ORIGINAL ARTICLE

Knowledge, Attitudes and Self-reported practices Questionnaire on Pureed Diet Preparation (KAP DYS Puree) among Food Handlers in Malaysian Hospitals for Dysphagia Management: Development, Validity, and Reliability Testing

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ABSTRACT

Introduction: This methodological research study aimed to measure content validity and reliability of a newly developed questionnaire of knowledge, attitudes, and self-reported practices towards pureed diet preparation (KAP DYS Puree) among hospital food handlers for dysphagia management. **Methods:** The study was conducted through face validation, content validation, content reliability and construct validation. A cross-sectional design with convenience sampling was carried out involving 4 panels for face validation, 10 raters for content validity and 161 food handlers participated for Exploratory Factor Analysis (EFA), while 30 food handlers were involved for test-retest reliability. The questionnaire which consisted of 40 items distributed into 3 domains and was assessed and analyzed using modified kappa ($k*$) for reliability. **Results:** Content Validity Index revealed the following I-CVI values: knowledge = 0.915, attitudes = 0.922 and self-reported practices = 0.900 and modified kappa values ($k*$) knowledge = 0.983, attitudes = 0.9214 and self-reported practices = 0.899. The EFA was employed for two dimensions which were self-reported practices and attitudes based on principal axis of factoring with varimax rotation. The factor analysis yielded two factors with a total of 10 items in the attitudes domain and two factors with a total of 9 items in the self-reported practices domain that had satisfactory factor loading (> 0.3). The Kaiser-Meyer-Olkin (KMO) values for attitudes = 0.816 and self-reported practices = 0.776. Bartlett's test of sphericity was significant at $p < 0.0001$ for attitudes and self-reported practices indicating the suitability of this data for factor analysis. Interclass Correlation Index (ICC) values for attitudes = 0.739 and self-reported practices = 0.789. **Conclusion:** This instrument can be used as a need assessment tool in the development of a comprehensive training module for pureed diet preparations in dysphagia management.
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Keywords: Dysphagia, Food Handlers, Hospital Foodservice, Knowledge Attitudes and Self-reported practices, Texture Modified Food

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INTRODUCTION

Dysphagia is a clinical terminology referring to a condition in which a patient is associated with an inability to swallow and chew naturally due to various factors. The muscle strength involved with chewing and swallowing fails to function optimally, and motivation to eat among these patients decreases, significantly leading to the main causes of malnutrition in dysphagia patients (1). Patients with stroke, head and neck cancer, senile dementia, as well as the elderly, commonly develop dysphagia and are at a high risk of dying from aspiration pneumonia. (2).

In hospitals, the safety of dysphagia patients with food is rudimentary. Healthcare foodservice is responsible for preparing different levels of modified texture food according to the patient's ability to chew and swallow. Food handlers in the healthcare setting must be capable

of preparing regular or "normal" and therapeutic diets. A therapeutic diet is typically a modified version of a regular diet, with modifications in nutrients, food allergens and texture. In principle, therapeutic diets are a modification of regular diet based on patient's needs. As texture-modified food (TMF) preparation is one of the most technical in preparation, in order to ensure safe consumption, the food consistency must be exact. Texture-modified food is the most common intervention conducted by clinicians to patients with dysphagia. The preparation of texture-modified foods should fulfil nutritional goals, guarantee homogenous texture, and meet food safety regulations (3).

In 2013, the International Dysphagia Diet Standardization Framework Initiative (IDDSI) was founded and started off its purpose on standardizing the framework for texture-modified foods and thickened liquid for dysphagia patients where this can be applied in countries around the world. The IDDSI Framework was then developed (Figure 1) and updated in 2019 comprising eight levels of drink thickness (levels 0 – 4) and food textures (levels 3 – 7) that can be identified by numbers, text labels and color codes (1).

Providing patients with a texture-modified diet with sufficient nutrition often results in meals that look and taste less desirable leading to high plate waste. Even though studies on hospital plate waste have been carried out quite extensively worldwide (4), there is not a lot of published research on texture-modified diets. In a recently published work on TMF (5), pureed diet was reported to be wasted the highest among hospitalized patients receiving texture-modified diets.

A pureed diet, according to the IDDSI, should be soft, smooth, moist and should hold together. It is commonly prescribed to dysphagia patients who transitioned from liquidized diet to soft diet. Furthermore, pureed diets, which are classified as level 4 by the IDDSI, necessitate extensive knowledge and practice among food handlers in order to ensure that the food is of the right consistency. A pureed diet can be very perilous to the patient if error occurs during food preparation. Hence, food handlers who are well trained in the preparation of pureed diets are essential in managing dysphagia. According to one's study, having more knowledge affects someone's conduct because action is driven by intention, which is impacted by how the individual perceives knowledge (6).

In Malaysia, menus at hospital are being planned by dietitian and food handlers. The involvement of food handlers is significant if compared to olden days as food handlers in hospital foodservice are upgrading their education level by seeking higher qualifications with high school diploma, certification, or a diploma, and others have a bachelor's or master's degree. Due to that, knowledge on food preparation are also expected to be

paralel with the upgrading qualification. Pureed diet was reported with high mean plate waste percentage at 65% in previous study has raised some question on pureed diet preparation. Lower knowledge has been linked to poor outcomes in previous studies on knowledge, attitudes, and practices (KAP) in various settings (7). One's study confirms that food safety awareness is a predictor of hygenic practise by assessing the degree of food safety knowledge (8). Texture modified diet preparation is highly technical, it is critical for food handlers to be well versed. When a pureed diet is prepared by food handlers with lack of knowledge, the patient's safety can be jeopardized. Since texture-modified foods are routinely provided as part of the assessment and management of eating and swallowing issues, an objective understanding of this issue is required. Previous study has also shown that incidence in food borne ilnesses has reduce and strongly influenced by the attitudes of the food handlers. Thus, with plate waste on pureed diet that shown high percentage of plate waste in hospital (2), there is a possible correlations towards attitudes of food handlers (9).

A previous KAP study reported that officers involved in injury cases had a lower score in self-reported precautionary practices when compared to non-cases (10). Self-reported practices are the act of aggregating routines and/or habits aimed at achieving a specific goal and requires constant application since altering an individual's behavior is difficult (11). However, to the best of our knowledge, there is no publication on such questionnaires that were developed and validated to date. Thus, this study was conducted with the aim to develop, validate, and determine the reliability of a questionnaire on knowledge, attitudes and self-reported practices of pureed diet preparation (KAP DYS Puree) specifically for food handlers.

MATERIALS AND METHODS

Data collection
The questionnaire was distributed to food handlers from three selected public hospitals: Kuala Lumpur Hospital (HKL), Tuanku Ampuan Rahimah Hospital, Klang (HTAR), and Serdang Hospital. These hospitals were chosen due to them being among the largest hospitals in the Klang Valley area of Malaysia with a large number of food handlers. In terms of foodservice provision, Serdang Hospital has outsourced its operation to a private caterer, while HKL and HTAR both run an in-house operation. Sample size calculation using the formula by Krejcie and Morgan (12) determined the need for 161 respondents for validation tests with a significant level and the degree of accuracy of 5% (11). This study has been approved by the Medical Research and Ethics Committee (MREC), Ministry of Health (NMRR-19-2804-47794 IIR) and Universiti Kebangsaan Malaysia Medical Research Ethics Committee (UKM PPI/111/8/JEP-2019-682). Prior to data collection, all food handlers were

informed about the study's aims, and written consent was obtained.

Questionnaire

The development of KAP DYS Puree was triangulated into knowledge, attitudes, and self-reported practices which comprised of domains adopted from previous studies as a base for the questionnaire construction (3, 14-15). The questionnaire was constructed based on the purpose and the information needed which the domains were categorized accordingly based on the operation needs. Knowledge was divided into 4 domains that is general knowledge on dysphagia, knowledge on pureed diet preparation, knowledge on food safety and knowledge on nutrition. Each of these domains were expanded into 5 sub domains according to the purpose of the questionnaire. All of these domains of information were required in pureed diet preparation because food handlers needed to understand it extensively before preparing it. In addition, lack in the information specifically in pureed diet preparation was observed on existing guideline that is available in government's foodservice department and these domains will tackle the loophole in pureed diet preparation.

Whilst attitudes and self-reported practices each of them contained 10 sub domains to serve its purpose to match the need of target users that is food handler. The sub domains for attitudes and self-reported practices was objectively to highlights the current area of opportunity among food handlers to be enhanced on dysphagia management. This questionnaire was newly developed since there are no questionnaire on knowledge, attitudes and self-reported practices on pureed diet preparation for dysphagia management. There were 40 questions included in the questionnaire with 20 item on knowledge, 10 items on attitudes, and 10 items on self-reported practices of food handlers towards pureed diet preparation. Measurement used for knowledge section was polytomous scoring (true, false, and not sure) while for attitudes and perception, likert scale was employed with range 1 to 5 (1 = never, 2 = rarely, 3 = sometimes, 4 = frequently, 5 = always).

Validity and Reliability

Face Validation

The first version of the questionnaire was drafted with 50 questions comprised of 20 items of knowledge, 15 items each on attitudes and self-reported practices and went through face validation that was conducted for a month in August 2019. Prior to the questionnaire development, the questions were constructed by the authors based on the feedbacks from the academics and industry and observation at the foodservice department. Face validity was then applied to ensure the content of the questionnaires are measuring the intended measure. The dichotomous scale was employed for face validity, with categorical options of "Yes" and "No" indicating a favorable and unfavorable item with grammar, clarity of the sentences, structure of sentences and the content of each items, respectively. In the end the only 40 questions remained in the questionnaire after being validated and reviewed through face validation by 6 professionals in industry and academic (catering officers, academic nutritionists and dietitians). The questionnaire was constructed in the Malay language and no forward and backward translation were involved.

Content Validation

Expert agreement was also included in the first phase of the study which involved reviews from experts on the relevancy of each item in the questionnaire. There were 10 appointed expert examiners comprising of 5 catering officers in the Ministry of Health's hospitals, 1 senior dietitian and 4 academicians in the field of nutrition and dietetics and experienced with dysphagia management. They were selected within the period of two months between November and December 2019 based on their reputation and expertise in the healthcare industry and academia.

The experts were asked to rate each question based on its relevancy by using a 4-point scale that is; 1= highly relevant, 2= somewhat relevant, 3 = slightly relevant, and 4 = not relevant (24). Experts were also asked to review each item and provide feedback items which required revision. The findings were derived using item-level (I-CVI) and scale-level (S-CVI) content validity indexes, with each expert assessing all 40 items on a 4-point scale based on relevance. The findings were derived using item-level (I-CVI) and scale-level (S-CVI) content validity indexes. The value of I-CVI was determined by dividing the number of panels by the number of experts who scored 3 and 4 (relevant and very relevant) on the four-point rating scale supplied in the questionnaire (I-CVI). This calculating technique will yield numbers indicating the relevance of each item in the questionnaire.

Furthermore, Scale-level CVI (S-CVI) was incorporated as an empirical approach to ensure the entire scale's validity. S-CVI was computed using two separate methods: S-CVI universal agreement (S-CVI/ua) and S-CVI Average (S-CVIave) (14). Both S-CVI/ua and S-CVI/Ave are scale level CVIs with distinct formula. To begin, S-CVI/ua among experts was determined by adding all things with I-CVI equal to 1 and dividing by the total number of items. The second technique for calculating S-CVI/Ave was to divide the total num-ber of items by the sum of the I-CVIs. Content validity indexes are considered good when I-CVI, S-CVIave and S-CVIua are at least 0.78, 0.80 and 0.90 (23). One's previous study suggested by calculating the index of agreement of among all experts that is relevant, limitation of CVI can be corrected (15). Before calculating the adjusted kappa, the probability agreement must be calculated using the formula (16).

$$Pc = (N! / A! A! (A-N)!) \times 0.5N$$

where N is the number of experts and A is the number of experts ranked 3 and 4 rating. Next, the kappa value k* was determined by using formula:

$k* = (I\text{-}CVI\text{-}Pc)/(1\text{-}Pc)$.

where Pc is probability agreement.

Application of the standard value for each k* prior to compute the modified kappa, will be based on the value for each k* which was fair (0.04 - 0.59), good (range 0.6 to 0.74) and excellent (more than 0.74) (1,17).

Reliability

The test re-test research methodology was employed on a subsample of 30 food handlers from Hospital Kuala Lumpur (HKL) to ensure the reliability of the questionnaire content. The food handlers from this test re-test study were excluded from the main data collection for construct validity. All the food handlers involved were asked to complete the questionnaire individually through an online platform (Google Forms) after they have agreed to participate and provide written consent. The same food handlers were given 7-day time interval to complete the same questionnaire to test reliability. The time interval of 7 days was chosen with the aim to reduce the possibility of participants remembering their initial responses or the so-called "carry-over" effect (18).

Exploratory Factor Analysis

Exploratory Factor Analysis was used to explore the construct and its internal reliability for this study. The analysis was using principal axis factoring and Varimax rotation to identify the underlying theoretical structure of data. This rotation yields a simpler solution and straightforward interpretation while maximizing the total variances of the squared loadings correlation between variables and factors (19). All domains for attitude and practice were included since categorical data for knowledge variables (yes, no and maybe) violating the first assumptions for EFA (20). All domains in the questionnaire were then identified and extracts the maximum common variance from all variables and converts it into a single score. All the domains were then run for Cronbach's alpha adjoining with EFA for internal consistencies. Kaiser-Meyer-305 Olkin (KMO), Bartlett's Test, exploratory factor analysis (EFA) was conducted factoring with varimax rotation

RESULTS

Sociodemographic Characteristics

This study recruited food handlers from 3 selected public hospitals in Klang Valley area of Malaysia with a total participation of 161 food handlers. The sociodemographic characteristics of the food handlers are presented in Table I. Majority of the participants involved in this study consisted of 148 Catering Assistant (91.9%) followed by Assistant 8 Catering Officers (5%) and 5 Catering Officer (3.1%). Furthermore, more female had participated in this study with 115 of them (71.45%)

Table I: Sociodemographic characteristics of the study participants, n=161.

Variables	(n)	Percentage (%)
Hospital		
Hospital Kuala Lumpur	86	53.4
Hospital Serdang	27	16.8
Hospital Tuanku Ampuan Rahimah	48	29.8
Gender		
Male	46	28.6
Female	115	71.4
Age		
18 – 29 years old	35	21.7
30 – 39 years old	83	51.6
40 – 49 years old	21	13.0
50 – 60 years old	22	13.7
Race		
Malay	157	97.5
Indian	4	2.5
Education		
Master's Degree	4	2.5
Bachelor's Degree	8	5.0
Diploma	54	33.5
Basic Certificate in Culinary	34	21.1
High Secondary	43	26.7
Lower Secondary	18	11.2
Position		
Catering Assistant	148	91.9
Assistant Catering Officer	8	5.0
Catering Officer	5	3.1

compared to males 46 (28.65%). The m-jority of food handlers were of Malay ethnicity (97.5%), diploma holders (33.5%) and had high school level education (26.7%) (Table I).

Content Validation

KAP DYS Puree was evaluated by 10 experts who were recruited to rate on each dimension and item in the questionnaire. As illustrated in Table 2, 40 items were rated and 95% of the items showed excellent content validity with value of I-CVI > 0.78 and k* > 0.74, one item was fair with the value of I-CVI < 0.78 and one item was poor at 0.40 ≤ with k* value ≤ 0.59. The values of each knowledge, attitudes and self-reported practices were sum up and averaged for the I -CVI value and revealed the value of each domain with knowledge was 0.915, attitudes at 0.922 and self-reported practices with 0.900 which is considered as excellent content validity. Whilst for modified kappa values (k*) knowledge was at 0.983, attitudes with 0.9214 and self-reported practices with 0.899. Only one item had low modified k* value (< 0.40) rated as poor as the accordance among rater was very low. This item was considered invalid and indicate rejection (Table II).

Table II: Content validity results for the KAP DYS-Puree (N=10).

Item	Item	Number of experts	Number of experts giving 3 or 4 rating	I-CVI[a]	Pc[b]	k^{*c}	Evaluation[d]	S-CVIave[e]	S-CVIua[p]
								0.90	0.81
KNOWLEDGE									
General Knowledge on Dysphagia	Item 1 : General knowledge on pureed diet	10	9	0.90	0.0079	0.899	Excellent		
	Item 2 : General knowledge on dysphagia condition	10	9	0.90	0.0079	0.899	Excellent		
	Item 3 : General knowledge on texture modification type of dysphagia food	10	9	0.90	0.0079	0.899	Excellent		
	Item 4 : General knowledge on dysphagia diet preparation	10	9	0.90	0.0079	0.899	Excellent		
	Item 5: General knowledge dysphagia diet characteristic	10	9	0.90	0.0079	0.899	Excellent		
Knowledge on Pureed Diet Preparation	Item 1 : Attribute of pureed diet preparation	10	10	1.00	0.0009	1	Excellent		
	Item 2 : Ingredients of pureed diet for dysphagia	10	9	0.90	0.0079	0.899	Excellent		
	Item 3 : Types of vegetables for pureed diet	10	9	0.90	0.0079	0.899	Excellent		
	Item 4 : Method of cooking for pureed diet	10	9	0.90	0.0079	0.899	Excellent		
	Item 5 : Standard of procedure for pureed diet preparation	10	9	0.90	0.0079	0.899	Excellent		
Knowledge on Food Safety	Item 1 : General knowledge on temperature for pureed diet safety	10	9	0.90	0.0079	0.899	Excellent		
	Item 2 : Holding time of pureed diet	10	9	0.90	0.0079	0.899	Excellent		
	Item 3 : Temperature of cooking	10	10	1.00	0.0009	1	Excellent		
	Item 4 : Utensil and tools safety during pureed diet preparation	10	10	1.00	0.0009	1	Excellent		
	Item 5 : Holding temperature for pureed diet	10	7	0.70	0.117	0.58	**Fair**		
Knowledge on Nutrition	Item 1: Vegetable selection for pureed diet preparation	10	9	0.90	0.0079	0.899	Excellent		
	Item 2 : Effect of temperature on nutrients	10	9	0.90	0.0079	0.899	Excellent		
	Item 3 : Food fortification for pureed diet	10	10	1.00	0.0009	1	Excellent		
	Item4 : Food pyramid selection	10	9	0.90	0.0079	0.899	Excellent		
	Item 5 : Calorie of pureed diet	10	10	1.00	0.0009	1	Excellent		
ATTITUDES									
	Item 1 : Attitudes towards efficiency	10	9	0.90	0.0079	0.899	Excellent		
	Item 2 : Attitudes on standard disregard	10	9	0.90	0.0079	0.899	Excellent		
	Item 3 : Attitudes towards accuracy of the ingredients	10	9	0.90	0.0079	0.899	Excellent		
	Item 4 : Attitudes towards standard recipe compliant	10	9	0.90	0.0079	0.899	Excellent		
	Item 5 : Attitudes towards self-meticulousness	10	9	0.90	0.0079	0.899	Excellent		
	Item 6 : Attitudes towards self-proactive	10	9	0.90	0.0079	0.899	Excellent		
	Item 7 : Attitudes towards Obedience	10	10	1.00	0.0009	1	Excellent		
	Item 8 : Attitudes with flexibility	10	9	0.90	0.0079	0.899	Excellent		
	Item 9 : Attitudes towards time-urgency	10	4	0.40	0.205	0.245	**Poor**		
	Item 10 : Attitudes towards self-skill	10	10	1.00	0.0009	1	Excellent		
PSELF-REPORTED PRACTICES									
	Item 1 : Accuracy	10	9	0.90	0.0079	0.899	Excellent		
	Item 2 : Standard Recipe	10	9	0.90	0.0079	0.899	Excellent		
	Item 3 : Work standard disregard	10	9	0.90	0.0079	0.899	Excellent		
	Item 4 : Preparation standard	10	9	0.90	0.0079	0.899	Excellent		
	Item 5 : Resources	10	9	0.90	0.0079	0.899	Excellent		
	Item 6 : Operational work flow	10	9	0.90	0.0079	0.899	Excellent		
	Item 7 : Time management	10	9	0.90	0.0079	0.899	Excellent		
	Item 8 : Competency	10	9	0.90	0.0079	0.899	Excellent		
	Item 9 : Planning on cooking	10	9	0.90	0.0079	0.899	Excellent		
	Item 10 : Standard Operating Procedure self-reported practicess	10	9	0.90	0.0079	0.899	Excellent		

Test - Retesta I-CVI (item content validity index) = number of experts/number of experts with a rating of 3 or 4.
b pc (probability of a chance occurrence) = [N!/A!(N - A)!] 0.5N where N = number of experts and A = number of experts who agree on good relevance
c k^{*} = kappa designating agreement on relevance: k^{*} = (I-CVI - pc)/(1 -pc).
d Evaluation criteria for kappa: fair = k of 0.40–0.59; good = k of 0.60–0.74; and excellent = k > 0.74.
e S-CVIave (average scale content validity index) = mean of I-CVI.
p S-CVIua (scale content validity index universal agreement) = number giving a rating 3 or 4/number of item

Reliability

Based on the table II, it showed the tabulation of socio demographic of food handlers (n=30) for test re-test. The test re-test was conducted in Hospital Kuala Lumpur (HKL) since the numbers of food handlers available were enormous if compared to other selected hospital. There were 27 Catering Assistant (90%) that are participated in this test. Food handlers that were participated in this test re-test were exempted for the main survey as they had already expose to the questions and they may response differently on the main survey using the questionnaire (Table III). Test-retest reliability for the KAP DYS Puree showed reliability for knowledge (ICC=0.642, p=0.0001), with attitudes value at 0.789 (p=0.0001) and self-reported practices value with 0.594 (p=0.0001) and these sections of the KAP DYS Puree showed moderate agreement. Furthermore, the Cronbach's alpha coefficient was also evaluated and found to have an acceptable degree of reliability at 0.6 - 0.7 and 0.8 or more deemed at a satisfactory level as shown at table IV (21). This indicates that the questions in each sub-category are well-connected.

Table III: Sociodemographic characteristics of the test re-test study population, n=30.

Variables	(n)	Percentage (%)
Hospital		
Hospital Kuala Lumpur	30	100
Gender		
Male	3	10
Female	27	90
Age		
18 – 29 years old	11	36.6
30 – 39 years old	12	40
40 – 49 years old	4	13.3
50 – 60 years old	3	10
Race		
Malay	29	96.7
Indian	1	3.3
Position		
Catering Assistant	27	90
Assistant Catering Officer	2	6.7
Catering Officer	1	3.3

Exploratory Factor Analysis

This questionnaire was further analyzed with 40 items focusing on attitudes and perception pureed diet preparation among food handlers. As for attitudes domain, maximum likelihood EFA was conducted factoring with varimax rotation. Prior to running the principle axis factoring, the data was not normally distributed. Sample adequacy of this study was also measured by using Kaiser-Meyer-Olkin (KMO) for the ordinal type of data only (attitudes and self-reported practices). The analysis revealed attitudes with value of 0.816 and self-reported practices 0.776 which was considered enough for the realization of the EFA.

The Bartlett's test of sphericity was also significant at p<0.0001 for indicating the suitability of this data for factor analysis. A high degree of reliability was found for attitudes of food handlers and moderate for self-reported practices on pureed diet preparation measurements. If the Bartlett's Test of Sphericity is big and significant, and the KMO measure is larger than 0.50, it may be inferred that factorability exists in the data set.

There were 2 constructs obtained based on principal axis of factoring with Varimax rotation with components for attitudes classified as "self efficiency" (component 1) and "operational conformity" (component 2). While self-reported practices components comprises of 2 constructs and classsified as "operational competencies"(component 1) and "technical competencies" (component 2). These constructs were determined through values from parallel analysis that were higher than mean eigenvalues. The exploratory analysis of the attitudes dataset with EFA showed components 1 and 2 with eigenvalues larger than one, which explained 79.5 percent and 81.1 percent of the data set's cumulative variability, respectively.

The average measure of Intraclass Correlation Coefficient (ICC) for attitudes was 0.739 and self-reported practices was 0.789 with a 95% confidence interval p<.001. Knowledge was omitted from this study since the test demands continuous data and having nominal data from knowledge will not be appropriate (21).

According to the result, attitudes item 1 and item 4 (attitudes are positively interrellated) and were paralel with findings on self-reported practices at item practices item 3 and item 6. These domains is highlighting on the standardize recipe and abide with the the work flow. However for attitudes item 6 and item 7 was negatively owing to cross loading, but they are positively interrelated to each other in the construct, thus these item retained. Interestingly, in line with the cross loading domains for self-reported practices which is at attitudes item 3 and item 6 , the construct was inversely related mentioning on being adhere to the standardization of recipe as shown in Table IV.

DISCUSSION

The KAP DYS Puree questionnaire was developed and validated for its content and reliability to assess the knowledge, attitudes, and self-reported practices of food handlers towards pureed diet preparation for dysphagia management. This questionnaire can be an effective tool to evaluate the level of KAP on diet preparation among food handlers especially in regard to the technicality of texture on dysphagia diet. Upon further validation, the framework of this study is significant in interpreting the reliable and validated scale which potentially used in different perspectives of diet preparation such as normal diet, therapeutics, and texture modification food.

Table IV: Descriptive statistic, Cronbach's Alpha and Exploratory Factor Analysis.

	Cronbach's Alpha	Mean and Standard Deviation	Factor Loading	
			Component 1	Component 2
AAttitudes				
Item 1 : Attitudes towards texture modification food preparation	.782	2.94 ± 1.15	.568	.568
Item 2 : Attitudes towards accuracy of food preparation	.798	2.27 ± 1.33	.423	
Item 3 : Attitudes towards accuracy of the ingredients	.771	3.32 ± 1.52	.679	
Item 4 : Attitudes towards standard recipe compliant	.801	2.25 ± 1.26		.570
Item 5 : Attitudes towards self-meticulousness	.764	3.57 ± 1.27	.744	
Item 6 : Attitudes towards self-proactive	.781	3.32 ± 1.40	.596	-.445
Item 7 : Attitudes towards Obedience	.777	3.97 ± 1.35	.630	-.467
Item 8 : Attitudes towards flexibility	.775	3.42 ± 1.57	.655	
Item 9 : Attitudes towards time urgency	.770	3.37 ± 1.35	.682	
Item 10 : Attitudes towards self-skill	.785	3.37 ± 1.35	.576	
PSelf-reported practices				
Item 1 : Accuracy	.722	2.94 ± 1.45	.649	
Item 2 : Standard Recipe	.728	3.41 ± 1.63	.567	
Item 3 : Work standard disregard	.766	2.68 ± 1.40		.742
Item 4 : Preparation standard	.717	4.41 ± 1.19	.672	
Item 5 : Resources	.703	3.88 ± 1.31	.799	
Item 6 : Operational work flow	.757	2.21 ± 1.55		.564
Item 7 : Time management	.728	3.17 ± 1.23	.528	
Item 8 : Competency	.714	3.81 ± 1.31	.750	
Item 9 : Planning on cooking	.742	2.81 ± 1.65		
Item 10 : Standard Operating Procedure self-reported practices.	.727	2.81 ± 1.65	.653	

KAP DYS Puree questionnaire provides a unique assessment tool for the management of food provision in assisting with the evaluation of factors that can be focused among food handlers. This is achievable through the application and operation of the current exercise or new module development as it is important to match the content domains with the module (20). Both scales' findings, I-CVI and k*, agreed, with items that did not meet the I-CVI threshold of 0.78 having exceptional k* values and vice versa, implying that both techniques resulted in the same conclusion and reinforcement of existing facts.

Further data collection was carried out for test-retest on a subsample of 30 food handlers. As the gold standard of α value of 0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater a very good level, the findings showed that the reliability of knowledge, attitudes and self-reported practices of this questionnaire were acceptable according to one's study (20). This has shown that the questionnaire measurement is representative and consistent over time. Then, the Intraclass Correlation Coefficient (ICC) was calculated for the stability analysis by comparing the score obtained after completing the questionnaire in the test re-test method. The analysis was determined to describe how strongly units in the same group resembled each other. In the other words, the analysis will categorize each items in their own units that have the similarity will have organized into groups. The findings showed that the values of both attitudes (0.793) and self-reported practices (0.789) were between 0.75 and 0.9 (14) respectively which is indicated good reliability (23).

The instrument for knowledge, attitudes and self-reported practices of pureed diet preparation for dysphagia management has been confirmed through this study and the data included this study was appropriate in order to conduct a valid EFA based on the descriptive statistics analysis. Through results obtained from the exploratory factor analysis, the outcome was showing that the questionnaire is a reliable and valid tool to be used in the preparation of pureed diet in the management of dysphagia. The positive and negative loadings however explained the linear relationship between self-reported practices and attitudes. The attitudes construct was positively correlated to self-reported practices even though exhibited inverse correlation at a few items. Based on the findings of this study's EFA, educators or management can use the KAP DYS Puree instrument to gain a better understanding of the level of learning readiness capabilities of food handlers by measuring self-efficiency, operational conformity, operational competencies, and technical competencies.

To date, no questionnaire has been developed and published to assess knowledge, attitude, and practice in pureed diet preparation for dysphagia management. However, this instrument is showing a good validation and reliability construct similar with previous study's findings on questionnaire development even though the scope of study is not focusing on pureed diet preparation

(25). As a result, this instrument could assist educators and management in developing better dysphagia management plans. Opportunities can be identified and best practices for management in terms of food handler knowledge, atti-tudes, and practices can be promoted. One of the inherent limitations shown in this study is that this questionnaire is uniquely limited to just one type of texture modified diet which is pureed diet and only quantitative approach was employed which could not further probe the responses during the development phase. The developed questionnaire was only tested among food handlers in public hospitals located in the central region of Malaysia. Testing this questionnaire on a wider range of food handlers would be beneficial. Other than that, the differences in terminology used to refer to pureed diet in the hospital setting in Malaysia was also a limitation faced as the term varied between blenderized diet and pureed diet. Future work to improve this questionnaire could include the addition of a quantitative approach as well as the expansion of the questionnaire to be more comprehensive so it can be be used not only for pureed diets, but also for other types of texture modified diets.

CONCLUSION

Evidence of validity of the newly established KAP DYS Puree was collected. This instrument serves as an effective tool for the healthcare provision to assess the level of KAP among food handlers with respect to therapeutic diets especially in regard to dysphagia diet preparation which involves technicality of texture for dysphagia management.

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