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Voice disorder management competencies: A survey of school-based speech-language pathologists in Nebraska

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Research Article

Voice Disorder Management Competencies: A Survey of School-Based Speech-Language Pathologists in Nebraska

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Purpose: The purpose of this survey was to determine the self-perceived competence levels in voice disorders of practicing school-based speech-language pathologists (SLPs) and identify correlated variables.
Method: Participants were 153 master's level, school-based SLPs with a Nebraska teaching certificate and/or licensure who completed a survey, including demographic information and a 25-item voice disorders competency checklist.
Results: Findings indicated school-based SLPs did not feel particularly competent in their ability to assess and treat students with voice disorders. Only 1 response mean was higher than a "moderately competent" level. All other item means were at or below this level. Four correlations indicated positive associations with SLPs' overall

self-perceived competence levels: number of continuing education activities related to voice disorders, number of clients with voice disorders in the last 3 months, percentage of time spent with clients who have voice disorders, and feelings of preparation in the area of voice disorders immediately after academic program completion. Informal comparisons to medically based SLP respondents ($n = 22$) were included.
Conclusion: School-based SLPs' competence perceptions with voice disorders are consistent with the minimal levels of competence reported for other underserved or low-incidence populations. Pursuing continuing education in voice disorders is recommended at the same time as access to the population becomes available.

From an international perspective, reported prevalence rates for voice disorders are variable; however, most estimates indicate a range of 3%–9% of children and adults have voice disorders (Andrews & Summers, 2002; Duff, Proctor, & Yairi, 2004; McAllister & Sjolander, 2013; Roy, Stemple, Merrill, & Thomas, 2007; Verdolini & Ramig, 2001). According to the American Speech-Language-Hearing Association (ASHA), a voice disorder involves abnormal or inappropriate production of vocal quality, pitch, loudness, resonance, and/or duration, which does not match an individual's age and/or gender (ASHA, 1993).

Certain variables seem to affect prevalence and incidence of voice disorders. These include gender, age, medical health, occupation, culture, and researchers' operational definition of voice disorder. For example, Akif Kilic, Okur, Yildirim, and Guzelsoy (2004) found that the prevalence of endoscopically confirmed vocal nodules was 21.6% of

school-age boys and 11.7% of school-age girls in Turkey. If basing prevalence only on the presence of hoarseness in school-age children, prevalence has been reported to be 3.9% by consensus of two trained speech-language pathologists (SLPs) when listening to a live voice during a screening (Duff et al., 2004). Roy, Merrill, Thibeault, Gray, and Smith (2004) found significant adverse effects for occupationally related voice disorders in that teachers were much more likely to experience symptoms of voice disorder than nonteachers. More than 60% of the 1,243 teachers sampled in that study attributed voice disorder symptoms to their occupation (Roy et al., 2004).

The focus of this article is children. Although many children have voice disorders, these individuals are reportedly underserved by SLPs in the schools (Kahane & Mayo, 1989). Some estimates indicate that voice disorders should represent 5% of a school-based SLP's caseload; however, in reality, only 2% of a typical caseload is made up of children with voice disorders (Wilson, 1987). To illustrate the relative disparity between the occurrence of voice disorders versus other more frequently treated disorders within an SLP's caseload, the 2012 *ASHA Schools Survey Report: SLP Caseload Characteristics Trends, 1995–2012* (Brook, 2012) indicated that only 22% of school-based SLPs served

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children with voice disorders compared with 93% of SLPs who served children with articulation and phonological disorders. This translates to each school-based SLP serving an average of 1.6 students with voice disorders versus 19.3 students with articulation and phonological disorders in a month (Brook, 2012), although the point prevalence for voice disorders may be higher than those for other conditions. For comparison to the adult population, SLPs reported spending only 5% of their time treating voice and/or resonance disorders in comparison to 42% of their time with swallowing disorders (ASHA, 2011).

Even though voice disorders do not represent a majority of most SLPs' caseloads, the potential impact of the disorder on an individual's life may be significant. Connor et al. (2008) interviewed children in four age groups to determine patterns of how chronic dysphonia affects children's lives. The most common themes noted for school-age children involved reports of physical and emotional impacts, including difficulty getting the voice out and running out of air. Older children felt their voices received undue attention and reported significant frustration and sadness because of their voices. The likely functional consequences of voice disorders in school-age children were outlined by Ruddy and Sapienza (2004). These consequences may include reduced ability to be heard in a school setting, negative attention from peers resulting in social isolation, and limited participation in extracurricular activities (e.g., music, cheerleading, drama). From a more global perspective, Irani, Abdalla, and Hughes (2014) surveyed 523 Arab college students and 417 Arab citizens regarding their attitudes about individuals with voice disorders, including both positive and negative aspects of having the disorder. A large number of respondents (45%) indicated that individuals with voice disorders are emotionally disturbed, 43% felt that having a voice disorder would interfere with finding a good job, and more than 50% reported that persons with voice disorders would have trouble making friends or getting married. In summary, people with and without voice disorders report negative attitudes about voice disorders. Hence, SLPs need an adequate knowledge base and clinical experience to provide effective and appropriate prevention, assessment, and treatment to this clientele whether in the United States or another country.

As training programs and professional standards boards seek to optimize the learning outcomes for SLP students and professionals, evidence is needed to guide decisions about curriculum and practica that contribute to a competent and confident service provider. In various areas of communication disorders, researchers are investigating variables, such as course work, clinical experience, length of time since the training program, participation in study groups, and continuing education, as potential contributors to a SLP's confidence and competence with various disorder types, such as traumatic brain injury (TBI), dysphagia, and autism. If SLPs report low levels of professional competence for a particular disorder area, we can presume they are accurate self-reporters, and

feelings of incompetence will likely inhibit their ability to confidently integrate and apply knowledge to the clinical population.

In an effort to provide evidence for other populations infrequently served by school-based SLPs, Frank, Redmond, and Ruediger (1997) studied the preparedness of educational SLPs in South Carolina to treat pediatric TBI. They found that less than a third of SLPs felt prepared to evaluate (21%) and treat (25%) pediatric TBI clients. One variable that significantly corresponded with SLPs' level of self-reported preparedness was university course work in TBI. SLPs who took TBI coursework, whether focused on adults or pediatrics, were at least seven times more confident in their ability to evaluate students with TBI compared with their peers who had no course work in TBI. A second variable correlated with higher confidence levels was clinical practicum experience in either pediatric or adult TBI clientele. Professionals who obtained clinical practicum experience with pediatric or adult clients with TBI felt eight times more likely to conduct therapy with pediatric TBI clients than those who did not have clinical practicum experience with persons of any age with TBI. These results differed from those in a similar study of SLPs in Connecticut. McGrane and Cascella (2000) did not find a correlation between school-based SLPs' perceived levels of knowledge and presence or amount of clinical experience in working with clients with TBI. The survey respondents reported being confident in their ability to treat students with TBI on average, but the relationship to clinical training was not confirmed.

Researchers also pursued evidence for dysphagia, another population infrequently served by school-based SLPs. Although swallowing disorders traditionally have been treated by medically based SLPs, growing literature includes cases in which children with diverse needs are being treated for dysphagia by SLPs in school settings (Homer, Bickerton, Hill, Parham, & Taylor, 2000; McKirdy, Sheppard, Osborne, & Payne, 2008). Hutchins, Gerety, and Mulligan (2011) used a 5-point Likert scale to assess school-based SLPs' confidence in assessing and treating dysphagia. Responses indicated that almost 70% of clinicians reported *low confidence* (ratings of "1" or "2") in assessing dysphagia, and approximately 56% indicated *low confidence* in their ability to treat children with dysphagia. The following characteristics were positively correlated with higher reported confidence: number of practicum hours in dysphagia, number of continuing education units (CEUs) earned in dysphagia, number of hours concurrently working in a medical setting, and number of students on caseload requiring dysphagia services.

School-based SLPs' self-perceptions of competence and/or confidence in working with other pediatric populations also have been studied, including children fitted with cochlear implants (Compton, Tucker, & Flynn, 2009), children with culturally and linguistically diverse backgrounds (Guiberson & Atkins, 2012), and children with autism spectrum disorder (Plumb & Plexico, 2013). For example, school-based SLPs in North Carolina rated themselves as having little to no confidence in their ability to assess

or treat children who have cochlear implants (Compton et al., 2009). Only 51% of school-based SLPs in Colorado felt "competent" in assessing and treating clients with a bilingual or multilingual background (Guiberson & Atkins, 2012). Last, Plumb and Plexico (2013) found greater degrees of confidence in working with children with autism spectrum disorder among those SLPs graduating prior to 2006 as opposed to SLPs graduating after 2006. It appeared as if the increase in number of years of experience and the continuing education of these professionals had influenced their confidence in working with this population.

Research specific to voice disorders has also been reported for school-based SLPs. Tillard, Lawson, and Emmerson (2011) surveyed SLPs who graduated prior to 2006 and after 2006. Their findings showed that new graduates and their employers reported perceiving voice disorders as one of several content areas of preparation weakness. Kelly et al. (1997) asked practicing school-based SLPs to rank-order seven clinical populations according to how prepared the clinicians felt in treating each area at the end of their clinical training (1 = *most prepared to assess*, 7 = *least prepared to assess*). Voice disorders had a mean ranking of 4.67, which represented a poorer level of preparedness than other disorders, such as fluency ($M = 4.37$). When asked to order the populations according to their current level of preparedness, SLPs reported preparedness for fluency was improved ($M = 4.15$); however, their self-perceived preparedness for voice worsened ($M = 4.77$) over the time span since completing their clinical training program. These SLPs also ranked their current competence in the seven total areas as follows (from most competent to least competent): (a) articulation and phonology, (b) language, (c) stuttering, (d) voice, (e) motor speech, (f) aural rehabilitation, and (g) aphasia.

In comparison, competence levels for voice disorders more typically treated by medically based SLPs have also been investigated. Manley, Frank, and Melvin (1999) studied SLPs involved in tracheostomy care teams. They assessed clinicians' confidence level in treating individuals with tracheostomy and found that around half of their sample felt "underconfident." As the number of years postgraduation from a graduate program did not, by itself, account for confidence levels, the authors' data indicated that confidence was accrued from a combination of academic training as well as clinical exposure to the targeted population. In a related study, Ward, Agius, Solley, Cornwell, and Jones (2008) reported on the continuing education activities that best supported Australian SLPs' feelings of confidence in caring for individuals with tracheostomy. SLPs surveyed reported membership in a national tracheostomy interest group as most supportive, followed by attendance at national workshops, and in-services within the workplace.

Overall, most studies regarding SLPs' self-perceptions of preparedness and/or competence (whether medical or school-based) are consistent in indicating low levels of competence for those populations that are not highly represented on SLP caseloads. Confidence levels dramatically fall for the populations of voice, pediatric TBI, and

dysphagia. For school-based SLPs, findings are inconsistent in the importance of course work and practicum for enhancing confidence in the ability to assess and treat these students. Given the functional consequences of voice disorders for school-age children, it is necessary to further examine school-based SLPs' self-perceived competence in assessing and treating voice disorders.

The aim of the present study was twofold: (a) to determine the self-perceived competence levels of practicing school-based SLPs in voice disorders and (b) to identify variables correlated with their self-perceived levels of competence, including (a) years postgraduation, (b) prior academic course work in the area of voice disorders, (c) presence of clinical practica experience, (d) feelings of competence immediately after graduation from last degree, (e) continuing education in voice disorders, and (f) access to a clinical population base that includes individuals with voice disorders.

Method
Procedure

All procedures involved in this study were approved by the Institutional Review Board of the University of Nebraska Medical Center before initiation of data collection. Participants were recruited through email contact. Email addresses for potential participants in the state of Nebraska were obtained using the Nebraska Speech-Language-Hearing Association directory and employee lists on school and medical setting websites. Survey Monkey was utilized to send a cover letter and a link to the survey. The survey link was sent to 493 individuals and kept live for 3 weeks. Two reminder emails were sent out after the initial email: one after the first week and the second after the second week. Participants provided consent to participate by clicking on a link attached to the introductory invitation. The researchers examined the respondents and eliminated those who did not meet the criteria of working 20 hours per week and holding current teaching certification or licensure in speech-language pathology. A total of 193 eligible surveys were returned (39% rate of return).

On the basis of the disproportionate number of respondents working in schools ($n = 153$) compared with medical ($n = 22$) and other settings, such as universities, private practices, and early intervention programs ($n = 18$), we elected to primarily analyze the 153 school-based surveys. As a post hoc evaluation, the researchers conducted analysis of medical participants for comparison. Data were anonymous and analyzed using Survey Monkey and IBM SPSS statistical program, version 21 (IBM Corp., Armonk, NY).

Participants

Participants were 153 master's-level SLPs who held a state of Nebraska teaching certificate and/or licensure. All participants were school-based, female SLPs. The majority (99%) held a master's degree with 89.6% maintaining their Certificate of Clinical Competence in speech-language

pathology. Forty-two percent had been out of school 0–10 years, 29% 11–20 years, and 29% more than 20 years. Ninety-nine point three percent had participated in a voice disorders course as a part of their graduate training, 25% had pursued additional continuing education in the area of voice disorders in the last five years, and 41.2% had treated at least one client with a voice disorder in the past 3 months. Refer to Table 1 for more participant demographics.

Materials

The survey utilized for the present study consisted of two components. First, the respondents answered demographic questions exploring employment, training, and clinical experience with clients who have voice disorders. Then, participants rated themselves on a 25-item checklist, created by the researchers (see Teten, DeVeney, & Friehe, 2013), of competencies related to voice disorders across the life span.

The checklist was designed by reviewing ASHA's Preferred Practice Patterns for voice assessment and treatment across the life span (ASHA, 1998) as well as other resources, such as the Special Interest Group 3: Voice and Voice Disorders Graduate Curriculum on Voice and Voice Disorders (ASHA, 2009). Items were structured in an attempt to balance information related to prevention, assessment, and treatment skills throughout life. In addition, each competency aimed to measure and represent a discrete skill. Colleagues who regularly teach and/or provide clinical services in the area of voice disorders reviewed and provided

feedback regarding the checklist content, which resulted in the 25 final items. The self-ratings involved a 1–5 Likert-type scale with "1" being *minimally competent* and "5" being *extremely competent*. Last, a measure of internal consistency was calculated. Cronbach's α was 0.974, indicating a high level of internal consistency. See Appendix to view the complete survey.

Results

Descriptive Analysis

Descriptive analyses were used to address the first study aim: to determine the self-perceived competence levels of practicing school-based SLPs in voice disorders across the life span. These results are summarized in Tables 2 and 3. The majority of the 25-item indicators ($n = 18$) resulted in mean competencies between 2.0 (*somewhat competent*) and 3.0 (*moderately competent*). No item indicators resulted in mean competencies above 4.0 (*very competent*). Only one item (Item 2 related to developing strategies to prevent voice disorders) resulted in a mean competency rating above 3.0, indicating above a *moderately competent* level ($M = 3.16$, $SD = 1.011$). The range for this item was 1 to 5, and the majority of respondents indicated either *moderately competent* ($n = 51$, 33.33% of respondents) or *very competent* ($n = 50$, 32.68%). In contrast, there were six items on which the mean competency rating was at or below 2.0, indicating a less than *somewhat competent* level. These items included the following:

Table 1. Frequency and percentage of occurrence for reported training, client, and continuing education experience.

Item	Frequency	Percentage
Years postgraduation		
0–2	19	12.42
3–5	20	13.07
6–10	25	16.34
11–15	22	14.38
16–20	22	14.38
21–25	12	7.84
26+	33	21.57
Training program had a voice disorder class	152	99.30
Training program clinical hours included pediatric voice clients	52	34.00
Training program clinical hours included adult voice clients	94	61.40
Feelings of competence immediately following graduation		
Minimally prepared	46	30.07
Somewhat prepared	66	43.14
Moderately prepared	31	20.26
Very prepared	8	5.23
Extremely prepared	2	1.31
Number of continuing education activities in voice disorders in past 5 years		
None	114	75.00
One or two activities	36	23.68
More than two activities	2	1.32
Percentage of time spent with voice disorder clients		
0%	90	58.82
1%–5%	62	40.52
6%–10%	1	0.65
More than 10%	0	0.00

Table 2. Descriptive data for items 1–25, school-based SLPs' perceived levels of competence in assessing and treating voice disorders.

Item	M	SD	Minimally competent, n/%	Somewhat competent, n/%	Moderately competent, n/%	Very competent, n/%	Extremely competent, n/%
1. Identifies normal voice by describing pitch, loudness, quality, and resonance.	2.85	0.955	11/7.19	46/30.07	56/36.60	36/23.53	4/2.61
2. Develops preventative strategies for maintenance of vocal wellness.	3.16	1.011	8/5.23	33/ 21.57	51/33.33	50/32.68	11/7.19
3. Obtains a comprehensive case history by documenting information about psychological, psychosocial, developmental, occupational, medical, pharmacological, behavioral, and cultural variables that may influence voice.	2.67	1.094	28/18.42	36/23.68	53/34.87	30/19.74	5/3.29
4. Collects representative voice samples in order to perform auditory-perceptual evaluations of roughness, breathiness, strain, pitch, loudness, and overall severity of the voice.	2.22	0.973	37/24.34	64/42.11	37/24.34	10/6.58	4/2.63
5. Considers environmental variables (e.g., emotional reactions, social pressures) that may impact the severity of the voice disorder through hierarchical analysis.	2.74	0.968	14/9.27	50/33.11	54/35.76	29/19.21	4/2.65
6. Utilizes available and appropriate non-instrumental and/or instrumental diagnostic measures (e.g., physiological, acoustic, aerodynamic, and auditory-perceptual) to assess voice.	1.73	0.827	72/47.06	58/37.91	18/11.76	4/2.61	1/0.65
7. Differentiates between etiologies of voice disorders (e.g., Muscle tension dysphonia [MTD] vs. organic vs. neurogenic vs. psychogenic) in order to make appropriate referrals and/or treatment decisions.	1.77	0.854	70/45.75	58/37.91	18/11.76	7/4.58	0/0.00
8. Identifies and describes anatomical/physiological sources of hyper- or hypo-function as they relate to voice disorders.	2.01	0.977	58/38.16	48/31.58	37/24.34	7/4.61	2/1.32
9. Attends to the needs, cultural values, gender role, and linguistic background of the client and relevant family members when performing assessments and/or interventions for voice disorders.	2.43	1.102	37/24.18	46/30.07	44/28.76	21/13.73	5/3.27
10. Considers the development and/or maintenance of voice disorders in a broader context that includes the potential presence of concomitant communication disorders such as motor speech and/or language disorders.	2.45	1.019	28/18.42	55/36.18	48/31.58	16/10.53	5/3.29
11. Integrates developmental vocal milestones (and/or expected changes) through the lifespan when assessing for voice disorders.	2.01	0.949	54/35.53	56/36.84	33/21.71	7/4.61	2/1.32
12. Displays flexibility in selecting appropriate facilitating voice techniques when assessing the client's stimulability for improved vocal quality at the time of the initial evaluation and during ongoing treatment.	2.03	0.983	55/6.18	52/34.21	33/21.71	10/6.58	2/1.32
13. Plans and implements a treatment program to address the individual needs of the client and communication styles of family members based on the results of comprehensive assessment and client and/or family consultation.	2.12	1.005	51/33.33	49/32.03	40/26.14	11/7.19	2/1.31
14. Clearly and effectively conveys information to clients and/or their family members regarding a variety of therapeutic choices and their evidence base.	2.18	1.105	53/34.64	45/29.41	35/22.88	16/10.46	4/2.61

(table continues)

Table 2. *(Continued).*

Item	M	SD	Minimally competent, n/%	Somewhat competent, n/%	Moderately competent, n/%	Very competent, n/%	Extremely competent, n/%
15. Demonstrates various therapeutic strategies for facilitating the restoration of normal balance between respiration, phonation, and resonance to achieve a natural sounding voice.	2.05	1.009	59/38.82	41/26.97	41/26.97	9/5.92	2/1.32
16. Considers implementation of several different procedures to facilitate maintenance and generalization of vocal improvements achieved in the clinical setting.	1.93	0.926	60/39.47	54/35.53	29/19.08	8/5.26	1/0.66
17. Recognizes procedures for implementing use of speaking valves with tracheostomized patients.	1.45	0.873	114/75.00	18/11.84	11/7.24	9/5.92	0/0.00
18. Identifies and demonstrates (or instructs) various modalities of communication for alaryngeal individuals.	1.41	0.793	113/74.83	20/13.25	4/9.27	4/2.65	0/0.00
19. Demonstrates knowledge of tracheo-esophageal voice prosthesis management, hygiene, and placement procedures.	1.31	0.710	124/81.58	15/9.87	10/6.58	3/1.97	0/0.00
20. Assists clients in developing and adhering to a plan for managing vocal hygiene over time.	2.18	1.041	48/31.58	50/32.89	36/23.68	16/10.53	2/1.32
21. Uses appropriate counseling skills to adequately attend to client and family feelings, attitudes, and coping strategies.	2.38	1.032	34/22.37	53/4.87	43/28.29	19/12.50	3/1.97
22. Demonstrates understanding of the roles of various professionals on the voice team and makes appropriate referrals to other professionals as needed.	2.40	0.962	29/19.08	56/36.84	47/30.92	19/12.50	1/0.66
23. Writes evaluation, therapy, and referral reports that adequately explain the nature of the client's voice disorder and its treatment for the client and family.	2.05	1.009	55/36.42	50/33.11	33/21.85	11/7.28	2/1.32
24. Communicates ethical and professional issues inherent in providing services to individuals with voice disorders.	2.30	1.070	41/26.97	52/34.21	36/23.68	20/13.16	3/1.97
25. Recognizes the potential handicapping nature of the voice disorder and educates client and/or relevant family members accordingly.	2.49	1.036	29/19.21	47/31.13	55/36.42	14/9.27	6/3.97

- Item 6 ($M = 1.730$, $SD = 0.827$), related to use of diagnostic measures

- Item 7 ($M = 1.770$, $SD = 0.854$), related to differentiating etiologies of voice disorders

- Item 16 ($M = 1.930$, $SD = 0.926$), related to implementing generalization strategies

- Item 17 ($M = 1.450$, $SD = 0.873$), related to use of speaking valves

- Item 18 ($M = 1.410$, $SD = 0.793$), related to alaryngeal modalities

- Item 19 ($M = 1.310$, $SD = 0.710$), related to voice prostheses

Table 3. SLPs' perceived levels of competency upon graduation and at the time of the survey.

Item	M	SD	Minimally prepared, n/%	Somewhat prepared, n/%	Moderately prepared, n/%	Very prepared, n/%	Extremely prepared, n/%
Perceived level of preparedness in voice disorders upon graduation	2.05	0.913	64/41.80%	66/43.10%	16/10.50%	5/3.30%	2/1.30%
Current level of perceived preparedness in voice disorders	1.94	0.810	49/32.45%	67/44.37%	30/19.87%	5/3.31%	0/0.00%

Prior to rating themselves on the 25-item checklist, SLPs were also asked the following: "On a scale of 1–5, what is your perceived level of competence in the area of voice disorders at present?" Consistent with the checklist items, responses ranged from 1 to 5 with 1 = *minimally competent* and 5 = *extremely competent*. Responses to this indicator of current perceived competence yielded a mean of 1.94 with a *SD* of 0.81.

Inferential Analysis

Inferential analyses were used to address the second study aim: to identify variables correlated with self-perceived levels of competency. Selected variables included (a) years postgraduation (in number of years), (b) prior academic course work in the area of voice disorders (yes or no), (c) prior clinical practica in both pediatric and adult populations in voice (yes or no), (d) feelings of competency immediately after graduation from last degree (1–5 Likert rating), (e) continuing education in voice disorders (number of CEU activities reported in the last 5 years), and (f) access to a clinical population base that includes individuals with voice disorders (both number of clients and percentage of time spent with clients who have voice disorders). Spearman's correlations were used to measure the strength and direction of the association between compared bivariate variables using version 21 of the IBM SPSS statistical program (IBM). An α level of .05 was adopted for each of eight comparisons conducted. Comparisons are summarized in Table 4.

Three comparisons showed no significance between the variable and the SLPs' self-perceived level of competence: (a) length of time since most recent degree ($r_s = .090$, $p = .273$), (b) prior academic course work in voice disorders ($r_s = .107$, $p = .190$), and (c) graduate-level practicum experience with pediatric voice disorders clients ($r_s = -.159$, $p = .051$). One comparison revealed a small negative correlation between the variable and the SLPs' self-perceived level of competence: practicum experience with adult voice disorder clients ($r_s = -.241$, $p = .003$). There were three comparisons that resulted in small positive correlations between the variables and the SLPs' self-perceived level of competence: (a) number of continuing education activities related to voice disorders in the last 5 years ($r_s = .213$, $p = .009$), (b) number of clients with voice disorders assessed and/or treated in the last 3 months ($r_s = .225$, $p = .006$), and (c) percentage of time spent with clients who have voice

disorders ($r_s = .258$, $p = .001$). Last, there was a moderate positive correlation between feelings of preparation in the area of voice disorders immediately after completion of an academic program and SLPs' present self-perceived level of competence ($r_s = .490$, $p < .001$).

Post Hoc Analysis

As a post hoc measure for comparison to the school-based SLP findings, we calculated results for the medically based SLP participants ($n = 22$). Descriptive analyses were examined (see Tables 5 and 6). For the medically based SLPs, the majority of the 25-item indicators ($n = 15$) resulted in mean competencies at or above 3.0, a *moderately competent* level. No item indicators resulted in mean competencies above 4.0, *very competent*. Only one item (Item 19 related to management of tracheo-esophageal voice prostheses) resulted in a mean competency rating below a 2.0, indicating less than a *somewhat competent* level ($M = 1.64$, $SD = 1.049$). Of interest, medically based SLPs rated their mean overall preparedness at the time of completing their graduate degree as 1.91 (or less than *somewhat prepared*). However, these same medically based SLPs rated their current levels of overall competence as 2.41 (between *somewhat competent* and *moderately competent*).

Discussion

Overall Competence

One purpose of the present study was to determine the self-perceived competence levels for the area of voice disorders with practicing school-based SLPs. Findings indicated that, overall, responding school-based SLPs in Nebraska did not report feeling particularly competent in their ability to assess or treat students with voice disorders. Of the 25 survey items to which the 153 SLPs responded, only one response mean was above 3.0, indicating a higher than *moderately competent* level of competence ("Develops preventative strategies for maintenance of vocal wellness"). All other item means were at or below 3.0. These findings were consistent with literature regarding school-based SLPs' self-perceived competency with voice disorders (Kelly et al., 1997) as well as literature related to low incidence or other underserved populations within speech-language pathology (Compton et al., 2009; Frank et al., 1997; Guiberson & Atkins, 2012).

Table 4. Spearman's correlations for comparisons to perceived level of competence overall.

Comparison	r_s	p value
(a) Length of time since most recent degree	.090	.273
(b) Presence of academic course work in voice disorders	.107	.190
(c1) Pediatric voice disorder practica experiences	−.159	.051
(c2) Adult voice disorder practica experience	−.241	.003
(d) Feelings of preparation immediately after academic program completion	.490	< .050
(e) Number of continuing education activities related to voice disorder	.213	.009
(f1) Number of clients with voice disorders assessed and/or treated in the last 3 months	.225	.006
(f2) Percentage of time spent with clients who have voice disorders	.258	.001

Table 5. Medical SLPs' perceived levels of competency upon graduation and at the time of the survey.

Item	M	SD	Minimally prepared, n/%	Somewhat prepared, n/%	Moderately prepared, n/%	Very prepared, n/%	Extremely prepared, n/%
Perceived level of preparedness in voice disorders upon graduation	1.91	.921	9/41.0	7/31.8	5/22.7	1/4.5	0/0.0
Current level of perceived preparedness in voice disorders	2.41	1.008	5/22.7	6/27.3	8/36.4	3/13.6	0/0.0

Table 6. Descriptive data for items 1–25, medically based SLPs' perceived levels of competence in assessing and treating voice disorders.

Item	M	SD	Minimally competent, n/%	Somewhat competent, n/%	Moderately competent, n/%	Very competent, n/%	Extremely competent, n/%
1. Identifies normal voice by describing pitch, loudness, quality, and resonance.	3.50	1.144	1/4.5	1/4.5	4/18.2	9/40.9	4/18.2
2. Develops preventative strategies for maintenance of vocal wellness.	3.86	1.125	1/4.5	1/4.5	6/27.3	6/27.3	8/36.4
3. Obtains a comprehensive case history by documenting information about psychological, psychosocial, developmental, occupational, medical, pharmacological, behavioral, and cultural variables that may influence voice.	3.45	1.101	0/0.0	6/27.2	4/18.2	8/36.4	4/14.8
4. Collects representative voice samples in order to perform auditory-perceptual evaluations of roughness, breathiness, strain, pitch, loudness, and overall severity of the voice.	2.91	1.269	4/18.2	3/13.6	9/41.0	3/13.6	3/13.6
5. Considers environmental variables (e.g., emotional reactions, social pressures) that may impact the severity of the voice disorder through hierarchical analysis.	3.55	1.011	0/0.0	4/18.2	6/27.2	8/36.4	4/18.2
6. Utilizes available and appropriate non-instrumental and/or instrumental diagnostic measures (e.g., physiological, acoustic, aerodynamic, and auditory-perceptual) to assess voice.	2.32	1.129	7/31.8	5/22.7	6/27.3	4/18.2	0/0.0
7. Differentiates between etiologies of voice disorders (e.g., Muscle tension dysphonia [MTD] vs. organic vs. neurogenic vs. psychogenic) in order to make appropriate referrals and/or treatment decisions.	2.45	1.224	6/27.3	6/27.3	5/22.7	4/18.2	1/4.5
8. Identifies and describes anatomical/ physiological sources of hyper- or hypo-function as they relate to voice disorders.	2.68	1.211	4/18.2	7/31.8	4/18.2	6/27.3	1/4.5
9. Attends to the needs, cultural values, gender role, and linguistic background of the client and relevant family members when performing assessments and/or interventions for voice disorders.	3.36	1.177	1/4.5	5/22.7	5/22.7	7/31.8	4/18.2
10. Considers the development and/or maintenance of voice disorders in a broader context that includes the potential presence of concomitant communication disorders such as motor speech and/or language disorders.	3.36	1.293	2/9.1	4/18.2	5/22.7	6/27.3	5/22.7
11. Integrates developmental vocal milestones (and/or expected changes) through the lifespan when assessing for voice disorders.	2.73	1.077	4/18.2	3/13.6	11/50	3/13.6	1/4.6

Table 6. *(Continued).*

Item	M	SD	Minimally competent, n/%	Somewhat competent, n/%	Moderately competent, n/%	Very competent, n/%	Extremely competent, n/%
12. Displays flexibility in selecting appropriate facilitating voice techniques when assessing the client's stimulability for improved vocal quality at the time of the initial evaluation and during ongoing treatment.	2.82	1.402	5/22.7	5/22.7	4/18.2	5/22.7	3/13.7
13. Plans and implements a treatment program to address the individual needs of the client and communication styles of family members based on the results of comprehensive assessment and client and/or family consultation.	3.09	1.306	3/13.6	5/22.7	4/18.2	7/31.8	3/13.7
14. Clearly and effectively conveys information to clients and/or their family members regarding a variety of therapeutic choices and their evidence base.	3	1.309	2/9	8/36.4	4/18.2	4/18.2	4/18.2
15. Demonstrates various therapeutic strategies for facilitating the restoration of normal balance between respiration, phonation, and resonance to achieve a natural sounding voice.	2.91	1.411	5/22.7	4/18.2	4/18.2	6/27.3	3/13.6
16. Considers implementation of several different procedures to facilitate maintenance and generalization of vocal improvements achieved in the clinical setting.	2.77	1.378	6/27.4	3/13.6	5/22.7	6/27.3	2/9
17. Recognizes procedures for implementing use of speaking valves with tracheostomized patients.	3.09	1.601	6/27.4	3/13.6	1/4.5	7/31.8	5/22.7
18. Identifies and demonstrates (or instructs) various modalities of communication for alaryngeal individuals.	2.27	1.316	9/41	3/13.6	7/31.8	1/4.5	2/9.1
19. Demonstrates knowledge of tracheo-esophageal voice prosthesis management, hygiene, and placement procedures.	1.64	1.049	14/63.6	4/18.2	3/13.6	0/0	1/4.5
20. Assists clients in developing and adhering to a plan for managing vocal hygiene over time.	3.00	1.234	3/13.6	5/22.8	5/22.8	7/31.8	2/9
21. Uses appropriate counseling skills to adequately attend to client and family feelings, attitudes, and coping strategies.	3.41	1.333	3/13.7	2/9.1	5/22.7	7/31.8	5/22.7
22. Demonstrates understanding of the roles of various professionals on the voice team and makes appropriate referrals to other professionals as needed.	3.55	1.438	3/13.6	3/13.6	2/9.1	7/31.9	7/31.9
23. Writes evaluation, therapy, and referral reports that adequately explain the nature of the client's voice disorder and its treatment for the client and family.	3.05	1.362	4/18.2	4/18.2	4/18.2	7/31.8	3/13.6
24. Communicates ethical and professional issues inherent in providing services to individuals with voice disorders.	3.32	1.211	2/9	4/18.2	4/18.2	9/41	3/13.6
25. Recognizes the potential handicapping nature of the voice disorder and educates client and/or relevant family members accordingly.	3.23	1.412	3/13.6	5/22.7	3/31.6	6/27.3	5/22.8

One explanation for these low competency perceptions may be the small number of school-based SLPs who provide therapeutic services for students with voice disorders, a mere 22% nationwide (Brook, 2012). The SLPs in the current study also reported low access to clientele with voice disorders in that approximately 40% of SLPs surveyed reported spending only 1%–10% of their time working with such clients, and 58.8% spent no time with voice disorder clients. These feelings of low self-perceived competence are not unique to voice disorders. For example, studies from other populations reveal low confidence in assessing and treating students with dysphagia (Hutchins

et al., 2011). However, Hutchins et al. (2011) noted that certain SLPs, such as those who currently or had previously worked in medically based environments, reported higher levels of competence in dysphagia than their peers without this experience.

Due to the nature and origin of the current study, only limited comparisons between the small group of medically based SLPs (*n* = 22) and the school-based SLPs (*n* = 153) were made. These results appear to support those of Hutchins et al. (2011) in that those school-based SLPs who had worked in medical settings indicated higher competencies for dysphagia in the schools than those who had not. For voice data in this study, school-based SLPs reported slightly higher self-rated, overall competency with voice disorder populations at the time of graduation (mean self-rated, overall preparedness at time of graduation = 2.0) than those reported by medically based SLPs at the time of graduation (1.91). In contrast, current levels of overall competency in voice were greater for the medically based SLPs (*M* = 2.41) than for the school-based SLPs' self-rated overall competency (*M* = 1.94). Although causation cannot be inferred from the present results, the medically based SLPs continued work with clients who had voice disorders a much higher percentage of the time than did the school-based SLPs. For example, 58.8% of school-based SLPs reported they spent no time with voice clients compared with only 9.1% of medically based SLPs. Further, fewer than 1% of school-based SLP respondents reported spending at least 6%–10% of their time with voice clients whereas 36.4% of medically based SLPs did.

Factors Affecting Self-Perceived Competence

Years Postgraduation

Regarding the second aim of the present study, to identify variables correlated with self-perceived levels of competence, we identified several variables of significance and also found some that seemed unrelated. Among the factors that were not related to overall feelings of competence was years postgraduation from an SLP training program. Consistent with results noted by Manley et al. (1999), the number of years postgraduation in this study did not account for confidence levels. The majority of participants in that study had completed their formal training more than 16 years prior with some as long as 26 years prior. It seems as if the length of time a clinician practices is not significantly associated with any dampening nor bolstering of his or her feelings of competence or confidence. Rather, Manley et al. concluded the accumulation of confidence was associated with both academic training preparation and clinical familiarity with the targeted population.

Academic Course Work

Contrary to conclusions reported by Manley et al. (1999), findings from the present study did not indicate a significant correlation between prior academic course work in voice disorders during an SLP's training program and an SLP's overall feelings of competence in voice. Rather, the present findings were similar to those of Frank et al. (1997) in that SLPs with and without content-specific academic course work reported self-perceived low levels of preparation to evaluate and treat the underserved population of voice disorders and the low-incidence population of pediatric TBI clients, respectively. One potential reason for our finding of no correlation between prior course work in voice and self-perceptions of competence in treating voice disorders is that nearly all (99.3%) of the SLPs surveyed in the current study had completed course work in voice disorders. Only 38% of SLPs in the study by Frank et al. had been exposed to course work in the area of TBI. Because most SLPs in the present study obtained dedicated course work for voice disorders, other variables were found more likely to make the difference in self-perceived competence in assessing and treating voice disorders.

Practicum Experience

The current data indicate that procurement of graduate-level clinical practica with pediatric clients who had voice disorders did not correspond to feelings of competence in working with voice disorders. This was similar to findings by McGrane and Cascella (2000), who found no correlations between clinical experience with pediatric TBI and self-perceived levels of preparedness to treat the disorder. However, in contrast to those findings, the present data showed a small negative correlation between experience with adult clientele with voice disorders during clinical practicum and feeling of competence in treating persons with voice disorders. Although the authors of the present study were not able to further probe respondents regarding rationale for this finding, perhaps it is due to an attempt to apply principles of adult voice therapy to pediatric populations. In doing so, SLPs may have been met with unsatisfactory results, which then prompted them to question their training experiences and competence level. Although 61% of the SLPs surveyed reported clinical practicum experience with adults with voice disorders, no data were collected on the quantity or quality of the experiences. It is possible that these SLPs felt undersupervised during their practica, or their supervisors were not competent themselves in the area of voice disorders treated, particularly if pediatric.

Years Postgraduation

Our results showed no correlations between year of graduation and self-perceived competence. From this research and others' (Tillard et al., 2011), new graduates do not feel any more well prepared than experienced SLPs to work with children with voice disorders just because of recent course work. Further, Kelly et al. (1997) reported that SLPs ranked their level of preparedness in voice disorders as low. Regardless of year of graduation, our data showed that SLPs who perceive a higher level of competence at the time of graduation also reported higher levels of competence than peers who did not report feeling as competent at the time of graduation.

Continuing Education

SLPs holding certification are expected to pursue continuing education. The importance of continuing education was supported in this study. SLPs reportedly felt more competent working with children who have voice disorders if the SLPs had been pursuing continuing education in the general area of voice within the last 5 years. This is similar to the findings of Ward et al. (2008), who also reported that continuing education activities best supported Australian SLPs' feelings of confidence in caring for tracheostomized individuals. Ward et al. posited that the feeling of competence was most likely influenced by a combination of factors, such as continuing education and actual work experience with a population base. For instance, as individuals exhibiting disorders with which SLPs are not confident in assessing and/or treating are accrued on the caseload, SLPs are more apt to seek out opportunities for learning about these individuals.

Access to Clinical Population Base

In the present study, there was a small association between self-perceived competence in working with voice disorders and current access to clientele with voice disorders. Access to clientele, which included both number of clients and percentage of time spent with clients who have voice disorders, was significantly associated with feelings of competence for the SLPs surveyed in the study by Hutchins et al. (2011) regarding dysphagia in the schools. The present findings may be explained in part by the fact that a small number of respondents actually served students with voice disorders. As noted previously, nearly 60% of the school-based SLPs surveyed reported that they spent 0% of their time working with clientele with voice disorders, and the other 40% of SLPs reported anywhere between 1% and 10% of their time working with such clients. These low percentages for school-based SLPs may be a function of the clinicians' sense of limited competence. However, the inverse could be argued: that the SLPs' limited experiences with voice disorders caused the reported feelings of low self-competence in the area. Perhaps school-based SLPs have not prioritized voice disorder cases because they felt more competent assessing and treating communication disorders considered to be higher priority, such as speech sound disorders, or felt more well-versed with the scientific evidence base available for other, more widely treated communication disorders. The present study findings were consistent with the qualitative responses of the SLPs surveyed by Ward et al. (2008). When asked the reasoning behind feeling only "sometimes" confident in treating patients with tracheostomies, a frequent response was that only a small component of their caseload was made up of such patients.

Practical Implications

The practical implications of the present study primarily revolve around the need to encourage school-based SLPs to seek CEUs in the area of voice disorders. Findings from the present study as well as those by Ward et al. (2008) support seeking continuing education at the same time as access to underserved or low-incidence populations becomes available. It is possible that, although course work and practicum experiences in voice disorders did not significantly affect self-perceived competence of the SLPs surveyed in the current study, the course work and practicum experiences laid a foundation that enabled SLPs to get the most out of continuing education activities at a later time. Beyond the SLPs' competencies with voice disorders, in-service and referral materials should be designed to garner more referrals from teachers (Wilson, 1987).

A cursory search of the ASHA website (n.d.) with the phrase "voice disorders continuing education" indicated a number of potential online continuing education opportunities, most offered through ASHA's Special Interest Group 3: Voice and Voice Disorders. For instance, SLPs affiliated with Special Interest Group 3 may earn CEUs through self-study of the memberships' *Perspectives* for a minimal cost. In addition, many state and regional organizations offer CEU opportunities focused on a number of content-area topics, including voice disorders. In general, these state and regional organizations solicit attendee feedback regarding content areas for CEU programming. If a number of SLPs affiliated with a particular group indicated a need for continuing education in voice disorders, it is likely that efforts would be made to offer such programming, such as through CEU opportunities within the school district, simulations, or grand round discussions. Considering the increasing diversity of the world's population, these continuing education activities should incorporate content on the variance between cultures in their attitudes, knowledge of, and cultural preferences for assessment and treatment services.

As an alternative, more isolated (or even larger) school districts might benefit from restructuring their SLP workload. For instance, if a district could provide increased education in the area of voice to a small number of SLPs, those SLPs could rotate to schools where children with voice disorders are on the caseload.

Limitations and Future Directions

As with any study, limitations exist. Although return rate for this survey was relatively high (39%), the data only represent one regional area in the United States. Future studies should include replicating the study in multiple areas of the country as well as internationally to shed light on global implications of this issue. In addition, because return from SLPs in medical settings was not high enough to make statistical comparisons to the school-based SLPs, it would be interesting to increase the sample of medical SLPs and investigate potential differences in feelings of competence and/or access to clientele between medical and educational SLPs.

Due to the nature of the study and the research questions posed, Bonferroni adjustments were not calculated for aim two of the study in which eight Pearson

correlations were conducted. With an α level set to .05 for each test, there is a .40 or 40% possibility of at least one erroneous conclusion. As a consequence, the risk of a Type 1 error cannot be disregarded due to the presence of alpha inflation.

Further, qualitative analyses were not attempted in this study. Due to the surprising finding of clinical practicum experiences with adult voice clients negatively affecting self-perceived competence of SLPs, qualitative descriptions regarding the quality, duration, frequency, and supervision related to these experiences could be elicited and examined for patterns. Also, qualitative data regarding quality of course work could be sampled to glean more information about why prior course work did not correlate with self-perceived competence in this study. In addition, having SLPs rate their self-perceptions of competence in other disorder areas found on school caseloads would be of interest to see how perceived competence in voice disorders compares. Last, determining additional uses for the 25-item Voice Disorders Competency Checklist such as a pre- or postmeasurement tool with current graduate students enrolled in voice disorders course work would be of value.

Acknowledgments

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Appendix

Voice Disorders Competencies Survey

Demographic questions

Please answer the following questions to the best of your ability.

Question	Response Options
Do you currently hold a state license and/or valid teaching certificate for SLP?	Yes/No
Do you currently work at least 20 hours/week?	Yes/No
Do you currently have your CCC-SLP?	Yes/No
What is the highest degree in speech-language pathology that you hold?	Bachelor's, Master's, Ph.D., other (please specify).
Length of time since your most recent degree in speech-language pathology.	0-2 years; 3-5 years; 6-10 years; 11-15 years; 16-20 years; 21-25 years; 26+ years
Did your academic preparation include a course in voice disorders?	Yes/No
• If yes, for how many credit hours was the course offered?	1, 2, 3, I don't know, other (specify)
Did your academic program include practicum experience with pediatric clients who have voice disorders?	Yes/No
Did your academic program include practicum experience with adult clients who have voice disorders?	Yes/No
How prepared did you feel in the area of voice disorders immediately after completion of your academic program?	1 = minimally prepared; 2 = somewhat prepared; 3 = moderately prepared; 4 = very prepared; 5 = extremely prepared
What is your primary work setting?	School; Private practice; Hospital; Skilled Nursing Facility; Early Intervention; University; Other (specify)
How many clients with voice disorders have you assessed and/or treated in the last 3 months?	None; 1-2; 3-4; 5-10; 10 or more
What percentage of your time is spent with clients who have voice disorders?	0%; 1-5%; 6-10%; 11-20%; 21-30%; 31-50%; 51% or more
How many continuing education activities related to voice disorders have you attended in the last 5 years?	None; 1-2; 3-4; 5-10; 10 or more
When seeking continuing education on voice disorders, which resource have you primarily used to obtain information?	None; Journal articles; In-service presentations (work site and/or local); Conferences; Online resources; Books; Other (specify)
On a scale of 1-5, what is your perceived level of competence in the area of voice disorders at present?	1 = minimally prepared; 2 = somewhat prepared; 3 = moderately prepared; 4 = very prepared; 5 = extremely prepared