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Clinical characteristics of dysphagia-related quality of life questionnaires

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Abstract

Dysphagia can interfere with quality of life (QOL) in several aspects. The broad goal of this study was to carry out a review of questionnaires assessing oropharyngeal dysphagia-related QOL that were used in both patients with neurological and oncological disorders. The specific goals were: 1) to evaluate the utility for clinical practice in terms of: readability, number of items, domains and sub-domains, type of scale, scoring procedures, cut-off point, burden (time to complete the questionnaire), administration mode, and adaptation into other languages; 2) to describe the populations in which the questionnaires were used. The literature search was carried out using the electronic databases PUBMED, SCOPUS, and SCIELO. All available papers up to June 2015 were included. The studies were chosen according to selected MESH terms, and from those published in English, French, Spanish, and Portuguese. Of the available publications, 136 studies were included, and they used five questionnaires: SWAL-QOL, Deglutition Handicap Index, Dysphagia Handicap Index, EAT-10, and MDADI. These data are a comprehensive resource that provides researchers and clinicians with clinical information about the use of five questionnaires, which are specific for the assessment of oropharyngeal dysphagia-related quality of life.

Keywords: deglutition disorder, dysphagia, quality of life

Características clínicas de los cuestionarios de calidad de vida en las disfagias

Resumen

La disfagia puede interferir de muchas maneras en la calidad de vida. El objetivo de este estudio fue llevar a cabo una revisión de cuestionarios que evalúan la calidad de vida en personas con disfagia que han sido usados tanto en pacientes neurológicos como en pacientes oncológicos. Los objetivos específicos fueron 1) evaluar su utilidad clínica en términos de claridad, número de ítems, dominios y subdominios, tipos de escala, procedimientos de puntuación, tiempo de compleción del cuestionario, modo de administración y adaptación a otras lenguas 2) describir las poblaciones en las cuales se emplean estos cuestionarios. La búsqueda bibliográfica se llevó a cabo en las bases PUBMED, SCOPUS y SCIELO. Se incluyeron todos los artículos disponibles hasta junio de 2015. Los artículos se escogieron de acuerdo a los criterios MESH y publicados en francés, inglés, portugués o español. Un total de 136

estudios fueron incluidos en los cuales se emplearon cinco cuestionarios: SWAL-QOL, Deglutition Handicap Index, Dysphagia Handicap Index, EAT-10, and MDADI. Los datos ofrecen una fuente comprehensiva de información clínica acerca del uso de los cinco cuestionarios que son específicos para la evaluación de la calidad de vida en los pacientes con disfagia orofaríngea.

Palabras clave: Calidad de vida; Disfagia; Trastornos de la deglución.

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Introduction

Dysphagia causes limitations or restrictions on activity and participation (Threats, 2007), and can lead to functional limitations and major complications, interfering with QOL in several aspects: emotional, physical and sociocultural (Chen et al., 2001; McHorney, Bricker, Robbins, Kramer, Rosenbek & Chignell, 2000). It is associated with more serious complications such as malnutrition, dehydration and pneumonia, and should therefore be the primary treatment target (Ekberg, Hamdy, Woisard, Wuttge-Hanning, & Ortega, 2002; Martino, Foley, Bhogal, Diamant, Speechley & Teasell, 2005). Currently, investigation on swallowing disorders has been more focused on physiological measures, through biomechanical pathophysiological studies (McHorney et al., 2000b). However, physiology is not the same as QOL and the disorder can also be measured including functioning, well-being, and satisfaction (McHorney et al., 2000b). QOL questionnaires could be used, either generic or specifically targeted to a disease or a symptom. The assessment of oropharyngeal dysphagia-related QOL allows for the understanding of the human experience of living with the disorder, and for interpretation of the users' perception in the various stages of treatment (McHorney et al., 2000b).

The appraisal of the usefulness of QOL measures for clinical practice is still lacking (Ojo, Genden, Teng, Milbury, Misiukiewicz & Badr, 2012), in spite of the great amount of research in this field.

The published reviews focus on the psychometric characteristics of dysphagia-related QOL and mostly on neurological patients (Keage, Delatycki, Corben, & Vogel, 2015; Ojo et al., 2012; Speyer, Cordier, Kertscher, & Heijnen, 2014; Timmerman,

Speyer, Heijnen, & Klijn-Zwijnenberg, 2014). Therefore, the broad goal of this review was to provide clinicians with information on the clinical characteristics, and use of questionnaires that assess oropharyngeal dysphagia-related QOL applied on both patients with neurological and oncological disorders. The specific goals were: 1) to evaluate the utility for clinical practice in terms of: readability, number of items, domains and sub-domains, type of scale, scoring procedures, cut-off point, burden, administration mode, and adaptation into other languages; 2) to describe the populations in which the questionnaires were used.

Method

For this review a careful search was carried out in the databases of PUBMED, SCOPUS, and SCIELO. One person performed the search and the selection of papers, using the following inclusion criteria: 1) published until June 2015, inclusively; 2) published in English, French, Spanish, and Portuguese; 3) full version available; 4) studies that use QOL questionnaires specific for oropharyngeal dysphagia; 5) self-administration mode; 6) instruments that can be used on both neurological and oncological patients.

The following query was developed: ("quality of life"[MeSH Terms] OR ("quality"[All Fields] AND "life"[All Fields]) OR "quality of life"[All Fields]) AND ("questionnaires"[MeSH Terms] OR "questionnaires"[All Fields] OR "questionnaire"[All Fields]) AND ("deglutition disorders"[MeSH Terms] OR ("deglutition"[All Fields] AND "disorders"[All Fields]) OR "deglutition disorders"[All Fields]). Initially, items were analysed by title and abstract.

The following data were extracted: author, year, readability (a measure of the difficulty experienced by people reading a text, calculated based on the count of polysyllabic words; scores above 13 indicate the need for college education or higher (McLaughlin, 1969)), number of items, domains and sub-domains, type of scale, scoring, cut-off point, burden (time to complete the questionnaire), administration mode, and adaptation into other languages. From the papers retrieved, description of the populations in which the questionnaires were used was also collected.

Results

From the 770 identified papers, 679 were excluded, and the full version of 91 papers was extracted and examined. Of those, 22 were excluded because they were either specific for head and neck cancer patients, generic QOL, oral health, and QOL reported by caregivers. The 69 selected papers were examined in their full version. After checking their references, four more were included, for a total of 73 papers that meet our inclusion criteria. After identifying the questionnaires that came up, for further broadening of the review the name of each one was searched individually, and 64 more papers were included, for a total of 137 papers that were analysed in this review. The decision process and the reasons for exclusion/inclusion of papers are represented in figure 1.

Therefore, 136 studies using five questionnaires have been included in this review: SWAL-QOL (Quality-of-life outcomes tool for dysphagia); Deglutition Handicap Index; EAT-10 (Eating Assessment Tool); Dysphagia Handicap Index; MDADI (M. D. Anderson Dysphagia Inventory). The clinical characteristics of the questionnaires and their use are described in this paper, and summarized in the appendix.

SWAL-QOL – Quality-of-life outcomes tool for dysphagia

SWAL-QOL is a questionnaire that measures specific symptoms, and the severity of oropharyngeal dysphagia. It is a 44-item tool with three domains (general QOL, dysphagia-related QOL, and symptoms) and 10 sub-domains. The answer scales are on a 5-point Likert system, and the scores should be linearly transformed to a 0-to-100 metric, with a lower score indicating less QOL (table 1). There are also three other questions regarding enteral feeding, and the consistencies of liquids and of solids (Langmore, 2000; McHorney et al., 2002).

For the original version in English, cut-off points were established (Rinkel, Verdonck-de Leeuw, Langendijk, van Reij, Aaronson, & Leemans, 2009; Rinkel et al., 2014). SWAL-QOL is translated and validated into Dutch (Bogaardt, Speyer, Baijens, & Fokkens, 2009; Lemmens, Bours, Limburg, & Beurskens, 2013; Vanderwegen, Van Nuffelen, & De Bodt, 2013), European Portuguese (Antunes, Vieira, & Dinis-Ribeiro,

2015), Brazilian Portuguese (Montoni, Horta, Bandeira, & Angelis, 2009; Portas, 2009), French (Khaldoun, Woisard, & Verin, 2009), Chinese (Lam & Lai, 2011), Swedish (Finizia, Rudberg, Bergqvist, & Ryden, 2012), and Spanish (Zaldibar-Barinaga, Miranda-Artieda, Zaldibar-Barinaga, Pinedo-Otaola, Erazo-Presser, & Tejada-Ezquerro, 2013). SWAL-QOL was used in 39 published papers in various areas: oncogenic disorders (Barros, Portas, & Queija, 2007; Costa Bandeira, Azevedo, Vartanian, Nishimoto, Kowalski, & Carrara-de Angelis, 2008; de Campos, Palma, & Leite, 2013; Genden et al., 2003; Kraaijenga, Oskam, van der Molen, Hamming-Vrieze, Hilgers, & van den Brekel, 2015; Lango et al., 2014; Lovell, Wong, Loh, Ngo, & Wilson, 2005; Pernambuco et al., 2012; Pinchot, Youngwirth, Rajamanickam, Schaefer, Sippel, & Chen, 2012; Portas et al., 2009; Queija, Portas, Dedivitis, Lehn, & Barros, 2009; Rinkel, Verdonck-de Leeuw, de Bree, Aaronson, & Leemans, 2015; Roe, Leslie, & Drinnan, 2007; Silveira, Dedivitis, Queija, & Nascimento, 2015; Thomas, Jones, Tandon, Katre, Lowe, & Rogers, 2008; Yan, Lin, Chen, & Ye, 2012; Zheng, Liu, Li, Zhang, Ge, Sun, & Tian, 2014), neurogenic disorders (Carneiro Coriolano, Belo, Marcos, Asano, & Lins, 2014; da Costa Franceschini & Mourao, 2015; Evatt et al., 2009; Heijnen, Speyer, Baijens, & Bogaardt, 2012; Leow, Huckabee, Anderson, & Beckert, 2010; Menezes, 2011; Paris et al., 2013; Plowman-Prine et al., 2009; Verin et al., 2011; Xia et al., 2011), cervical spine surgeries (Fengbin, Xinwei, Haisong, Yu, Xiaowei, & Deyu, 2013; Lu, Tumialan, & Chou, 2013; Siska, Ponnappan, Hohl, Lee, & Kang, 2011; Siska, Ponnappan, Hohl, Lee, Kang, & Donaldson, 2011), and other specific aetiologies (Carlaw et al., 2012; Cassol, Galli, Zamberlan, & Dassie-Leite, 2012; Clayburgh, Milczuk, Gorsek, Sinden, Bowman, & MacArthur, 2011; Greenblatt, Sippel, Leverson, Frydman, Schaefer, & Chen, 2009; Kraaijenga, van der Molen, Stuiver, Teertstra, Hilgers, & van den Brekel, 2015; McKinstry, Tranter, & Sweeney, 2010; Sabaretnam et al., 2012; Schindler et al., 2014). It can be used to monitor the effectiveness of rehabilitation in the patient's point of view, and is sensitive to the swallowing of healthy versus dysphagic individuals (Langmore, 2000; McHorney et al., 2002). It discriminates them by aetiology, by degree of dysphagia, and by the possible topographic region of the disorder (Langmore, 2000; McHorney et al., 2002).

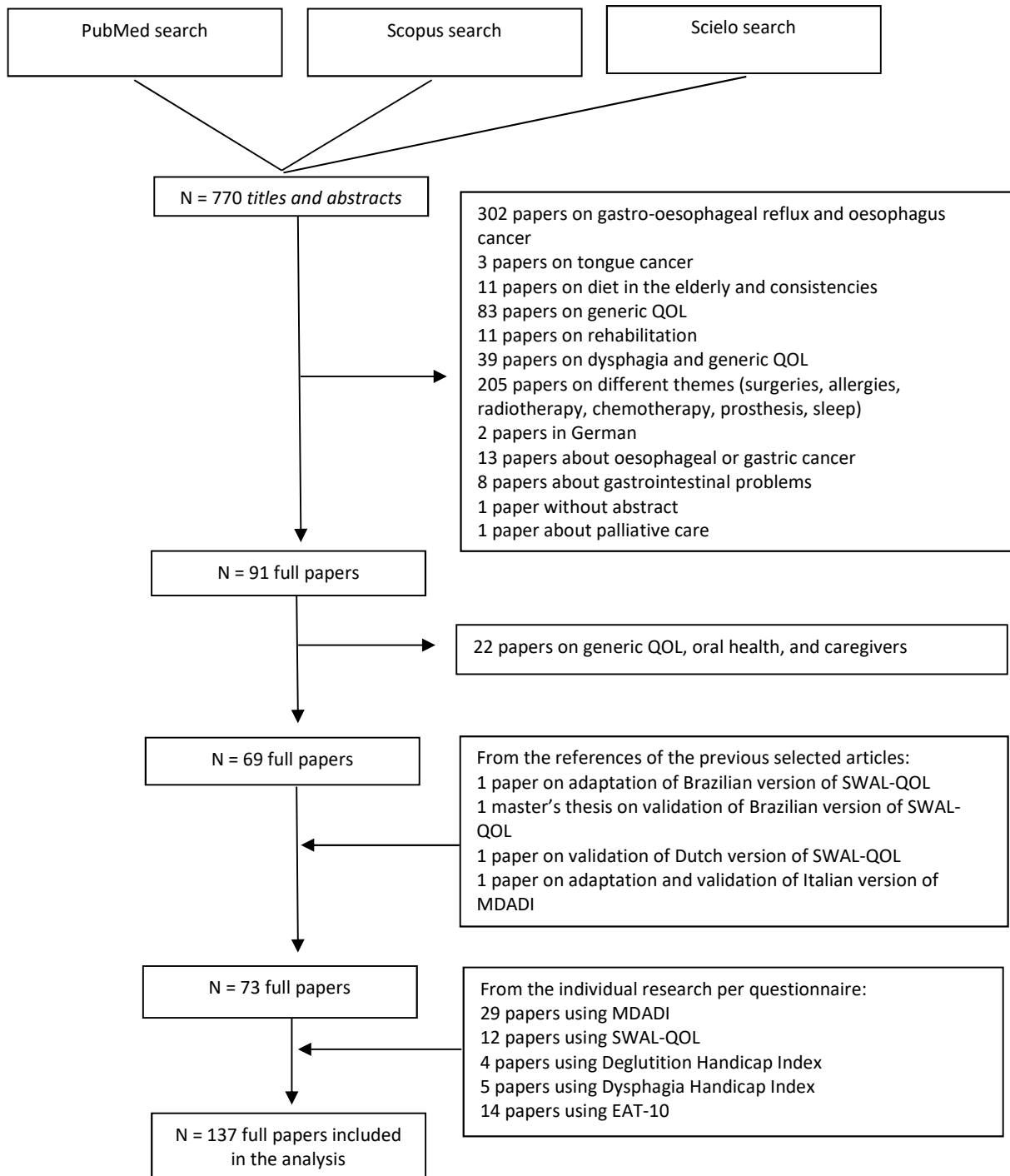


Figure 1. Literature search flow diagram: first stage.

Deglutition handicap index

Deglutition Handicap Index is a self-administered questionnaire to assess oropharyngeal dysphagia in adults. It is composed of 30 items divided into three domains with 10 items each: physical, functional, and emotional. Answers vary from 0 to 4 on a Likert-type scale. Maximum handicap is represented by a total of 120 points, with a lower score indicating higher QOL (Woisard, Andrieux, & Puech, 2006). For French patients with neurological and oncological disorders, it has content, concurrent, and construct validity (Woisard et al., 2006), temporal reliability (Woisard & Lepage, 2010), and sensibility to change (Crestani, Moerman, & Woisard, 2011; Woisard & Lepage, 2010). The Dutch version of this questionnaire has validity and reliability for oncological patients (Speyer et al., 2011).

There are four studies that use Deglutition Handicap Index as the main assessment instrument. One study has shown that it is a good complementary tool for the functional evaluation of swallowing because it includes three subdomains: physical, functional, and emotional (Lauret, Garnier, Borel, Tessier, Sauvignet, & Crevier-Buchman, 2012). Other studies have used it on post-stroke oropharyngeal dysphagia (Verin & Leroi, 2009), and on cricopharyngeal dysfunction (Bachy, Matar, Remacle, Jamart, & Lawson, 2013); (Woisard-Bassols, Alshehri, & Simonetta-Moreau, 2013).

EAT-10 - Eating Assessment Tool

EAT-10 can be completed in less than two minutes and a result greater than or equal to three is an indicator of change in oropharyngeal dysphagia-related QOL. There are neither sub-scales nor visual scales to measure; therefore no formula is needed to calculate the final result. Clinicians merely add the results of each item, with a high result indicating a high self-perception of oropharyngeal dysphagia (Belafsky et al., 2008). EAT-10 has been adapted from English (the original language) (Belafsky et al., 2008) into Brazilian Portuguese (Gonçalves, Remaili, & Behlau, 2013), Italian (Schindler et al., 2013), European Portuguese (Nogueira, Ferreira, Reis, & Lopes, 2015), and

Spanish (Burgos et al., 2015). The EAT-10 scale, by its simplicity and limited number of questions, could be proposed as a screening test in neurological patients, and in the geriatric population (Lauret et al., 2012).

There are 10 studies with EAT-10. It was used to study the prevalence oropharyngeal dysphagia (Argente Pla et al., 2014; Galán, Santander Vaquero, Cortazar Saez, de la Morena Lopez, Susi Garcia, & Martinez Rincon Mdel, 2014; Kertscher, Speyer, Fong, Georgiou, & Smith, 2015), for screening of aspiration risk (Cheney, Siddiqui, Litts, Kuhn, & Belafsky, 2015), and for clinical evaluation (Abdel-Aziz, Azab, Rashed, & Talaat, 2014; Belafsky, Plowman, Mehdizadeh, Cates, Domer, & Yen, 2013; Hans et al., 2013; Kelly, Koszewski, Jaradeh, Merati, Blumin, & Bock, 2013; Lazarus et al., 2014; Rofes, Arreola, Mukherjee, & Clave, 2014).

Dysphagia Handicap index

Dysphagia Handicap Index assesses the handicapping effects of oropharyngeal dysphagia. It is a patient-reported outcomes tool, with 25 items subdivided into emotional, physical, and functional domains. The answer scales are on a 3 and 7-point Likert system. A lower score indicates lower QOL. It is easy for most populations since it uses concrete statements supplied from patient complaints, and is easy to use in daily practice for measuring the effects of oropharyngeal dysphagia-related QOL in individuals with a variety of medical diagnoses affecting swallowing (Silbergleit, Schultz, Jacobson, Beardsley, & Johnson, 2012a). Regarding cultural and linguistic adaptation, it should be noted that Dysphagia Handicap Index exists in English (its original language) (Silbergleit, 2012a), in Arabic (Farahat, Malki, Mesallam, Bukhari, & Alharethy, 2014), and in Persian (Asadollahpour, Baghban, & Asadi, 2015). It was used in post-stroke dysphagic patients (Gallas, Marie, Leroi, & Verin, 2010), endoscopic thyroidectomy (Chung et al., 2015), and in Parkinson's disease (Silbergleit, et al., 2012b).

MDADI - M. D. Anderson Dysphagia Inventory

MDADI aims to verify measures of oropharyngeal dysphagia-related QOL in patients with oncological disorders (Chen et al., 2001) or neurological disorders (Carlsson, Ryden, Rudberg, Bove, Bergquist, & Finizia, 2012) through four domains: global, emotional, functional, and physical. It consists of 20 items, with a five point Likert scale. One of the items is a general question that is quoted individually. A high score represents better functioning in day-to-day and better QOL (Chen et al., 2001). MDADI is translated and validated from its original language (English) into Dutch (Speyer et al., 2011), Italian (Schindler, Borghi, Tiddia, Ginocchio, Felisati, & Ottaviani, 2008), Swedish (Carlsson et al., 2012), Korean (Kwon, Kim, Park, Oh, & Han, 2013), and Brazilian Portuguese (Guedes, Angelis, Chen, Kowalski, & Vartanian, 2013).

MDADI was used in 38 published papers in various areas, as described next. It was widely used within the field of oncology (Alicandri-Ciufelli et al., 2013; Barata, de Carvalho, Carrara-de Angelis, de Faria, & Kowalski, 2013; Browne, Butler, & Rees, 2011; Cartmill, Cornwell, Ward, Davidson, & Porceddu, 2012; Chan, Lua, Starmer, Sun, Rosenblatt, & Gourin, 2011; de Almeida, Park, Villanueva, Miles, Teng, & Genden, 2014; Dingle, Mishoe, Nguyen, Overton, & Gillespie, 2013; Dwivedi et al., 2012; Gillespie, Brodsky, Day, Lee, & Martin-Harris, 2004; Hans et al., 2013; Hutcheson, Yuk, Holsinger, Gunn, & Lewin, 2015; Iseli, Kulbersh, Iseli, Carroll, Rosenthal, & Magnuson, 2009; Jepsen, Gurushanthaiah, Roy, Smith, Gray, & Davis, 2003; Junior, Angelis, & Lima, 2015; Kazi et al., 2008; Khan, Patterson, Owen, Rees, Gamberini, & Paleri, 2015; Levendag et al., 2007; Lin, Starmer, & Gourin, 2012; Molteni et al., 2009; More et al., 2013; Nichols et al., 2013; O'Hara, Cosway, Muirhead, Leonard, Goff, & Patterson, 2014; Oozeer, Corsar, Glore, Penney, Patterson, & Paleri, 2011; Peretti, Piazza, Cattaneo, De Benedetto, Martin, & Nicolai, 2006; Peretti et al., 2013; Robertson, Yeo, Dunnet, Young, & Mackenzie, 2012; Roe, Drinnan, Carding, Harrington, & Nutting, 2014; Shinn et al., 2013; Teguh et al., 2008a; Teguh et al., 2008b; Yang et al., 2015). It was also applied as a screening tool (Zuydam, Ghazali, Lowe, Skelly, & Rogers, 2013), and in other areas such as: after cerebellopontine angle surgery (Starmer et al., 2014), in Zenker's diverticulum (Skaug, Geirdal, & Brondbo, 2013), in sleep apnoea (Eesa,

Montevecchi, Hendawy, D'Agostino, Meccariello, & Vicini, 2015), in Parkinson's disease (Heijnen et al., 2012).

Discussion

There are several methods for the assessment of oropharyngeal dysphagia (Langmore, Schatz, & Olsen, 1988; Logemann, 1993; Logemann, Veis, & Colangelo, 1999; Rosenbek, Robbins, Roecker, Coyle, & Wood, 1996). The construction of specific instruments that assess the impact of oropharyngeal dysphagia in QOL is important for understanding the self-perception of the patients. This is a key step for swallowing treatment programmes, since health professionals can organize a more specific and individual intervention plan (Bandeira, 2004).

Considering the patients' perspective, self-administration is possible for all the questionnaires, and *SWAL-QOL* can also be completed by interview. Readability scores above 13 indicate the need for college education or higher (McLaughlin, 1969), and all the tools described here have scores below this. *Dysphagia Handicap Index* has the lowest readability score of eight, which indicates that it is the one that causes less difficulty in its reading, and is more accessible to individuals with lower levels of literacy. *MDADI* has the highest readability score, of 12. English is the original version of *SWAL-QOL* (McHorney et al., 2000b; McHorney, Martin-Harris, Robbins, & Rosenbek, 2006; McHorney et al., 2002), *EAT-10* (Belafsky et al., 2008), *Dysphagia Handicap Index* (Silbergleit, Schultz, et al., 2012), and *MDADI* (Chen et al., 2001). The original language of *Deglutition Handicap Index* is French (Woisard et al., 2006). The languages into which the tools have been adapted are summarized in table 1.

Only *SWAL-QOL* and *EAT-10* have reported cut-off points (table 1) (Belafsky et al., 2008; McHorney et al., 2002). The scoring of *SWAL-QOL* requires a step of transforming the Likert scale into a 0-to-100 metric scale, which is time consuming (McHorney et al., 2002). *EAT-10* is easy to score since no formula is needed (Belafsky et al., 2008). *MDADI* has direct scoring but it has two questions where the numerical scale runs in the opposite direction that have to be reversed (Chen et al., 2001). *Deglutition Handicap Index* has a direct scoring (Woisard et al., 2006). *Dysphagia*

Handicap Index also has a direct scoring system but the Likert scale with just three levels, could be insufficient for representing the real impact of symptoms in daily activities (Silbergleit, Schultz, et al., 2012).

SWAL-QOL is the most detailed tool; therefore it is the longest with 44 items and more sub-domains than all the others, and with the highest burden (14 minutes on average to complete) (McHorney et al., 2002). *EAT-10* is suitable as a screening tool because it is the shortest tool with only ten items, and an estimated time of two minutes or less for completion (Belafsky et al., 2008), and it is simple in use and classification. Due to its characteristics it assists clinicians in the decision on whether a patient needs treatment, and in monitoring the rehabilitation process concerning symptom severity and treatment efficacy. *EAT-10* has normative data available (Belafsky et al., 2008), however data on sensibility is still necessary.

Deglutition Handicap Index has the same structure as Voice Handicap Index, but is directed to specific oropharyngeal dysphagia symptoms and its consequences (Woisard et al., 2006). This is one more example of a tool of simple and quick administration, which could also be used in screening or in combination with another one.

Dysphagia Handicap Index assesses the psychosocial impact of the oropharyngeal dysphagia, distinguishing between dysphagic and non-dysphagic patients, and the discrimination of the severity of the oropharyngeal dysphagia makes it a good tool to be used not only as a measure of interventions' outcomes, but also in research as a variable to classify participants (Silbergleit et al., 2012a). McHorney et al. (McHorney et al., 2000a; McHorney et al., 2000b; McHorney et al., 2006; McHorney et al., 2002) consider *SWAL-QOL* to be the only questionnaire that comprehensively assesses oropharyngeal dysphagia regardless of aetiology. It also allows the assessment of QOL in relation with the location of the disorder, and the monitoring of therapy progression. Since it differentiates dysphagic from normal swallowing individuals, it could be a good choice for clinical practice and research. In spite of having more questions than the others, this has not stood out as a handicap in the published papers. *MDADI* can collect vast information related to the impact of

oropharyngeal dysphagia in QOL, despite having fewer domains than SWAL-QOL. MDADI is able to detect differences according to site of, pathological findings of, and time elapsed since last treatment of the primary head and neck tumour (Chen et al., 2001).

SWAL-QOL was used with different populations, in several research centres, and there are so far 39 published papers in oncogenic disorders, neurogenic disorders, cervical spine surgeries, and other specific aetiologies. *Deglutition Handicap Index* was tested in research with patients with stroke and with cricopharyngeal dysfunction. *EAT-10* was applied to diverse populations within neurological and oncological disorders, and to the geriatric population. *Dysphagia Handicap Index* assessed post-stroke dysphagic patients, thyroidectomy patients, and individuals with Parkinson's disease. *MDADI* was conceived initially for patients with head and neck cancer, and was later tested in neurological disorders, cerebellopontine angle surgery, Zenker's diverticulum, and sleep apnoea.

In conclusion, all the questionnaires are suitable for assessing QOL. According to the paradigm of utility of these questionnaires for research versus clinical practice versus patients, it is important to consider the time spent with assessment, which is largely dependent on the caseload of the clinician. When choosing a tool, consideration should be given to the goal of the assessment. If the professional is making a bedside assessment, a simpler and quicker instrument such as *EAT-10*, *Dysphagia Handicap Index*, or *Deglutition Handicap Index* would be more appropriate. For cancer patients *MDADI* could be more suitable because it is the population with whom it has been used more frequently. *SWAL-QOL* provides a very comprehensive assessment and it allows the gathering of information on specific topics under specific themes/domains, which the other tools do not.

Quantifiable measures of dysphagia-related QOL outcomes as reflected by patients themselves should be emphasized, instead of an exclusive focus on the clinical goals of therapy for swallowing disorders. The data presented in this paper are a comprehensive resource that provides researchers and clinicians with information

about five questionnaires, which are specific for the assessment of oropharyngeal dysphagia-related QOL, in both patients with neurological and oncological disorders.

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Appendix. Clinical characteristics of the questionnaires.

Questionnaire criteria	SWAL-QOL	Deglutition Handicap Index	EAT-10	Dysphagia Handicap Index	MDADI
Readability	10	11	10	8	12
Number of items	44	30	10	25	20
Domains (sub-domains)	<ul style="list-style-type: none"> - General QOL / global <i>(sleep and fatigue)</i> - QOL related to dysphagia <i>(selection of food, burden, mental health, social functioning, fear, duration of feeding, desire to eat, communication)</i> - Symptoms <i>(pharyngeal, oral, saliva)</i> 	<ul style="list-style-type: none"> - Physical <i>(symptoms)</i> - Functional <i>(nutrition and respiratory sequel)</i> - Emotional <i>(psychosocial sequel)</i> 	<ul style="list-style-type: none"> - Symptoms 	<ul style="list-style-type: none"> - Emotional - Functional - Physical 	<ul style="list-style-type: none"> - Global - Emotional - Functional - Physical
Type of scale	Mixed: 5 point Likert scale; Yes-no, 5 response answer categories	5 point Likert scale	5 point Likert scale	3 and 7 point Likert scale	5 point Likert scale

Scoring	Global score Subscales score 0 (no problem)-100 (problem)	Global score Subscales scores 0 (no problem)-120 (problem)	Global score 0 (no problem)-40 (problem)	Global score Subscales scores 0 (problem)-100 (no problem)	Global score Subscale scores 0 (problem)-100 (no problem)
Cut-off point	≥14 points indicates problem (oncogenic disorders)	Not reported	0-2 normal 3-40 swallow problem	Not reported	Not reported
Burden (min.)	14	30	2	Not reported	10
Administration mode	Interview Self-administration	Self-administration	Self-administration	Self-administration	Self-administration
Languages available	English + Dutch, European Portuguese, Brazilian Portuguese, French, Chinese, Swedish	French + Dutch	English + Brazilian Portuguese, Italian, European Portuguese, Spanish	English + Arabic + Persian	English + Dutch, Italian, Swedish, Korean, Brazilian Portuguese
