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Dysphagia training for speech-language pathologists: Implications for clinical practice

RAHAYU MUSTAFFA KAMAL[1,2], ELIZABETH WARD[1,3], and PETREA CORNWELL[4,5]

1. The University of Queensland, Queensland, Australia
2. The National University of Malaysia, Kuala Lumpur, Malaysia
3. Centre for Functioning & Health Research, Queensland Health, Queensland, Australia
4. Metro North Health Service District, Queensland Health, Queensland, Australia
5. Griffith University, Queensland, Australia

Correspondence: Rahayu Mustaffa Kamal, School of Rehabilitation Sciences (Speech Sciences), Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur, Malaysia. E-mail: nisayu@yahoo.com.

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Running head: Dysphagia training: Implications for practice

Abstract

There are competency standards available in countries with established speech-language pathology services to guide basic dysphagia training with ongoing workplace mentoring for advanced skills development. Such training processes however are not as well established in countries where speech-language pathology training and practice is relatively new such as Malaysia. The current study examines the extent of dysphagia training and workplace support available to speech-language pathologists (SLPs) in Malaysia and Queensland, Australia, and explores clinicians' perceptions of the training and support provided, and of their knowledge, skills and confidence. Using a matched cohort cross-sectional design, a purpose built survey was administered to 30 SLPs working in Malaysian government hospitals and 30 SLPs working in Queensland Health settings in Australia. Malaysian clinicians were found to have received significantly less university training, less mentoring in the workplace and were lacking key infrastructure needed to support professional development in dysphagia management. Over 90% of Queensland clinicians were confident and felt they had adequate skills in dysphagia management, in contrast, significantly lower levels of knowledge, skills and confidence were observed in the Malaysian cohort. The findings identify a need for improved university training and increased opportunities for workplace mentoring, training and support for Malaysian SLPs.

Introduction

Ensuring healthcare providers have adequate levels of training and skill is fundamental to them undertaking their clinical responsibilities and providing quality services (Yolsal, Karabey, Bulut, Topuzoglu, Agkoc, Onoglu, et al., 2004). Training begins at a pre-vocational level for most health professions, including speech-language pathologists (SLPs), with university-based courses that provide undergraduates the basic skills required to commence clinical practice. In the case of SLPs, many professional associations across the world have developed guidelines that stipulate the pre-requisite skills required upon graduation from university (American Speech-Language-Hearing Association [ASHA], 2002; Canadian Association of Speech-Language Pathologists and Audiologists [CASLPA], 2007; Royal College of Speech and Language Therapists [RCSLT], 2003; Speech Pathology Australia, 2001). Some of the guidelines specify the number of hours of training required (e.g., a minimum of one semester course and 10 hours of supervised clinical practice is required by CASLPA (2007) for SLPs to practice in Canada), whilst others outline minimum levels of knowledge and skill across key areas of the profession (e.g., ASHA, 2007; College of Audiologists and Speech-Language Pathologists of Ontario [CASLPO], 2007). These guidelines also stipulate the importance of combining both theoretical and practical learning in prevocational or undergraduate training in order to ensure acquisition and consolidation of clinical knowledge and skills.

Further development of vocation specific knowledge and skills once in the workplace is also recognized as an important, ongoing process supporting clinical learning and skills development (Golding & Gray, 2006; Health Professions Council, 2006; Jasper, 2006). Generally referred to as *professional development*, there are multiple options available to healthcare providers to continue to enhance professional competence or learn new knowledge and skills, including but not limited to: reading current literature, attending workshops, seminars and conferences, and undertaking professional mentoring or supervision (Golding & Gray, 2006; Jasper, 2006). The importance of ongoing professional development to healthcare providers is widely acknowledged and in many cases is a mandated requirement for registration (ASHA, 2010; Health Professions Council, 2006; RCSLT, 2011). Research has shown that professional development activities conducted in areas of advanced or specialist skills (e.g., reproductive health for doctors) can have a positive impact on patient care (Yolsal et al., 2004). Conversely, inadequate skill and a lack of training has been documented to have a negative impact on treatment outcomes (Meriweather, 2006). Studies specific to the speech-language pathology profession also support that vocation specific training has a positive impact on the acquisition of knowledge and skills (Kaplan & Dreyer, 1974; Ullrich, Wollbrück, Danker, & Singer, 2011).

Providing clinicians with the opportunity to undertake quality undergraduate training followed by ongoing postgraduate training once in the workforce is therefore important for ensuring a skilled, competent and confident workforce. However, while guidelines regarding training and practice standards may be quite overtly stated in countries with established speech-language pathology services, such as Australia (Speech Pathology Australia, 2001), USA (ASHA, 2007) and the UK (RCSLT, 2003; 2005; 2011), it is unclear what training and ongoing professional development opportunities are available for SLPs working in countries with less developed speech-language pathology services and training infrastructure. Malaysia is one such country where the field of speech-language pathology is still in its infancy with the necessity to hold a university degree to practice as an SLP in Malaysia introduced as recently as 1994. A recent survey of Malaysian clinicians reported that the majority lacked confidence in managing patients with dysphagia (a swallowing impairment), and the authors proposed that this was influenced by limited undergraduate clinical training in this area

(Sharma, Harun, Mustaffa Kamal, & Noerdin, 2006). The study authors also called for more clinical training to be made available for Malaysian clinicians. Unfortunately, the research did not elucidate exactly what and how much clinical training and education, ongoing professional development, and workplace support for training was available to the clinicians. It also did not state clearly the method involved in measuring clinicians' levels of training and confidence, or if it was in fact the clinicians' perceptions that they had received inadequate training and/or support. Thus there is a need for further systematic examination of the levels of training and workplace support provided to SLPs in Malaysia in the area of dysphagia management and the clinicians' perceptions of their clinical skills.

Dysphagia management is recognized to be a primary responsibility of SLPs in most clinical settings such as in the United States (ASHA, 2001), United Kingdom (RCSLT, 2009), and Canada (CASLPA, 2001). It is a highly prevalent condition impacting anywhere up to 60% of patients within acute care clinical services (Mann, Hankey, & Cameron, 1999; Morgan, Ward, Murdoch, Kennedy, & Murison, 2003). Poor or inadequate management of dysphagia can have significant negative consequences for a patient's health, quality of life and contribute to increased length of hospital stay (Doggett, Tappe, Mitchell, Chapell, Coates, & Turkelson, 2001; Finestone, Greene-Finestone, Wilson, & Teasell, 1995). Hence it is critical that the professionals managing this condition are adequately trained and confident to perform the clinical skills required to provide best patient care.

In light of the preliminary evidence indicating that Malaysian clinicians lack confidence and clinical training in managing dysphagia (Sharma et al., 2006), it was the aim of the current study to examine the training and ongoing professional development opportunities available for SLPs in Malaysia. Furthermore the study aimed to identify clinicians' perceptions of the adequacy of this training, as well as their perceived knowledge, skills and confidence managing patients with dysphagia. In order to determine how the training, support and perceptions of the Malaysian clinicians align with the experiences and perceptions of clinicians practicing elsewhere, the information obtained from the Malaysian clinicians will be compared with data obtained from clinicians working in Queensland Health settings, Australia; a country with established dysphagia services (Armstrong, 2003).

Methodology

Participants

All SLPs who managed dysphagia and worked full time in government hospitals throughout Malaysia were suitable for inclusion. Government hospitals in Malaysia that employed SLPs were general hospitals that cater for both adult and paediatric populations, and provide acute inpatient services and outpatient rehabilitation. A total of 43 SLPs from 27 hospitals were identified as potential participants and sent the questionnaire by post during the data collection period between February to May of 2009. Due to the fact that the training programs within Malaysia for SLPs began as recently as 1995, the potential cohort was limited to clinicians with less than 11 years clinical experience at the time of the study.

A total of 31 Malaysian SLPs responded to the survey; however, one person's data was later excluded as they reported they did not manage people with dysphagia. Valid and complete data was thus obtained from only 30 clinicians, representing a response rate of 69.8%. The study then recruited a cohort of SLPs who managed people with dysphagia and were working full time in Queensland public health settings that provided acute and/or rehabilitation services. Over 100 questionnaires were distributed to Queensland clinicians and data collection continued until a cohort of 30 surveys were received from SLPs who both met

this inclusion criteria and matched the Malaysian cohort in terms of years of clinical practice. Participants were not matched by caseload due to fundamental inherent differences in clinical caseloads and practice patterns between the two cohorts. Clinicians from Queensland, Australia were chosen as a comparison cohort as the country has been recognized to have established dysphagia services (Armstrong, 2003) with guidelines for undergraduate training and preparation for clinical practice in dysphagia management (Speech Pathology Australia, 2004). Recruitment of Queensland clinicians took place between June 2009 and June 2010. All participants provided informed consent. The study received ethical clearances from both the Medical Research Ethics Committee (MREC), Ministry of Health in Malaysia, and the Behavioural and Social Sciences Ethical Review Committee (BSSERC), The University of Queensland, Australia.

The demographics of the two cohorts have been reported elsewhere (Mustaffa Kamal, Ward, & Cornwell, in press) in a companion study conducted with this same cohort. In summary, the data revealed the majority of respondents had between one to six years work experience (Malaysian n=19, 63.3%; Queensland n=18, 60.0%), with no clinician having greater than 10 years experience. Respondents in both groups held entry level degrees (Malaysian: Bachelor degree=30; Queensland: Bachelor degree=24, Masters Coursework degree=6) which was obtained in their country of practice, and completed between 2002 and 2008 (Note: in Australian Universities a Masters Coursework degree is offered as an alternate entry, initial pre-registration program into the speech-language pathology profession). All Malaysian respondents managed a mixed adult and paediatric caseload, with the majority of them worked mainly with paediatric cases. The majority (98%) of Queensland clinicians managed a purely adult caseload.

Questionnaire

The questionnaire used in the current study was developed through modifications and adaptations of available published surveys and guidelines in the area of speech-language pathology (Bateman, Leslie, & Drinnan, 2007; Martino, Pron, & Diamant, 2004; Mathers-Schmidt & Kurlinski, 2003; O'Donoghue & Dean-Claytor, 2008; Pettigrew & O'Toole, 2007; Speech Pathology Australia, 2004; Ward, Jones, Solley, & Cornwell, 2007). Prior to distribution, clarity and content of the questionnaire was validated by a group of Malaysian and Australian SLPs. The timing for completing the survey was also examined prior to distribution. Despite the large number of questions, many were simple forced choice responses and hence the full questionnaire took no more than 10-15 minutes to complete. The total questionnaire contained 56 items and was designed for two purposes: (a) to explore the current practices of dysphagia management by SLPs in Malaysia, and (b) to identify the training and workplace support received by the clinicians and their perceptions of their training, support, confidence, knowledge and skills. The current study reports on only the items related to the second objective. The results of the other questions have been reported elsewhere (Mustaffa Kamal et al., in press). Items in the current study included 24 questions relating to demographic data, formal education, on-the-job training, workplace support, and perceptions of the training, confidence, knowledge and skills in managing dysphagia (see Supplemental Appendix). Questions included a mixture of forced and multiple choice answers, and exploration of opinions to 10 statements e.g., "I feel confident managing patients with dysphagia" (table 1) rated using a five-point Likert scale, where 1=strongly disagree, 3=neutral, and 5=strongly agree.

Data Analysis

Descriptive and inferential statistics were used for analysis. The original five-point rating scales used in the survey were simplified into three categories 1=disagree (combination of strongly disagree and disagree), 2=uncertain (neutral) and 3=agree (combination of agree and strongly agree) prior to further analysis. Chi-square tests were used to compare data between the Malaysian and Queensland cohorts. A conservative alpha of $p<0.01$ was adopted to reduce the potential for Type II error due to multiple comparisons (Shearer, 1982) and values which were >0.01 but <0.05 were interpreted as trends.

Results

Training

Twenty-nine (96.7%) of the Malaysian and 100% of the Queensland clinicians indicated that they had a course in dysphagia as part of their university academic curriculum; however, the average number of hours of training in the Malaysian cohort (mean (M)=10.1, SD=1.3) was significantly lower (χ^2=31.4, $p<0.001$), at less than one fourth of that received by the Queensland clinicians (M=42.1, SD=1.8) (figure 1). All Malaysian clinicians received their training through their undergraduate training program. In Queensland, training was either received through their undergraduate Bachelors or postgraduate Masters Coursework programs. The number of Malaysian clinicians who experienced clinical observations and/or clinical placements involving dysphagia management was also significantly lower (Malaysian n=10, Queensland n=29; χ^2=25.4, $p<0.001$).

[**insert figure 1 here**]

Comparison of on-the-job training opportunities revealed that a significantly (χ^2=8.3, p=0.004) lower proportion (n=12, 40.0%) of Malaysian SLPs had received supervision/ mentoring related to dysphagia management and for significantly shorter periods of time (χ^2=15.6, p=0.001) prior to undertaking independent practice in a clinical setting. Average duration of Malaysian mentoring was nine hours (SD=1.3); however, it was noted that seven had received more than 20 hours of supervision. In comparison in the Queensland cohort, 76.7% (n=23) received supervision/mentoring with the average duration being 12.7 hours (SD=1.0).

There was no significant difference in the proportion of clinicians who had attended workshops/courses on dysphagia management in either group (Malaysian n=26, 86.7%; Queensland n=29, 96.7%; χ^2=2.0, p=0.16), the number of courses attended (Malaysian M=5.0, SD=0.4; Queensland M=5.4, SD=1.1; χ^2=3.2, p=0.36) nor in duration spent attending courses (Malaysian 9.6 hours, Queensland 9.9 hours; χ^2=1.9, p=0.38). In the Malaysian cohort they attended workshops/ seminars held both nationally (n=26, 86.7%) and internationally (n=3, 10.0%) similar to those in the Queensland cohort (n=29, 96.7%; n=3, 10.0%; respectively).

Support

There was a trend (χ^2=4.3, p=0.04) for the number of Malaysian SLPs who received workplace support for professional development activities in dysphagia management (n=26, 86.7%) to be lower than in Queensland (n=30, 100%). Of the 26 Malaysian clinicians who indicated they received support, 16 (53.3%) indicated that their workplace supported them in

organizing seminars/workshops and provided sponsorship/funding to assist program development relevant to dysphagia management, 27.0% (n=9) participated in group discussion/consultation and 34.6% (n=9) were provided mentoring opportunities. All 26 Malaysian SLPs who attended workshops/seminars in dysphagia management received funding from their employer/workplace to attend with only three also using some personal funds. This was a significantly different (χ^2=20.7, p<0.001) pattern to the Queensland cohort, where the majority (n=21, 72.4%) of clinicians reported using their own savings in addition to some funding from their workplace (n=24, 82.8%) and private agencies (n=2, 6.9%).

Regarding workplace resources/facilities available to support ongoing professional development, there was no significant difference (χ^2=0.4, p=0.55) in the proportion of Malaysian (n=28, 93.3%) and Queensland (n=29, 96.7%) clinicians who had access to the internet/email. However, access to journals (n=8, 26.7%), dysphagia support/research groups (n=2, 6.7%), or video/teleconferencing facilities (n=0) were not available in most Malaysian hospital settings. In comparison the majority (n=28, 93.3%; p<0.001) of Queensland SLPs reported having access to these services/resources in their facility to use for professional development.

Perception of Adequacy of Training, Support and Skills

The perceptions of the Malaysian and Queensland clinicians regarding training, support, confidence and knowledge differed significantly across all questionnaire items (table 1) with greater concerns regarding adequacy of training, knowledge and skills raised by the Malaysian clinicians. Malaysian SLPs perceived they did not receive adequate formal education to develop sufficient skills in managing the disorder and only half felt that on-the-job training they received had assisted them in establishing their clinical skills. Only half had access to support from other clinicians though they did not feel these clinicians were experts. Confidence was also significantly lower. All questions relating to perceived knowledge and skills for elements of dysphagia management revealed around two thirds of the Malaysian clinicians were either uncertain or did not feel they had the knowledge and skills required to conduct dysphagia management. In comparison two thirds of the Queensland cohort felt their undergraduate training prepared them well while over 90.0% felt their on-the-job training had assisted skill development. Over 90.0% felt supported, confident and perceived they had the adequate knowledge and skills to manage dysphagia.

[**insert table 1 here**]

At the end of the survey, all Malaysian clinicians and 90.0% (n=24) of the Queensland clinicians indicated that they would like to have further workshops for training/support in dysphagia management. The majority of Malaysian respondents also indicated a desire to undertake clinical observations (n=27, 90.0%; Queensland n=14, 46.7%) and join a supportive network of clinicians working in dysphagia (n=25, 83.3%; Queensland n=11, 36.7%).

Discussion

Overall the data revealed the large majority of the Queensland clinicians felt their training and workplace support prepared and supported them to undertake dysphagia management. The large majority was confident and all felt they had adequate knowledge and skills to perform the tasks they needed for dysphagia management. The contrasting pattern of results

obtained from the Malaysian cohort, however, highlights a workforce who may benefit from enhanced undergraduate training and workplace support. Although it is acknowledged that a number of factors impact on clinicians' perceptions of their skills and confidence in clinical practice, the deficits in training and workplace support available to Malaysian clinicians identified by the current data are potential contributing factors which can be addressed.

The amount of undergraduate academic and clinical training in relation to dysphagia management for SLPs in Malaysia was found to be well below that of the Queensland graduates, and this training was perceived by these clinicians as inadequate preparation for their clinical practice. This finding verifies the concerns raised previously by Sharma and colleagues (2006) regarding the inadequacy of Malaysian undergraduate training in dysphagia management. Both professional practice guidelines (e.g., CASLPA, 2007) and recognized experts in this field (Logemann, 1997) suggest that at least one semester in undergraduate training should be allocated to formal education on dysphagia. The average of just 10 hours of training in dysphagia reported by the Malaysian SLPs, compared to the 42 hours received by the Queensland clinicians suggests that the amount of knowledge acquired is likely to be limited given the extent of content that could be covered. This finding, that Malaysian clinicians received less training in their undergraduate program than clinicians in other countries, appears not to be unique to dysphagia management. Inadequate training at the undergraduate level in Malaysia has also been suggested to exist for other area of speech-language pathology, specifically in the management of children with developmental disabilities (Joginder Singh, Iacono, & Gray, 2011).

Whilst the current study has identified that limited hours in dysphagia training are offered to clinicians within Malaysia, it is important to note that the current investigation did not examine the nature of the specific training provided to clinicians. Hence exactly what content or skills were taught, or how these are taught within the Malaysian program are currently unknown. In order to further develop university training programs within Malaysia, it is important that in the future there is consideration of both the proportion of time dedicated to undergraduate training in dysphagia and the quality and nature of that training.

It was also of concern to note that the current data revealed that Malaysian clinicians lacked practical/clinical training during their formal education. Effective clinical training is recognized as central to developing critical thinking and problem-solving skills among healthcare providers (O'Connor, 2008). The Queensland SLPs reported receiving an average of 13 hours of clinical dysphagia training which falls in line with training recommended in the practice guideline of the Canada Association (CASLPA, 2007), which recommend at least a minimum of 10 clinical hours of supervised dysphagia practicum prior to graduation. Such minimum standards however were not met the large majority of clinicians in Malaysia.

The low levels of academic and clinical training received by the Malaysian clinicians highlight areas of university training deficit which are potentially contributing to the clinicians' perceptions of reduced skills, confidence and preparedness. It is possible that the low hours of academic and clinical training provided to the Malaysian clinicians may be a reflection of the limited numbers of academic staff and clinicians available to run and support the university training program. In light of such challenges, it is important that Malaysia and other countries developing formal training courses consider how their undergraduate curriculum can be both designed and delivered to ensure graduating clinicians achieve entry-level skills comparable with standards set in other countries.

Issues were also identified in the current study with on-the-job training and support. Again the experiences of the Malaysian SLPs were inconsistent with recommendations made by other professional bodies regarding the need for mentored clinical support (RCSLT, 2003, Speech Pathology Australia, 2001) with less than half of clinicians having received mentoring prior to providing independent dysphagia management. Mentoring sees

experienced clinicians transfer knowledge, experience and skills to less experienced clinicians so as to guide them consolidate relevant clinical skills (Bozeman & Feeney, 2007). It is a form of training that provides support within actual clinical conditions, helping clinicians to gain confidence in carrying out duties and adapting to the working environment (Oxley, Fleming, Golding, & Pask, 2003).

While one-to-one clinical supervision by more experienced clinicians is considered beneficial for clinical learning (Dibben & James, 1998), reasons why the Malaysian clinicians lacked mentoring opportunities appear due to a limited number of experienced SLPs in the country available to provide expert mentoring and support. With only 43 clinicians currently employed across the 27 Malaysian government hospitals, many work in small departments of only one to three clinicians (Joginder Singh et al., 2011), all of whom currently have less than 10 years clinical experience. The current data confirmed that only half of the clinicians felt they had other SLPs they could access for support, and then very few felt they had expert clinical support available. This was vastly different from the responses of the Queensland clinicians who all indicated they had access to mentors and clinical support from other clinicians.

It is quite possible that the lack of mentors and workplace support is a factor influencing the perceived confidence of the Malaysian clinicians. The majority of the Malaysian cohort was quite junior in their clinical experience, as a direct consequence of graduate training commencing only in 1995 in the country. Furthermore most Malaysian clinicians managed large, mixed adult-paediatric caseload. This type of caseload, by nature, requires them to be competent across a wide range of clinical skill areas. In this type of environment the ability to have access to expert support across a range of clinical skills and services becomes even more important. Hence, in addition to considering ways to improve training opportunities for Malaysian clinicians, the current data also highlight a need for strategies to help manage mentoring and support of the clinicians. Until the workforce develops and becomes more experienced, a possible initial solution may be to encourage clinicians to seek mentoring from international colleagues via emails and/or teleconferencing. Promoting contact with those Malaysian clinicians who are confident and experienced and are willing to mentor clinicians across a number of clinical settings may also assist in the short term.

It is possible that the awareness of their university training deficits and lack of clinical mentors available locally, as well as the low levels of confidence and perceived skills in managing dysphagia may have been the reason why most Malaysian SLPs have attended a number of seminars/workshops on dysphagia management. Professional guidelines and policies on dysphagia management note that basic skills and knowledge acquired during the formal education should be continuously updated and developed throughout the SLPs' clinical career (ASHA, 2010; RCSLT, 2003; Speech Pathology Australia, 2001). Hence the high commitment to seeking sources to improve knowledge and skills in this area is a positive finding for both cohorts.

Questions relating to workplace infrastructure available to support ongoing training and professional development however revealed that the Malaysian clinicians have reduced facilities available compared to the Queensland cohort. Even though the number of SLPs who received funding to attend seminars/workshops in dysphagia management was high, clinicians reported that the amount of funding received was insufficient (Mustaffa Kamal, Ward, & Cornwell, 2009). Lack of other critical resources such as access to journals, support groups, and video/teleconference may also be possible factors contributing to limited opportunity for self directed professional development among the clinicians. This data highlights a need for Malaysian clinicians to seek further support from their employer to improve access to facilities and resources critical to facilitating ongoing professional learning and networking.

Conclusion

It is expected that SLPs who manage dysphagia have adequate knowledge and skills to perform swallowing assessment and treatment procedures (ASHA, 2007; Logemann, 1997). However, the current data indicate that the majority of Malaysian clinicians surveyed do not feel capable of meeting this expectation. In light of the significantly greater levels of training and workplace support reported by the Queensland clinicians and their high levels of perceived confidence and skills, the current data would suggest that the reduced training and workplace infrastructure available for clinicians in Malaysia may both be factors contributing to the low confidence and perceived skills reported. Taking into account that speech-language pathology services are still in their infancy in Malaysia, data from the current study can be used as a guide by local universities to address future training program development. Implementation of strategies which enhance workplace mentoring, facilitate ongoing professional development activities, and improve infrastructure such as internet for access to online journals and formation of clinical support groups will also be beneficial.

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TABLE

Table 1. Perceptions of SLPs in Malaysia (n=30) and Queensland (n=30) regarding their training, support, knowledge, skills and confidence in managing people with dysphagia

Statement	Malaysia			Queensland			Chi-square	*p*
	Disagree	Uncertain	Agree	Disagree	Uncertain	Agree		
Formal education that I received provides sufficient skills for me to manage patient with dysphagia	22 (73.4%)	7 (23.3%)	1 (3.3%)	0	11 (36.7%)	19 (63.3%)	39.089	**<0.001**
*On-the-job training received has assisted in establishing my skills in managing dysphagia	3 (10.3%)	11 (38.0%)	15 (51.7%)	0	1 (3.3%)	29 (96.7%)	15.776	**<0.001**
I have the ability to access support from other SLPs	3 (10.0%)	12 (40.0%)	15 (50.0%)	0	0	30 (100%)	20.000	**<0.001**
**I have expert clinical support within my multidisciplinary team	12 (42.9%)	13 (46.4%)	3 (10.7%)	2 (6.7%)	7 (23.3%)	21 (70.0%)	22.401	**<0.001**
I feel confident managing patient with dysphagia	5 (16.7%)	21 (70.0%)	4 (13.3%)	0	2 (6.7%)	28 (93.3%)	38.696	**<0.001**
I have adequate knowledge and skills to complete a clinical swallowing examinations	11 (36.7%)	13 (43.3%)	6 (20.0%)	0	0	30 (100%)	40.000	**<0.001**
I have adequate knowledge and skills to diagnose dysphagia	6 (20.0%)	14 (46.7%)	10 (33.3%)	0	0	30 (100%)	30.000	**<0.001**
I have adequate knowledge and skills to appropriately plan for swallowing treatment	6 (20.0%)	16 (53.3%)	8 (26.7%)	0	0	30 (100%)	34.737	**<0.001**
I have adequate knowledge and skills to monitor treatment outcomes	6 (20.0%)	15 (50.0%)	9 (30.0%)	0	0	30 (100%)	32.308	**<0.001**
I have adequate knowledge and skills to educate patients, caretakers and other professionals about dysphagia	4 (13.3%)	15 (50.0%)	11 (36.7%)	0	0	30 (100%)	27.805	**<0.001**

Note: SLPs – speech-language pathologists, **Bold** - significant difference ($p<0.01$), * - one missing Malaysian data, ** - two missing Malaysian data.

Figure

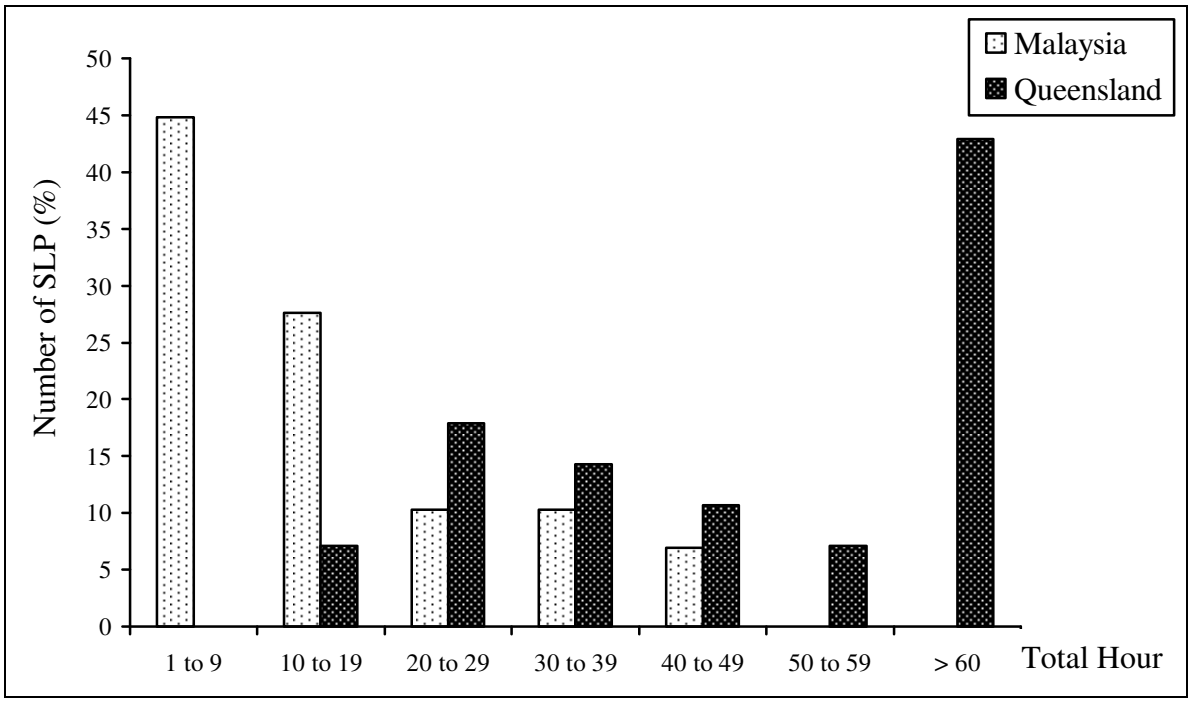

Figure 1. Total hour of formal training (theoretical and practical) in dysphagia received by both the Malaysian (n=29) and Queensland (n=28, two missing data) cohorts.

SUPPLEMENTAL APPENDIX

QUESTIONNAIRE

Part A: Demographic Data

1. How many years have you been practising speech-language pathology?
   A. < 1 year B. 1-3 years C. 4-6 years
   D. 7-9 years E. 10-12 years F. ≥ 13 years

2. How many years have you been working in a hospital setting?
   A. < 1 year B. 1-3 years C. 4-6 years
   D. 7-9 years E. 10-12 years F. ≥ 13 years

Part B: Formal Education

1. What is your highest degree in speech-language pathology?
   A. Bachelor B. Master C. Doctorate (PhD)

2. Where did you undertake your degree(s) in Speech-Language Pathology?
   (*Please tick (✓) all relevant options that apply to you*)
   A. In Malaysia B. In Australia C. Other country

3. What year did you graduate from the program that granted your highest degree in speech-language pathology?
   A. Before 1996 B. 1996-1998 C. 1999-2001
   D. 2002-2004 E. 2005-2008

4. (i) Did you have a course (theoretical and/or practical) in dysphagia as part of your academic curriculum?
   Yes ☐ No ☐

   (ii) Approximately how many hours in total were dedicated specifically to theoretical and/or practical learning about dysphagia?
   A. 0-9 B. 10-19 C. 20-29
   D. 30-39 E. 40-49 F. 50-59
   G. > 60

   (iii) During your formal dysphagia education, which different types of learning experience did you have? (*Tick all relevant options*)
   A. Lecture/tutorial/demonstration
   B. Clinical observation as a student clinician
   C. Clinical practice as a student clinician
   D. Others (specify) _____

Part C: On-the-Job Training

1. (i) Has your district, state or country held seminars/workshops on swallowing disorders?
   Yes ☐ No ☐ (*if no, go to Question 2*)

   (ii) Have you attended any?
   Yes ☐ No ☐

2. Have you ever attended seminars/workshops on swallowing disorders held in other countries?
   Yes ☐ No ☐

3. (i) How many seminars/workshops on swallowing disorders have you attended since working in a government hospital?
   A. None (*go to Question 4*) B. 1-5 C. 6-10
   D. 11-15 E. 16-20 F. > 20

   (ii) Approximately how many hours of training (theoretical and/or practical) have you received through seminars/workshops?
   A. None B. 1-9 hours C. 10-19 hours D. > 20 hours

   (iii) Where did you get funding to attend these seminars/workshops? (*Tick all relevant options*)
   A. Employer/workplace B. Private agencies
   C. Own savings D. Other (specify) _____

4. (i) Does your workplace support professional development specifically in dysphagia?
   Yes ☐ No ☐ (*if no, go to Question 5*)

   (ii) In what way does your workplace show its support? (*Tick all relevant options*)
   A. Organizing seminars/workshops/conferences
   B. Promoting group discussion/consultation
   C. Providing sponsorship/funding to assist your program development
   D. Providing opportunities for mentoring
   E. Others (specify): _____

5. (i) Did you receive any supervision/mentoring of swallowing management sessions prior to beginning independent practice in your clinical setting?
   Yes ☐ No ☐ (*if no, go to Question 6*)

   (ii) How many hours of supervision/mentoring session have you received?
   A. 1-9 hours B. 10-19 hours C. > 20 hours

6. What resources/facilities are available in your workplace to support continuous professional development in dysphagia management? (*Tick all relevant options*)
   A. Internet access/email B. Access to journals
   C. Support/research groups D. Videoconference/teleconference
   E. Others (specify) _____

Part G: Skills in Managing Dysphagia

Please circle ONE relevant option for each statement below.	*Not Applicable*	*Strongly Disagree*	*Disagree*	*Somewhat Agree*	*Agree*	*Strongly Agree*
1. I believe the formal education that I received provides sufficient skills for me to manage patients with dysphagia.	0	1	2	3	4	5
2. I found that on-the-job training received has assisted in establishing my skills in managing dysphagia.	0	1	2	3	4	5
3. I feel that I have the ability to access support from other speech-language pathologist.	0	1	2	3	4	5
4. I feel that I have expert clinical support within my multidisciplinary team for the management of patients with dysphagia.	0	1	2	3	4	5
5. I feel confident managing patients with dysphagia.	0	1	2	3	4	5
6. I have adequate knowledge and skills to complete a clinical swallowing examination.	0	1	2	3	4	5
7. I have adequate knowledge and skills to diagnose dysphagia.	0	1	2	3	4	5
8. I have adequate knowledge and skills to appropriately plan for swallowing treatment.	0	1	2	3	4	5
9. I have adequate knowledge and skills to monitor treatment outcomes.	0	1	2	3	4	5
10. I have adequate knowledge and skills to educate patients, caretakers and other professionals about dysphagia.	0	1	2	3	4	5

11. I would like further training/support in dysphagia management.
Yes ☐ No ☐

12. Options for training I would like to participate in are (*Tick all relevant options)*
Workshops/further training ☐
Opportunity to undertake clinical observations ☐
Join supportive network of clinicians working in dysphagia ☐
Others (specify): _____ ☐