from outside sources (Pouline et al. 2020), peaking at 57% during lunch (Ashari et al. 2022). This preference is mirrored in escalating expenditure. The Household Expenditure Survey noted a 53.7% increase in spending on eating out, with the average monthly cost rising from RM432.00 in 2016 to RM664.00 in 2022 (Ministry of Economy 2023). Moreover, 2019 data from the Department of Statistics Malaysia (DOSM 2019) showed that all income groups dedicate a significant portion of their total expenditure to eating out: 12.6% (B40), 14.5% (M40), and 13.8% (T20).

The escalating prevalence of Non-Communicable Diseases (NCDs) presents a major public health challenge in Malaysia. Currently, over 0.5 million Malaysians are living with four major NCDs, specifically diabetes, hypertension, high cholesterol, and obesity (Institute for Public Health 2024). Furthermore, the rates of overweight and obesity continue to climb across all age groups. Among children and adolescents, the prevalence stands at 14.4% (overweight) and 13.6% (obese), while adult rates are substantially higher at 30.5% (overweight) and 23.1% (obese) (Institute for Public Health 2025). Dietary habits outside the home significantly contribute to these issues. A study on local street food found that snack and main meal

categories contained significantly higher amounts of sodium compared to dessert foods. Moreover, 63% of the street foods examined were cooked, with deep-frying being the most common preparation method (Hasnah Haron et al. 2022). Studies have consistently found that a higher frequency of eating meals prepared outside the home is associated with increased health risks, including cardiovascular disease risk (Ang et al. 2022) and an increased risk of all-cause mortality (Du et al. 2021).

Given the high prevalence of eating food prepared outside the home and its contribution to increased risk of non-communicable diseases (NCDs), immediate action is needed to curb this trend, especially among working adults in urban areas. Although the government has introduced various initiatives such as the Malaysian National Plan of Action for Nutrition (NPANM III 2016–2025) to encourage food operators to offer healthier food choices including programs like the Healthy Cafeteria recognition, MyChoice and MyMeal logos; training modules such as the Healthy Catering Training Module; guidelines like the Healthy Meal Serving Guide During Meetings; as well as advisory, mentoring and consultation services (MOH 2022; NCCFN 2016), response from food operators remains low. All these initiatives have not incorporated the entrepreneurial aspect and food preparation techniques but have instead focused on aspects of hygiene and food safety, food handler hygiene, and food premises safety, primarily aimed at reducing cases of food poisoning nationwide. The RightDiet4U Module Version 1.0 Program was introduced by UKM's Healthy Ageing and Wellness Research Centre (H-CARE) in 2017 with primary objective of guiding nutritionists and dietitians in providing a comprehensive training for food vendors. This module was developed to address critical community issues, specifically the limited availability of healthy food options in the market and significant cooking fatigue and time constraints experienced by working women. However, over the past six years, the food service industry has undergone substantial and rapid changes that necessitate an update. These factors include major shifts in sociodemographic profiles, the rise of social media-driven food trends, and the proliferation of online food delivery services (such as Foodpanda and GrabFood), which fundamentally altered consumption patterns. Consequently, the enhancement of the RightDiet4U module is

crucial to ensure its continued relevance, expand its comprehensiveness, and effectively assist food operators in creating appealing, healthy menus for diverse target groups in the current market. Thus, the objective of this study is to update and validate the content of the food entrepreneur training module Right Diet For You (RightDiet4U) to effectively train food vendors to offer healthy food, a vital step in improving their knowledge and skills in offering healthy menus for the future.

MATERIALS AND METHODS

The study employed a cross-sectional design using a mixed-methods approach which combined qualitative and quantitative methods, conducted in two main phases. Data collection and evaluation were executed in two phases over a five-month period. The first phase comprised the needs assessment for updating the content of the RightDiet4U Module version 1.0, while Phase 2 (content validation) was conducted with expert panels. The study subjects consisted of five categories: food vendors, dietitians, nutritionists, chefs, and a business expert. Participant selection was done through convenience sampling based on specific inclusion and exclusion criteria. Food vendors had to be owners, managers, or cooks with decision-making authority regarding menu offerings, and they had to have at least two years of experience. Those who were not full-time food vendors were excluded. This study was strategically conducted in the Klang Valley, given its high concentration of food vendors and the notably high prevalence of eating meals outside the home (Ashari et al. 2022). Food vendors were recruited through networks such as Malaysian Muslim Entrepreneurs Association (PRESMA), Association of Restaurant & Bistro Owners (PPRB), Gastronomy Association of Malaysia (GAM), Malaysian Consumer and Hawkers (PPPKM), and Malaysia Association of Hawkers and Small Entrepreneurs (GPPPKM). The sample size for the needs assessment study was determined based on achieving a thematic saturation point, where interviews and discussions continued until no new data emerged from the qualitative analysis. A total of 28 participants were recruited for Phase 1, comprising 11 experts and 17 food vendors. To gather comprehensive qualitative insights, a total of 5 focus group discussions (FGDs) were conducted. To maintain homogeneity and encourage open discussion, participants were grouped by category: 2 FGDs were held for the expert groups (consisting of 5 to 6 participants per session), and 3 FGDs were held for the food vendors (consisting of 5 to 6 participants per session). For the expert groups, comprising dietitians, nutritionists, and chefs, participants had to be Malaysian citizens with a minimum of three

years of relevant professional experience, and not retired or currently working in unrelated fields, such as the pharmaceutical industry. Business experts were selected from among experienced academic lecturers in business management with appropriate academic qualifications.

All participants were provided with an information sheet about the study, and informed consent was obtained through signed form before participation. This study was granted ethical approval by the Research Ethics Committee of Universiti Kebangsaan Malaysia (JEPUKM) under the FRGS researchers, with the ethical approval code JEP-2025-838. In the first phase, the research instrument consisted of a semi-structured questionnaire developed based on literature reviews (Nordin et al. 2023), the study objective and the content of the RightDiet4U Module Version 1.0 from Khairuddin et al. (2018) (Refer to Figure 1). Respondents evaluated the module based on content relevance, accuracy, language clarity, vocabulary, and question flow. Evaluation was conducted either in groups or individually, depending on the type of participants, with data collected using printed forms for food vendors and Google Forms for professionals. The evaluation form used in the study consisted of three sections: Part A collected sociodemographic information, Part B contained the topic-based evaluation, and Part C offered space for overall comments. In the topic-based evaluation (Part B), respondents assessed the suitability of each proposed topic for inclusion in the module using a 4-point Likert scale. On this scale, a rating of 1 indicated strongly disagree, 2 indicated disagree, 3 meant agree, and 4 indicated strongly agree regarding the topic's suitability.

To further clarify the topic-based evaluation of Part B, it consisted of two sections for each topic: a quantitative section using a 4-point Likert scale to rate topic suitability, and a qualitative section with an open-ended response box for participants to provide comments, suggestions, or feedback regarding the content of each topic.

The qualitative data from these open-ended responses were analysed using thematic analysis. All comments from both experts (n=11) and food vendors (n=17) were compiled and reviewed line by line. Similar comments were grouped together to identify recurring themes, patterns, and specific suggestions for each topic. These themes were then discussed among the research team and used as the basis for updating and developing the draft of the RightDiet4U Module Version 2.0 in Phase 2.

The findings from both the quantitative ratings and qualitative feedback from Phase 1 are presented in Table 2, which summarises the mean scores and key comments for each topic.

FIGURE 1. The content of the RightDiet4U Module Version 1.0

TOPIC	DESCRIPTION
 1. Fundamentals of Healthy Food Preparation & Menu Development	• Introduction & characteristics of healthy food • Guidelines & tips for preparing a healthy menu • Healthy food preparation training • Healthy food choices & cooking methods
 2. Business Planning & Financial Management	• Business plan planning • Business financing opportunities • Calculation techniques & cost control for healthy menus • Determining selling prices
 3. Food Quality & Safety	• Importance of food quality & safety • Guidelines for maintaining food hygiene & safety
 4. Branding, Packaging, and Labeling	• Types & methods of healthy & safe food packaging • Labeling methods for healthy food products
 5. Business Marketing	• Digital platform options for food sales (FB & WhatsApp) • Online promotion techniques for healthy food
 6. Food Preparation & Standard Recipes	• Importance of standardized recipes • Healthy menu modification techniques • Healthy food preparation training
 7. Customer Satisfaction Evaluation	• Methods for providing quality customer service • Methods for evaluating customer satisfaction

The second phase involved the updating and validation process for developing the draft of the RightDiet4U Module Version 2.0. The revised content was developed based directly on the feedback and needs assessment findings gathered in Phase 1. The RightDiet4U Module Version 2.0 was collaboratively developed by a core team consisting of five dietitians, one chef, and one business expert. The RightDiet4U Module Version 2.0 was updated in Malay language to ensure more effective, clear, and easily understood delivery of information to its primary target audience, namely local food entrepreneurs. The use of Malay language aligns with its status as the official language of the country and the main medium of communication among Malaysians, including small and medium-sized business owners who are the focus of this module. The subsequent step involved the formal content validity process. The module version 2.0 was evaluated by seven experts specifically five dietitians, one chef, and one business expert. This evaluation utilized the Content Validity Index (CVI), which includes both the Item-level CVI (I-CVI) and the Scale-level CVI (S-CVI) (Polit & Beck 2006). CVI was calculated by rating the relevance of each item on a scale of 1 to 4, which was then recorded as 1 (relevant: scores of 3 or 4) or 0 (not relevant: scores of 1 or 2). S-CVI was measured using two methods: S-CVI/Average (average I-CVI across all items) and S-CVI/Universal Agreement (S-CVI/UA) (proportion of items rated 3 or 4 by all experts). Based on established psychometric guidelines, a minimum acceptable Scale-Content Validity Index (S-CVI) value of ≥ 0.83 was adopted for both the average (S-CVI/Ave) and universal agreement (S-CVI/UA) measures (Lynn 1986; Yusoff 2019). Scores meeting or exceeding this threshold were considered to demonstrate a satisfactory level of content validity. The formulas used to calculate the

Item-Content Validity Index (I-CVI) and S-CVI were as follows (Polit & Beck 2006). :

$$I - CVI = \frac{\text{Number of number of agreed items}}{\text{Total number of experts}}$$

$$S - CVI / Ave = \frac{\sum I - CVI \text{ for all items}}{\text{Total number of items}}$$

Data in this phase were collected using Google Forms, based on a questionnaire adapted from Nordin et al. (2023). The evaluation form included three parts: (A) sociodemographic information, (B) instrument assessment (scientific accuracy and content), and (C) overall comments.

To further strengthen the content validity evidence, the Modified Kappa statistic (κ^*) was calculated for each item. Modified Kappa adjusts the I-CVI for the possibility of chance agreement among experts (Polit et al. 2007). The κ^* value was computed using the formula:

$$\kappa^* = \frac{I - CVI - p_c}{1 - p_c}$$

, where P_c represents the probability of chance agreement. The P_c was calculated using the formula: P_c

$$\kappa^* = \frac{I - CVI - p_c}{1 - p_c}$$

where N is the number of experts and A is the number who rated the item as relevant. Based on Cicchetti and Sparrow (1981), κ^* values were interpreted as follows: excellent (≥ 0.74), good (0.60–0.73), fair (0.40–0.59), and poor (< 0.40).

RESULTS

Sociodemographic of Respondents in the Phase 1

TABLE 1. Sociodemographic of Respondents in the Phase 1

Expert (n=11)	n (%)	Mean ± S. D.	Food vendors (n=17)	n (%)	Mean ± S. D.
Gender			Gender		
Male	7 (58%)	-	Male	6 (35%)	-
Female	4 (42%)		Female	11 (65%)	
Age (years)			Age (years)		
25-35	2 (18%)	39.8 ± 7.66	18-39	13 (76%)	28.9 ± 9.92
36-45	7 (64%)		40-59	4 (24%)	
56-65	2 (18%)				
Highest level of education			Highest level of education		
Certificate	1 (9%)		Malaysian Certificate of Education (SPM)	11 (65%)	-
Tertiary (Diploma/Undergraduate/Master/PhD)	10 (91%)	-	Tertiary (Diploma/Technical/Undergraduate)	6 (35%)	
Occupation			Business Size		
Dietitian	8 (73%)		Micro (<5 employees, Annual Sales <RM300K)	12 (71%)	
Nutritionist	1 (9%)	-	Small (5-30 employees, Annual Sales RM300K-RM3M)	4 (24%)	-
Chef	1 (9%)		Medium (30-75 employees, Annual Sales RM3M-RM20M)	1 (6%)	
Business expert	1 (9%)				
Average monthly income (RM)^a			Average monthly income (RM)		
<RM5249 (B40)	2 (18%)		<RM5249 (B40)	14 (82%)	-
RM5249-RM11820 (T20)	8 (73%)	-	RM11820 (T20)- RM5249	2 (12%)	
>RM13000 (T15)	1 (9%)		>RM13000 (T15)	1 (6%)	
Working experience			Experience in the Food Business		
2-10 years	5 (46%)	-	1-5 years	11 (65%)	-
>10 years	6 (55%)		6-10 years	3 (18%)	
			16-20 years	1 (6%)	

* Reference: (Jabatan Perangkaan Malaysia 2023)

Table 1 shows the sociodemographic characteristics of experts in Phase 1 of the need assessment study. The majority of Phase 1 expert participants were male (58%) and aged 36–45 years (64%). Most held a tertiary education (91%). By occupation, dietitians were dominant (73%), followed by nutritionists, chefs, and business experts. The majority had an income in the M40 category (73%) and possessed over 10 years of work experience (55%).

The food vendors in Phase 1 were predominantly female (65%) and relatively young, aged 18 to 39 years (76%). The majority had a maximum qualification of SPM (65%). Financially, most vendors (82%) reported an income under RM5,249 (B40 category). The majority operated micro businesses (71%) with fewer than 5 employees and annual sales under RM300K. The business format was split, with nearly half running food trucks, street stalls (47%), and another 47% operating from home/kitchens. More than half of food vendors had (65%) had 1 to 5 years experience in the food business.

A total of 28 participants (11 experts and 17 food vendors) provided both quantitative ratings and qualitative comments on the RightDiet4U Module Version 1.0. The qualitative feedback was analysed thematically, and the key suggestions for each topic are summarised alongside the mean scores in Table 2. Topic 1 and Topic 3 received the highest ratings from food vendors. Topic 6 received the lowest rating with an average of 3.82 (Table 2). For the experts, Topic 6 and Topic 7 received the highest ratings, indicating that they considered healthy food preparation and customer satisfaction assessment as very important and effective topics. Topic 4 with a rating of 3.64 indicated that more emphasis should be placed on branding and labeling of food products to improve participants' understanding.

For Topic 1, the highest priority was to embed the official national guide, the “Quarter, Quarter, Half” concept, to ensure food preparation principles were both scientifically accurate and simple to apply. Furthermore, the inclusion of interactive quizzes for this topic was stressed to ensure participants could actively apply theoretical knowledge and confirm comprehension. This focus on practical application continued into Topic 6, where experts emphasized the integration of cultural food needs to enhance customer acceptance and long-term adherence to healthier diets, alongside a recommendation for a simulation visit to markets to provide essential hands-on experience in selecting high-quality ingredients.

The experts identified major deficiencies in business and digital literacy. For Topic 2, they insisted on replacing abstract theory with tools like the Business Model Canvas (BMC) and detailed cost/pricing training to improve the sustainability and profitability of healthy menus. Critically, for Topic 3, the focus is to add practical tips to prevent food spoilage and strengthening instruction on safe storage and handling. Furthermore, the experts recognized the non-negotiable role of technology in today's market: Business Marketing. Topic 5 needed comprehensive training on digital platforms, particularly TikTok, and the use of AI-based tools to help small entrepreneurs create engaging and targeted content, while Topic 7 required adoption of digital feedback mechanisms (e.g., QR codes) to capture real-time customer insights. Lastly, in Topic 4, the recommendation was to focus on regulatory compliance for healthier food recognition schemes (like MyMeal) and modern packaging technologies to maintain food integrity and extend shelf life, particularly for food delivery services.

TABLE 2. Findings of the Phase 1 Study from Experts (n=11) and food vendors (n=17) on the RightDiet4U Module Version 1.0.

Topic	Mean Rating ± S. D.		Comments
Topic 1: Fundamentals of Healthy Food Preparation & Healthy Menu Development	Expert:	Experts:	
	3.73 ± 0.47	- Introduce “Quarter, Quarter, Half” concept for balanced nutrition. - Include interactive activities like quizzes	
<i>(Topik 1: Asas Penyediaan Makanan Sihat & Pembangunan Menu Sihat)</i>	Food vendor:		Food vendor: Add nutrition labeling
	3.94 ± 0.47		

continue...

...cont.

Topic 2: Business Planning & Financial Management	Expert: 3.73 ± 0.47	Experts: Introduce Business Model Canvas and group presentations.
<i>(Topik 2: Rancangan Perniagaan & Pengurusan Kewangan)</i>	Food vendor: 3.88 ± 0.47	Include practical training on cost calculation and pricing.
Topic 3: Food Quality & Safety	Expert: 3.82 ± 0.40	Experts: Add tips to prevent food spoilage and quizzes for understanding.
<i>(Topik 3: Kualiti & Keselamatan Makanan)</i>	Food vendor: 3.94 ± 0.40	
Topic 4: Branding, Packaging, and Labeling	Expert: 3.64 ± 0.50	Experts: Teach how to obtain healthier food recognition, e.g., healthy cafeterias.
<i>(Topik 4: Penjenamaan, Pembungkusan dan Pelabelan)</i>	Food vendor: 3.88 ± 0.50	- Expose participants to food labeling and health claims. - Add packaging module with modern technologies like vacuum packing. - Invite experts in food packaging.
		Food vendor: Add photography classes to promote products with attractive photos.
Topic 5: Business Marketing	Expert: 3.73 ± 0.47	Experts: Introduce AI-based marketing tools for effective content creation.
<i>(Topik 5: Pemasaran Perniagaan)</i>	Food vendor: 3.88 ± 0.47	- Provide practical digital marketing training, especially using TikTok. - Offer hands-on training for creating social media posts and ads. - Focus on cost-effective and efficient social media advertising.
Topic 6: Food Preparation & Standard Recipes	Expert: 3.91 ± 0.30	- Add training session to create healthy menus based on cultural needs. - Include a simulation visit to markets for ingredient selection.
<i>(Topik 6: Penyediaan Makanan & Resipi Piawai)</i>	Food vendor: 3.82 ± 0.30	Incorporate hands-on activities and rubrics to evaluate recipes.
Topic 7: Customer Satisfaction Evaluation	Expert: 3.91 ± 0.30	Experts: Use digital feedback tools like QR codes, Google Forms, and reviews.
<i>Topik 7: Kaedah Penilaian Kepuasan Pelanggan</i>	Food vendor: 3.94 ± 0.30	Enhance communication skills to handle negative feedback effectively.

Based on feedback from Phase 1, the RightDiet4U Module Version 1.0 has been updated to include additional topics and practical activities (Table 3). These changes aim to address identified weaknesses and make the module more relevant to the current needs of food entrepreneurs in Malaysia. Some of the new topics added in this module are Business Model Canvas (BMC) for business planning, Food Styling and Photography to enhance the visual appeal of healthy food. In addition, practical

activities have been added, including interactive activities such as quizzes, group discussions, and individual assignments to increase participant engagement. RightDiet4U Module Version 2.0 also includes learning assessments for each topic to assess participant understanding and application. In fact, the module content has also been updated to provide more in-depth details on important topics such as food labelling, food safety, and digital marketing for food businesses.

TABLE 3. Structural mapping and evolution of topics between RightDiet4U Module Version 1.0 and Version 2.0

Core Theme / Core Modules	RightDiet4U Version 1.0 Topics	Updated RightDiet4U Version 2.0 Topics
Healthy Nutrition & Menu Design	Topic 1: Fundamentals of Healthy Food Preparation & Healthy Menu Development	Topic 1: Fundamentals of Healthy Food Preparation & Healthy Menu Development
Food Safety & Quality Systems	Topic 3: Food Quality & Safety	Topic 2: Introduction to Food Industry & Safety Control
Government Recognition & Licensing	<i>None (New Addition)</i>	Topic 3: Healthy Food Entrepreneur Recognition
Product Integrity & Packaging	Topic 4: Branding, Packaging, and Labeling	Topic 4: Food Labelling Topic 6: Branding, Packaging & Labeling
Business Plan Infrastructure	Topic 2: Business Planning & Financial Management	Topic 5: Business Planning (Business Model Canvas)
Financial & Recipe Control	Topic 6: Food Preparation & Standard Recipes	Topic 7: Financial Management Guide & Importance of Standard Recipes
Culinary Aesthetics & Media	<i>None (New Addition)</i>	Topic 8: Preparation, Styling, Food Photography & Standard Recipes
Modern Digital Marketing	Topic 5: Business Marketing	Topic 9: Social Media Marketing & Creative Content
Customer Feedback & Relations	Topic 7: Customer Satisfaction Evaluation	Topic 10: Customer Satisfaction Evaluation

It should be noted that the original RightDiet4U Module (Version 1.0) and the updated version (Version 2.0) have different topic structures. After adding new content based on the needs assessment findings, several topics from the original module were reorganised, expanded, or given new titles to better suit the updated learning objectives and current industry needs. As a result, the order and names of the topics are no longer the same between the two versions. To make a fair comparison, Table 3 maps the core modules side-by-side thematically, showing how the original topics have been kept, improved, or expanded in Version 2.0 .

Content Validation of RightDiet4U Module Version 2.0

More than half of experts in this study were male (57%), 36–45 age group (57%), held high educational qualifications, primarily Bachelor/Master's (MSc) degrees (71%) or PhDs (29%), most were dietitians (71%) and had significant experience, with 71% having 1 to 10 years of work experience (Table 4).

TABLE 4. Sociodemographic characteristics of Experts (n=7) involved in Content Validation of RightDiet4U Module Version 2.0

Demographic Characteristics		n (%)	Mean ± S. D.
Gender	Male	4 (57%)	-
	Female	3 (43%)	
Age (years)	25-35	2 (29%)	36.9 ± 8.09
	36-45	4 (57%)	
	46-55	1 (14%)	
Highest Educational Level	Bachelor/MSc	5 (71%)	-
	PhD	2 (29%)	
Occupation	Dietitian	5 (71%)	-
	Chef	1 (14%)	
	Business consultant	1 (14%)	
Working Experience	1-10 years	5 (71%)	-
	11-20 years	2 (29%)	

A total of 22 questions (including general and topic-specific) were administered to 7 experts to assess the appropriateness and relevance of each topic in the module (Table 5).

Table 5 displays the content validity results evaluated by seven experts. A total of 22 items were developed to evaluate the content validity of the module. These items were mapped across the ten core topics of the curriculum and were categorized into four evaluative aspects: Content Accuracy (8 items), Industry Relevance (6 items), Pedagogical Suitability (5 items), and Operational Practicality (3 items). This structured approach ensured a comprehensive assessment of the module's technical integrity, market pertinence, instructional design, and real-world feasibility.

The first evaluative aspect, Content Accuracy (comprising 8 items), assesses the technical integrity and evidence-based foundation of the module. This domain evaluates whether the nutritional principles, food safety protocols, and regulatory requirements are factually correct and aligned with national standards, such as the Malaysian Dietary Guidelines and the Food Regulations 1985. Specifically, Questions 1 and 2 examine the core nutritional principles in Topic 1 (Fundamentals of Healthy Food Preparation & Healthy Menu Development), while Question 4 evaluates the safety standards in Topic 2 (Introduction to Food Industry & Safety Control). The accuracy of information regarding Ministry of Health (MoH) recognitions in Topic 3 (Healthy Food Entrepreneur Recognition) is assessed by Questions 5 and 6, and the legal mandates for nutrition labeling in Topic 4 (Food Labelling) are covered by Questions 7 and 9. Finally, Question 11 ensures the technical accuracy of packaging requirements within Topic 6 (Food Preparation & Standard Recipes).

The second aspect, Industry Relevance (comprising 6 items), measures the alignment between the module content and the contemporary

entrepreneurial landscape in Malaysia. This domain focuses on the pertinence of business planning frameworks and digital marketing strategies for the target audience of micro-entrepreneurs. It includes Question 10, which assesses the applicability of the Business Model Canvas in Topic 5 (Business Planning), and Question 12, which evaluates the market-readiness of packaging techniques in Topic 6 (Food Preparation & Standard Recipes). The creative strategies found in Topic 8 (Preparation, Styling, Food Photography & Standard Recipes) and Topic 9 (Social Media Marketing & Creative Content) are addressed by Question 14 (food styling appeal) and Questions 16 and 17 (social media marketing content). Lastly, Question 21 evaluates the overall capacity of the module to prepare entrepreneurs for real-world industry challenges.

The third aspect, Pedagogical Suitability (comprising 5 items), investigates the instructional effectiveness and the delivery of the training. This domain evaluates whether the interactive simulations and teaching modalities are suitable for adult learners and effective in reinforcing complex concepts. Specifically, it assesses the appropriateness of hands-on activities, such as the menu modification simulation in Topic 1 (Question 3), the labeling exercises in Topic 4 (Question 8), and the styling simulations in Topic 8 (Question 15). Additionally, this category examines the overall teaching methods including the mix of lectures and group activities via Question 20, and the feasibility of the time allocated for each topic through Question 22.

The fourth aspect, Operational Practicality (comprising 3 items), focuses on the feasibility of implementing the acquired skills within a real-world business environment. This domain examines the sufficiency and utility of the tools provided for financial and operational management. Question 13 evaluates the practical application of Topic 7 (Financial Management Guide & Importance of

TABLE 5. Expert Consensus and Content Validity Results for the Updated Module (Phase 2)

Question	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Experts in Agreement	Item-Level Content Validity Index (I-CVI)	Universal Agreement (UA)
Question 1	1	1	1	1	1	1	1	7	1	1
Question 2	1	1	1	1	1	1	1	7	1	1
Question 3	1	1	1	1	1	1	1	7	1	1
Question 4	1	1	1	1	1	1	1	7	1	1
Question 5	1	1	1	1	1	1	1	7	1	1
Question 6	1	1	1	1	1	1	1	7	1	1
Question 7	1	1	1	1	1	1	1	7	1	1
Question 8	1	1	1	1	1	1	1	7	1	1
Question 9	1	1	1	1	1	1	1	7	1	1
Question 10	1	1	1	1	1	1	1	7	1	1
Question 11	1	1	1	1	1	1	1	7	1	1
Question 12	1	1	1	1	1	0	1	6	0.86	0
Question 13	1	1	1	1	1	1	1	7	1	1
Question 14	1	1	1	1	1	0	1	6	0.86	0
Question 15	1	1	1	1	1	1	1	7	1	1
Question 16	1	1	1	1	1	0	1	6	0.86	0
Question 17	1	1	1	1	1	1	1	7	1	1
Question 18	1	1	1	1	1	1	1	7	1	1
Question 19	1	1	1	1	1	1	1	7	1	1
Question 20	1	1	1	1	1	1	1	7	1	1
Question 21	1	1	1	1	1	1	1	7	1	1
Question 22	1	1	1	1	1	1	1	7	1	1
								(S-CVI/AVE)	0.98	
Relevance Rate	1	1	1	1	1	0.86	1	(S-CVI/UA)		0.86
Average rate of items rated as relevant by 7 experts										

- **Note: Item-Level Evaluative Aspect Mapping**
- **Content Accuracy** (Items Q1–Q2, Q4–Q7, Q9, Q11): Evaluates core nutritional principles in Topic 1 (Q1, Q2); food safety protocols in Topic 2 (Q4); MoH recognition parameters in Topic 3 (Q5, Q6); regulatory food labeling compliance in Topic 4 (Q7, Q9); and technical criteria for packaging in Topic 6 (Q11).
- **Industry Relevance** (Items Q10, Q12, Q14, Q16–Q17, Q21): Evaluates business canvas applicability in Topic 5 (Q10); market viability of packaging in Topic 6 (Q12); food styling appeal in Topic 8 (Q14); social media marketing content in Topics 9 (Q16, Q17); and readiness for real-world entrepreneurial challenges (Q21).
- **Pedagogical Suitability** (Items Q3, Q8, Q15, Q20, Q22): Evaluates interactive simulations for menu modification (Q3); labeling practice exercises (Q8); food styling hands-on applications (Q15); composite lecture-group work delivery methods (Q20); and curriculum time allocation (Q22).
- **Operational Practicality** (Items Q13, Q18–Q19): Evaluates standardized recipe utility for costing/pricing in Topic 7 (Q13); digital customer feedback tools in Topic 10 (Q18); and the field viability of the 1-month experiential business trial (Q19).

Standard Recipes) regarding the use of standardized recipes for accurate cost management and price setting. Question 18 assesses the feasibility of utilizing digital feedback tools for customer satisfaction in Topic 10 (Customer Satisfaction Evaluation). Finally, Question 19 evaluates the one-month practical training component to determine if the duration and structure are sufficient for participants to gain meaningful, hands-on experiential learning in managing a sustainable healthy food business.

The overall Scale-Level Content Validity Index based on the Average Method (S-CVI/AVE) was 0.98, indicating excellent content validity. The Scale-Level Content Validity Index based on Universal Agreement (S-CVI/UA) was 0.86. Individually, 19 out of 22 items achieved a perfect I-CVI score of 1.00. Three items (Questions 12, 14, and 16) received an I-CVI of 0.86, but were still retained as they met the minimum acceptable threshold.

The results for both S-CVI/Ave and S-CVI/UA showed satisfactory validity values. Specifically, S-CVI/Ave scored 0.98 while S-CVI/UA scored 0.86, which exceeded the threshold value of 0.83 suggested chronologically by Lynn (1986) and reaffirmed by Yusoff (2019) for studies involving 6 to 8 experts. This indicates that the entire RightDiet4U Module Version 2.0 is relevant and meets the needs in the educational context for food operators, with all items assessed being considered relevant and appropriate.

To provide stronger evidence of content validity, the Modified Kappa statistic (κ) was calculated for each item to adjust for chance agreement. As shown in Table 6, all 22 items demonstrated excellent κ values, with 19 items achieving $\kappa^* = 1.00$ and three items (Questions 12, 14, and 16) achieving $\kappa^* = 0.85$. These findings indicate that the level of expert agreement on the relevance of all items was significantly beyond what would be expected by chance alone.

TABLE 6. Modified Kappa (κ^*) Values for Content Validity of RightDiet4U Module Version 2.0

Item	I-CVI	Experts in Agreement (A)	Pc	κ^*	Interpretation
Q1-11, Q13, Q15, Q17-22	1.00	7	0.0078	1.00	Excellent
Q12, Q14, Q16	0.86	6	0.0547	0.85	Excellent

DISCUSSION

During Phase 1, Topic 1 and Topic 3 received the highest ratings from food vendors indicating that they highly valued the approach to healthy food preparation and food safety. Topic 6 received a slightly lower rating with an average of 3.82, indicating that more practical training is needed for food preparation to improve participants' understanding and skills. Under Topic 1, vendors specifically requested training on nutrition labeling.

The rationale for this could be twofold: enabling compliance with national health initiatives and fulfilling the growing demand from health-conscious urban consumers for transparent nutritional information, which can serve as a competitive edge. Providing clear and accurate nutrition labels plays a vital role in consumer education, influencing purchasing intention towards healthier options (Shangguan et al. 2019). This transparency is increasingly vital for manufacturers and consumers alike (Monir et al. 2021).

Second, integrating photography classes into Topic 4 (Branding, Packaging, and Labeling) is essential because high-quality visual presentation shapes consumer perception and serves as a primary driver of sales and digital engagement (Arun et al. 2025; Janjić et al. 2023). For small businesses with limited financial resources, mastering food photography is an invaluable, low-cost skill for promoting healthy menus on social media, where visual content is the main driver of discovery (Alhanatleh et al. 2023). These vendor requests highlight an immediate need for action-oriented digital and compliance skills. Furthermore, expert feedback affirms that while the original module's concepts are foundational, they must now integrate modern digital competencies, behavioral change strategies, and current national health guidelines to help vendors successfully transition into the healthy food market.

For Healthy Menu Development, experts stressed the mandatory incorporation of the national "Quarter, Quarter, Half" concept, as it is the official and simplest visual guide for meal composition, thereby directly addressing the high prevalence of non-communicable diseases (NCDs) in Malaysia (Mohamad Hasnan et al. 2023). This focus on practical application extends to food preparation, where the training must integrate local cultural preferences to ensure consumer acceptance and long-term adherence to healthy eating (Monterrosa et al. 2020). This cultural element is coupled with a demand for hands-on activities, specifically recommending a simulation visit to markets to provide essential practical experience in ingredient selection. The recommendation for a simulation visit to markets for ingredient selection is essential for delivering experiential learning, which is highly effective for adult entrepreneurs (Kolb 2015). This practical exercise is crucial for micro-entrepreneurs because proficiency in raw material procurement directly impacts both cost control and quality assurance. The hands-on ability to visually assess ingredient freshness and negotiate prices is the first line of defense for maximizing profit margins, ensuring the nutritional integrity of the healthy menus, and maintaining food safety compliance, which are all vital for business sustainability (FAO 2023).

The experts highlighted significant gaps in business. They insisted on using structural, modern tools like the Business Model Canvas (BMC), viewing it as a roadmap for starting or refining a business and enabling sound planning and decision-making (Muwafak 2021). This business focus is supported by a strong push for digital literacy: Business Marketing must include training on TikTok and AI-based tools, recognizing the platform's role in driving sales through personalized and engaging content (Alhanatleh et al. 2023; Potwora et al. 2024).

Under the domain of Food Quality & Safety, expert feedback underscored a critical dual imperative: balancing public health responsibility with private business sustainability. First and foremost, food safety is a fundamental public health obligation and consumer protection necessity, as improper food handling practices can lead to foodborne illnesses that endanger community health (Hussain & Dawson 2013). This concern aligns with the Malaysian government's mandatory Food Handler's Training Certificate (SLPM), which requires all food handlers to undergo basic food safety training to ensure safe food preparation and handling.

While unsafe practices can also result in business losses through food spoilage and wasted inventory, the primary importance of food safety training lies in preventing foodborne diseases and protecting consumer wellbeing. For micro-entrepreneurs operating on tight budgets, improper practices linked to food spoilage impose a dual threat: they erode the vendor's narrow profit margins due to wasted inventory ("shrink") and carry the devastating risk of costly foodborne outbreaks, as microbial contamination directly jeopardizes consumer safety (Hussain & Dawson 2013). By structuring the updated module to address these gaps, the module now emphasizes practical tips to prevent food contamination and reinforces that proper safety training improves food handler knowledge and practices (Afrin et al. 2024), thereby supporting national food safety objectives.

The module must also cover food labeling and compliance with healthier food recognition schemes (like MyMeal). This is essential for consumer education and using clear nutrition information as a competitive tool. Food vendors also emphasized the importance of teaching nutrition labeling to ensure food operators understand how to manage labels and nutrition content. Nutrition labeling plays a pivotal role in educating consumers about healthy choices. Clear and accurate nutrition labels can significantly influence consumer behavior, encouraging healthier food choices (Shangguan et al. 2019). Finally, the module should include the use of modern packaging (like vacuum packing) to preserve food quality and extend shelf life (Monir et al. 2021), alongside the implementation of digital feedback mechanisms such as QR codes for continuous customer satisfaction monitoring (Kee et al. 2025). The incorporation of interactive elements such as quizzes, case studies, hands-on activities, and the market visit simulation is essential for achieving the module's objective of driving long-term behavioral change in adult food entrepreneurs. These methods align with principles of andragogy, which emphasize that adult learners are self-directed and learn best when content is immediately relevant and experiential (Knowles

1984). Quizzes and assessments, recommended for checking comprehension of complex concepts, provide immediate feedback necessary for self-correction and skill mastery. The practical cooking sessions and market visit simulation (Topic 6) leverage experiential learning theory, where participants actively acquire and refine skills, directly connecting theoretical knowledge (like nutritional content) to real-world application (like ingredient cost and quality) (Kolb 2015). This active, practice-based approach is significantly more effective in building competence and confidence in implementing new practices than traditional lecture-only formats (Lavelle et al. 2017).

In phase 2, the findings highlight strong acceptance and perceived relevance of the RightDiet4U Module Version 2.0. The validation and positive reception of the RightDiet4U Module Version 2.0 among both food vendors and professional experts reflects a strong demand for practical, health-focused entrepreneurial training.

The high average ratings across all module topics (3.64–3.94/4.00) indicate that the revised content is well-aligned with the learning needs and realities of Malaysia's food vendor sector. The CVI findings, with an S-CVI/Ave of 0.98, further validate that the module items are not only relevant but also practical and appropriately tailored for the food service and small business environment. This aligns with the established baseline (Lynn 1986; Yusoff 2019) demonstrating that an S-CVI ≥ 0.83 signifies high content validity. The excellent Modified Kappa values ($\kappa^* \geq 0.85$) further reinforce the robustness of the content validity, confirming that the expert agreement was not due to chance (Polit et al. 2007).

Specifically, the emphasis on topics like “Healthy Food Preparation” and “Customer Satisfaction Evaluation” scored highest, signaling that both nutritional quality and service excellence are highly valued. Moreover, the integration of interactive components such as hands-on practice, quizzes, and digital marketing tools (e.g., TikTok and AI content generation) received strong endorsement from both groups—reflecting a growing expectation for experiential and media-savvy training formats in adult education (Knowles 1984; Lavelle et al. 2017).

The results of this study echo previous literature that has called for more integrated and action-oriented training modules for micro and small-scale food entrepreneurs. Khairatun (2024) identified that most food vendors in Malaysia struggle with basic business literacy, digital marketing, and regulatory compliance, which RightDiet4U Module Version 2.0 attempts to address comprehensively.

The validation of RightDiet4U Module Version 2.0 has potential as a national-level training tool to be used by dietitian and nutritionist to train food vendors. It can be embedded in various initiatives,

including Ministry of Health community health programs. At the policy level, integration into national strategies (e.g., NPANM III) can boost vendor participation and healthy food availability. To achieve effective national scaling across Malaysia's culturally and geographically diverse regions, the module's implementation strategy relies on actionable linguistic and digital adaptations. First, utilizing the Malay language serves as a unifying educational baseline, as it is the primary medium of instruction and commercial communication among small and medium-sized business owners nationwide, transcending ethnic and regional divisions. To accommodate regional culinary diversities, the core nutritional principles—such as the “Quarter, Quarter, Half” concept—are kept universally simple, allowing local trainers to adapt recipe application examples to traditional local diets without altering the underlying scientific accuracy.

Second, transitioning the training from physical workshops to hybrid or fully digital delivery mechanisms directly circumvents the geographic constraints of urban-centric data collection. By packing short, interactive modules into accessible micro-learning formats on platforms like TikTok and utilizing WhatsApp for peer-mentorship groups, the curriculum can effortlessly scale to rural and East Malaysian food vendors. This digital delivery model eliminates travel barriers, accommodates the demanding and irregular working shifts of micro-entrepreneurs, and enables scalable, self-directed learning that supports widespread public health compliance.

LIMITATIONS

This study has several limitations that should be acknowledged. One of them is geographic limitation: the research was conducted only in the Klang Valley region, which may not represent food vendors in rural or East Malaysian contexts. Cultural, economic, and operational differences may influence module applicability. Second, it is the sample size and representation: The number of experts involved in the CVI process was limited ($n=7$), although it met the minimum threshold recommended by Lynn (1986). Furthermore, because the 7 experts participating in the Phase 2 content validation process were a subset of the 11 experts involved in the Phase 1 needs assessment, a potential limitation is the introduction of response bias. This structural overlap can lead to panel conditioning, wherein prior exposure to the module's objectives alters subsequent evaluation behaviors (Bertoli et al. 2024). Additionally, because the revised module directly integrated their initial feedback, experts may exhibit confirmatory bias, leading to artificially elevated consensus scores to validate their own

previous recommendations (Andrews et al. 2012). To mitigate this familiarity bias, evaluations were strictly conducted independently via anonymized digital questionnaires. Inclusion of more diverse panels (e.g., public health officers and policy maker could enhance generalizability. Future research should explore longitudinal evaluations of vendor behaviour, customer dietary impact, and integration with digital learning platforms to extend the reach of RightDiet4U Module Version 2.0.

CONCLUSION

This study successfully updated the RightDiet4U healthy food entrepreneurship module, making it highly relevant for Malaysian food vendors. The revised RightDiet4U Module Version 2.0 is more comprehensive, featuring new topics, practical learning outcomes, and high content validity, confirming its reliability as a training resource. The integration of modern digital competencies including Artificial Intelligence (AI), social media strategy, and digital marketing tools within the RightDiet4U Module Version 2.0 is strategically aligned with the post-pandemic shift in consumer behavior. As the COVID-19 era has fostered a more digitally literate demographic, equipping food vendors with these competencies is essential for navigating contemporary market trends and enhancing consumer outreach within a competitive digital landscape. This updated module is expected to make a meaningful impact on the Malaysian food service industry by promoting healthier eating. Future studies should evaluate the module's effectiveness on both vendor business success and public health outcomes.

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to all the participants who took part in this study. This research was supported by the Fundamental Research Grant Scheme (FRGS) FRGS/1/2024/SKK06/UKM/02/13) provided by the Ministry of Higher Education Malaysia

REFERENCES

- Afrin, S., Salma, N., Yeasmin, S., Promy, S. T., Salam, S., & Ali, M. K. M. 2024. Perceptions and perspectives towards safe food handling and its practices: a case study at Jahangirnagar University. *Journal of health, population, and nutrition*, 43(1): 225. <https://pubmed.ncbi.nlm.nih.gov/39719654/>
- Alhanatleh, H., Alghizzawi, M., Habes, M., Tahat, K. & Tahat, D. 2023. *The Impact of Digital Marketing Through the TikTok Application on Purchase Intent*. https://www.researchgate.net/publication/377090572_The_Impact_of_Digital_Marketing_Through_the_TikTok_Application_on_Purchase_Intent
- Ali N. & Abdullah M.A. 2012. The food consumption and eating behaviour of Malaysian urbanites: issues and concerns. *Geografia Malays J Soc Space* 8(6):157-165. <https://journalarticle.ukm.my/5608/>
- Andrews, R., Logan, T. & Sinkey, M. 2012. Identifying confirmatory bias in the field: Evidence from a poll of experts. *National Bureau of Economic Research Working Paper Series No. 18064*. <https://doi.org/10.3386/w18064>
- Ang, C. W., Ismail, R., Kassim, Z., Mohd Ghazali, A. N., Reidpath, D. & Su, T. T. 2022. Frequent Eating Out and 10-Year Cardiovascular Disease Risk: Evidence from a Community Observatory in Malaysia. *Biomed Res Int* 2022: 2748382. <https://pubmed.ncbi.nlm.nih.gov/35295957/>
- Arun, A., Karthikeyan, B. & Moyeenudin, H. M. 2025. The influence of food presentation and photography on restaurant sales and customer preferences. *International Journal of Innovative Research in Technology* 11(12): 3766-3771. https://www.researchgate.net/publication/391902235_The_Influence_of_Food_Presentation_and_Photography_on_Restaurant_Sales_and_Customer_Preferences
- Ashari, Lydiatul & Rashid, Ainaa & Lee, Yeong Yeh & Kueh, Yee Cheng & Abdul Hakim, Bibi Nabihah & Shafiee, Nor & Raja Ali, Raja Affendi & Mohamed, Jan. 2022. Exploring the norms of eating-out practice among adults in Malaysia. *Malaysian Journal of Nutrition* 28(1): 31-41. https://www.researchgate.net/publication/358886806_Exploring_the_norms_of_eating-out_practice_among_adults_in_Malaysia
- Bertoli, A., Jakli, L. & Pascoe, H. 2024. Analyzing the impact of events through surveys: Formalizing biases and introducing the dual randomized survey design. *Political Science Research and Methods advance online publication*. <https://doi.org/10.2139/ssrn.4707579>
- Castro, M. S., Pilger, D., Fuchs, F. D., & Ferreira, M. B. 2007. Development and validity of a method for the evaluation of printed education material. *Pharmacy Practice* 5(2): 89-94. <https://pubmed.ncbi.nlm.nih.gov/25214924/>
- Cena, H. & Calder, P.C. 2020. Defining a healthy diet: Evidence for the role of contemporary dietary patterns in health and disease. *Nutrients*, 12(2): 334. <https://pubmed.ncbi.nlm.nih.gov/32012681/>
- Cicchetti, D. V., & Sparrow, S. A. 1981. Developing criteria for establishing interrater reliability of specific items: Applications to assessment of adaptive behavior. *American Journal of Mental Deficiency*, 86(2): 127-137.
- Department of Statistics Malaysia (DOSM). 2019. https://www.dosm.gov.my/site/downloadrelease?id=household-income-%26-basic-amenities-survey-report-2019&lang=English&admin_

- view =#:~:text=DIS POS ABLE%20 INCOME,of%20total%20mean%20gross%20 income.
- Du, T., Du, P., Hivert, M. F., & Imamura, F. 2021. Association Between Frequency of Eating Away-From-Home Meals and Risk of All-Cause and Cause-Specific Mortality. *Journal of the Academy of Nutrition and Dietetics*, 121(3): 509–518.e1. <https://pubmed.ncbi.nlm.nih.gov/33775622/>
- FAO. 2023. *Food Systems Transformation: Maximizing the Value of Quality Ingredients*. Rome: Food and Agriculture Organization of the United Nations. Retrieved from <https://www.fao.org/publications/card/en/c/CC4891EN/>
- Finch, H., Lewis, J. & Turley, C. 2014. Focus groups. In J. Ritchie, J. Lewis, C.M.N. Nicholls & R. Ormston (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp. 211–242). London: Sage. <https://scispace.com/pdf/qualitative-research-practice-a-guide-for-social-science-l4y32se0bj.pdf>
- Hasnah Haron, Wong S.F., Mohd Taib M.N., Karim N.A., Noor Hafizah Y., Kamaruddin N.A. & Norimah A.K. 2022. Street food in Malaysia: What are the sodium levels? *Foods* 11(23): 3791. [https://pmc.ncbi.nlm.nih.gov/articles/PMC9739403/#:~:text=The%20average%20sodium%20content%20in%20the%20snack,and%20then%20desserts%20\(92%E2%80%9393190%20mg/100%20g%20sample\).](https://pmc.ncbi.nlm.nih.gov/articles/PMC9739403/#:~:text=The%20average%20sodium%20content%20in%20the%20snack,and%20then%20desserts%20(92%E2%80%9393190%20mg/100%20g%20sample).)
- Household Expenditure Survey Report 2019. Putrajaya: DOSM. Retrieved from <https://www.dosm.gov.my>
- Hussain, M. A., & Dawson, C. O. 2013. Economic Impact of Food Safety Outbreaks on Food Businesses. *Foods (Basel, Switzerland)*, 2(4): 585–589. <https://doi.org/10.3390/foods2040585https://pmc.ncbi.nlm.nih.gov/articles/PMC5302274/>
- Institute for Public Health. 2024. National Health and Morbidity Survey (NHMS) 2023: Non-Communicable Diseases and Healthcare Demand - Key Findings. Selangor: Institute for Public Health, National Institutes of Health (NIH), Ministry of Health Malaysia. <https://iku.gov.my/nhms-2023>
- Institute for Public Health. 2025. National Health and Morbidity Survey (NHMS) 2024: Nutrition – Key Findings. Shah Alam: National Institutes of Health, Ministry of Health Malaysia. <https://iku.nih.gov.my/NHMS-2024>
- Jabatan Perangkaan Malaysia. 2023. *Household Income and Basic Amenities Survey (HIS/BA) 2022 Technical Note*. Putrajaya: Jabatan Perangkaan Malaysia.
- Janjić, L., Vujović, S., Zdravković, I. & Ilić, D. 2023. The Impact of Food Visual Aesthetics on Consumer Perception of a Healthy and Tasty Meal in the Hospitality and Tourism Industry. *Economic of Agriculture* 70(3): 689–710. <https://www.researchgate.net/publication/375502105>
- Kee, K. W., Kwa, C. C., Lim, S. K. & Yuka, I. 2025. Customer Perception and Satisfaction on Food Service Technology Service Quality in Restaurant Operations. *Journal of Tourism, Hospitality and Environment Management* 10(39): 24-38. <https://www.researchgate.net/publication/391341394>
- Kementerian Kesihatan Malaysia. 2022. Portal Rasmi Kementerian Kesihatan Malaysia. Retrieved from <https://www.moh.gov.my/index.php/pages/view/2410>
- Kim, D. & Ahn, B.I. 2020. Eating out and consumers' health: Evidence on obesity and balanced nutrition intakes. *International Journal of Environmental Research and Public Health*, 17(2): Article 768. <https://www.mdpi.com/1660-4601/17/2/586>
- Knowles, M. S. 1984. *The Adult Learner: A Neglected Species*. 3rd ed. Houston: Gulf Publishing. https://www.academia.edu/84998232/The_Adult_Learner
- Kolb, D. A. 2015. *Experiential Learning: Experience as the Source of Learning and Development*. 2nd ed. Upper Saddle River, New Jersey: Pearson Education. https://www.researchgate.net/publication/315793484_Experiential_Learning_Experience_as_the_source_of_Learning_and_Development_Second_Edition
- Lavelle, F., McGowan, L., Hollywood, L., Surgenor, D., McCloat, A., Mooney, E., Caraher, M., Raats, M. & Dean, M. 2017. The development and validation of measures to assess cooking skills and food skills. *International Journal of Behavioral Nutrition and Physical Activity* 14: 118. <https://link.springer.com/article/10.1186/s12966-017-0575-y>
- Lynn, M.R. 1986. Determination and quantification of content validity. *Nursing Research*, 35(6): 382–386. <https://pubmed.ncbi.nlm.nih.gov/3640358/>
- Mohamad Hasnan, A., Norsyamliana, C.A.R., Cheong, S.M., Ruhaya, S., Munawara, P., Wan Shakira, R.H., Shubash, S.G., Khairul Hasnan, A. & Noor Ani, A. 2023. Ever-never heard of 'Malaysian Healthy Plate': How many people know and practice this healthy eating concept? *PLOS ONE*, 18(7): e0288325. <https://doi.org/10.1371/journal.pone.0288325>
- Mohamad Marzuki, M.F., Yaacob, N.A. & Yaacob, N.M. 2018. Translation, cross-cultural adaptation, and validation of the Malay version of the System Usability Scale questionnaire for the assessment of mobile apps. *JMIR Human Factors*, 5(2): e10308. <https://pubmed.ncbi.nlm.nih.gov/29759955/>
- MoH (Ministry of Health). 2020. *Malaysian Dietary Guidelines 2020*. Putrajaya: Ministry of Health Malaysia. Retrieved from https://hq.moh.gov.my/nutrition/wp-content/uploads/2024/03/latest-01.Buku-MDG-2020_12Mac2024.pdf
- Monir, A., Hafidh, B. & Hassan, A. P. D. L. 2021. The Role of Packaging Technology in The Food Product. *IOP Conference Series: Earth and Environmental Science* 761: 012116. https://www.researchgate.net/publication/351929984_The_Role_of_Packaging_Technology_in_The_Food_

Product

- Monterrosa, E. C., Frongillo, E. A., Drewnowski, A., De Pee, S. & Vandevijvere, S. 2020. Sociocultural Influences on Food Choices and Implications for Sustainable Healthy Diets. *Food and Nutrition Bulletin* 41(2_suppl): 59S-73S. <https://pubmed.ncbi.nlm.nih.gov/33356592/>
- Muwafak, Bishr Muhamed. 2021. Business Model Canvas (BMC) as a tool of Planning and Implementing Entrepreneurial Projects: A Case Study of GOOGLE Business Model Canvas. *Global Scientific Journals*, 9(5): 1245–1260. https://www.globalscientificjournal.com/researchpaper/Business_Model_Canvas_BMC_as_a_tool_of_Planning_and_Implementing_Entrepreneurial_Projects_A_Case_Study_of_GOOGLE_Business_Model_Canvas.pdf
- Nordin, N.A., Haris, S.N. & Hamid, S.B.A. 2023. 'Eat Right, Future Bright: Nutrition Education Program' (ERFB-NEP) module for aboriginal primary school children in Malaysia. *Journal of Education and Health Promotion*, 12(11). <https://pubmed.ncbi.nlm.nih.gov/37034863/>
- Nutrition Division, Ministry of Health Malaysia. 2016. National Plan of Action for Nutrition of Malaysia III 2016–2025. Putrajaya: Ministry of Health Malaysia.
- Ozair, M., Baharuddin, K.A., Mohamed, S., Esa, W. & Yusoff, M.S.B. 2017. Development and validation of the Knowledge and Clinical Reasoning of Acute Asthma Management in Emergency Department (K-CRAMED). *Education in Medicine Journal*, 9: 1–17. https://eduimed.usm.my/EIMJ20170902/EIMJ20170902_01.pdf
- Polit, D.F. & Beck, C.T. 2006. The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health*, 29(5): 489–497. <https://pubmed.ncbi.nlm.nih.gov/16977646/>
- Polit, D. F., Beck, C. T., & Owen, S. V. 2007. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Research in Nursing & Health*, 30(4): 459–467.
- Potwora, M., Vdovichena, O., Semchuk, D., Lipysh, L. & Saienko, V. 2024. The use of artificial intelligence in marketing strategies: Automation, personalization and forecasting. *Journal of Management World* 2024: 41-49. https://www.researchgate.net/publication/380423097_The_use_of_artificial_intelligence_in_marketing_strategies_Automation_personalization_and_forecasting
- Rahman, A., Baharlouei, P., Koh, E. H. Y., Pirvu, D. G., Rehmani, R., Arcos, M., & Puri, S. 2024. A Comprehensive Analysis of Organic Food: Evaluating Nutritional Value and Impact on Human Health. *Foods*, 13(2): 208. <https://pubmed.ncbi.nlm.nih.gov/38254509/>
- Rahman, A.R.A., Zahari, M.S.M. & Chik, C.T. 2019. 'Kafeteria Sihat' initiative in Malaysian public hospitals: Do customers accept it? *Journal of Foodservice Business Research*, 23(1): 57–77. https://www.researchgate.net/publication/336674229_‘Kafeteria_Sihat’_initiative_in_Malaysian_public_hospitals_Do_customers_accept_it
- Sahidi, N. S., Alias, N. S. M. S., Mohamed@Naba, M., Abdul Rahman, A. R., & Jaafar, S. N. 2022. Intention to Use Online Food Delivery Service among University Students in Dungun, Terengganu. *International Journal of Academic Research in Business and Social Sciences*, 12(12): 424–438. https://www.researchgate.net/publication/367574464_Intention_to_Use_Online_Food_Delivery_Service_among_University_Students_in_Dungun_Terengganu
- Shangguan, S., Afshin, A., Shulkin, M., Ma, W., Marsden, D., Smith, J., Saheb-Kashaf, M., Shi, P., Micha, R., Imamura, F., Mozaffarian, D., & Food PRICE (Policy Review and Intervention Cost-Effectiveness) Project 2019. A Meta-Analysis of Food Labeling Effects on Consumer Diet Behaviors and Industry Practices. *American journal of preventive medicine*, 56(2): 300–314. <https://pubmed.ncbi.nlm.nih.gov/30573335/>
- Yusoff, M.S.B. 2019. ABC of content validation and content validity index calculation. *Education in Medicine Journal*, 11(2): 49–54. https://eduimed.usm.my/EIMJ20191102/EIMJ20191102_06.pdf