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Speech Language Pathologists' Use of Standardized Diet Levels In the Treatment of Dysphagia

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SPEECH LANGUAGE PATHOLOGISTS' USE OF STANDARDIZED DIET LEVELS IN THE TREATMENT OF DYSPHAGIA

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SANTINA M. D'AGOSTINO

ABSTRACT

The purpose of this study was two-fold, to determine practicing medical speech language pathologists' (SLP) belief of importance of standardization in dysphagia diets and to determine their knowledge and utilization of corresponding standardized terminologies. Three main research questions were examined: (1) What are SLPs' beliefs regarding the importance of standardization in dysphagia diet prescription? (2) How familiar are medical SLPs with standardized dysphagia diet level terminologies? (3) How often do these SLPs utilize correct, standardized levels when treating patients with dysphagia? This qualitative study included 51 participants who were medical SLPs employed in hospitals, skilled nursing facilities, and rehabilitation centers across several states. Participants completed an online survey via Qualtrics. The study found that the majority of participants value the standardization of dysphagia diets. However, it appears that participants were still uncertain about the terminologies associated with the International Dysphagia Diet Standardization Initiative (IDDSI) and the National Dysphagia Diet (NDD). The conclusion of this study was that SLPs could benefit from training in the use of standardized dysphagia diet terminologies.

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INTRODUCTION

Dysphagia is defined as "anatomical or physiological abnormalities that interfere with swallowing (Taylor, K. A., & Barr, S. I. 2006). Dysphagia is treated by speech language pathologists and frequently entails diet modifications or postural changes. Swallowing or deglutition can be categorized into four phases. These stages include the oral preparatory, oral, pharyngeal, and esophageal phases.

Oral Preparatory

The oral preparatory phase involves behaviors including lip closure, labial and buccal tension, rotary and lateral jaw movement, rolling and lateral lingual motion to manipulate food and liquid into a bolus, and a pulling forward of the soft palate, or velum to seal food into the oral cavity. Tongue mobility serves as the most important function of the oral preparatory phase, facilitating mastication (Logemann, 1984). Following adequate mastication, the tongue forms a cohesive bolus from the solid and liquid materials scattered throughout the oral cavity (Logemann, 1984).

Oral Phase

The oral phase is responsible for propelling the bolus into the throat, or pharynx. This phase begins when the tongue begins to propel the bolus posteriorly, in an upward

and backward rolling motion. Food is squeezed along the palate until it reaches the anterior faucial arches, where the swallowing reflex is then triggered. The oral phase of swallow is under voluntary control. This control is responsible for contributing to the trigger of the swallow reflex, which requires a component of cortical input. One of the major cranial nerves responsible and associated with the swallow reflex is the glossopharyngeal nerve, or ninth cranial nerve. The glossopharyngeal nerve carries impulses directly to the swallowing center in the brain. The swallowing center is adjacent to the respiratory center. These two centers function closely together and coordinate with one another so that the instant the swallow is triggered, respiration is paused. The oral phase of the swallow is completed when the reflexive swallow has been triggered at the level of the anterior faucial arch (Logemann, 1984).

Pharyngeal Phase

The pharyngeal phase begins when the swallow is triggered, and the bolus is squeezed into the pharynx. This stage is critical in the closing off the airway to prevent materials from entering the windpipe, or trachea. During the pharyngeal phase of the swallow, several neuromotor components fall into place. These include a) velopharyngeal closure to prevent food from entering the nasal cavity; b) peristaltic contraction to squeeze the bolus through the pharyngeal lumen, c) laryngeal elevation and closure; and d) cricopharyngeal relaxation in order to allow the bolus to pass into the esophagus. This phase lasts a maximum time of 1 second, regardless of food consistency (Logemann, 1984).

Esophageal Phase

The esophageal phase is triggered once the bolus has passed through the cricopharyngeus muscle. This stage entails the opening and closing of the esophagus, or more specifically, the upper esophageal sphincter (UES), allowing food and liquid to pass from the mouth into the stomach. It is important to note that the esophageal phase of the swallow is beyond the control of a speech language pathologist. The first three phases, however, lie within an SLP's scope. Regardless, the esophageal phase of the swallow does play a role in the overall presentation of the swallow and may contribute to aspiration if not intact. Without proper squeeze, or peristalsis of materials through the UES, retention of food and drink may accumulate above the upper esophageal sphincter and eventually migrate over the arytenoid prominences into the airway. Patients experiencing esophageal dysfunction, or any type of reflux may ultimately demonstrate behaviors such as coughing or choking during meals, which may be misconceived as dysfunction of the pharyngeal phase of the swallow (Logemann, 1984).

Etiologies and Prognoses of Dysphagia

Dysphagia can affect all populations, at any time throughout individuals' lives. The most common etiologies of dysphagia are strokes, traumatic brain injury (TBI), and Parkinson's disease. Other progressive neurological diseases in which swallowing is likely to be affected include Amyotrophic Lateral Sclerosis (ALS), Myasthenia Gravis, and Multiple Sclerosis (MS) (NINDS, 2019).

The prognosis of dysphagia can often be determined by the type of swallowing deficit present in combination with the neurological disorder that produces it (NINDS, 2019). In some cases, dysphagia may be treated through diet manipulation. In other

situations, however, where the problem is more severe, aggressive intervention such as feeding tubes may be introduced. In severe cases, dysphagia is likely to lead to life-threatening conditions such as pneumonia, infection, or malnutrition if not addressed appropriately (American Speech Language and Hearing Association, 2017).

History of Standardized Dysphagia Diets

One of the most common forms of dysphagia management is that of texture-modified foods and thickened liquids. These modified consistencies are provided to help at-risk individuals reduce the hazard of choking or aspiration. This type of dysphagia management may be commonly referred to as a dysphagia diet (American Speech Language and Hearing Association, 2017).

Prior to the introduction of standard dysphagia diets, numerous studies reported that a lack of common terminology existed in the nutritional management of individuals suffering from deglutition, or swallowing deficits. A study conducted by Giel and Ryker (1996) found that among seventy-one dieticians in twenty-seven states, forty different labels were used to describe solids and eighteen were used to describe liquids. This study showed a clear need for standardization of the terminology. Hence, the introduction of the National Dysphagia Diet Task Force (NDDTF) was formed. This committee was comprised of Dieticians in Physical Medicine and Rehabilitation, a practice group of the American Dietetic Association, and a Special Interest Division 13 of the American Speech-Language and Hearing Association (National Dysphagia Diet Task Force & American Dietetic Association, 2002).

The National Dysphagia Diet (NDD) was created by the National Dysphagia Diet Task Force, American Dietetic Association, and a Special Interest Division of the

American Speech-Language and Hearing Association in 2002. This intended to produce a standard of care in order to eliminate frustration and confusion in dysphagia treatment. The goals of the NDDTF were to eliminate this confusion. Furthermore, the National Dysphagia Diet (NDD) attempted to establish objective and measurable properties of both solids and liquids. This standardization was intended to be utilized in both healthcare and at-home settings (National Dysphagia Diet Task Force & American Dietetic Association, 2002).

In 2002, the NDD was officially published by the American Dietetic Association (McCullough, Pelletier, & Steele, 2003). The diet levels included in the NDD were:

Level 1: Dysphagia-Pureed (homogenous, very cohesive, pudding-like, requiring very little chewing ability).

Level 2: Dysphagia-Mechanical Altered (cohesive, moist, semisolid foods, requiring some chewing).

Level 3: Dysphagia-Advanced (soft foods that require more chewing ability).

Regular: A regular diet is not allocated a level, as that is considered a non-restrictive diet.

Ultimately, the NDD brought about the initiation of standardization in dysphagia management. However, the intention of the NDDTF to quantify both solids and liquids fell short of being accomplished. As acknowledged by the task force, solid consistencies only were integrated into the national standardization of the dysphagia diet. Individuals on the NDDTF recognize that the NDD is to be considered an evolving process that will be improved as science strives to better define appropriate nutritional therapy for people

with dysphagia (National Dysphagia Diet Task Force & American Dietetic Association, 2002).

Twelve years post-initiation of the NDD, the International Dysphagia Diet Standardization Initiative (IDDSI) was produced in 2015. Created by a group of diverse professionals including dieticians, speech pathologists, physicians, and nurses, their aim was to develop international standardized terminology and definitions for texture modified foods and thickened liquids for persons with dysphagia. These changes brought about global, standardized definitions and terminology to label texture-modified foods and liquids used to treat individuals with dysphagia in all settings (Lam & Cichero, 2016). The IDDSI framework is composed of 8 diet levels ranging from 0-7. Liquid consistencies are measured from 0-4, while solids are measured 3-7. Each of these values is paired with a corresponding text label and color code to carefully delineate each texture or thickness defined in the framework, as seen in Figure 1.1 below.

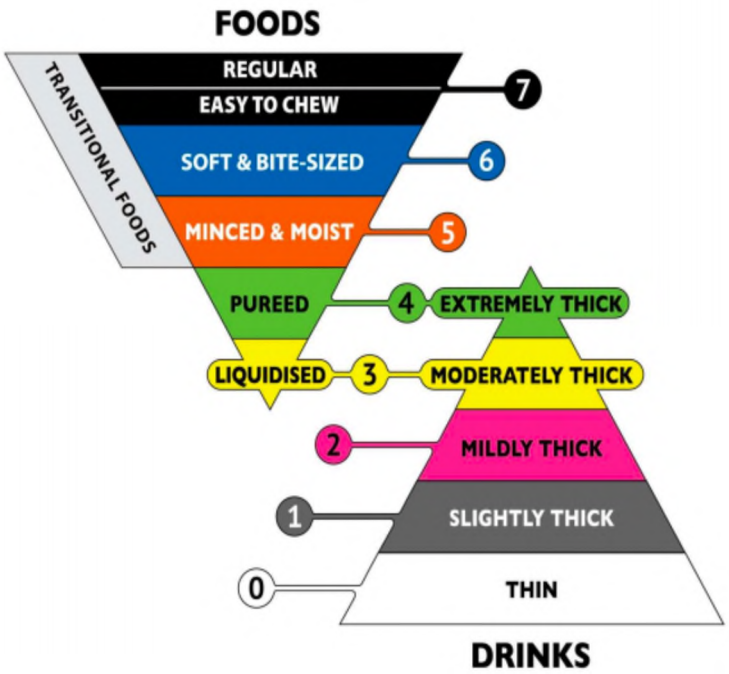


Figure 1.1. IDDSI Diet Levels

The purpose of this diet, similarly to that of the NDD, was to propose standardization in dysphagia treatment in order to eliminate its ambiguity. These measures became necessary to ensure the safety of individuals with swallowing difficulties. Even with these changes, more clarification and education regarding the IDDSI continue to be necessary for dysphagia management.

Literature Review

In recent years, many countries around the world collaborated to develop dysphagia diet standards at both regional and national levels. Unfortunately, these standards used different terminologies, diet labels, numbers and levels that further added to the confusion for health professionals, such as speech language pathologists, caregivers, patients and researchers. Many studies have endeavored to quantify dysphagia diets as a means of educating all personnel concerned.

McCullough, Pelletier, and Steele (2003) reported that even though the NDD was constructed with the contribution of speech-language pathologists (SLPs), the American Speech and Hearing Association (ASHA) did not officially approve the diet as a standard. This led clinicians to approach the use of this four diet-level hierarchy with caution. The current research into the use of standardization of dysphagia diets looks more closely at how these standardized diets are understood and utilized in relation to the New International Dysphagia Diet Standardization Initiative.

An evidence-based statement and concise review of the International Dysphagia Diet Standardization Initiative (IDDSI) was provided by Lam & Cichero (2016). These authors provide a framework for understanding the work completed by the International Dysphagia Diet Standardization Committee. The work of the committee included the year

the initiative was founded, goals to be achieved, time spent fulfilling the research, culmination date of the framework, updates made, as well as future plans of progression for its implementation. This initiative is discussed in the current research as the standard that facilities ought to be utilizing to best serve patients with dysphagia. The utilization of this international standardization is especially important to consider in the United States as the nation continues to grow into an even greater melting pot, becoming home to individuals from all around the world. Furthermore, this source documents levels of evidence in support of the IDDSI framework, establishing its credibility.

The Academy of Nutrition and Dietetics as well as the American Speech and Hearing Association (ASHA) offered their support of the International Dysphagia Diet Standardization Initiative (IDDSI), or the new global initiative of dysphagia diet standardization for those who suffer from swallowing disorders (2017). Its support of the IDDSI validates the research being done in the current study, which delves deeper into the IDDSI and its usage in order to best serve people with dysphagia. President of ASHA, Gail J. Richard expresses, "The standardization framework represents a tremendous step forward in collaborating in the care of people with swallowing disorders." From this statement and the already published support of the IDDSI, the current study plans to examine further the implementation of this standardization and determine the need to educate on the topic pending research results.

In recent years, countries have worked to develop dysphagia diet standards at the regional, national, and international levels. Unfortunately, all of these different standards utilize varying terminology or levels to describe their diets. When describing dysphagia diets, health care professionals may commonly use terms such as "soft," "chopped,"

"mechanical soft," "blended smooth," etc. With a wide range of terminology, however, necessary food and drink modifications may be unclear (Carlson, 2018). Furthermore, patients with dysphagia may find that their diet texture is called one thing during their hospital stay, while upon their transfer to skilled nursing, it is referred to as something different. "Changing over to globally recognized terminology [the IDDSI], – based on evidence – is critical, regardless of the patient population or type of facility you are practicing in" (Carlson, 2018). Implementation should develop in phases. The first step in applying this globally recognized terminology is building awareness, followed by preparation and adoption, ending with monitoring across all phases (Carlson, 2018).

The condition of dysphagia has diverse causes and symptoms, which can vary greatly. SLPs and nurses are the primary health care workers managing dysphagia patients, whether in acute care units, rehabilitation centers, or skilled nursing facilities (Garcia & Chambers, 2010). Diet texture modifications are a fundamental aspect in the management of dysphagia and if not properly prescribed or communicated, may lead to harming patients.

Reported benefits of standardization include patient safety and enhanced inter and intra-professional communication (Cichero, 2014). However, in addition to the benefits of standardization, there are also challenges that need to be overcome. Similar to other sources on the topic, Chicero maintains the idea that there are numerous areas in which common terminology for dysphagia diets could be advantageous. The area that would benefit the utmost, however, would be dysphagia intervention. More specifically, the language that is utilized and communicated in order to thicken liquids and texture-modify foods for individuals with swallowing disorders could become more easily recognizable,

less ambiguous, and ultimately much safer for patients. Due to the concerns mentioned above, Cichero asserts that there is a rationale for an international initiative to develop globally standardized terminology for dysphagia diets and food/liquid modifications. This article was published one year prior to the IDDSI reaching fruition, which resolved the greatest concern discussed by Cichero. However, research does not cover the additional apprehensions that accompany the standardization of this terminology. There is limited data suggesting the utilization of the IDDSI and whether or not facilities managing dysphagia patients are truly applying the common terminologies that have been so sought after and ultimately generated.

Despite the important role texture modified foods and liquids play in dysphagia intervention, the descriptions used to describe these consistencies continues to vary throughout the world, within countries, and across hospitals that are geographically proximal to one another (Cichero et al., 2017). Cichero et al. (2017) forms a comparison between dysphagia diets and "dose-driven medication prescriptions..." for varying severities of medical conditions. The researchers continue to state that individuals are assessed and prescribed diet modifications appropriate to their physical and mental states, much like medication prescriptions for otherwise ill individuals. Similarly to adverse situations that may result from errors in medication dosages, death and other severe conditions have been attributed to inconsistencies in labeling texture-modified diets for those with dysphagia (Cichero et al., 2017). Therefore, while novel standards to improve patient care have been created in recent years, the abundance in terminology combined with increased access to information through the internet has only led to increased confusion related to proper usage of standard dysphagia terminology.

The mission of constructing a standard of care for patients with dysphagia, specifically in the area of nutritional management, was to eliminate the frustrations of health care workers and produce more effective patient management (The American Dietetic Association 2002). A study was conducted by Linda Giel and Angel Ryker (1996), which found that from seventy-one dieticians in twenty-seven states, forty labels were utilized to describe solid textures and eighteen to describe liquid viscosities. Results of the study proved a need for change, which brings about the current research. The original goals of the NDD task force included plans for both solids and liquids. However, the force admits that standardization of liquid viscosities fell short. As the NDD initiated the onset of standardization in dysphagia diets, the task force acknowledges the evolving process that is required in order to improve nutrition for people with dysphagia.

An additional study was conducted in which sixty speech therapists working with neurogenic oropharyngeal dysphagia (NOD) management were to sort commercial liquids (thin to thickest viscosity) to match IDDSI levels 0-4 (Salles Machado et al., 2019). Upon these speech therapists' sorting, they were additionally requested to designate the appropriate term for each consistency, once again based on the IDDSI. Results of the study concluded that although these experts were able to sort the given liquids appropriately, in accordance with the IDDSI diet levels, the terminologies utilized were markedly divergent from each other on all levels. Three different terms for level zero consistencies were assigned; level one terms consisted of twenty-four varying labels; level two had twenty-five terms; twenty-three terms were used for level three; and eighteen terms for level four. Out of the sixty speech therapists participating in the study, none of them were able to identify all five levels presented, correctly. Ultimately,

consistencies were progressed properly, but multiple terminologies being utilized for the same consistency at all levels proved a lack of knowledge of standardization apart from the IDDSI levels being in place.

This research validates a need for education on IDDSI diet levels for those employed at institutions where dysphagia management is necessary. This study, conducted only one year ago and four years post IDDSI completion, serves as an authentic invitation to delve further into the utilization and knowledge of the IDDSI that individuals may or may not have. Serving as a pivotal aspect of the current research, the study conducted by Salles Machado et al. (2019) defined professionals' bewilderment in the utilization of standard dysphagia terminology. While the previous study reported on a smaller scale, the current research will be conducted through a different means and with heightened participation from professionals across the nation. The current study will make advancements in gathering recent and relevant data related to appropriate use of IDDSI terminologies, serving as the foundation for necessary training resources to be created in order to improve the application of dysphagia diet standardization.

Purpose of the Study

In recent years, a number of dysphagia diet standardization initiatives have been developed both nationally and internationally. Research has proven these initiatives necessary in order to best care for patients with dysphagia. A topic of research that has not been covered extensively, however, has been that regarding the proper utilization of standardized dysphagia diet terminology. Without standardization of terminology, health care workers, specifically speech-language pathologists who diagnose and treat dysphagia may be confused as well as unable to treat dysphagic patients to the best of

their ability. Many patients diagnosed with dysphagia in the hospital setting are eventually discharged to skilled nursing facilities (SNFs), to their homes, or to acute rehabilitation centers. Without communication of a prescribed standardized diet upon hospital discharge, the management and care of the individual with dysphagia is likely to be less efficient due to varying terminology, labels, and levels used to identify the appropriate diet recommended (Academy of Nutrition and Dietetics, 2020).

The purpose of this study is two-fold: (1) to discover the extent to which SLPs in healthcare facilities utilize standardized diets in the treatment of dysphagia, and (2) to gather information in order to educate medical SLPs on the current standardized dysphagia diet terminology. Three research questions have emerged from this study: (1) What are SLPs' beliefs regarding the importance of standardization in dysphagia diet prescription? (2) How familiar are medical speech language pathologists (SLPs) with standardized dysphagia diet level terminologies? (3) How often do these SLPs utilize correct, standardized levels when treating patients with dysphagia?

CHAPTER II

METHODS

This qualitative study was approved by Cleveland State University's internal IRB review board. Participants were required to sign an initial statement of the survey indicating their consent to participate (Appendix A).

Participants

Fifty-two licensed speech language pathologists were recruited from several states across the nation. These states included: Alabama, California, Colorado, Illinois, Louisiana, Michigan, Montana, New Mexico, New York, Ohio, Pennsylvania, Texas, Virginia, Washington, and Wyoming, amongst others. Of the fifty-two participants that were recruited, fifty-one participated. One participant could not be included in the study because of failure to complete the survey. Each participant in the study was a licensed, practicing SLP, recruited from public listings of hospitals, skilled nursing facilities, and rehabilitation centers from the above states.

Procedure

Initially, facilities in each state were contacted via phone call to determine whether speech pathology was a service offered at their facility. Upon making this determination, a survey via an electronic link through Qualtrics was sent to each licensed

speech language pathologist. Consenting participants responded to the survey electronically. Upon completion, the survey was uploaded to Qualtrics for recording and sorting.

Survey

The first statement on the survey was the consent to participate in the study. The survey for this research consisted of ten questions. Questions were further categorized into four domains, including Demographics (questions 1-3); Belief of importance of standardized dysphagia diets (questions 7-8); Knowledge about standardized dysphagia diets (question 6); and Utilization of standardized dysphagia diets (questions 4-5; 9-10). The time estimated for participants to complete the survey was approximately five minutes (Appendix A).

CHAPTER III

RESULTS

The purpose of qualitative research is to present the participants' own experience of a particular phenomenon from their own perspective, and it aims to interpret what was said and why. Consequently, much of the data are reported descriptively staying faithful to the participant's response. This qualitative study presents the data gathered in terms of descriptive statistics.

Table 3.1. Domains & Survey Questions

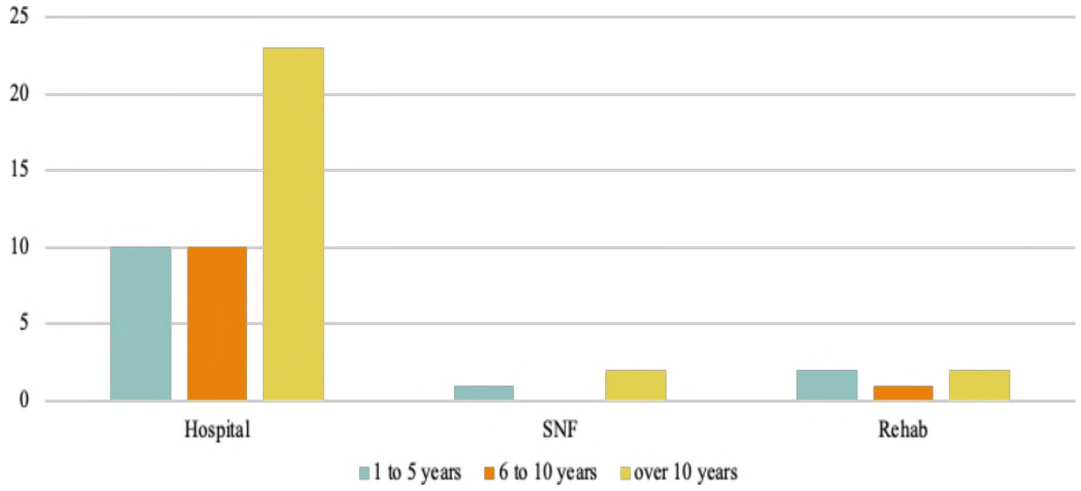
Survey Domains	Questions Related to Domains
Demographics	(1) Number of Years Employed as a Certified SLP (2) Board-Certified Dysphagia Specialist? (3) Facility Employed at
Belief of Importance of Standardized Dysphagia Diets	(7) Belief that Standardization in Dysphagia Diet Levels is Important in Treating Patients (8) Belief that the knowledge of the IDDSI is Beneficial in Treating Dysphagia Patients (6) Certainty of Which Diet Terminology to Utilize when Prescribing Dysphagia Diets to Patients
Knowledge Regarding Standardized Dysphagia Diets	(4) Dysphagia Diet Levels Utilized in Facility (5) Dysphagia Diet Levels Utilized most Frequently
Utilization of Standardized Dysphagia Diet	(9) Facility Utilizes National Dysphagia Diet (10) Facility Utilized International Dysphagia Diet Standardization Initiative

Table 3.1 presents the various domains of the survey, aligned with their respective questions.

Table 3.2. Demographics of Participants (Domain 1)

Setting (Number of Participants)	Years of Experience (Number of Participants)
Hospital (43)	1-5 Years (10) 6-10 years (10) Over 10 Years (23)
Skilled Nursing Facility (3)	1-5 Years (1) 6-10 years (0) Over 10 Years (2)
Rehabilitation Center (5)	1-5 Years (2) 6-10 years (1) Over 10 Years (2)
Total Participants (51)	1-5 Years (13) 6-10 years (11) Over 10 Years (27)

Figure 3.1 Years of Experience of Participants Employed in Various Settings

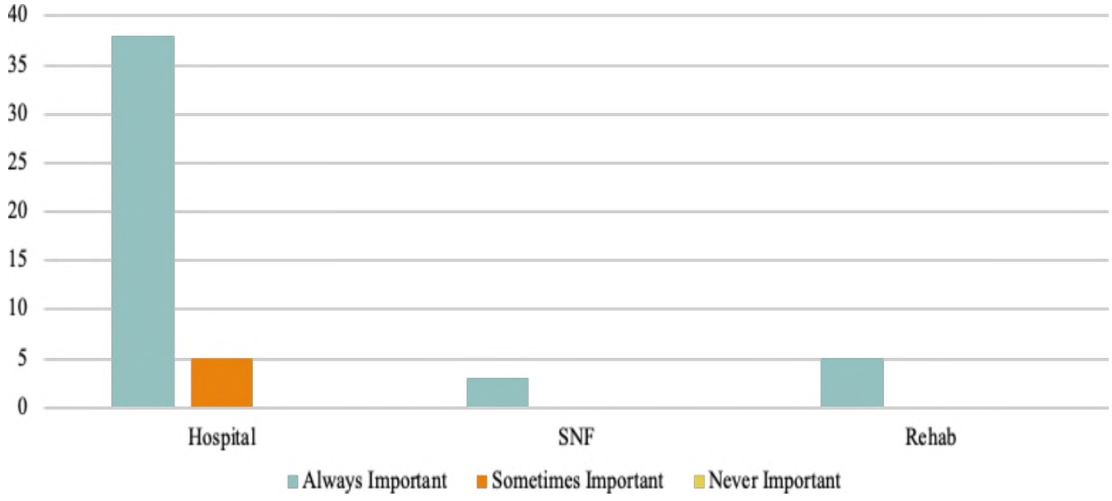


Demographic information including years of experience as well as employment setting were obtained from the participants. This information is reported in Table 3.2, as well as in Figure 3.1. Of the fifty-five participants that completed the survey questions, forty-three of these individuals were employed in the hospital setting, three were

employed at skilled nursing facilities and five at rehabilitation centers. From the hospital participants, 10/43 had been employed between 1-5 years, 10 were employed 6-10 years, and 23 were employed for > ten years. Three participants were employed at skilled nursing facilities. One of these individuals worked between 1-5 years, while the other two individuals have been employed > ten years. Lastly, two individuals employed in rehabilitation centers have worked 1-5 years, one individual 6-10 years, and two individuals >ten years. Ultimately, out of all survey participants, 13 individuals have been employed 1-5 years, 11 individuals have been employed 6-10 years, and 27 individuals have been employed > ten years.

Domain 2: Belief of Importance of Standardized Dysphagia Diets

Figure 3.2 Importance of Standardization of Dysphagia Diet Levels by Setting

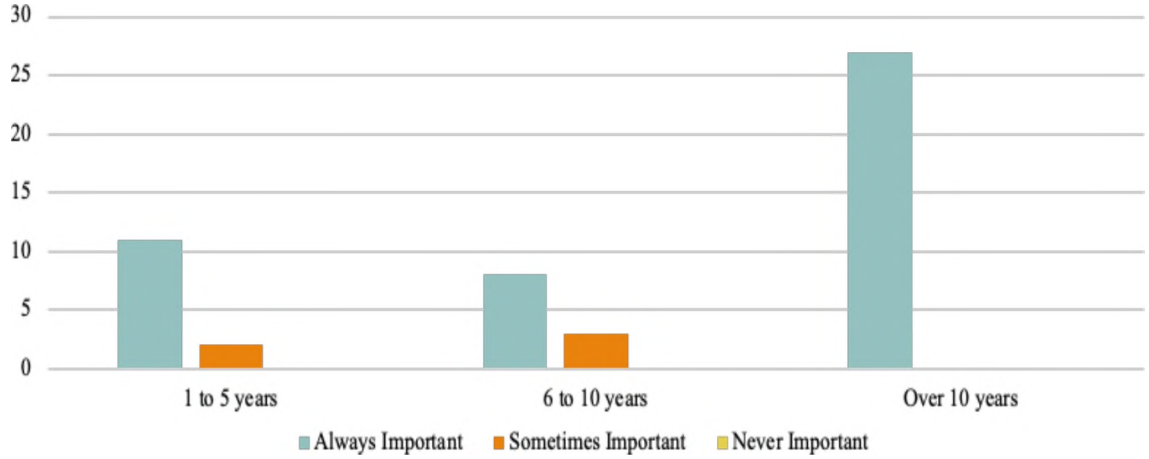


As seen in Table 3.1, the questions targeting the domain of "Belief of Importance of Standardized Dysphagia Diets," are as follows: 1) "I feel as though the standardization of dysphagia diet levels in treating patients is important;" 2) I feel that knowledge of the International Dysphagia Diet Standardization Initiative (IDDSI) is beneficial in treating

dysphagia patients." Participants were to respond to these statements with *Always, Sometimes,* or *Never.*

Responses to the first question in this domain were again broken down by settings and years of experience (Figures 3.2 and 3.3). Of the hospital participants, 38/43 (88%)

Figure 3.3 Importance of Standardization of Dysphagia Diet Levels by Years Employed

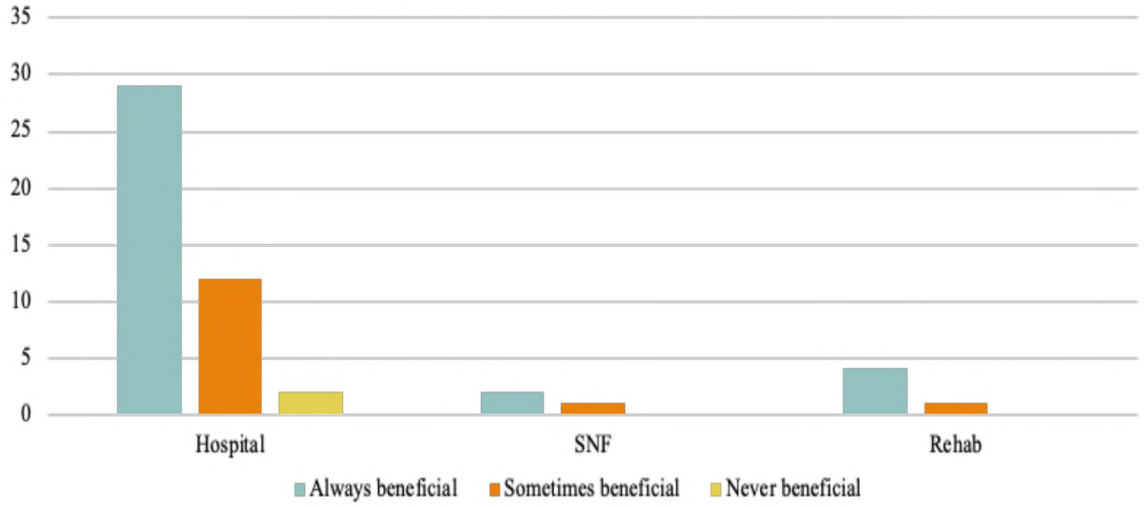


affirmed that standardization of dysphagia diet levels when treating patients is *always* important, while 5/43 (12%) of hospital participants expressed their view of the importance of standardization of dysphagia diet levels as *sometimes* important. The three SNF participants in the study, as well as the five rehabilitation participants, stated that standardization is *always* important. No participants in the research reported feeling as though standardization of dysphagia diet terminology was unimportant. Rather, in all settings in which data was collected, participants indicated the importance of standardizing dysphagia diets/terminology.

Figure 3.3 represents a breakdown of the participants' responses to the importance of diet standardization according to years of experience. Of the individuals employed 1-5 years, 11/13 (85%) expressed agreement that standardization of dysphagia diet levels is

always important, whereas 2/13 (15%) of these individuals stated that standardization was important to them only *sometimes*. Those employed 6-10 years, (8/11 73%) stated standardization was *always* important. On the other hand, 3/11 participants (27%) stated standardization of dysphagia diet levels was *sometimes* important. All twenty-seven participants (100%) who were employed > 10 years agreed that standardization of dysphagia diet levels is *always* important.

Figure 3.4 Knowledge of IDDSI is Beneficial by Setting



Question 8, which also corresponded to the domain of "Belief of Importance of Standardization of Dysphagia Diets" stated, "I feel that knowledge of the International Dysphagia Diet Standardization Initiative (IDDSI) is beneficial in treating dysphagia patients." Figure 3.4 and 3.5 illustrate participants' beliefs that knowledge of the IDDSI is beneficial in treating dysphagia patients. Those employed within a hospital setting, (29/43 67%) stated that knowledge of the IDDSI is *always* beneficial when treating dysphagia patients, while 12/43 (28%) in this setting stated that this knowledge is *sometimes* beneficial, and 2/43 (5%) said that it is *never* beneficial. The SNF participants,

(2/3 67%) reported that knowledge of the IDDSI is *always* beneficial, while 1/3 (33%) stated this knowledge is *sometimes* beneficial. Those employed in the rehabilitation setting, (4/5 80%) stated that knowledge of the IDDSI is *always* beneficial and 1/5 (20%) stated it is *sometimes* beneficial. Only 2/51 (4%) of the respondents stated a belief that knowledge of the IDDSI is *never* beneficial when treating patients with dysphagia.

Figure 3.5 Knowledge of IDDSI is Beneficial by Years of Experience

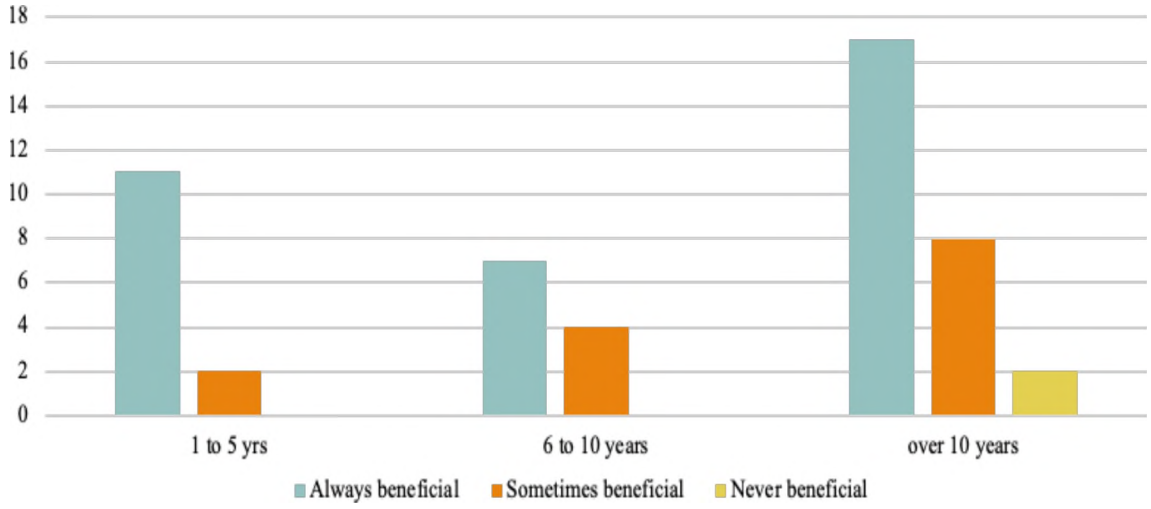


Figure 3.5 presents the survey responses to question 8 based on years of experience. Of the participants employed 1-5 years, 11/13 (85%) believe that IDDSI knowledge is *always* beneficial, and 2/13 (15%) individuals believe that it is *sometimes* beneficial. Among those employed 6-10 years, 7/11 (64%) believed IDDSI knowledge is *always* beneficial, while 4/11 (36%) believe it is *sometimes* beneficial. Out of those being employed > 10 years, 17/27 (63%) stated that knowledge of the IDDSI is *always* beneficial when treating dysphagia patients, whereas 8/27 (30%) believed this knowledge was sometimes beneficial, and 8/27 (7%) disagreed with this knowledge ever being beneficial.

Domain 3: Knowledge About Standardized Dysphagia Diets

Domain 3, "Knowledge About Standardized Dysphagia Diets" was explored through the statement, "I feel unsure regarding which diet terminology to use when prescribing dysphagia diets to my patients." Participants responded with *Always, Sometimes,* or *Never*. Results of domain 3 will later be compared to results found in domain 4. This domain served as a direct link to the research questions.

Figure 3.6 Knowledge of Diet Terminology by Setting

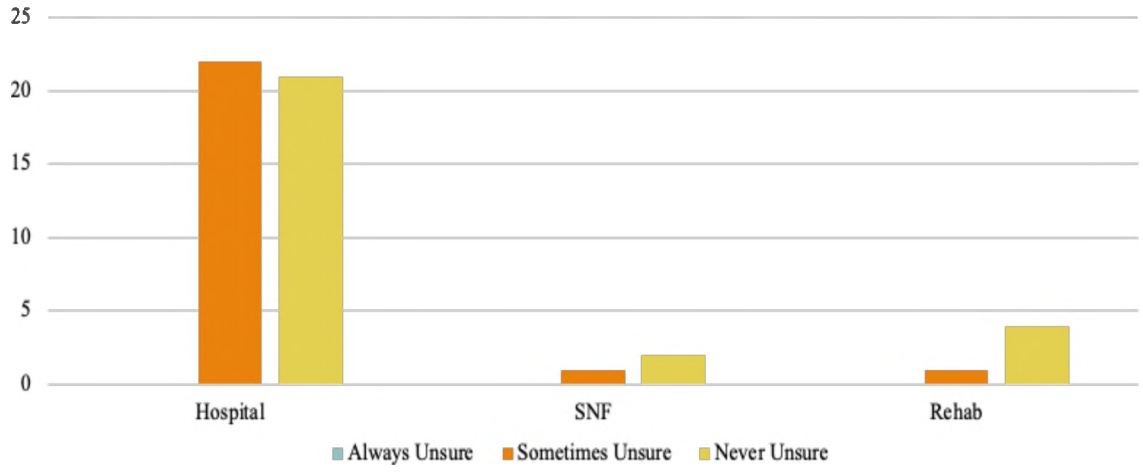
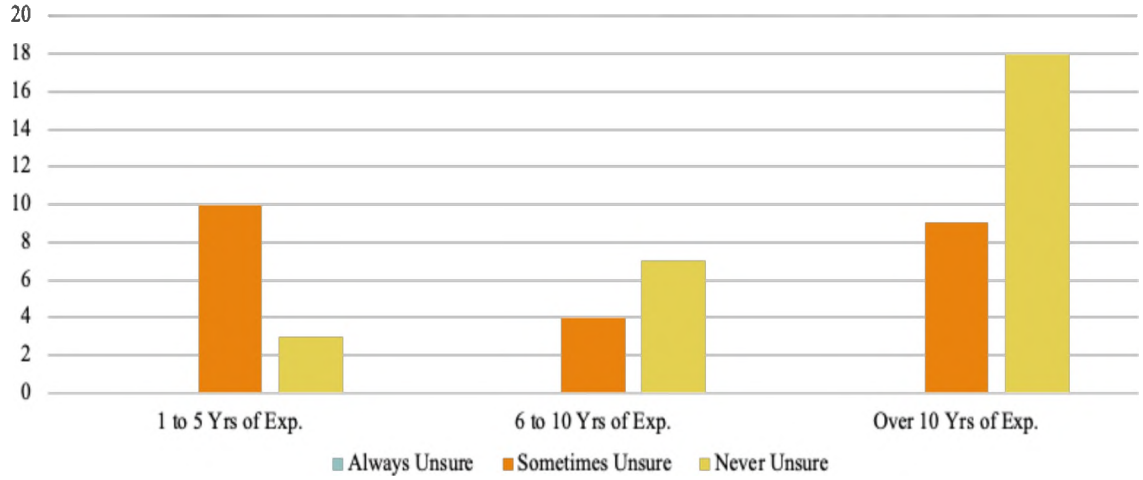


Figure 3.6 represents data based on participants' employment settings. No participants reported *always* feeling unsure of dysphagia diet terminologies. Of the hospital participants, 22/43 (51%) were *sometimes* unsure of diet terminologies, while 1/3 (33%) SNF participants and 1/5 (20%) rehabilitation participants were *sometimes* unsure. Of the hospital participants, 21/43 (49%) stated that they were never unsure of which diet terminology to utilize, while 2/3 (67%) participants from the SNF and 4/5 (80%) from rehabilitation were never unsure of these terminologies.

Figure 3.7 Knowledge of Diet Terminology by Years of Experience



When considering certainty of diet terminology based on years of experience, again, no participants reported being *always* unsure, while 10/13 (77%) participants who have been employed 1-5 years stated being *sometimes* unsure and 3/13 stated being *never* unsure (23%). In the group of participants employed for 6-10 years, 4/11 (36%) stated that they were *sometimes* unsure and 7/11 (63%) stated being *never* unsure. Lastly, in the group employed > 10 years, 9/27 (33%) stated they were *sometimes* unsure, while 18/27 (67%) stated they were *never* unsure of which diet terminologies to utilize when prescribing dysphagia diets to patients.

Domain 4: Utilization of Standardized Dysphagia Diets

Questions 4 and 5, as well as questions 9 and 10 of the survey dealt with diet levels utilized in the facilities in which SLPs were employed.

The questions in this domain were as follows: (4) “Check the dysphagia diet levels that you use in your facility”; (5) “Check the dysphagia diet levels you utilize most frequently at your facility; (9) “The facility in which I am employed utilizes the National

Dysphagia Diet (NDD); and (10) "The facility in which I am employed utilizes the International Dysphagia Diet Standardization Initiative (IDDSI)."

With respect to questions 4, 9 and 10, the information probed how individuals utilized various diet levels, as well as how individuals utilized diet levels strictly from one standardized diet, a combination of standardized diets, or no standardization. These questions also provided information about diet level terminologies, and combinations of terminologies utilized in these three settings (Table 3.3, Table 3.4).

Table 3.3 Utilization of Dysphagia Diet Levels by Participating SLPs (by Facility)

	Hospital	SNF	Rehab	Total
Non-Standardized Only	0	0	0	0
NDD Only	0	0	0	0
IDDSI Only	6 (14%)	0 (0%)	1 (20%)	7 (14%)
IDDSI + NDD*	4	1	0	5
Combination of 2+ Diets	37 (86%)	3 (100%)	4 (80%)	44 (86%)

**5 (11%) participants out of the 44 total participants utilizing a combination of 2+ diets reported utilization of IDDSI + NDD diet levels only, with no usage of non-standardized diet levels*

Table 3.4 Utilization of Dysphagia Diet Levels by Participating SLPs (by Years of Experience)

	1-5 Years	6-10 Years	Over 10	Total
Non-Standardized Only	0	0	0	0
NDD Only	0	0	0	0
IDDSI Only	3 (23%)	2 (18%)	2 (7%)	7 (14%)
IDDSI + NDD*	1	1	3	5
Combination of 2+ Diets	10 (77%)	9 (82%)	25 (93%)	44 (86%)

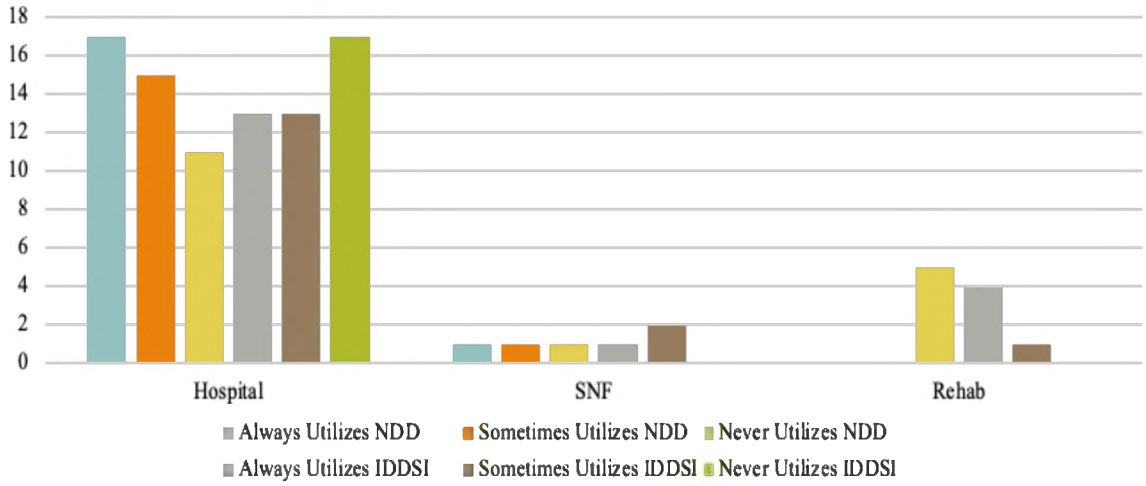
**5 (11%) participants out of the 44 total participants utilizing a combination of 2+ diets reported utilization of IDDSI + NDD diet levels only, with no usage of non-standardized diet levels*

Based on responses from question 4, "Check the dysphagia diet levels that you use in your facility," 44/51 participants (86%) selected a general combination of diet

terminologies they utilize, whether this included IDDSI, NDD, and non-standardized levels; IDDSI and NDD; IDDSI and non-standardized levels; or NDD and non-standardized levels. Of these individuals who utilized a combination of dysphagia diet terminologies, 5/44 (11%) selected terminologies from a combination of both standardized diets only (IDDSI & NDD). Finally, 7/51 participants (14%) selected IDDSI levels only.

Questions 9 and 10 of the survey contributed to the domain of "Utilization of Standardized Dysphagia Diets" ("The facility in which I am employed utilizes the National Dysphagia Diet (NDD)," and "The facility in which I am employed utilizes the International Dysphagia Diet Standardization Initiative (IDDSI)"). Although contributing to the same domain, these two items were answered in terms of *Always, Sometimes,* and *Never,* compared to the checklist of diet levels completed by participants in question 4. Again, responses to questions 9 and 10 were displayed in two separate figures, one by facility employed (Figure 3.8), and one by years of experience in the field (Figure 3.9).

Figure 3.8 Utilization of NDD vs. IDDSI by Setting

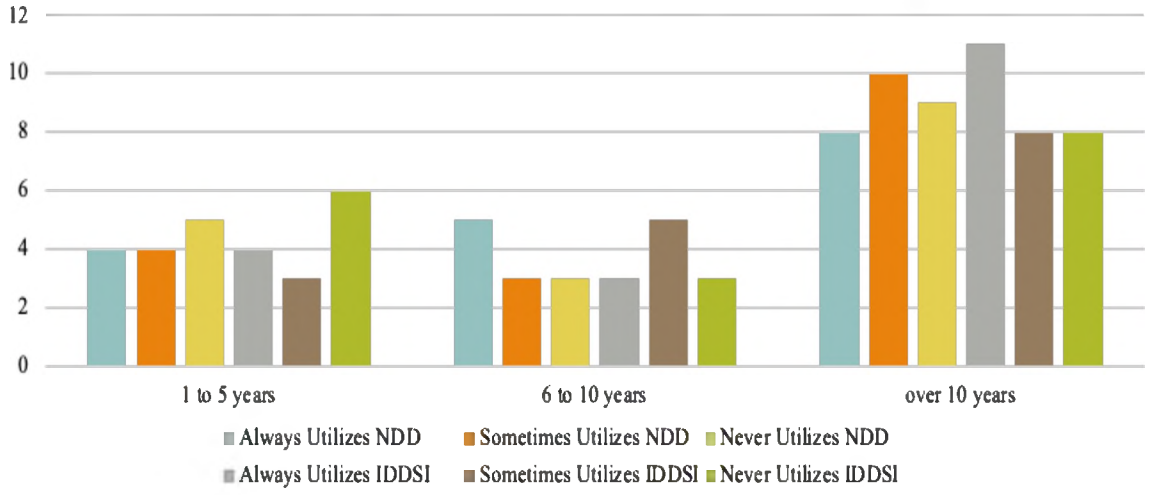


A review of the results for questions 9 and 10 found that 17/43 (40%) of hospital participants reported *always* utilizing the NDD, 15/43 (35%) reported that they *sometimes* utilize the NDD, and 11/43 (25%) said they *never* utilize the NDD. In comparison, 13/43 hospital participants (30%) reported *always* utilizing the IDDSI, 13/43 (30%) expressed *sometimes* utilizing IDDSI, and 17/43 (40%) said they *never* utilize the IDDSI.

Observation of the responses from the SNF participants revealed the following: 1/3 (33%) participants *always* utilized NDD, 1/3 (33%) *sometimes* utilized the NDD, and 1/3 (33%) *never* utilized the NDD. On the other hand, 1/3 (33%) *always* utilized IDDSI and 2/3 (67%) *sometimes* utilized IDDSI. No participants employed in the SNF setting reported *never* utilizing the IDDSI.

Among the rehabilitation participants, no one reported *always* or *sometimes* utilizing NDD, while all 5 (100%) reported *never* utilizing the NDD at their facility. Lastly, 4/5 (80%) participants in the rehabilitation facility reported *always* using IDDSI and 1/5 (20%) reported *sometimes* utilizing IDDSI. No participants employed in this setting reported *never* to the utilization of the IDDSI.

Figure 3.9 Utilization of NDD vs. IDDSI by Years of Experience



In terms of years of experience, based on the responses for questions 9 and 10, it was found that of those with 1-5 years (4/13 31%) reported *always* utilizing the NDD, 4/13 (31%) reported *sometimes* utilizing NDD, and 5/13 (38%) reported *never* utilizing the NDD. On the

other hand, 4/13 (31%) participants employed 1-5 years reported *always* utilizing the IDDSI, 3/13 (23%) reported *sometimes* utilizing IDDSI, and 6/13 (46%) reported *never* utilizing the IDDSI.

For those participants employed for 6-10 years, 5/11 (45%) reported *always* utilizing the NDD, while 3/11 (27%) reported using the NDD *sometimes*, and 3/11 (27%) reported *never* utilizing the NDD. In this same group, 3/11 participants (27%) reported *always* utilizing the IDDSI, 5/11 (45%) reported *sometimes* utilizing the IDDSI, and 3/11 (27%) reported *never* utilizing the IDDSI.

Lastly, in the group employed for > 10 years, 8/27 (30%) reported *always* utilizing the NDD, 10/27 (37%) reported *sometimes* utilizing the NDD, and 9/27 (33%) reported *never* utilizing this diet. Furthermore, in this same group, 11/27 (40%) reported that they *always* utilize the IDDSI, 8/27 (30%) reported *sometimes* utilizing the IDDSI, and 8/27 (30%) reported *never* to the utilization of the IDDSI.

CHAPTER IV

ANALYSIS

Since this is a qualitative study, quantitative statistical analysis was not applied, instead, descriptive statistics were more appropriate for data interpretation. Consequently, the data were analyzed in terms of the number and percentage of responses to questions in a particular domain. Three broad research questions were identified in this study. The research questions addressed were: (1) What are SLPs' beliefs regarding the importance of standardization in dysphagia diet prescription? (2) How familiar are medical speech language pathologists with standardized dysphagia diet level terminologies? and (3) How often do these SLPs appear to utilize correct, standardized dysphagia diet levels when treating patients with dysphagia? These questions corresponded to the different domains of demographics, belief of importance of standardization, knowledge regarding standardized dysphagia diets, and utilization of standardized dysphagia diets. Analysis and discussion of each research question are as follows:

Research Question 1. What are SLPs' beliefs regarding the importance of standardization in dysphagia diet prescription?

Domain 2. Belief of Importance of Standardized Dysphagia Diets

Research question 1 was associated with domain 2, which addressed the following 2 questions: (1) I feel as though the standardization of dysphagia diet levels in treating patients is important and (2) I feel that knowledge of the International Dysphagia Diet Standardization Initiative (IDDSI) is beneficial in treating dysphagia patients.

The focus of this study was based on SLPs' value of, familiarity with, and utilization of standardized dysphagia terminology. Question 7 within domain 2 stated, "I feel as though the standardization of dysphagia diet levels in treating patients is important." Responses to this question revealed that 46/51 (90%) participants in the survey believed standardization of dysphagia diets is *always* important. The remaining 10% of participants believed standardization is *sometimes* important. All of the participants in the survey believed that standardization in dysphagia management is important.

Comparison of "belief of importance" of standardization in dysphagia diets according to "employment facilities," did not reveal notable discrepancies in the results. However, a comparison of "belief of importance" according to the "years of experience," reveal that those who have been in the field for the longest number of years reported the least variability and greatest "belief of importance" of standardization in dysphagia diet prescription (Figure 3.3).

The responses for question 8, within that same domain, were analyzed. This question stated, "I feel that knowledge of the International Dysphagia Diet Standardization Initiative (IDDSI) is beneficial in treating dysphagia patients." Results of this item showed that 49/51 (96%) participants believe that the IDDSI is *always* or *sometimes* beneficial, with only 2/51 (4%) claiming that the IDDSI is *never* beneficial in

dysphagia management. This suggests that the majority of SLPs value standardization and believe it is important, despite their varying settings of employment and years of experience.

Research Question 2. How familiar are medical speech language pathologists with standardized dysphagia diet level terminologies?

Domain 3. Knowledge Regarding Standardized Dysphagia Diets

Research question 2 was associated with domain 3, which addressed the following question: "I feel unsure regarding which diet terminology to use when prescribing dysphagia diets to my patients." The results from this domain indicated that the participants are not entirely familiar with standardized dysphagia diet level terminologies. This finding corroborates that of Carlson, (2018), who also found that medical speech pathologists are not familiar with dysphagia diet terminologies (Figures 3.6 and 3.6). These figures show 47% of participants in the study express being "sometimes uncertain" when responding to question 6, which read, "I feel unsure regarding which diet terminology to use when prescribing dysphagia diets to my patients." Although less than half of the participants expressed uncertainty when prescribing dysphagia diet levels to patients, there was not much of a discrepancy when comparing the responses of SLPs according to their place of employment. In terms of years of experiences, results showed that those who have been employed > 10 years feel the least uncertain when prescribing dysphagia diets. As presented in the results, those who have been employed 1-5 years were *sometimes* uncertain 77% of the time, while those who have been employed > 10 years were *sometimes* uncertain only 33% of the time.

Research Question 3. How often do these SLPs appear to utilize correct, standardized dysphagia diet levels when treating patients with dysphagia?

Domain 4. Utilization of Standardized Dysphagia Diets

Research question 3 was associated with domain 4, which addressed the following questions: (1) Check the dysphagia diet levels that you use in your facility, (2) Check the dysphagia diet levels you utilize most frequently at your facility, (3) The facility in which I am employed utilizes the National Dysphagia Diet (NDD), and (4) The facility in which I am employed utilizes the International Dysphagia Diet Standardization Initiative (IDDSI).

These four questions focused on utilization of standardized dysphagia diets. Analysis of the responses indicated that many SLPs are unsure as to the current diet they are utilizing. Therefore, they are likely to be incorrectly prescribing a dysphagia diet. Results of questions 4, 9 and 10 of the survey are found in Tables 3.3 and 3.4, as well as Figures 3.8 and 3.9. Discrepancies exist between participants who selected utilization of specific diet *levels* (question 4) versus their response of *Always, sometimes,* or *never* to questions 9 and 10, which inquired how often participants utilized the NDD and IDDSI standard *diets* at their given facilities of employment. Many participants seem to be uncertain of which diet levels fall into each standardized or unstandardized diet. These individuals are likely to be uncertain regarding which diet they are utilizing when they prescribe specific diet terminology levels such as "minced moist" or "nectar thick liquids" to their patients with dysphagia.

Responses to question 4, "Check the dysphagia diet levels that you use in your facility," showed that 44/51 (86%) participants utilized a combination of 2+ diets when

treating patients with dysphagia. This information is based on the individual diet level terminologies each participant selected as being utilized within their facility. For this question, 7/51 (14%) selected *only* utilizing IDDSI diet levels when answering question 4, none of the 51 participants selected *only* utilizing NDD, and 5/51 (10%) indicated that they utilize both standardized diets (IDDSI and NDD) in combination with one another only (without utilizing non-standardized diet levels). Moreover, when analyzing results from questions 9 and 10, 17/51 (33%) expressed *always* for the utilization of the NDD at their facility and 18/51 (35%) expressed *always* for the utilization of the IDDSI at their facility. However, it should be recognized that most participants' responses in question 4 differed from their responses in questions 9 and 10. Since these three questions all surveyed the particular topic of standardized diet utilization, responses should have been similar.

Many participants demonstrated confusion when they responded to either question 9 or 10 as *always* utilizing a standardized diet, but then contraindicated their statement in the paired question (9 or 10) when responding that they *sometimes* or *always* utilize the other diet. By indicating usage of one diet as *always*, there is consequently no room for stating *always* or *sometimes* in the utilization of the other standardized diet. The mismatch of responses between questions 9 and 10 was also mirrored in several participants' responses to question 4. For example, one participant checked utilization of diet level terminologies belonging to the NDD category as well as non-standard levels. However, in question 9, this same participant reported *sometimes* to the utilization of the NDD and *always* to the utilization of the IDDSI, although no IDDSI diet level

terminologies were selected in question 4. This is an example of many similar instances that were observed in participants' responses.

Of the 51 participants in this current study, only 20 (39%) responded to questions 4, 9 and 10 in a manner that demonstrates that they understood the terminologies of the NDD and the IDDSI. Although these 20 individuals appear to recognize the standardized diets and diet level terminologies they are utilizing, they remain consistent with the majority of SLPs in the study in that they were utilizing a combination of diets in their practice. The utilization of more than one diet protocol may become confusing when prescribing a dysphagia diet, particularly when terminologies from various diets are used interchangeably. This may be of additional concern when patients are transferred to one facility from another. Of the 51 participants, only 4 (8%) appeared to understand the dysphagia diets and terminologies they utilize, as well as complete usage of the IDDSI diet. The IDDSI is the most preferred utilization based on current research.

Of all the 51 participants, 40 reported the utilization of diet levels from the IDDSI, in combination with levels from the NDD or other non-standardized levels. Furthermore, 33/51 participants reported utilizing the IDDSI *sometimes* or *always* at their given facility. Again, based on question 4, 7/51 (14%) reported utilizing only IDDSI diet terminologies, and 4 participants (8%) appear to fully comprehend and utilize only the IDDSI. An explanation for these discrepancies might be the possibility of transitioning from non-standardized dysphagia diets to more standardized protocol. It is also likely that participants reporting to utilize the IDDSI with other diet terminologies might be in the process of becoming familiar with, or even being trained in a more standardized protocol while continuing to utilize what they know best (perhaps non-standardized terms).

The data were analyzed in terms of employment facility as well as years of experience. According to table 3.3, 6/7 (86%) individuals indicated in question 4 to be only utilizing levels from the IDDSI were employed in hospitals. In terms of years of experience, however, there was not much discrepancy in the consistent utilization of standardized vs. multiple diet variations.

CHAPTER V

DISCUSSION

The results of the current study support the findings of the already published research surrounding standardized dysphagia diet terminologies. Cichero (2014) provided an in-depth discussion on the rationale for international standardization. In addition, the results of this current study corroborate the findings of Salles Machado et al. (2019), who reported a lack of knowledge of standardization among SLPs when asked to sort viscosities correctly. The obvious lack of knowledge in this study was observed in regard to labeling diet levels. Without the ability to label standardized diet levels appropriately, the level of continuity of care for dysphagia patients may be compromised. SLPs assuming new patients already on dysphagia diets must be able to begin proper diet prescriptions for these patients based on reading their chart from the previous facility.

There is potential risk of confusion in prescribing incorrect diets due to the apparent uncertainty among practicing SLPs regarding diet terminologies. This highlights the need to educate current and future SLPs on proper dysphagia diet prescription. SLPs need to understand the importance of consistency in the use of diet terminologies. Most importantly, SLPs must receive proper training in the globally recognized diet levels being adopted in order to provide quality care for their patients. Being fully educated in

the appropriate dysphagia diet levels will also give the SLPs confidence in the care they are providing for their patients.

In conclusion, this research served to determine speech language pathologists' utilization and understanding of standardization in dysphagia diet terminology when treating patients. Moreover, one of the goals outlined in the introduction chapter of this study was to determine a need for proper education in standardized dysphagia diets. Generally, the majority of SLPs participating in this research value standardization in dysphagia diets. However, results of the study show that these SLPs do not necessarily have the knowledge of the terminologies associated with standardized dysphagia diets. Based on the results and analysis of the data obtained in the study, SLPs in general require training in the use of standardized dysphagia terminologies and the appropriate use of diet levels.

Limitations

Although this was intended to be a comprehensive study, there were a few obvious limitations. One limitation in this current study was the sample size. The size of the sample was 51. This clearly does not reflect the findings of what could have been accrued from a larger sample. Future studies should include a larger number of participants so that there could be more confidence in responses. A possible reason for this small sample size could be the fact that at the time of the distribution of the questionnaire, the entire country was experiencing the acute phase of the COVID-19 pandemic. It could very well be that potential participants were unable to dedicate the time necessary to complete the survey. Another possible limitation of the survey was that there was not a question that specifically addressed participants being formally trained in

the various standardized protocols. This consideration would have provided further insight into participants' understanding and correct utilization of standardized dysphagia diets and terminologies, or lack thereof.

Future Research

The current research of SLPs' usage of standardized diet levels in the treatment of dysphagia may serve as a basis for future studies interested in discovering more. As mentioned above, a greater sample size should be included in future research. Areas of focus may delve into which medical facilities (hospitals, SNF, and rehabilitation) are currently, or will in the future be offering specialized training protocol for the IDDSI. Research may also expand into which regions of the country are offering these types of training programs. Although the current research did gather data from across the nation, no specifics based on region or geographical location were studied in depth. With the potential information to be gained from future research on this topic, the education necessary for medical SLPs on standardized dysphagia diets may find its starting point.

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APPENDIX A

Survey

Demographics

Q1 Circle the number of years you have been employed as a certified SLP.

[] 1-5 years [] 6-10 years [] Over 10 years

Q2 Are you a Board-Certified Dysphagia Specialist?

[] Yes [] No

Q3 Check the facility in which you are employed.

[]Hospital [] Skilled Nursing Facility [] Rehabilitation Center

Q4 Check the dysphagia diet level(s) that you use in your facility.

[] Regular

[] Regular, Easy to Chew

[] Dysphagia Advanced

[] Soft & Bite Sized

[] Dysphagia-Mechanical Altered

[] Minced & Moist

[] Dysphagia-Pureed

[] Pureed Solids & Extremely Thick Liquids

[] Liquidized Solids & Moderately Thick Liquids

[] Honey Thick Liquids

[] Nectar Thick Liquids

[] Mildly Thick Liquids

[] Thin Liquids

Q5 Check the dysphagia diet level(s) you utilize most frequently at your facility.

[] Regular

[] Regular, Easy to Chew

[] Dysphagia Advanced

[] Soft & Bite Sized

[] Dysphagia-Mechanical Altered

[] Minced & Moist

[] Dysphagia-Pureed

[] Pureed Solids & Extremely Thick Liquids

[] Liquidized Solids & Moderately Thick Liquids

[] Honey Thick Liquids

[] Nectar Thick Liquids

[] Mildly Thick Liquids

[] Thin Liquids

Q6 I feel unsure regarding which diet terminology to use when prescribing dysphagia diets to my patients.

[] Always [] Sometimes [] Never

Q7 I feel as though the standardization of dysphagia diet levels in treating patients is important.

[] Always [] Sometimes [] Never

Q8 I feel that knowledge of the International Dysphagia Diet Standardization Initiative (IDDSI) is beneficial in treating dysphagia.

[] Always [] Sometimes [] Never

Q9 The facility in which I am employed utilizes the National Dysphagia Diet (NDD).

[] Always [] Sometimes [] Never

Q10 The facility in which I am employed utilizes the International Dysphagia Diet Standardization Initiative (IDDSI).

[] Always [] Sometimes [] Never

APPENDIX B

Informed Consent

Speech Language Pathologists' use of Standardized Diet Levels in Treating Dysphagia

Dear Participant,

We are Dr. Cox and Santina D'Agostino, faculty member and graduate student. We are in the Speech and Hearing Program at Cleveland State University. For the purpose of research, we are interested in studying how speech-language pathologists use diet levels in swallowing treatment.

Your participation is voluntary. You may withdraw at any time. I agree to protect your privacy. I will not share your information with anyone outside of this study. You do not have to sign your name on this survey. Your responses will in no way identify you. There is no reward for participating in this study. There are no consequences for not participating in this study. Any risks associated with this research do not exceed those of daily living. The survey should take about 10 minutes to complete.

For further information regarding this research, please contact my thesis advisor, Dr. Violet Cox at (216) 687-6909, email: v.cox@csuohio.edu, or the co-investigator, Santina D'Agostino at (440) 554-8560, email: s.m.dagostino@vikes.csuohio.edu.
If you have any questions about your rights as a research participant, you may contact the Cleveland State University Institutional Review Board at (216)687-3630.

By checking this box, you acknowledge that you are 18 years of age or older [ ]
Checking the box at the end of this statement will constitute my consent to participate in this study. [ ]
Thank you in advance for your cooperation and support.

APPENDIX C

Phone Call Script

Hello,

My name is Santina D'Agostino. I am a graduate student at Cleveland State University. I am completing a Master's Thesis on speech pathologists' use of standardized diet levels in the treatment of dysphagia. I am seeking for SLPs to participate in an anonymous, online survey. If you are willing to participate, please disclose your email address to me and I will follow-up with an email containing the link to the survey. Thank you.