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The validity and reliability of the Thai version of M.D. Anderson dysphagia inventory and correlation between quality of life and dysphagia severity in patients with head and neck cancer

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ABSTRACT

Background: Dysphagia is one of the most significant side effects of head and neck cancer (HNC) treatments, which increases the symptom rate after treatments. This has negative effects on patient quality of life (QoL); therefore, the evaluation of quality of life by standardized instruments is essential to patient-reported outcomes.

Objectives: The purpose of this study was to translate and validate the M.D. Anderson Dysphagia Inventory (MDADI), which is a specific QoL instrument that evaluates the impact of dysphagia on QoL in HNC patients, into the Thai language by a cross-cultural adaptation process. This subsequently determines the reliability of the Thai version of MDADI (MDADI-TH), and to verify a correlation between dysphagia severity and QoL in HNC patients.

Materials and methods: The six steps for a cross-cultural adaptation process, which include: forward translation, translation synthesis, backward translation, expert committee review, pretesting, and final proof reading were performed. Sixty-five HNC patients with dysphagia were included in this study. The patients completed the same questionnaires two weeks after first enrollment, to determine the reliability. The Reliability was determined by internal consistency (Cronbach's alpha) and test-retest reliability. The correlation was verified between the total score of MDADI-TH and Penetration-aspiration scale, from a video-fluoroscopy swallowing study (VFSS) by independent t-test.

Results: Validation was achieved by a cross-cultural adaptation process, except for one question (E7), which was not equivalent to the original version in semantic proposition. A total of twenty-nine patients completed the same questionnaires two weeks later. The MDADI-TH subscale and total scores showed acceptable internal consistency reliability (ranging from 0.71-0.94), and test-retest reliability (ranging from 0.86-0.99). For the correlation study, a total of sixty patients were able to be examined by VFSS. The results showed that correlation between dysphagia severity and QoL was significant in total scores, the emotional subscale, and the functional subscale (p<0.05).

Conclusion: The MDADI-TH showed good reliability; therefore, the MDADI-TH can be a useful dysphagia-specific QoL instrument, for measuring QoL in Thai patients with HNC. Patients with more severity of dysphagia showed it had a compromising effect on the quality of life, especially in the emotional and functional domains.

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Introduction

Head and neck cancer (HNC) are the sixth most common cancer, and the eighth most cause of cancer death worldwide. The incidence rate of this cancer has increased in tendency.[1] Dysphagia is one of the most common side effects in HNC patients, which may occur before or after treatments; however, it mostly increased in rate after treatments.[2-4] HNC patients experiencing dysphagia may have health impairment[5-7], from dysphagia complications (malnutrition, dehydration, and aspiration), leading to an impaired quality of life (QoL).[8,9] Particularly aspiration; which is one of the complications and significant symptom signs of dysphagia, occurring in approximately 50%[10] of patients, and this is a risk factor that causes life-threatening aspiration pneumonia.[11] Likewise, aspiration also affects patients health and emotional well-being; hence, diminishing the patient's QoL.[12] As a result, dysphagia has a strong impact on QoL.[9, 13]

Currently, the evaluation of QoL plays an important role of patient-reported outcomes to promote clinical care, for improving therapeutic regimens and indicating effective treatments.[14, 15] As to the impact of dysphagia on QoL evaluations, the dysphagia-specific related QoL questionnaire is recommended, as it provides potential information regarding the impact of dysphagia on quality of life resulting from symptoms, and related treatments; so as to conduct effective symptom management.[16, 17]

M.D. Anderson Dysphagia Inventory (MDADI) is a dysphagia-specific QoL instrument to evaluate the impact of dysphagia on the quality of life in HNC patients. The MDADI contains 20 questions, divided into 4 domains (global, emotional, functional, and physical). The questions of the MDADI were developed by HNC patients with dysphagia, and their families by interviewing[18], so as that they may guarantee the questions are directly associated with the symptoms resulting from HNC, and its treatment influence on the patient's QoL. The MDADI questions also contain both health-related quality of life (HRQOL) measuring, reflecting a patient's health perceptions, in addition to their functional health status (FHS) measuring, which reflects the influence of dysphagia on the patient's ability to perform tasks.[8, 19] In addition, this questionnaire has a small number of questions that are easy and quick to complete for use in clinical practice.[20] Therefore, the MDADI is considered a useful, standardized QoL instrument in clinical practice for reporting patient outcomes. However, there is no standardized dysphagia-specific QoL Thai instrument for measuring QoL in HNC patients.

The purposes of this study were to translate and validate The MDADI into the Thai language as well as to determine the reliability of the Thai version of the M.D. Anderson Dysphagia Inventory (MDADI-TH). Additionally, another purpose was to verify a correlation between dysphagia severity and quality of life in patients with HNC.

Materials and methods

MDADI

The original MDADI is a self-administered questionnaire developed by Chen et al.[18] This questionnaire consists of 20 questions to measure the effect of dysphagia on QoL in 4 domains, including: global (single question), emotional (6 questions), functional (5 questions) and physical (8 questions). Each question is scored on the 5-points Likert scale, consisting of a point value from 1 to 5 (strongly agree, agree, no opinion, disagree, strongly disagree) for all questions, except for 2 questions. These two questions; on the emotional domain (E7: I do not feel self-conscious when I eat) and functional domain (F2: I feel free to go out to eat with my friends, neighbors, and relatives), are reversely scored, as 5 points for strongly agree and 1 point for strongly disagree. The global question is scored individually, while the other questions, of each domain, are summed; and the mean score is multiplied by 20 to obtain a total score. Thus, higher scores indicate better day-to-day functioning and better QoL.

Translation Process

We performed the following six-step guidelines on the acceptable, internationally cross-cultural adaptation process.[21, 22]

Step 1: *Forward translation*, permission of the original MDADI was translated into Thai by two bilingual translators, who are proficient in both English and Thai languages; one translator having a medical background (both HNC and dysphagia) and the other with linguistic proficiency, but no medical background.

Step 2: *Synthesis*, the two translations were synthesized into one common translation by consensus between the two translators and authors.

Step 3: *Back translation*, the consensus version of the Thai translation was translated into English by two, additional bilingual translators, who were blinded from the original version. Neither of the two back-translators have a medical background, nor preliminary MDADI knowledge.

Step 4: *Expert committee review*, all translations were sent to an expert committee. The committee reviewed all translations and reached a consensus on the pre-testing version for cultural equivalence. The committee of bicultural experts consisted of two doctors who work with HNC patients, and another doctor who works with dysphagic patients. Discrepancies between the translations and the original MDADI were resolved by repeating the process as needed.

Step 5: *Pretesting*, the pre-testing version was tested on 10 HNC, patients who experienced dysphagia by cognitive interviews. Both the meaning and chosen response to each question without any clarification was verified. In depth interviews were conducted when there was misunderstanding, and ambiguity were found. All changes were in consensus within the research group.

Step 6: *Final proofreading*, typographic and other errors were corrected, and then the translated MDADI was completed.

Participants and Data collection

The cross-sectional study was conducted in the out-patient clinic at the Department of otolaryngology, Faculty of Medicine, Prince of Songkla University, Thailand. A total of 65 patients were enrolled. The inclusion criteria were patients diagnosed with HNC with dysphagia and who should undergo the video-fluoroscopic swallowing study (VFSS) by an otolaryngologist, age ≥18, with fluency in spoken and written Thai, who treated with radiotherapy, either alone or combination, should undergo treatment for at least 3 weeks, and able to complete the translated questionnaire. Patients who were diagnosed thyroid cancer and salivary gland cancer, who treated with total laryngectomy, who declined VFSS examination, who were pregnant, or unable to follow the procedure were excluded. Written informed consent was obtained from all participants.

All participants completed the pre-final version questionnaire and were examined with the swallowing function by VFSS upon enrollment. Two weeks later, the same questionnaire was performed again, to determine test-retest reliability.

Swallowing function

The swallowing function examination was conducted in radiographic imaging rooms, at the Department of Radiology, following routine clinical evaluation by a radiologist and an otolaryngologist; whom is an expert in evaluating and managing HNC and dysphagic patients.

The Penetration-Aspiration Scale (PAS) is the standard method to examine swallowing function that can indicate the severity of dysphagia, by describing airway invasion during swallowing. Airway invasion can define by the severity of penetration and aspiration, following the Rosenbek *et al*.[23] scale observed in VFSS.

For this study, dysphagia severity of patients was divided into 2 groups; according to the PAS are non-aspiration group (PAS level 1), and penetration and aspiration groups (PAS level 2-8) then the correlation between QoL and dysphagia severity was analyzed.

Data analysis

The content validation of MDADI-TH was determined by the cross-cultural adaptation process. The reliability was determined by internal consistency reliability and test-retest reliability to achieve the completed Thai version of MDADI (MDADI-TH). All analyses were conducted using Statistical Package for the Social Sciences version 16.0 (SPSS Inc., Chicago, IL, USA) for windows. Descriptive analysis was expressed as relative frequency distribution and arithmetic mean.

Internal consistency reliability was determined for each subscale, except the global subscale, by Cronbach's α coefficient (Cronbach's α). The acceptable level of Cronbach's α is 0.7 or greater, which indicates an adequate internal consistency reliability.[24]

Test-retest reliability was established by comparing scores between test (ass_1) and retest (ass_2) by calculating the mean difference, using paired sample t-test; with a statistical significance level of a two-tailed 0.05 level (p<0.05). Additionally, the stability coefficient was investigated by Spearman's rho correlation coefficient, which determined the relationship between test-retest calculating of each subscale score, with the statistical significance at a two-tailed 0.01 level: the higher the correlation between ass_1 and ass_2 the greater the stability coefficient of the questionnaire.[25] The intra-class correlation coefficient (ICC) was used as relative reliability. An ICC value of 0.75, or greater, is indicative of good reliability.[26] The correlation of each QoL aspect, evaluated by MDADI-TH with dysphagia severity assessed in VFSS, was verified by independent t-test with a significant level of p<0.05.

Results

Cross-Cultural Adaptation

The original MDADI was translated into the Thai language, by a cross-cultural adaptation process to achieve the equivalent, as comparing to the original, to establish the content validity. In a step of the synthesis, the consensus between the translators and authors was reached to add an explication (*The pronoun "I" in the first statement to the last one used to refer to the respondent*). An explication was considered to avoid confusing patients in using the pronoun or proposition, when the questionnaire was translated into Thai, when it was not clarifying any questions in this QoL instrument. When comparing between the Thai translation and the original, there were 19 items that were equivalent, except for one item in an emotional subscale; this was an E7 item. The most challenging aspect was the difficultly to translate the term self-conscious. The term self-conscious could be interpreted in different ways, and it was difficult to find in Thai a single word that could explain this term. One of the translators translated "self-conscious" as "*Pràːmàː* meaning lose self-confidence, lose courage, or nervous, while the other translators translated it as "*Ŕuːtua*", which means be aware. The consensus agreed with the term "*Pràːmàː*" as this best represented the word of self-conscious, and best captured a concept of emotional domain. The equivalent was checked by the expert committee review and back-translation process. The committee also agreed with the term *Pràːmàː* in the point of self-conscious representation, but this word may be incomprehensible for a target group, therefore the comprehensible word, which remained as a semantic equivalent, was substituted. However, the difference was found in an E7 item between the Thai translation and the original, in the point of a semantic proposition when back-translation was performed again. Furthermore, most of the interviewees did not noticed the negation in E7 and F2 items, leading to the giving of a wrong answer; thus, they were asked to read these questions again, so they could choose the correct answer. Hence, the two question items remained in the negation sentences, but changed typography involving typeface and letter-spacing for easier notice.

Psychometric Analyses

Sample Characteristics

In total, 65 HNC patients with dysphagia were included. However, five patients were excluded, because they could not follow the routine VFSS protocol; accordingly, sixty patients who met the selection criteria answered ass_1 and were

examined for swallowing function by VFSS, to verify the correlation. For reliability testing, a total of twenty-nine patients completed ass_2 by two weeks after first enrollment. Thirty-one patients were excluded because eighteen patients lost to follow up at the second assessment, five patients were unable to complete the questionnaire by two weeks after the first assessment, and eight changed feeding procedure in between ass_1 and ass_2 (Figure 1).

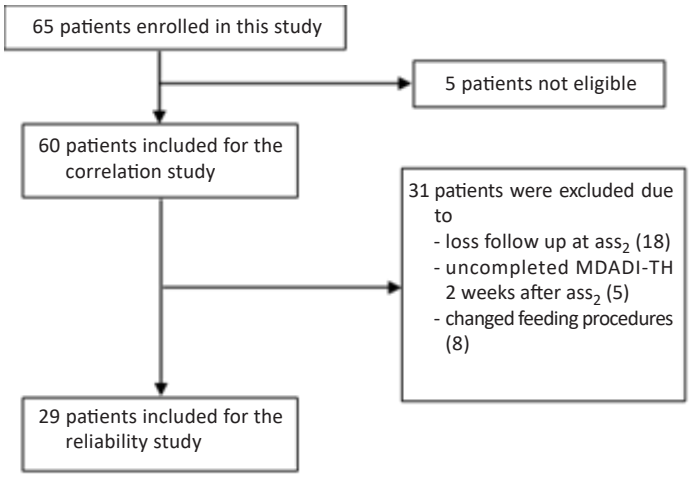


Figure 1. *Participants enrollment.*

Participants, consisting of 60 patients, are summarized characteristics in Table 1. Most patients were male (70%); with a mean age of 57 years, and the mean time since last treatment was 17.7 months. The oral cavity was the most frequent, primary tumor site, with 20 cases (33.33%). Most patients (76.67%) had clinical stage IV of the disease. Concurrent chemoradiotherapy (CCRT) was the highest prevalent treatment, with 29 cases (48.33%). The most common feeding procedure was a percutaneous endoscopic gastrostomy tube (PEG), consisting of 21 cases (35%). Twenty (33.33%), patients had a tracheostomy, which was the most common treatment for patients, who had penetration and aspiration.

Table 1 Demographic and clinical characteristics of 60 HNC patients with dysphagia.

Variable	No. of Patients	%	Mean
Gender			
Male	42	70	
Female	18	30	
Age (years)			
<60	25	41.67	57
≥60	35	58.33	
Primary tumor site			
Oral cavity	20	33.33	
Oropharynx	10	16.67	
Nasopharynx	16	26.67	
Hypopharynx	4	6.67	
Larynx	10	16.67	
Clinical stage			
I	4	6.67	
II	4	6.67	
III	5	8.83	
IV	46	76.67	
Information missing	1	1.67	

Table 1 Demographic and clinical characteristics of 60 HNC patients with dysphagia. (continues)

Variable	No. of Patients	%	Mean
Treatments regiments			
Surgery	1	1.67	
RT	9	15	
CCRT	29	48.33	
Surgery and RT	8	13.33	
Surgery and CCRT	13	21.67	
Feeding procedures			
Oral	12	20	
NG	10	16.67	
PEG	21	35	
Oral and NG	6	10	
Oral and PEG	11	18.33	
Tracheostomy			
Yes	20	33.33	
No	40	66.67	
Time from last treatment to study enrollment (month)			17.70

Note: *RT: radiotherapy, CCRT: concurrent chemoradiotherapy, NG: nasogastric tube, PEG: percutaneous endoscopic gastrostomy tube.*

Reliability

The internal consistency of the MDADI-TH was checked by Cronbach's α coefficient for each subscale, except the global subscale, because it only contains a single question. Cronbach's α were in the optimum range; 0.9 for emotional subscale, 0.88 for functional subscale, 0.71 for physical subscale and 0.94 for total score (Table 2).

For test-retest reliability, mean differences of each subscale between test-retest were not statistically significant, with $p>0.05$; -5.52 for global subscale, 0.00 for emotional subscale, -1.79 for functional subscale, 0.95 for physical subscale and -0.07 for total score (Table 3). The Spearman's rho between each subscale showed a high correlation, ranging from 0.78 to 0.99, with statistical significance (Table 4). Similarly, all subscales presented with excellent ICC values, ranging from 0.86-0.99 (Table 4).

Table 2 Internal consistency of the MDADI-TH (N=29).

MDADI-TH Subscale	No. of questions	Cronbach's α coefficient
Global	1	-
Emotional	6	0.9
Functional	5	0.88
Physical	8	0.71
Total score	19	0.94

Table 3 Mean differences of overall scores, and the MDADI-TH subscale scores between test-retest (N=29).

MDADI-TH Subscale	Mean score±SD Ass_1	Mean score±SD Ass_2	Mean diff±SD (95% CI)	*p*-value
Global	46.90±28.92	52.41±27.99	- 5.52±7.47 (-11.91, 0.88)	0.09
Emotional	63.10±21.80	63.10±21.27	0.00±5.66 (-1.79, 1.79)	1.00
Functional	60.55±21.82	62.34±21.04	-1.79±5.63 (-3.81, - 0.22)	0.08
Physical	54.57±14.32	53.62±14.66	0.95±3.80 (-0.75, 2.64)	0.26
Total score	58.84±17.71	58.91±17.62	- 0.07±4.64 (-1.11, 0.96)	0.89

Note: *Ass1: first assessment, Ass2: second assessment, 95% CI: 95% confident interval, *p<0.05.*

Table 4 Correlation coefficient of overall scores, and the MDADI-TH subscale scores between test-retest; and intra-class correlation coefficient of the MDADI-TH (N=29).

	Global	Emotional	Functional	Physical	Total score	ICC (95%CI)
Global	0.78**	-	-	-	-	0.90 (0.78-0.95)
Emotional	-	0.97**	-	-	-	0.94 (0.90-0.97)
Functional	-	-	0.95**	-	-	0.94 (0.89-0.97)
Physical	-	-	-	0.95**	-	0.86 (0.77-0.92)
Total score	-	-	-	-	0.99**	0.99 (0.98-0.99)

Note: *ICC: intra-class correlation coefficient, **p<0.01*

Correlation between QoL and dysphagia severity

Dysphagia severity, by VFSS, showed non-penetration and aspiration (PAS level 1) had the most frequent severity of symptoms (51.67%). Penetrations (PAS level 2-5) were secondary presented (40%), and conversely, aspirations (PAS level 6-8) were rarely presented; with only 5 cases (8.33%). Furthermore, additional residue was observed that located at the base of the tongue, valleculae, and pyriform sinuses. This residue was most common in the non-penetration and aspiration group: approximately 50% (Figure 2).

According to dysphagia severity, they were divided into 2 groups consisting of a non-penetration and aspiration (npasp) and penetration and aspiration (pasp) group. The comparison of each subscale of MDADI-TH between the 2 groups showed statistically significant association with the mean total score, emotional subscale, and functional subscale: 8.69 for total score, 12.11 for emotional subscale, and 10.93 for functional subscale. In contrast, no significant association, with $p>0.05$, was demonstrated with global or physical subscales. The correlation between the severity groups and mean score of the MDADI-TH subscales is shown in Table 5.

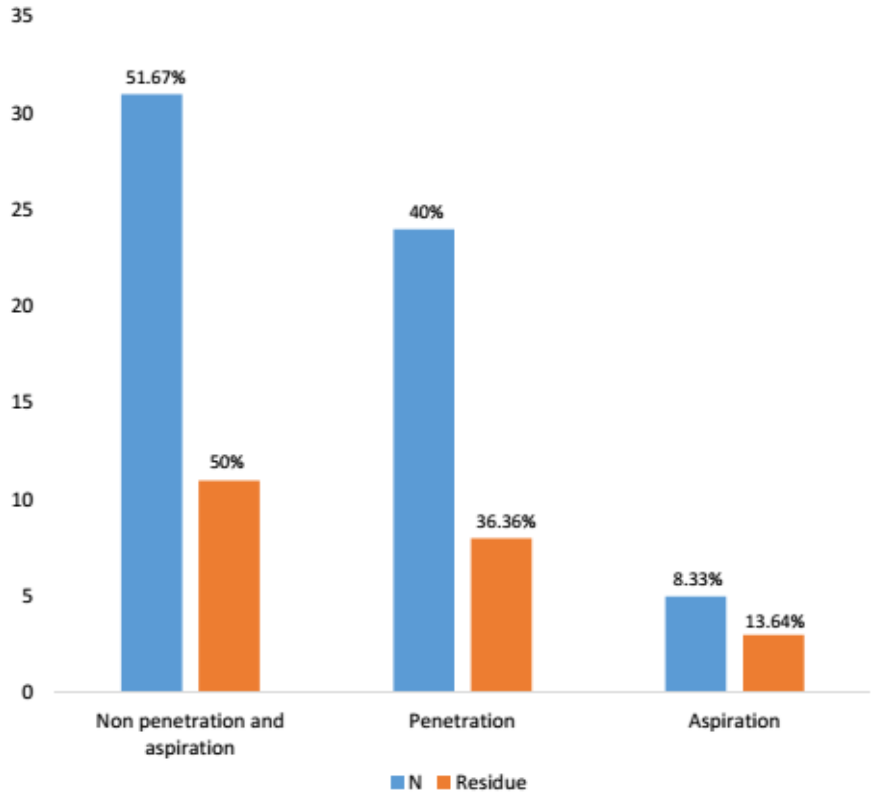


Figure 2. *Characterization of the results of VFSS for the presence of dysphagia severity and residue.*

Table 5 Correlation between the MDADI-TH subscales and dysphagia severity groups (N=60).

MDADI-TH Subscale	Mean (SD)		Range of scores		Mean diff (95% CI)	*p*-value
	Non pasp group[a]	Pasp group[b]	Non pasp group[a]	Pasp group[b]		
Global	46.45 (27.99)	38.62 (19.22)	80 (20-100)	60 (20-80)	7.83 (-4.66, 20.32)	0.21
Emotional	**64.41(20.35)**	**52.30 (18.54)**	**70 (26.7-96.7)**	**66.70 (23.3-90)**	**12.11 (2.03, 22.19)**	**0.02***
Functional	**59.48 (20.78)**	**48.55 (16.06)**	**72 (28-100)**	**60 (20-80)**	**10.93 (1.29, 20.58)**	**0.03***
Physical	54.03 (13.07)	49.31 (11.02)	47.5 (35-82.5)	50 (32.5-82.5)	4.72 (-1.55, 10.99)	0.14
Total score	**58.77 (15.90)**	**49.97 (12.51)**	**54.7 (35.8-90.5)**	**46.3 (31.6-77.9)**	**8.69 (1.25, 16.13)**	**0.02***

Note: *Non pasp group: non-penetration and aspiration group, Pasp group: penetration and aspiration group, *p<0.05, [a]N: 31, [b]N: 29.*

Discussion

The purpose of this study was to translate and validate the MDADI into Thai, and subsequently to verify reliability and correlation between QoL and dysphagia severity in HNC patients. The MDADI was translated into the Thai language by the cross-cultural process recommendation for translation and validation. According to the process, some questions of the MDADI-TH questionnaire were modified in a semantic proposition, to be explicitly and simply comprehension as well as suitable for the evaluators; but they retained the same meaning as compared with the original MDADI. This was in accordance to the semantic equivalence principle[21]; wherein, the difficulty of translation of grammatical structure, and vocabulary differences between the two languages may have to be modified, or replaced by a similar item. This was to reflect the same meaning with the source language and based on the same concept as the original measurement objective as well. Nevertheless, we found differences of semantic equivalence in E7 item. Therefore, the scoring of E7 item should be carefully considered when applying this in clinical practice.

The reliability of the MDADI-TH was satisfactory. The internal consistency reliability was established by Cronbach's α coefficient, with the value of Cronbach's α coefficient ranging from 0 to 1. The value approached closer to 1 as the questions within domain have greater internal consistency reliability.[26] In general, the minimum acceptable value of internal consistency is 0.7, suggesting that the questions within the domains are measuring via the same underlying concept.[24] In this study, Cronbach's α coefficient was within the optimum range (range from 0.71-0.94). As a result, the MDADI-TH demonstrated good internal consistency reliability.

Test-retest reliability was computed by comparing mean scores of each subscale between test-retest, stability coefficient and the intra-class correlation coefficient (ICC). Mean differences between test-retest demonstrated no difference of the MDADI-TH subscale scores; indicating that the MDADI -TH has consistent measuring. Stability coefficient was investigated by the correlation of subscale scores between test-retest. This relationship revealed a high correlation (range from 0.78-0.99); indicating that the MDADI-TH has great stability. Likewise, the relative reliability revealed the true ICC values as greater than 0.75 (range from 0.86-0.99). Considering a 95% confidence interval of estimated ICC values, these values were greater than 0.75 as well indicating good reliability. Hence, the MDAD-TH questionnaire is a precise measurement.

Considering the dysphagia severity, as related to HNC patient's QoL, it was expected that patients who present with worse airway invasion (penetration and aspiration) on VFSS will have an increased chance of reduced QoL. In this study, the results of comparison between the MDADI-TH subscale scores and dysphagia severity were significant in total scores, as demonstrated by HNC patients who had ineffective swallowing, causing penetration and aspiration. These presented as having a lesser QoL than those without penetration or aspiration. These results may indicate that patients with more severity of dysphagia showed obvious compromise on their QoL. Similar to previous studies,[27, 28] patients with severe dysphagia have a worse quality of life, compared to those without dysphagia or less severe dysphagia. Patients with moderate to severe dysphagia have worse QoL than those with mild dysphagia, or those without dysphagia.[12]

According to Timmerman *et al*.,[17] which shows the conceptual model of the possible impact of dysphagia on general health and QoL, supports our findings that an aspiration which is considered a significant symptom sign of dysphagia, leads to an inefficient or inability to eat and drink as a consequence of dehydration, malnutrition and aspiration pneumonia. Patients suffering from aspiration may have increased anxiety during their mealtimes and lose self-satisfaction, which causes a lack of willingness to eat and avoidance of eating with other people, this in turn may lead to weight loss and nutrition deficiency. Moreover, increasing aspiration severity is thought to decrease the patient's weight. These consequences limit the ability to perform daily activities resulting in diminished patient's

life quality.[9, 13]

Furthermore, the results obviously revealed that HNC patients who had more severe dysphagia had diminished QoL, especially in the emotional and functional subscales. These findings are rather like the study of Meyer *et al*.[29], wherein it was found that more severe dysphagia affects the ability to perform daily activities; especially the normalcy of diet and eating in public. However, other related studies found that the severity of dysphagia affects QoL in the physical subscale as well.[27, 28] In this study, we found not only aspiration, but also residue is one of the significant symptom signs of dysphagia.[29] HNC patients who were enrolled in the study also complained about food sticking, which corresponded to VFSS results showing that residue was found at the base of the tongue, valleculae and pyriform sinuses. When such residue occurs, the patient will have to make an effort of swallowing or gagging to get rid of said residue; reflecting impaired swallowing function.[30-32] In addition, the residue is also a risk factor that may lead to a post swallowing aspiration influence on efficient and safe swallowing.[30] Due to this fact, residue is another factor that affects QoL. Residue was mostly found in patients without penetration or aspiration, so it may be possible that residue may affect QoL in the physical subscale. As a result, QoL in this subscale of patients in both groups, were not different due to the residue reflecting the impairment of swallowing function as well as aspiration. Therefore, more severe dysphagia may affect QoL on both emotional functional and physical subscales.

In addition to aspiration and residue factors influencing QoL, there are other factors that also affect the QoL of patients. A feeding tube is one of the factors that strongly affect QoL.[34, 35] The presence of the feeding tube has negatively affected the patient's QoL. Also, it restricted their daily and social activities, which impact on emotional and functional subscales.[35] In this study, the presence of the feeding tube was mostly found. The main feeding via NG or PEG alone is most frequent, which was mostly found in the patients presenting with penetration and aspiration. Feeding tube dependence decreases the use of swallowing muscles causing disused atrophy of pharyngeal muscles and possibly increases the risk of formation stricture of muscles, which diminished the patient's QoL.[36, 37] Thus, this may possibly be a contributing factor that made HNC patients with penetration and aspiration has more deteriorated QoL than those without penetration and aspiration. Radiotherapy and/or chemotherapy treatments and tracheostomy are secondary factors that also significantly affect QoL.[34,35] Radiotherapy and/or chemotherapy treatments cause a complication that affects the patient's ability to perform activities of daily living, especially xerostomia, which is a complication caused by radiotherapy. It has an effect on swallowing efficiency, resulting in a worse QoL related to the limitation of the functional domain.[38, 39] Our study founded that the vast majority of HNC patients were treated with radiotherapy, either alone or combined with other treatments. This was a contributing factor that may possibly worsen QoL in the patient with penetration and aspiration. These was another a contributing factor, namely tracheostomy, that may possibly worsen QoL in the patient with penetration and aspiration. HNC patients who underwent the tracheotomy have limitation in social and daily activities that impact on emotional and functional subscales.[35] In our study, we founded that the tracheostomy was seen in the patients with penetration and aspiration that might diminish QoL. Thus, the patients with penetration and aspiration have lesser QoL than those without penetration and aspiration. These factors could contribute to the diminishing QoL in the patients who present penetration and aspiration, particularly in emotional and functional subscales.

Limitation

Several limitations were presented in our study. Firstly, the construct validity could not be established by discrimination between the groups of subjects. We expected to discriminate between the groups by comparing the MDADI-TH scores between patients, with grouping in different severity of clinical stage; but it was limited in characteristics of subjects. Thus, further research would be needed to establish the construct validity of the MDADI-TH with a proper method. Second, the concurrent validity could not be established, due to the lack of another Thai version of a dysphagia-specific QoL instrument. Third, the sample size was too small for the correlation study. We expected to divide the subjects into 3 groups, following PAS, consisting of a non-penetration and aspiration group, a penetration group, and an aspiration group, but the aspiration group was rarely present. Therefore, a large sample size would be required for further studies. Fourth, the residue is also a significant factor influencing QoL as is described, and hereby further research is warranted to inspect the residue in a correlation study. Fifth, scoring of the E7 item in the MDADI-TH should be considered carefully, because inequivalent in semantic proposition was found.

Conclusion

The MDADI-TH is a useful dysphagia-specific QoL instrument in clinical practice, for Thai HNC patients to evaluate QoL influenced by dysphagia symptoms. Patients with more severity of dysphagia showed compromise on their quality of life, especially in the emotional and functional domains.

Conflicts of interests

The authors declare that they have no conflict of interest.

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แบบสอบถามกลืนลำบาก The M.D. Anderson Dysphagia Inventory ฉบับภาษาไทย (MDADI-TH)

แบบสอบถามฉบับนี้สอบถามความเห็นเกี่ยวกับความสามารถในการกลืนของท่าน ข้อมูลที่ได้จะช่วยให้เราเข้าใจว่าท่านรู้สึกอย่างไรเกี่ยวกับการกลืน
ข้อความต่อไปนี้ทำขึ้นโดยผู้ที่มีปัญหาเกี่ยวกับการกลืน บางข้อความอาจใช้ได้กับท่าน
กรุณาอ่านข้อความแต่ละข้อและวงกลมรอบคำตอบที่สะท้อนถึงประสบการณ์ที่ตรงที่สุดของท่านในสัปดาห์ที่ผ่านมา

** โดยจะใช้คำสรรพนามว่า " ข้าพเจ้า " แทนตัวท่านตั้งแต่ข้อแรกจนถึงข้อสุดท้าย **

G. ความสามารถในการกลืนของข้าพเจ้าได้จำกัดกิจวัตรประจำวันของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

E2. ข้าพเจ้ารู้สึกอายในพฤติกรรมการกินอาหารของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

F1. คนอื่นมีความลำบากในการทำอาหารให้ข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P2. การกลืนจะลำบากมากขึ้นในช่วงท้ายของวัน

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

E7. ข้าพเจ้า **ไม่รู้สึก** กังวลใจเมื่อกินอาหาร

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

E4. ข้าพเจ้ารู้สึกแย่ในปัญหาการกลืนของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P6. ข้าพเจ้าต้องใช้ความพยายามอย่างมากในการกลืน

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

E5. ข้าพเจ้าไม่ออกไปข้างนอกเนื่องจากปัญหาการกลืน

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

F5. การกลืนลำบากของข้าพเจ้าทำให้สูญเสียรายได้

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P7. ข้าพเจ้าใช้เวลานานขึ้นในการกินอาหารเนื่องจากปัญหาการกลืน

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P3. คนอื่นถามข้าพเจ้าว่า "ทำไมไม่สามารถกินสิ่งนั้น"

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

E3. คนอื่นมักหงุดหงิดเกี่ยวกับปัญหาการกินอาหารของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P8. ข้าพเจ้าไอเมื่อพยายามดื่มของเหลว

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

F3. ปัญหาการกลืน**จำกัด**การเข้าสังคมและชีวิตส่วนตัวของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

F2. ข้าพเจ้า **รู้สึกสบายใจ** ที่จะออกไปกินอาหารกับเพื่อน เพื่อนบ้าน และญาติ

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P5. ข้าพเจ้าจำกัดการกินอาหารเนื่องจากการกลืนลำบาก

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P1. ข้าพเจ้าไม่สามารถรักษาน้ำหนักตัวไว้ได้เนื่องจากปัญหาการกลืนของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

E6. ข้าพเจ้ารู้สึกด้อยค่าเนื่องจากปัญหาการกลืนของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

P4. ข้าพเจ้ารู้สึกว่ากำลังกลืนอาหารได้ทีละมากๆ

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

F4. ข้าพเจ้ารู้สึกแปลกแยกเนื่องจากพฤติกรรมการกินอาหารของข้าพเจ้า

เห็นด้วยอย่างยิ่ง เห็นด้วย ไม่มีความเห็น ไม่เห็นด้วย ไม่เห็นด้วยอย่างยิ่ง

ขอขอบคุณสำหรับการตอบแบบสอบถามนี้

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