Qualifications, professional roles and service practices of nurses, occupational therapists and speech-language pathologists in the management of adults with oropharyngeal dysphagia: a Nordic survey

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RESEARCH ARTICLE

Qualifications, professional roles and service practices of nurses, occupational therapists and speech-language pathologists in the management of adults with oropharyngeal dysphagia: a Nordic survey

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ABSTRACT

Purpose: To identify the qualifications, professional roles and service practices of nurses, occupational therapists (OTs) and speech-language pathologists (SLPs) in the management of adults with oropharyngeal dysphagia (OD) in the Nordic countries.

Methods: A web-based survey was developed that consisted of 50 questions on respondent demographics, education, experience, roles and service practices provided for adults with OD. The survey was distributed to practicing nurses, OTs, and SLPs in five Nordic countries via professional associations, social media, online networks and snowballing.

Results: Data from 396 nurses, OTs and SLPs whom provided services for adults with OD revealed that the majority of respondents worked in acute care and inpatient rehabilitation facilities. Most respondents had minimal undergraduate education and practical clinical training in OD. Notable variances in roles and service practices in OD between professions and countries were found. OTs were the primary service provider for OD management in Denmark, while SLPs had this role in the other Nordic countries. Nurses were mainly involved in screening and some compensatory treatments in most Nordic countries. Limited use of evidence-based screening, non-instrumental or instrumental clinical assessments and rehabilitative therapeutic methods was evident.

Conclusions: Study results highlight challenges in education and training of professionals responsible for the management of adults with OD in the Nordic countries. Increased use of evidence-based assessment and exercise-based treatments to improve swallowing are warranted. Adherence to European and international clinical practice guidelines for the management of adults with OD is recommended.

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Introduction

The ability to swallow safely and effectively is as natural as breathing for most people. However, for persons with oropharyngeal dysphagia (OD), each swallow of food or liquid can be a source of anxiety. Normal swallowing requires intact sensory and motor pathways, providing adequate movement and timely coordination of muscles and structures in the mouth, pharynx, larynx and upper esophagus [1]. Any disruption in movements or timing can put the person at risk of aspiration of food or liquid into the airway [2]. OD is associated with negative medical (e.g. respiratory complications, malnutrition and dehydration) and psychosocial (e.g. anxiety, depression and social isolation) consequences [3–5]. OD is common in the elderly, after central nervous disease or injury (e.g. stroke, traumatic brain injury, Parkinson's disease) and head and neck cancer [6]. Prevalence of OD in these populations is high and expected to rise with an aging population [7]. Some medical complications such as malnutrition, hydration and aspiration pneumonia from OD are preventable, but dependent on timely, evidence-based identification and management [8].

Identification of risk for OD is often the first step in the acute phase of a disease or injury, and is typically performed using a non-diagnostic pass/fail screening tool. Persons that fail the screening are typically referred to more comprehensive non-instrumental or instrumental clinical assessment [9]. Non-instrumental assessments can include a clinical swallowing assessment (CSA) and/or a dysphagia-specific patient-reported outcome measure (PROM). The CSA is a thorough clinical assessment comprised of several elements such as medical history, cranial nerve exam, oral and laryngeal function and an observation of the intake of food/liquids, resulting in clinical impressions on possible causes,

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possible intervention and need for instrumental assessment. Dysphagia-specific PROM provide valuable information about the impact of OD on quality of life from the patient's perspective [9]. The use of screening and non-instrumental clinical assessments with optimal diagnostic performance and psychometric properties is recommended in a European White paper [9]. Instrumental assessments, such as the videofluoroscopic swallowing (VFSS) and fiberoptic endoscopic swallowing assessments (FEES), are however considered gold standards [10], as they provide more objective visualization of swallow safety and efficiency that is necessary to determine appropriate treatment. The psychometric properties of the measurements used in the interpretation of VFSS and FEES are however insufficient [10].

Treatment for OD can be provided by different health professions, should be individually tailored and can be compensatory, rehabilitative or a combination of the two. Compensatory treatments, such as a change in head position and diet modification, may reduce the symptoms of dysphagia and its consequences [11]. Rehabilitative treatment is intended to improve physiological and functional swallowing and often involves intensive exercised-based training of specific muscle groups [12].

Management of OD is dependent on many factors including the healthcare setting, level of knowledge and services provided by healthcare professionals. OD is a complex disorder and requires the collaboration of multiple disciplines such as physicians (e.g. neurologists, radiologists, otolaryngologists, gastroenterologists), nurses, dieticians, speech-language pathologists (SLP), occupational therapists (OT) and physiotherapists (PT) [13]. The degree of involvement and inclusion of team members in OD management will vary depending on the severity of OD, available resources and country [14,15].

Persons at risk for OD are dependent on healthcare professionals to provide evidence-based diagnosis and individually tailored OD management. The SLPs role in OD management came to the forefront in the 1980s and continues to evolve [16]. The American Speech-Language-Hearing Association (ASHA) published one of the first guidelines on clinical training requirements for SLPs in OD management [17]. Other international professional associations for SLPs have also developed clinical guidelines and clinical standards required for OD management in association with professional certification [18–20]. In much of the international literature, the SLP is referred to as the primary provider of OD management and responsible for coordinating team involvement [21–23]. Nurses and OTs are also recognized as key members of the OD management team. Nurses spend the most time with the patient, and are often responsible for initial dysphagia screening, monitoring of nutritional status, administration of medications and tube feedings, oral care and implementation of compensatory dysphagia treatment [21,24]. OTs are specialists in assessing and managing activities of daily living, and participation in mealtimes can be a challenge for persons with OD. Positioning, sitting balance, upper extremity function for eating and drinking, and arrangement of adaptive devices to aid in self-feeding are some areas of focus for the OT [25]. Although other professions such as physicians, dieticians and PTs also play an important role in the management of OD, their involvement can be more limited, intermittent or indirect than the nurse, OT and SLP, who are often involved in the screening, assessment and treatment of OD [25–28].

It is essential that healthcare professionals responsible for persons at risk for OD have sufficient knowledge and training to provide evidence-based screening, non-instrumental and instrumental clinical swallowing assessments and intervention for OD [9,29]. National surveys in countries where OD is considered within the SLPs scope of practice (e.g. United States of America, Australia, and the United Kingdom and Ireland) have investigated the level of knowledge, skills and/or service practices of SLPs [30–33]. However, little is known about the education of nurses and their role in the field of OD [34] and we are not aware of any studies investigating OTs knowledge and service practices in OD management. Considering the importance of disciplinary collaboration in the management of OD and limited research in this area, we conducted a survey to investigate the general qualifications, clinical competencies and service practices for nurses, OTs and SLPs working with adults with OD in Denmark, Finland, Iceland, Norway and Sweden. Specifically, this study aimed to answer the following questions:

1. What is the level of education and self-reported expertise in OD management for Nordic nurses, OTs and SLPs?
2. Which professionals usually perform the OD screening and non-instrumental clinical assessments, and what tools are used to identify and diagnose OD?
3. What is the availability and use of instrumental clinical assessment procedures and what instrumental measurement tools are used for OD diagnosis in the Nordic countries?
4. What interventions do nurses, OTs and SLPs use for OD and how often do they participate in multidisciplinary meetings?
5. How do the roles for nurses, OTs and SLPs in OD management differ between countries?

Materials and methods

Study design

An anonymous cross-sectional self-administered web-based survey was used. This approach allows for an effective and standardized way to collect a large amount of data from participants in the diverse target professions and countries.

Participants

This survey targeted all practicing nurses, OTs and SLPs in the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden). Respondents that were unemployed at the time of study inclusion were excluded from the survey.

Survey development

The research group developed and piloted the survey in collaboration with six international OTs, SLPs and nurses with experience in dysphagia, research and survey development. Survey items included matrix questions, multiple choice questions, ordinal scales and text boxes for comments/example of "other". Answer options for questions pertaining to which outcome measures, assessment elements or intervention methods respondents used, were chosen based on evidence-based literature, clinical practice and suggestions from the piloting phase. To account for the differences in educational structure between countries, common educational degree combinations were provided for respondents to choose from. The survey was in English in order to ensure a common understanding among participants and to aid consistent interpretation of data. Short definitions of terminology used in the questions were provided with several questions to support language clarification and understanding. The survey comprised of a total of 50 questions. The first 14 questions were for all practicing nurses, OTs and SLPs, and provided information on general demographic, professional education and employment information. The remaining 36 questions were to be answered only by practicing nurses, OTs and SLPs who had been involved in the management of at least one adult with OD in the past twelve months. These questions extracted detailed information about the workplace and professional responsibilities; routines for screening, non-instrumental clinical swallowing assessment; instrumental clinical swallowing assessments; and treatment practices for OD. The purpose of collecting data from a sample of professionals not currently working with adults with OD was to establish if those who did work with adults with OD were comparable on variables such as gender, age, profession, level of education, years in profession, and country of employment. Data collection was handled by a questionnaire created with an online survey tool developed and operated by the University of Oslo Center for Information Technology (USIT) and specifically designed to meet Norwegian privacy requirements. The first 14 questions were estimated to take 5 min to complete, while the entire survey was estimated to require 30 min.

Recruitment

The survey collected data from a convenience sample, and was distributed *via* email to collaborating professional associations (Nursing, Occupational and Speech-Language Pathology) in the Nordic countries of Denmark, Finland, Iceland, Norway and Sweden. The email contained information regarding the purpose of the study, privacy and data security for participants and a link to the survey. Due to restrictions by some of the larger professional associations (e.g. nurses in Norway and Sweden), which prohibited distribution to all members, distribution was routed via regional associations and professional subgroups where possible. Invitations to participate were also distributed by e-mail to national dysphagia networks where available, via social media, and "snowballing". The survey was available from April 1 to September 15, 2019. Up to three reminders were sent to collaborating professional associations and dysphagia networks. Approval was obtained for this study from the Norwegian Centre for Research Data (NSD, Norsk senter for forskningsdata) (Ref. no. 616573). The Regional Committed of Medical and Health Research Ethics deemed ethical approval for this study unnecessary as it was not defined as health research. A completed survey was accepted as consent to participation.

Data analysis

Survey data were downloaded from the digital format to a Microsoft Excel spreadsheet. Data were analyzed using IBM SPSS Statistics version 26 [35]. Results are reported using descriptive statistics: frequency and percentage distributions. Calculation of Pearson's Chi-square tests (x^2) were performed to explore differences between respondents who did not work with OD and those who did. All survey responses were included in the analysis regardless of whether respondents answered all of the survey questions.

Results

Sample demographics

There was a total of 1023 respondents. Eight respondents were removed from the data set as they reported not currently practicing in their profession. Data of four professionals classified as "other" (dietician, dentist, social worker, and physiotherapist) were also excluded from analyses, resulting in a final sample of 1011 respondents. An overview of the demographic information for respondents working with OD is available in Table 1. When comparing the sample of respondents not working with persons with OD with respondents who did, significant, but small group differences were found between gender (X^2 (1, $n = 1011$) $=6.61$; $p=.012$), age (X^2 (4, $n = 1011$)$=25.02$; $p<.001$) and country (X^2 *(4,* $n = 1011$*)=12.99;* $p=.023$). The group working with OD had a slightly lower percentage of females and was younger. No significant group differences were found for profession (X^2 (2, $n = 1011$) $=2.96$; $p=.228$), level of education (X^2 (2, $n = 1000$) $=4.52$; $p=.104$) or number of years in their profession (X^2 (6, $n = 1011$) $=10.94$; $p=.090$).

As this survey used convenience sampling and snowballing, it is not possible to provide a response rate. However, in order to give perspective to the study population, national professional associations for each profession were asked to report the number of registered members and an estimation of what percent of the total professional population their members represented. The number of registered members along with prevalence per capita estimates for each profession are provided in Supplementary Table 1. The estimates for nurses from Sweden were provided only for "active or working" members. Denmark appears to have the highest relative prevalence of OTs among the Nordic countries, and a lower prevalence of SLPs than all other countries.

Table 1. Demographic overview of survey respondents who had worked with at least one adult with OD within the past 12 months ($n = 396$).Profession

Characteristics	*n* (%)
Gender (female)	($n = 396$) 364 (91.9)
Age (years)	($n = 396$)
21–25	14 (3.5)
26–35	138 (34.8)
36–45	132 (33.3)
46–55	74 (18.7)
>55	38 (9.6)
($n = 396$)	
Nurse	50 (12.6)
Occupational Therapist	224 (56.6)
Speech-Language Pathologist	122 (30.8)
Country of employment	($n = 396$)
Denmark	217 (54.8)
Finland	34 (8.6)
Iceland	14 (3.5)
Norway	70 (17.7)
Sweden	61 (15.4)
Level of education	($n = 393$)
Bachelor	276 (70.2)
Masters	107 (27.3)
Doctorate	10 (2.6)
Years in profession	($n = 396$)
<1 year	32 (8.1)
1–2 years	38 (9.6)
3–5 years	63 (15.9)
6–10 years	75 (18.9)
11–15 years	66 (16.7)
16–25 years	83 (21.0)
>25 years	39 (9.8)

Country of employment, profession, workplace and level of experience for respondents working with adults with OD

Subsequent results will address the research questions based on responses from the 396 respondents that had been involved in the management of adults with OD the past twelve months and included in the analyses. OTs ($n = 224$; 56.6%) made up the majority of respondents, while 30.8% were SLPs ($n = 122$) and 12.6% were nurses ($n = 50$). Danish respondents ($n = 217$) were primarily OTs ($n = 206$; 95.0%), with a small number of nurses ($n = 9$; 4.1%) and SLPs ($n = 2$; 0.9%). Finland ($n = 34$) was represented mostly by SLPs ($n = 25$; 73.5%), followed by nurses ($n = 6$; 17.6%) and OTs ($n = 3$; 8.8%). Iceland had the fewest respondents ($n = 14$) but also the smallest population of all Nordic countries: SLPs ($n = 7$; 50.0%), nurses ($n = 6$; 42.9%) and OTs ($n = 1$; 7.1%). Norwegian respondents ($n = 70$) were mostly SLPs ($n = 39$; 55.7%) and nurses ($n = 20$; 28.6%), with a few OTs ($n = 11$; 1.3%). Sweden ($n = 61$) was represented by mainly SLPs ($n = 49$; 81.7%), in addition to nurses ($n = 9$; 15.0%) and OTs ($n = 3$; 0.5%).

The majority of nurses (49/50; 98.0%), OTs (195/224; 87.1%) and SLPs (106/122; 86.9%) currently worked in urban/metropolitan areas. Nearly two-thirds worked in inpatient rehabilitation ($n = 110$) and acute care settings ($n = 143$). The remaining respondents worked in outpatient clinic/rehabilitation ($n = 64$), long-term care/nursing home/-day care ($n = 43$), private practice/in-home care ($n = 22$), academic/university patient clinic ($n = 8$) and other ($n = 6$).

Respondents had a wide range of experience levels, as nearly half of all nurses (24/50; 48.0%) had ≥16 years of work experience and most OTs (95/224; 42.4%) reported 6–15 years of experience, while SLPs (56/122; 45.9%) had ≤5 years of professional experience. In regards to the number of years of experience working with adults with OD, almost half of the nurses (22/50; 44.0%) reported having 6-15 years of experience, compared to OTs (101/224; 45.1%) and SLPs (61/122; 50.0%) that had ≤5 years of experience working with adults with OD. All three professions had fewest respondents with >16 years of experience working with adults with OD: 22.0% nurses (11/50), 13.4% OTs (30/224) and 18.9% SLPs (23/122).

Level of education and self-reported expertise in OD management for Nordic nurses, OTs and SLPs

Most respondents completed their education between 2000 and 2009 ($n = 123$; 31.3%) and 2010–2019 ($n = 179$; 45.5%). A summary of the level of education and training in OD management for respondents can be found in Table 2. The highest reported level of education for the majority of nurses and OTs was a bachelor level education (3–4 years) while the majority of SLPs reported a master level education (4–6 years). Most respondents reported between 1 and 5 lecture hours in OD during their education. Overall, nurses (22/50; 44.0%) had the largest proportion of respondents that had no supervised training for OD during their education, while 25.9% of OTs (58/224) and 20.5% of SLPs (25/122) reported having none. Of those that had supervised training, over one-third of SLPs (43/122; 35.5%) reported more than one week, compared to nurses (6/50; 12.0%) and OTs (45/223; 20.1%). Since curriculum might change over time, post hoc analysis were performed regarding hours of lectures and supervised training for those educated the past 10 years compared to those educated more than 10 years ago. The only significant difference was in the SLP group which showed an increase in their supervised training over the past decade.

Participation in post-graduate training in OD was more common for OTs and SLPs than for nurses. The most common types of post-graduate training for nurses were internships with experienced clinicians or training by colleagues (28.0%), while one-fifth of nurses answered that post-graduate training in OD was not relevant. OTs and SLPs participated mostly in local dysphagia networks (45.4 and 56.6%, respectively) and attended workshops, conferences or research symposiums for OD (43.8 and 63.9%, respectively). Examples of training at workshops/conferences/symposiums provided by respondents in open text boxes included evaluation and treatment methods such as, The McGill Ingestive Skills Assessment (MISA) [36], fiberoptic endoscopic evaluation of swallowing (FEES), facial-oral tract therapy (F.O.T.T.) [37], McNeill Dysphagia Therapy Program (MDTP) [38], neuromuscular electrical stimulation (NMES) [39] and deep pharyngeal neuromuscular stimulation (DPNS) [40]. For those respondents that did not participate in post-graduate OD training ($n = 57$) the primary reasons were lack of post-graduate training offered to the profession

Table 2. Education and training for respondents working with adults with OD.

	Profession *n* (%)			
Education	Nurse ($n = 50$)	OT ($n = 224$)	SLP ($n = 122$)	Total ($n = 396$)
Level of education				
Bachelor degree	**32 (65.3)**	**204 (91.9)**	40 (32.8)	**276 (70.2)**
Master degree	14 (28.6)	16 (7.2)	**77 (63.1)**	*107 (27.2)*
Doctorate	3 (6.1)	2 (0.9)	5 (4.1)	*10 (2.5)*
Total	*49 (100.0)*	*222 (100.0)*	*122 (100.0)*	*393 (100.0)*
Lecture hours in OD				
Not relevant for my education	0 (0.0)	1 (0.5)	1 (0.8)	*2 (0.5)*
None	4 (8.0)	28 (12.6)	20 (16.4)	*52 (13.2)*
1–5 h	**29 (58.0)**	**102 (45.9)**	**46 (37.7)**	**177 (44.9)**
6–10 h	7 (14.0)	48 (21.6)	29 (23.8)	*84 (21.3)*
11–15 h	4 (8.0)	14 (6.3)	9 (7.4)	*27 (6.9)*
16+ hours	6 (12.0)	29 (13.1)	17 (13.9)	*52 (13.2)*
Total	*50 (100.0)*	*222 (100.0)*	*122 (100.0)*	*394 (100.0)*
Supervised training in OD during education				
Not relevant for my education	0 (0.0)	1 (0.4)	0 (0.0)	*1 (0.3)*
None	**22 (44.0)**	58 (25.9)	25 (20.5)	*105 (26.5)*
<1/2–1 day	21 (42.0)	**86 (38.4)**	**39 (32.0)**	**146 (36.9)**
2–5 days	1 (2.0)	34 (15.2)	15 (12.3)	1 *(12.6)*
1–4 weeks	4 (8.0)	30 (13.4)	30 (24.6)	*64 (16.2)*
>5 weeks	2 (4.0)	15 (6.7)	13 (10.7)	*30 (7.6)*
Total	*50 (100.0)*	*224 (100.0)*	*122 (100.0)*	*396 (100.0)*
Post-graduate training[a]				
Not relevant	10 (20.0)	13 (5.8)	2 (1.6)	25 (6.3)
Post graduate diploma ESSD	1 (2.0)	20 (8.9)	3 (2.5)	24 (6.1)
M.S. Deglutology	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
MSc. Clinical Speech and Language studies: dysphagia	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
University coursework	2 (4.0)	8 (3.6)	26 (21.3)	36 (9.1)
Workshops/conferences/research symposium	9 (18.0)	98 (43.8)	**78 (63.9)**	**185 (46.7)**
Special Interest Group (SIG)	2 (4.0)	24 (10.7)	25 (20.5)	51 (12.9)
Internship/training by colleagues	**14 (28.0)**	81 (36.2)	53 (43.4)	148 (37.4)
Local dysphagia network	9 (18.0)	**102 (45.5)**	69 (56.6)	180 (45.5)
Social media network for OD	0 (0.0)	34 (15.2)	39 (32.0)	73 (18.4)
Other	10 (20.0)	73 (32.6)	20 (16.4)	103 (26.0)

Note: OD: oropharyngeal dysphagia; OT: Occupational Therapist; SLP: Speech-Language Pathologist. The values written in bold highlight the answers chosen by the majority of respondents per profession and combined.
[a]Respondents were able to choose more than one answer.

(nurses, 47.1%), financial reasons (OTs, 55.2% and SLPs, 45.5%), and lack of available time to attend (SLPs, 45.5%).

Respondents were asked to rate their level of professional expertise in the following areas of OD management: screening, non-instrumental clinical swallowing assessment, instrumental assessments, treatment/therapy. Overall, nearly 20% of nurses reported no expertise in most areas of OD management, whereas the only area for which ≥20% of OTs and SLPs reported no expertise was with instrumental assessments. Interestingly, high numbers of respondents rated their level of expertise as being above average/very high for both screening (nurses: $n = 17/48$; 35.4%, OTs: $n = 119/219$; 54.3%, SLPs: $n = 67/155$; 55.4%) and non-instrumental clinical swallowing assessment (nurses: $n = 17/48$; 35.4%, OTs: $n = 110/217$; 50.2, SLPs: $n = 70/121$; 57.8%). The vast majority of nurses ($n = 39/48$; 81.3%) and OTs ($n = 155/217$; 70.8%) reported having no expertise in instrumental clinical assessments, compared to SLPs (29/122; 24.0%). Nearly one-third of SLPs (37/121; 30.6%) reported above average/very high expertise in instrumental clinical assessments compared to nurses (1/48; 2.1%) and OTs (16/217; 7.3%). Nearly half of OTs ($n = 100/218$; 45.9%) reported above average/very high expertise in treatment/therapy, while nearly half of SLPs ($n = 57/121$; 47.1%) and one third of nurses ($n = 16/48$; 33.3%) reported average expertise.

Profession(s) that usually perform the OD screening and non-instrumental clinical assessments, and measurement tools that are used to identify and diagnose OD

An overview over which personnel perform screening and non-instrumental clinical swallowing assessments can be found in the Figure 1. When asked what profession usually performed screening at their workplace, the larger percentage of each profession reported that their respective professions usually performed screenings and non-instrumental clinical swallowing assessments, with the exception of nurses for which nearly half reported SLPs as usually performing non-instrumental clinical swallowing assessments. Nurses showed a larger variation in their responses for both screening and non-instrumental clinical assessment than OTs and SLPs. SLPs were also varied in their response for who usually performed screenings.

The type of screening and non-instrumental clinical swallowing assessment tools used by respondents are shown in Supplementary Table 2. The most frequently used screening

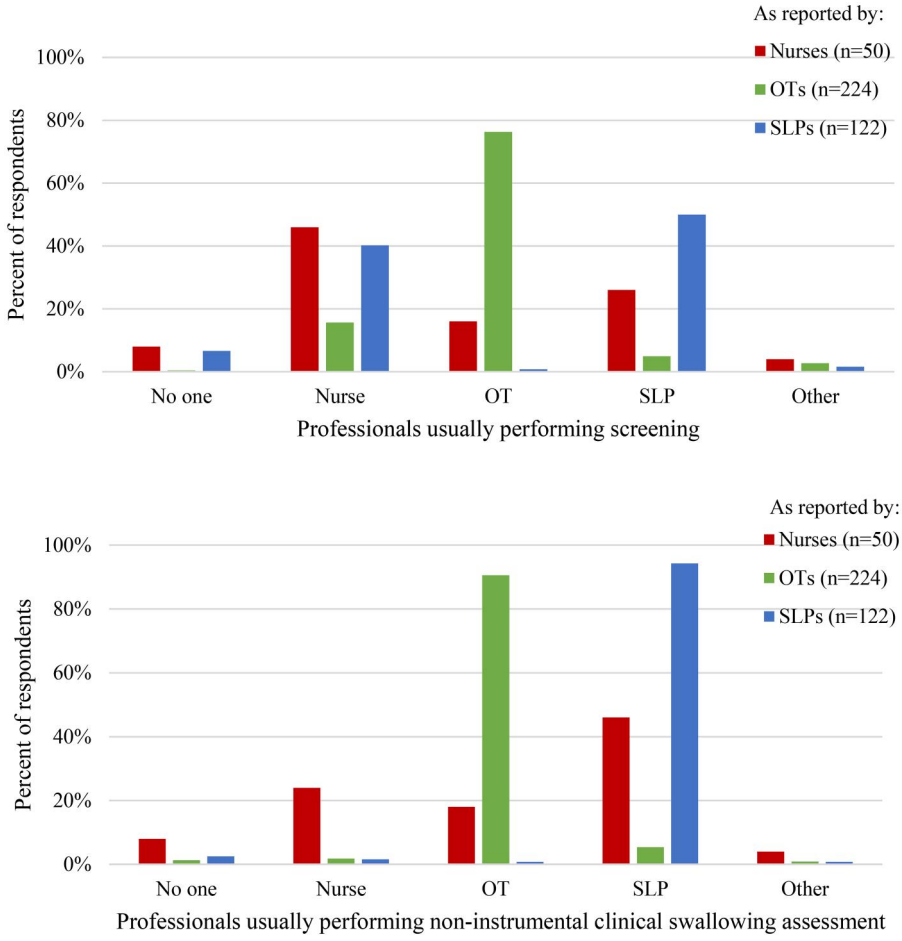

Figure 1. Profession that usually performs screening and non-instrumental clinical swallowing assessment (CSA) for adults with OD as reported by nurses, OTs and SLPs ($n = 396$).

tool was the Gugging Swallowing Screen (GUSS) [41]; 16.0% nurses [8/50], 32.6% OTs [73/224], 5.7% SLPs [7/122]. The largest percentage of all respondents; 42.0% nurses [21/50], 47.8% OTs [107/224] and 58.2% SLPs [71/122] reported that they used "other" types of screening. Examples of the "other" screenings tools written in the open text boxes included unspecified "water swallow tests", locally developed screenings, the Danish F.O.T.T Swallowing Assessment of Saliva [42] and a Swedish version of the Standardized Swallowing Assessment [43]. With regards to non-instrumental clinical swallowing assessments, the Functional Oral Intake Scale (FOIS) [44] was the most frequently used tool; 24.6% of OTs [55/224], 23.0% of SLPs [28/122] and 6.0% of nurses [3/50)]. Most respondents either did not use a non-instrumental clinical swallowing assessment or chose "other". Examples of these included locally developed and non-standardized clinical swallowing assessments.

The majority of nurses ($n = 38/45$; 84.4%) and OTs ($n = 142/209$; 67.9%), and about forty percent of SLPs ($n = 45/116$; 38.8%) did not use patient-reported outcome measures in their clinical assessment of OD. The most frequently used patient-reported outcome measures were the Eating Assessment Tool −10 [45] (32.8% of SLPs [38/116], and 14.8% of OTs [31/209] and 4.4% nurses [2/45]), the Sydney Swallow Questionnaire [46] (18.0% of SLPs [21/116], 0% of OTs and nurses), the M.D. Andersen Dysphagia Inventory (MDADI) [47] (6.9% of SLPs [8/116], 1.9% OTs [4/209] and 0% of nurses), and the Swallowing Quality of Life survey [48] (11.2% of SLPs [13/116], 0.5% OTs [1/209] and 0% of nurses). The following measures were used by less than 10 respondents (2.7%): Swallowing Quality of Care survey [48], Dysphagia Handicap Index [49], Deglution Handicap Index [50], Symptom Inventory for Oropharyngeal Dysphagia [51], University of Washington Quality of Life survey [52], Dysphagia-Specific Screening Tool [53], and Swallowing Disturbance Questionnaire [54].

Availability and use of instrumental assessment procedures and the outcome measures mostly used for OD diagnosis

FEES was more frequently available ($n = 168/396$; 42.4%) than VFSS ($n = 110/396$; 27.8%) across clinical settings. Respondents working in acute care facilities ($n = 110$) had greater access to FEES (72.7%) and VFSS (43.6%) than other settings. In the inpatient rehabilitation setting ($n = 143$), FEES and VFSS were available for 40.5% and 29.3% of respondents respectively, while in the outpatient clinic/rehabilitation setting ($n = 64$), slightly more respondents had access to VFSS (31.3%) than FEES (21.9%). In long-term care/nursing home/day care ($n = 43$) and private practice/in-home services ($n = 22$) less than 10% had access to FEES or

VFSS, while in the academic/university patient clinic ($n = 8$) 75.0% had access to FEES and 37.5% VFSS, and in other settings ($n = 6$) 16.7% had FEES and 33.3% had VFSS. As presented in Supplementary Table 3, >94% of nurses, 50–63% of OTs and 16–28%% of SLPs with access to instrumental assessment tools, were unaware of the visuoperceptual measurement tools used to evaluate swallowing function in VFSS and FEES recordings. The Penetration Aspiration Scale [55] was the most commonly used outcome measure for VFSS and FEES as reported by SLPS and OTs. Other examples of less frequently used measures as listed by the participants were the Yale Pharyngeal Residue Severity Rating Scale [56], Boston Residue and Clearance Scale [57] and Murray Secretion Scale [58].

Treatment interventions used by nurses, OTs and SLPs and their participation in multidisciplinary meetings

Professionals reporting to usually provide compensatory and rehabilitative services for OD can be found in Figure 2. Most nurses reported that nurses usually provided compensatory treatment such as head and body positioning, while OTs and SLPs reported that they usually provided these services. In regards to rehabilitative treatment, half of nurses reported that SLPs provided rehabilitation services, while the great majority of OTs and SLPs reported that their profession usually provided these services. Table 3 provides a detailed list of treatment methods, both compensatory and rehabilitative, and the frequency for which nurses, OTs, and SLPs report to use them. Compensatory treatments such as head and body positioning, bolus modification and supervised swallow trials with food/liquid were most frequently used by all three professions. However, nurses were seldom involved in the rehabilitative treatment of persons with OD as listed in Table 3. The most frequent rehabilitative technique used by OTs were Facial oral tract therapy (F.O.T.T.; very often/always; 69.4% [145/224]), which probably reflects the high number of Danish OTs in the sample. Other techniques commonly used were oromotor exercises (very often/always; 61.5% [131/224]) and facial exercises (very often/always; 58.8% [126/244]). Most frequently reported rehabilitative techniques by SLPs were oromotor exercises (sometimes; 50.8% [61/122]) and effortful/hard swallow (sometimes; 43.0% [52/122]). In addition, many other techniques were used by both OTs and SLPs but less frequently.

Regarding participation in multidisciplinary meetings for the management and care for persons with OD, only respondents working in acute care ($n = 110$) and inpatient rehabilitation settings ($n = 143$) were included in data analysis as the other settings had less than four respondents from one or more of the professional groups. Close to half of the nurses reported that they sometimes discussed OD in

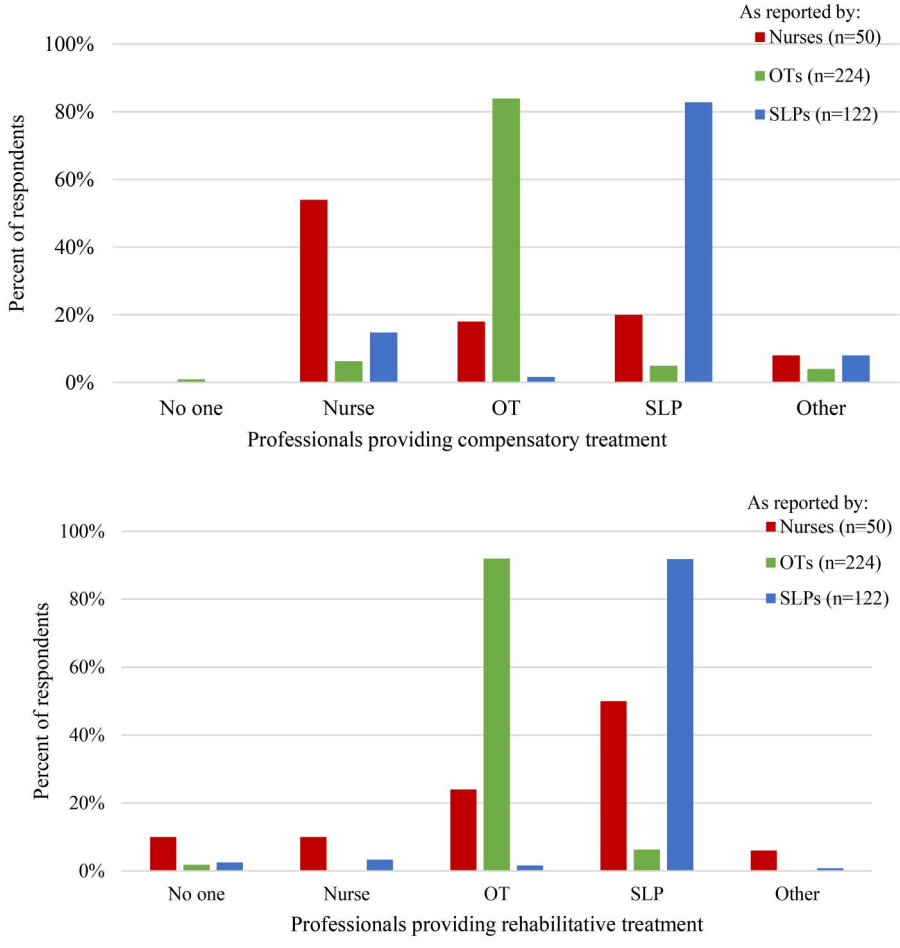

Figure 2. Profession that usually provides compensatory and rehabilitative treatment as reported by nurses, OTs and SLPs ($n = 396$).

Table 3. Treatment interventions used by nurses, OTs and SLPs for OD[a] ($n = 396$).

	Profession *n* (%)								
	Nurse ($n = 50$)			OT ($n = 224$)			SLP ($n = 122$)		
Intervention	Rarely/ Never[b]	Sometimes	Very often/Always[b]	Rarely/Never[b]	Sometimes	Very often/Always[b]	Rarely/Never[b]	Sometimes	Very often/Always[b]
Head positioning ($n = 388$)	3 (6.0)	5 (10.0)	**42 (84.0)**	8 (3.7)	19 (8.7)	**191 (87.6)**	4 (3.3)	44 (36.7)	**72 (60.0)**
Body positioning ($n = 387$)	2 (4.1)	3 (6.1)	**44 (89.8)**	5 (2.3)	12 (5.5)	**202 (92.2)**	6 (5.0)	34 (28.6)	**79 (66.4)**
Bolus modification ($n = 385$)	3 (6.3)	5 (10.4)	**40 (83.3)**	6 (2.7)	10 (4.6)	**202 (92.7)**	1 (0.8)	6 (5.0)	**112 (94.1)**
Supervised swallow trials with food / liquid ($n = 375$)	14 (29.8)	7 (14.9)	**26 (55.4)**	18 (8.5)	35 (16.6)	**158 (74.9)**	9 (7.7)	30 (25.6)	**78 (66.7)**
Supraglottic swallow ($n = 366$)	**32 (74.4)**	5 (11.6)	6 (14.0)	**93 (45.1)**	59 (28.6)	54 (26.2)	**53 (45.3)**	50 (42.7)	14 (12.0)
Super-supraglottic swallow ($n = 361$)	**31 (75.6)**	6 (14.6)	4 (9.8)	**110 (53.6)**	50 (24.4)	45 (21.9)	**70 (60.8)**	39 (33.9)	6 (5.2)
Effortful/hard swallow ($n = 369$)	**33 (76.7)**	7 (16.3)	3 (7.0)	**92 (44.9)**	52 (25.4)	61 (29.8)	25 (20.7)	**52 (43.0)**	44 (36.4)
Mendelsohn's manoeuver ($n = 353$)	**40 (93.0)**	2 (4.7)	1 (2.3)	**110 (55.9)**	47 (23.9)	40 (20.3)	**60 (53.1)**	46 (40.7)	7 (6.2)
Facial oral tract therapy (F.O.T.T.) ($n = 365$)	**34 (77.3)**	5 (11.4)	5 (11.3)	34 (16.3)	30 (14.4)	**145 (69.4)**	**101 (90.2)**	10 (8.9)	1 (0.9)
Facial exercises ($n = 385$)	**27 (55.1)**	17 (34.7)	5 (10.2)	19 (8.8)	73 (33.5)	**126 (58.8)**	**54 (45.8)**	37 (31.4)	27 (22.9)
Oromotor exercises ($n = 380$)	**29 (61.7)**	15 (31.9)	3 (6.4)	27 (12.7)	55 (25.8)	**131 (61.5)**	24 (20.0)	**61 (50.8)**	35 (29.2)
Lingual pressure generation exercises (e.g. IOPI) ($n = 346$)	**38 (89.9)**	2 (4.9)	1 (2.4)	**139 (72.0)**	36 (18.7)	18 (9.3)	**96 (85.7)**	14 (12.5)	2 (1.8)
Masako exercise (tongue hold) ($n = 362$)	**38 (90.5)**	4 (9.5)	0 (0.0)	**90 (43.7)**	62 (30.1)	54 (26.3)	**61 (53.5)**	46 (40.4)	7 (6.1)
Lee Silverman Voice Treatment (LSVT) ($n = 347$)	**38 (92.7)**	2 (4.9)	1 (2.4)	**181 (95.2)**	5 (2.6)	4 (2.1)	**73 (63.9)**	32 (27.6)	11 (9.5)
Thermal tactile stimulation ($n = 359$)	**36 (87.7)**	4 (9.5)	2 (4.8)	**125 (63.1)**	47 (23.7)	26 (13.1)	**66 (55.5)**	36 (30.3)	17 (14.2)
McNeill Dysphagia Therapy Program (MDTP) ($n = 351$)	**41 (97.6)**	1 (2.4)	0 (0.0)	**186 (96.4)**	5 (2.6)	2 (1.0)	**103 (88.8)**	11 (9.5)	2 (1.8)
Respiratory resistance training (EMST) ($n = 355$)	**39 (92.8)**	1 (2.4)	2 (4.8)	**167 (85.7)**	19 (9.7)	9 (4.6)	**87 (73.7)**	27 (22.9)	4 (3.4)
Shaker/head lift ($n = 362$)	**34 (85.0)**	4 (10.0)	2 (5.0)	**93 (45.3)**	59 (28.8)	53 (25.9)	**75 (64.1)**	34 (29.1)	8 (6.8)
Chin tuck against resistance ($n = 362$)	**35 (85.3)**	3 (7.3)	3 (7.3)	**90 (43.9)**	59 (28.8)	56 (28.2)	**53 (45.7)**	37 (31.9)	26 (22.5)
Biofeedback Surface Electromyography (sEMG) ($n = 344$)	**42 (97.6)**	1 (2.3)	0 (0.0)	**181 (96.7)**	4 (2.1)	2 (1.1)	**110 (96.5)**	3 (2.6)	1 (0.9)
Neuromuscular Electrical Stimulation (NMES) ($n = 361$)	**42 (97.6)**	1 (2.3)	0 (0.0)	**175 (87.5)**	8 (4.0)	17 (8.2)	**107 (90.7)**	8 (6.8)	3 (2.5)
Deep Pharyngeal Neuromuscular Stimulation (DPNS) ($n = 352$)	**42 (97.6)**	1 (2.3)	0 (0.0)	**187 (97.9)**	3 (1.6)	1 (0.5)	**102 (86.5)**	10 (8.5)	6 (5.1)
Other ($n = 152$)	**16 (88.9)**	1 (5.6)	1 (5.6)	**76 (92.7)**	2 (2.4)	4 (4.8)	**44 (84.6)**	4 (7.7)	4 (7.7)

Note: OT: Occupational Therapist; SLP: Speech-Language Pathologist; OD: oropharyngeal dysphagia. The values written in bold highlight the answers chosen by the majority of respondents for each type of intervention, per profession.
[a]Respondents were able to choose more than one answer.
[b]Collapsed categories rarely/never and very often/always.

multidisciplinary meetings ($n = 18/40$; 45.0%), while approximately half of the OTs ($n = 56/131$; 42.8%) and SLPs ($n = 41/82$; 50.0%) reported that they often/always participated in such multidisciplinary meetings.

Differences between countries in the roles of nurses, OTs and SLPs in OD management

The differences in professional roles for screening, non-instrumental clinical swallowing assessment, compensatory and rehabilitative treatment in relation to country of employment are displayed in Table 4. Screening was usually performed by OTs in Denmark, whereas in the other Nordic countries nurses and SLPs were responsible for screening for OD. All Nordic countries except Denmark reported that SLPs usually performed non-instrumental clinical swallowing assessment, while in Denmark the OTs usually performed this task. Similar results were reported when asking about which professionals usually provided compensatory and

Table 4. Professionals usually performing screenings, non-instrumental clinical swallowing assessments, compensatory and rehabilitative treatment for OD per country of employment ($n = 396$).

	Country *n* (%)				
Profession	Denmark	Finland	Iceland	Norway	Sweden
Screening					
No one	1 (0.5)	2 (5.9)	0 (0.0)	5 (7.1)	5 (8.2)
Nurse	36 (16.6)	13 (38.2)	6 (42.9)	20 (28.6)	**32 (52.5)**
OT	**174 (80.1)**	0 (0.0)	0 (0.0)	6 (8.6)	0 (0.0)
SLP	0 (0.0)	**19 (55.9)**	**8 (57.1)**	**37 (52.9)**	21 (34.4)
Other	6 (2.8)	0 (0.0)	0 (0.0)	2 (2.9)	3 (4.9)
Total	*217 (100.0)*	*34 (100.0)*	*14 (100.0)*	*70 (100.0)*	*71 (100.0)*
Non-instrumental clinical swallowing assessment					
No one	1 (0.5)	1 (2.9)	0 (0.0)	6 (8.6)	2 (3.3)
Nurse	5 (2.3)	2 (5.9)	3 (21.4)	5 (7.1)	3 (4.9)
OT	**208 (95.9)**	0 (0.0)	0 (0.0)	5 (7.1)	0 (0.0)
SLP	0 (0.0)	**30 (88.2)**	**10 (71.4)**	**54 (77.1)**	**56 (91.8)**
Other	3 (1.4)	1 (2.9)	1 (7.1)	0 (0.0)	0 (0.0)
Total	*217 (100.0)*	*34 (100.0)*	*14 (100.0)*	*70 (100.0)*	*71 (100.0)*
Compensatory treatment					
No one	2 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Nurse	15 (6.9)	12 (35.3)	5 (35.7)	20 (28.6)	7 (11.5)
OT	**190 (87.6)**	1 (2.9)	0 (0.0)	7 (10.0)	1 (1.6)
SLP	1 (0.5)	**20 (58.8)**	**8 (57.1)**	**41 (58.6)**	**52 (85.2)**
Other	9 (4.2)	1 (2.9)	1 (7.1)	2 (2.9)	1 (1.6)
Total	*217 (100.0)*	*34 (100.0)*	*14 (100.0)*	*70 (100.0)*	*71 (100.0)*
Rehabilitative treatment					
No one	4 (1.8)	3 (8.8)	1 (7.1)	3 (4.3)	1 (1.6)
Nurse	0 (0.0)	1 (2.9)	2 (14.3)	2 (2.9)	4 (6.6)
OT	**211 (97.2)**	1 (2.9)	0 (0.0)	7 (10.0)	1 (1.6)
SLP	1 (0.5)	**29 (85.3)**	**11 (78.6)**	**56 (80.0)**	**54 (88.5)**
Other	1 (0.5)	0 (0.0)	0 (0.0)	2 (2.9)	1 (1.6)
Total	*217 (100.0)*	*34 (100.0)*	*14 (100.0)*	*70 (100.0)*	*71 (100.0)*

Note: OD: oropharyngeal dysphagia; OT: Occupational Therapist; SLP: Speech-Language Pathologist. The values written in bold highlight the profession in each country that *usually* provide the respective service (e.g. screening, assessment).

rehabilitative treatment for OD. In Denmark, OTs usually provided both compensatory and rehabilitative treatment. However, in the other Nordic countries SLPs and nurses had leading roles in compensatory treatment, and SLPs primarily provided rehabilitative treatment (Table 4)

Discussion

This survey provides insight about the competencies and clinical service practices of nurses, OTs and SLPs whom work with adults with OD in the Nordic countries, particularly from the acute care and inpatient rehabilitation settings. In summary, management of adults with OD in the Nordic countries is characterized by a minimum of educational curriculum dedicated to OD, a discrepancy in clinical roles between countries and suboptimal clinical service practices in the diagnosis and treatment of OD in reference to the existing evidence-based and international best-practice guidelines.

Education, post-graduate training and self-reported level of expertise

The findings indicate a lack of systematic professional education and training in OD for nurses, OTs and SLPs. All three groups reported a minimum of lecture hours in OD. Overall, it is concerning that only limited instruction in OD assessment and management is required for professions having OD in their scope of practice. However, the amount of educational training resembled results from a survey of SLPs in the United States, by Mathers-Schmidt and Kurlinski [59], which showed a median of 1–5 h of classroom training and 6–10 h of supervised training. In 2007, an adapted replication of the United States survey was completed for speech-language therapists in the United Kingdom and Ireland [60]. That study showed a median of 11–15 h of lectures and ≥16 h of supervised training for speech-language therapists. As the majority of respondents in our survey were educated more than ten years ago, improvements in curricular education for OD might be expected. However, the only change we detected was that SLPs receive more supervised training. The call for improved OD curriculums in the Nordic countries thus is highly relevant. In Norway, there are currently no professional guidelines for the SLP university curriculums, as the SLP in Norway is not an authorized profession. Hence, it is likely that many SLP graduates in Norway enter the workplace without adequate training or clinical skills to provide sufficient evidence-based diagnostic and treatment approaches for their patients with OD. This example illustrates a need for curriculum revisions and set standards in line with other international professional organisations such as presented by the Royal College of Speech Language Therapy [20]. Additional changes might include adding requirements for post-graduate training and clinical supervision prior to independent practice for professionals working with OD. Studies have shown that graduate [61] and post-graduate training of healthcare professionals can improve knowledge, skills and confidence in the management of OD, particularly nursing staff [26,34,62]. Most nurses in this study reported post-graduate training in the form of internships with more experienced clinicians/training by colleagues. Nurses without post-graduate training indicated a lack of access to training. On the other hand, as many as two-thirds of SLPs reported participating in workshops/conferences/research symposiums. This difference may be because OD is in the scope of practice for SLPs in many countries and many courses with instruction on protocols for screening, assessment and treatment techniques for OD have been developed by SLP's [16,38,55,63–66]. Nevertheless, there is a shortage of SLPs and qualified healthcare specialists in OD in the Nordic countries [34,67,68]. This, combined with increasing pressures for effective, evidence-based clinical practice and proficient interprofessional skills, may result in challenges providing adequate OD services. One solution may include promoting a more multiple disciplinary approach, requiring specific standards to the interprofessional educational and training needs within OD at the graduate and post-graduate level [61,69,70].

It is noteworthy that, despite the minimal amount of reported education and training in the field of OD, respondents reported high levels of self-reported expertise in nearly all areas of OD management. It is known that the level of self-reported expertise does not necessarily equate actual competencies [71]. Unfortunately, we could not check subjective reports against objective competency measures. Nevertheless, findings of this study might reflect contextual

factors that influence self-reported expertise. For example, respondents may likely represent the few professionals within their work environment that have experience and knowledge in OD management.

Delivery of care; professional roles and service practices

Differences in clinical roles and service practices between the Nordic countries and compared to international practices within the field of OD were evident. The most noteworthy difference was the primary role that OTs have in the management of OD in Denmark. This is confirmed in the Danish national clinical guidelines for OD [72] which states, "In Denmark it is typical that occupational therapists perform the clinical assessment, while abroad, it is more often the speech-language pathologist that performs the clinical assessment, which is reflected in the international literature." This difference may be a result of the Danish educational curricula, nevertheless, the OTs role in Denmark extends beyond the traditional focus on feeding skills and posture adjustment, and often incorporates the facial-oral tract therapy approach in both diagnosis and treatment of OD in the neurologic population [73,74]. This approach, which is inspired by the Coombes concept [75,76] has a limited evidence-base [37,74]. Other notable findings not only support previous research showing that nurses have a prominent role in screening in the hospital setting [77], but moreover illuminates the distinct role nurses have in providing compensatory treatments in the Nordic countries. Differences in sample size and a biased representation of OTs from Denmark, where OTs play a major role in OD management, calls for caution in the generalization of these results. Nonetheless, it appears evident that all three professions considered their own contributions to the care and management of OD as essential. The commonalities in clinical roles between the Nordic countries demonstrate an overlap in knowledge of OD between professions and allude to an interdisciplinary approach to OD management.

A large majority of survey respondents worked in metropolitan areas within tertiary care. These specialized facilities usually have access to a high level of expertise in their multiple disciplinary teams, access to evidence-based procedures and training for personnel that help secure strong competencies in the screening, assessment and treatment of adults with OD [78]. Despite this, the reported educational and post-graduate training levels within the assessment and treatment of adults with OD was still minimal for many respondents. To complicate matters, hospital length of stay has become significantly shorter, putting pressure on the municipalities to provide continued high quality care [79,80]. Finland, Norway and Sweden are countries with an abundance of sparsely populated areas posing a challenge with access to SLPs and other professionals (e.g. dieticians, OTs) with expertise in the field of OD. A study from Sweden, investigating patients' perspectives on living with OD post-stroke revealed a lack of follow-up and individually tailored support from qualified healthcare professionals after hospital discharge [81]. Engh and Speyer [34] found that half of the Norwegian nursing homes did not have access to experts in OD and revealed an obvious need for staff trained in the care and management OD. As a consequence, the current management of patients with OD following hospital discharge is challenging in most Nordic countries.

The current findings furthermore demonstrate a lack of standardization in assessment procedures, as respondents, to a large extent either did not use a standardized screen and/or non-instrumental clinical assessment tool, used a locally developed tool, or used tools for screening and non-instrumental clinical assessment with suboptimal diagnostic performance or psychometric properties. Although there is no consensus on one preferred screening or non-instrumental clinical assessment tool, it is recommended to implement screening tools with sufficient diagnostic performance and clinical measures with robust psychometric properties [9,82–84]. Two systematic reviews on bedside screening for OD set example standards for sensitivity ($\geq$70%) and specificity ($\geq$60%) [82,85]. Similarly, a psychometric framework like the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) may provide criteria to support measure selection [86]. The Nordic countries cover relatively small geographical areas. Despite many similarities, there are also cultural discrepancies and different languages, which creates challenges in meeting validation and cultural adaptation requirements (cross-cultural validity). Nonetheless, the use of screening tools with insufficient diagnostic performance or measures with poor psychometric measurement properties may result in the misidentification of persons with OD, and inability to determine treatment effects [9].

The unavailability of instrumental clinical assessments (FEES and VFSS) in most clinical settings in the Nordic countries provides yet other challenges. Instrumental clinical assessments are considered the gold standard because they allow the identification of aspiration, silent aspiration and changes in swallowing physiology, which is necessary to determine the appropriate physiology-based treatments [11]. Thus, lack of access to instrumental clinical assessments may contribute to why the majority of respondents chose compensatory, rather than rehabilitative treatment methods. Yet, a recent study by Forbes and Humbert [87] demonstrated that due to individual differences and variation in physiologic swallowing abnormalities, compensatory treatment planning should also be based on instrumental clinical assessments. In the Nordic countries, it was evident that most rehabilitative treatments were never or rarely used. These results mirror a survey by McCurtin and Healy [88] investigating the clinical decision-making of Irish SLPs when choosing OD treatment. The study revealed that the majority of SLPs did not use rehabilitative treatment methods and that treatment decisions were based on client suitability (e.g. whether the patient could perform the treatment method) and clinical knowledge, or lack thereof, rather than theoretical reasoning or scientific evidence. A study from the USA by Vose and colleagues [89] provides further explanation of SLPs decision-making in treatment planning

which takes into account the lack of graduate training provided in both healthy and disordered swallowing physiology.

Limitations

As we did not have access to the actual numbers for all professionals in each country, the estimated prevalence data of nurses, OTs and SLPs per capita should be interpreted with caution. A limitation when generalizing the results from the present study may be the low response rate from Iceland, Finland and the nursing profession. This might be due to difficulty in survey distribution within the associations or that few professionals are involved in the management of persons with OD. However, half of the respondents in this survey had six or more years of experience working with adults with OD, which may add validity to the results. Furthermore, recruitment was targeted to professionals known to work with persons with OD within the last 12 months. The on-line survey solution that was used did not have survey logic; allowing respondents to skip questions not applicable to them and save time. Also, the survey being in English might have represented an obstacle to some respondents, and we did not ask respondents to assess their English proficiency. However, providing a survey in five languages was considered impractical with regard to resource and time limitations, in addition to challenges that would have arisen in interpreting the data. English is a mandatory second language in the Nordic countries and professional educations often have English in their educational curriculum.

Conclusions

To the best of our knowledge, this is the first study to provide insight into the education, training and clinical service practices of nurses, OTs and SLPs, currently working with adults with OD in the Nordic countries. The study provides novel knowledge on the differences and similarities in education, training, professional roles and service practices in the Nordic countries. All professionals subjectively rated their level of expertise in OD management as high, despite the fact that the amount of education in the field of OD was minimal for all professions. The Danish OTs as the primary therapist in OD management and the nurses' role in compensatory treatment were also unique findings of this study. There was minimal use of validated screening and assessment tools, in addition to limited access to instrumental assessments. Use of compensatory treatments such as bolus modification and body positioning were common, while use of rehabilitative treatment techniques was lacking. The management of OD requires a multiple disciplinary approach and evidence-based practice, thus there is a need for a collaborative effort between educational and healthcare systems to promote interprofessional training policies and clinical practice guidelines in the management of OD.

Disclosure statement

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