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FOR VOICE AND SPEECH DISORDERS RESULTING FROM PARKINSON'S
DISEASE

Clinician Survey of the Lee Silverman Voice Treatment for Voice and Speech Disorders

Resulting from Parkinson's Disease

Lauren K Vickrey

The University of North Carolina - Greensboro

CLINICIAN SURVEY OF THE LEE SILVERMAN VOICE TREATMENT FOR VOICE AND SPEECH DISORDERS RESULTING FROM PARKINSON'S DISEASE

Abstract

This study examined clinician perception of the factors that impact success in the use of the Lee Silverman Voice Treatment (LSVT) for patients with Parkinson's disease. Two hundred twenty speech language pathologists, certified to administer the LSVT LOUD program, completed an online questionnaire distributed via email. Several factors that can impede the success of treatment were identified. These include lack of motivation, cognitive impairments, attitude, lack of family support, or apathy. Distance from clinic, insurance and financial factors, and lack of awareness of the program were also reported to limit the patient's ability to receive treatment. Because these factors can limit patient success in improving vocal function, it is of utmost importance that a team addresses specific areas of a patient's life in order for the best outcome of treatment.

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Background

Parkinson's disease is a progressive neurodegenerative disorder that primarily affects the motor system, hindering the affected person's ability to control both voluntary and involuntary movements. Nearly ninety percent of the affected individuals will develop speech or voice disorders during the disease's course, with hypophonia (reduced loudness), hypoprosodia (lack of pitch inflection), hoarse or breathy voice quality, and imprecise articulation being the most common speech problems. Because there is no known cure for Parkinson's disease and the number of aging adults acquiring the disease is rising, the need for a treatment to increase the quality of life for these individuals is in high demand. A behavioral therapy, known as the Lee Silverman Voice Treatment (LSVT), has proven, through many years of study, to be an effective treatment in short and long-term improvement of voice and speech in individuals with Parkinson's. Aimed at producing loud speech, it improves functioning for deficits affecting respiration, phonation, and articulation in Parkinson's.

The Lee Silverman Voice Treatment LOUD program executes key exercises of loud speech that stimulate and promote neural plasticity, protection, and restoration through intensive training and practice of motor tasks (Sapir, Spielman, Ramig, Story, & Fox, 2007). This is targeted due to the generally accepted hypothesis that speech/voice in Parkinson's disease is affected due to the reduced amplitude of the neural drive from the motor cortex down to the muscles used for speech. To increase the neural drive, amplitude is used as a single motor control parameter that enhances the voice source that triggers more prominent muscular activation across all speech and voice mechanisms. The intensive treatment, administered four times a week over

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the course of four weeks, aims for recalibration of the patient's perceived normal vocal effort and loudness and trains the patient to independently monitor and sustain the increased motor output.

Due to the singular goal of being "loud," it is an ideal treatment for those with comorbid dementia or other cognitive deficits that could make remembering many details difficult.

Purpose of Survey

Although extensive research has been conducted on the processes behind and the success of the LSVT LOUD program, it has remained fundamentally unchanged since its beginnings in the mid-1980s. In addition, although many patients suffer from various cognitive and physical conditions along with Parkinson's disease, there is only one version of the program. Finally, studies have suggested that only three to four percent of individuals affected with Parkinson's disease seek or receive speech therapy, despite a speech or voice disorder prevalence rate of approximately 90% among that population (Trail et al., 2005). Therefore, a survey (see Appendix A) was designed to determine the perception of clinicians using LSVT as to the factors that limit patient success and utilization of the program. In addition, the survey included questions that addressed clinicians' opinions of the program and whether they believe it could be modified based on individual patient characteristics.

Method

Contact information for potential participants was obtained through published listings on the LSVT Global website. An email was sent to each potential participant that included a brief description of the purposes of the survey and a link to the webpage containing the survey. The survey was hosted by Google Forms and contained questions response tools in the form of multiple choice, checkboxes, short text response boxes, and optional paragraph response boxes.

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The sections asked questions on the clinician's demographic information, experience with patient factors limiting improvement in therapy, patient participation, family involvement, overall structure of the program, generalization of treatment, and an optional section to discuss any additional opinions.

One thousand two hundred eighty-five contact emails were sent. One hundred eight did not reach viable email addresses. A total of 220 (17.1%) clinicians completed and submitted the questionnaire before closing the survey eighteen days following the initial email distribution. These respondents account for 7.2% of the total number of certified clinicians in the United States (LSVT Global, 2015). The survey was distributed across 30 of the 48 contiguous states in the United States in an attempt to obtain responses from each geographical region in the country. All respondents are current speech-language pathologists certified to administer the LSVT LOUD program.

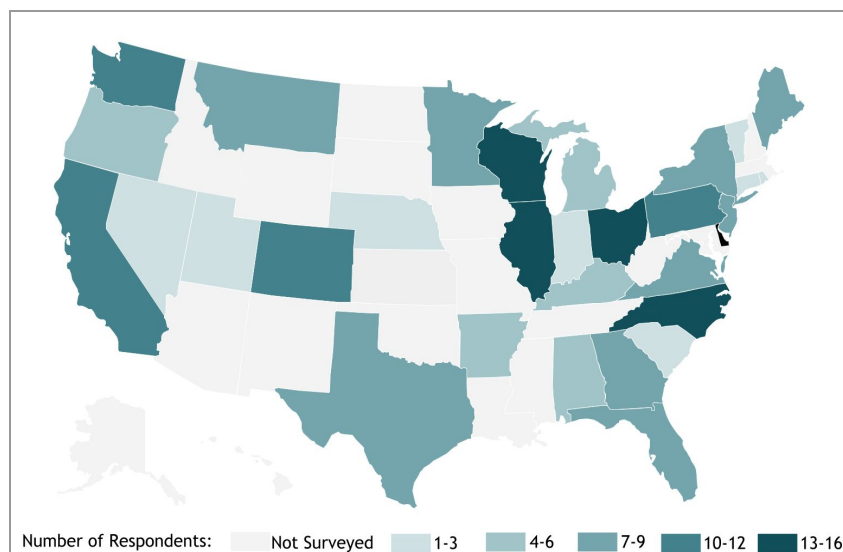


Figure 1. Respondents by state. This map depicts the geographical distribution of responses.

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Years of experience as:	Range	Mean	Median	Mode
Speech-Language Pathologist	1 - 40	14.8	12	5
LSVT Certification	<1 - 31	3.9	3	1

Table 1. Statistical data of respondents on years certified as a speech language pathologist and years certified to administer LSVT.

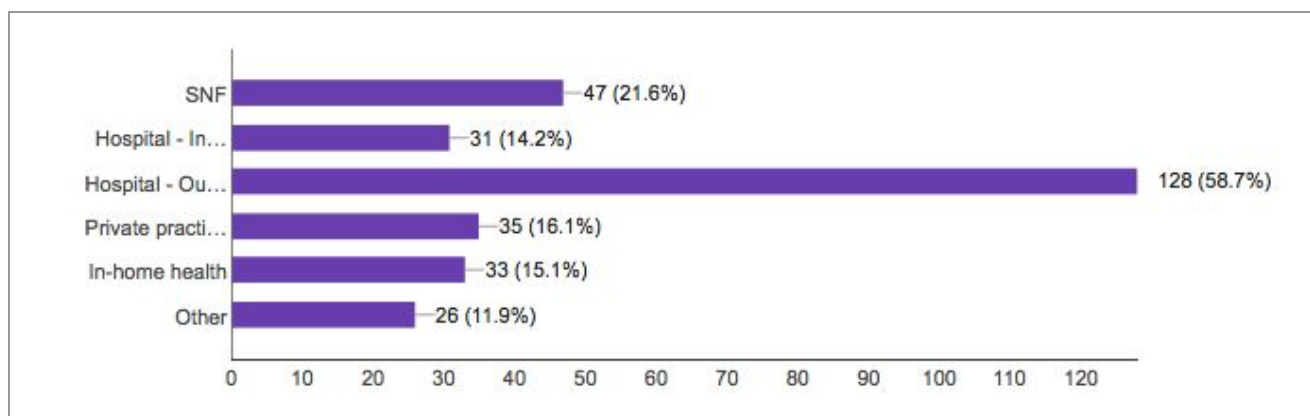


Figure 2. Bar graph representing the settings respondents have given LSVT in.

Results

Description of Reporting Clinicians

Demographic information was provided by each responding clinician, including occupation, setting(s) in which they have administered LSVT, years worked in the field as a speech-language pathologist, years LSVT certified, and the state in which they primarily work in. Figure 1 shows a map of the United States and the number of respondents per state. Table 1 provides information on the range, mean, median, and mode of the respondent's time spent certified as a speech-language pathologist and as an LSVT certified clinician.

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Figure 2 displays the results of settings in which responding clinicians have administered LSVT. Of the 220 respondents, 58.7% have given LSVT in a hospital outpatient setting, making it the most common response. Skilled nursing facilities (21.6%), private practices (16.1%), and in-home health (15.1%) followed as the most popular responses.

Factors Limiting Success in Treatment

Clinicians were asked, "From your experience, what hinders a patient's chance for success of treatment?" Clinicians were able to select one or more of the following answers: "distance/transportation to and from clinic," "cost of treatment," "insurance coverage," "lack of family support," "attitude or lack of cooperation," "apathy," "poor overall health," and an "other" option where clinicians could write in additional answers. Figure 3 displays the answer choices and distribution of responses.

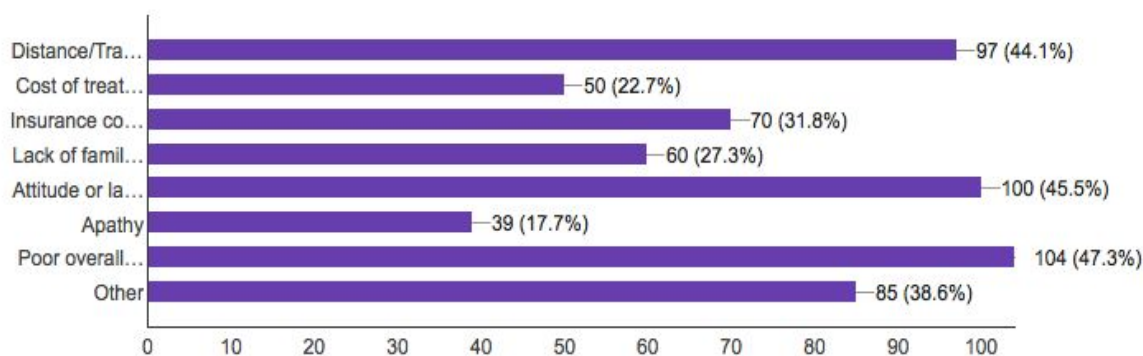


Figure 3. Summary of responses of negative factors that could set back success in LSVT.

The most frequently selected responses are as followed: poor overall health (47.3% of responding clinicians), attitude or lack of cooperation (45.5%), and distance/travel to or from clinic (44.1%). Of the 85 (38.6%) of clinicians writing their own responses in the "other" category, approximately 32% stated that cognitive impairments were a factor in hindering

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success. Additionally, approximately 25% of claimed that time commitment or frequency of treatment has proved to limit a patient's success in treatment, as well.

If clinicians selected more than 3 factors for that question, they were given the option to list "the top 3 factors that have the greatest chance of hindering success." Of the 45 responses, the most frequently mentioned factors were: insurance coverage (48.9% of responses), distance/transportation (46.7%; listed as a single factor 20 out of 21 times), attitude or lack of cooperation (34%), and poor overall health (31.8%). All other factors listed occurred in less than 10% of responses.

Apathy

Due to a prevalence rate of 40-50% concerning apathy or depression in Parkinson's disease (Ong et al., 2005), clinicians were asked, "Have you noticed a patient's depression or apathy negatively affecting the progress of treatment?" Clinicians responded: "yes" (62.7%), "no" (32.3%), and the remaining 5.1% selected "other" and wrote in an answer. Of the "other" responses, the majority noted that it depends on the degree of impairment, and several clinicians mention that apathy affects the patient initially, but improves over the course of the treatment.

Clinicians were given the opportunity to clarify their answer or provide additional information on those situations by typing in responses. Of the 48 total responses, the most frequently occurring statement attributed the lack of motivation to the patient's depression or apathy. Because LSVT aims to calibrate the patient's normal speaking volume to the newly trained loud voice, practicing as much as possible outside of the clinic is necessary for carryover into communication of daily living. When the patient isn't motivated to continue the therapy program outside of the clinic, the therapy program will not be successful.

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Additionally, clinicians mentioned that the apathy/depression may be keeping a patient from noticing changes in their voice, whether it be the decline of speech quality since the diagnosis, or improvement in their speech since treatment began. However, there were still several clinicians reporting overall optimism and motivation in patients struggling with apathy, especially after seeing improvement. It was noted on several responses that a psychiatric evaluation pre-treatment and/or counseling during treatment is recommended to patients.

Completion of Home Exercises

At-home exercises are an integral part of the LSVT LOUD program because they assist in generalizing their new “loud” voice outside the clinic. Clinicians were asked, “From what you’ve observed, do patients typically complete at-home exercises or assignments?” The responses were: “yes” (56.2%). “no” (19.8%), and the remaining 24% responded “other” and wrote in responses. Of the “other” responses, it was most commonly explained that, due to the large number and diversity of patients they’ve treated, they were unable to give a generalized answer.

Clinicians were asked, “Of the patients who habitually didn’t do the at-home assignments or practice, why do you think it wasn’t done?” For this question, clinicians responded by typing in their answers. Of the 147 responses, the most frequently occurring responses were: lack of support from loved ones (40 times mentioned), cognitive impairment (35), and lack of motivation (23). Within the many “lack of motivation” responses, some clinicians noted that due to the repetitive nature of the program and the difficulty to see noticeable improvements (either due to the gradualness of progress or possible perceptual deficits), patients frequently benefit from the LSVT Homework Helper DVD designed for the LOUD program to assist in motivation.

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Other factors mentioned in at least ten responses were: lack of motivation (18), apathy (17), patient doesn't see problem with voice (17), time commitment needed (15), and fatigue (10).

Family Attending Sessions

Because family and loved ones are typically one of the greatest systems of support, this survey sought to find a correlation between family or loved one attendance to therapy sessions and success in therapy. The question asked, "From your experience, do family members or loved ones typically come to therapy sessions with the patient?". Figure 4 displays the distribution of results. Just over half (55.8%) of clinicians responded "varies/sometimes," 22.1% responded "yes," and 22.1% responded "no." Clinicians noted that these statistics could be due to a number of factors, such as the setting in which treatment is given. For example, in a skilled nursing facility, family members may not be routinely present during therapy hours, but in a private practice, a family member may need to drive the patient to the clinic daily and therefore attend all sessions. Clinicians were then asked "Do you feel patients benefit from having a loved one present during the session?" Responses, displayed in Figure 5, included: "depends" (50.5%), "yes" (43.1%), and "no" (6.4%).

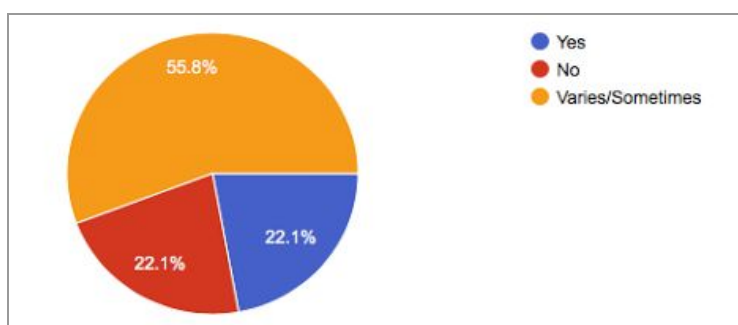


Figure 4. Responses when asked if family/loved ones typically attend therapy sessions.

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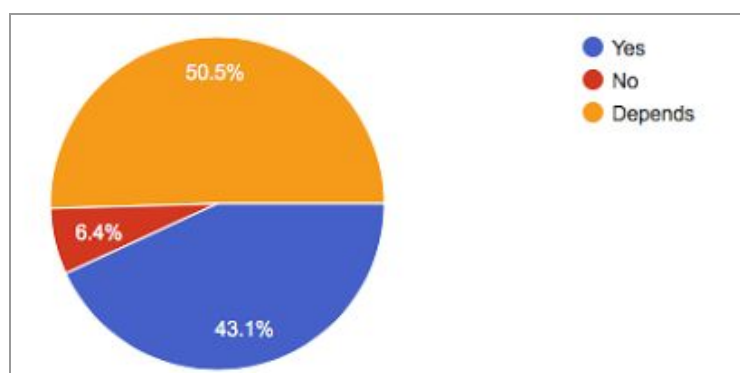


Figure 5. Responses when asked if patients benefit from the presence of family during therapy.

Clinicians were asked, “If ‘no’ or ‘depends,’ why do you think those patients didn't benefit from their presence?” Answer choices included “interruptive or distracting,” “lack of interest,” “critical of patient or program,” and an “other” option for clinicians to write in a response not listed. Of the 118 responses (shown in Figure 6), most of the answering clinicians report that the loved one is “interruptive or distracting” (65.3% of clinicians) during treatment or “critical of the patient or program” (39.8%). In addition, 22.9% of clinicians selected “other” and wrote in their own response. Approximately 40% of clinicians who wrote in responses mentioned that the presence of a family member in the therapy sessions can lead the patient to become too dependent on others to hold them accountable for using their loud voice outside of the clinic. It was noted that LSVT promotes independent self awareness, effort, and monitoring, so dependence on others is counterproductive in carryover. Additionally, approximately 25% of the “other” responses mentioned that patients feel self conscious, embarrassed, or do not participate as fully in the treatment when there is someone else in the room, impeding improvement.

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Likewise, if clinicians responded “yes” or “depends,” they were asked, “in which ways do you feel they most benefit?” Answer choices included “increased motivation during session,” “increased motivation to complete homework,” “increases family member’s awareness/knowledge,” and an “other” option where clinicians could write in additional answers. Of the 188 responses, 89.9% of these respondents reported that the patient benefited by “increased family member’s awareness/knowledge of the program” and 58.8% reported that the presence of a loved one during the session “increased motivation to complete the homework exercises.” Of the nine “other” responses where the clinician wrote in a response, multiple respondents mentioned that it helps increase the generalization of the improved, louder voice beyond the therapy setting.

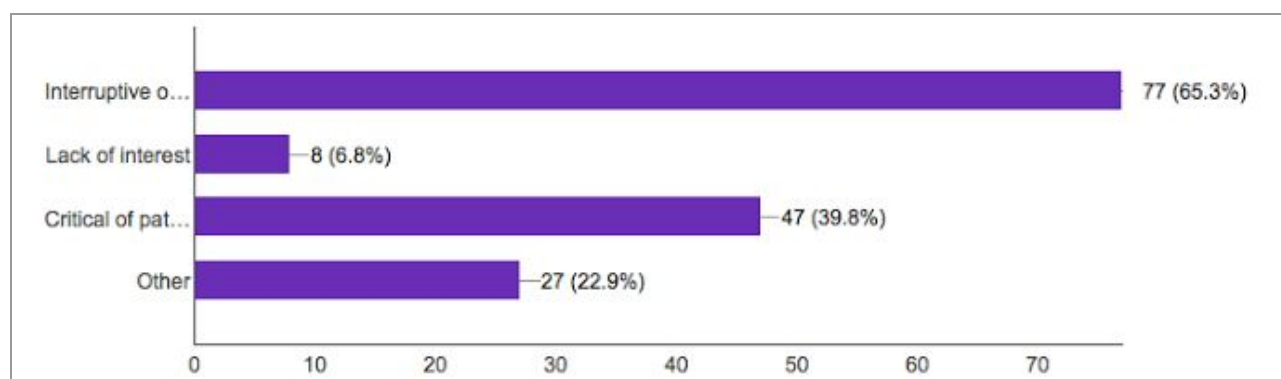


Figure 6. Reasons given on why a patient may not benefit from the presence of a loved one during the therapy session.

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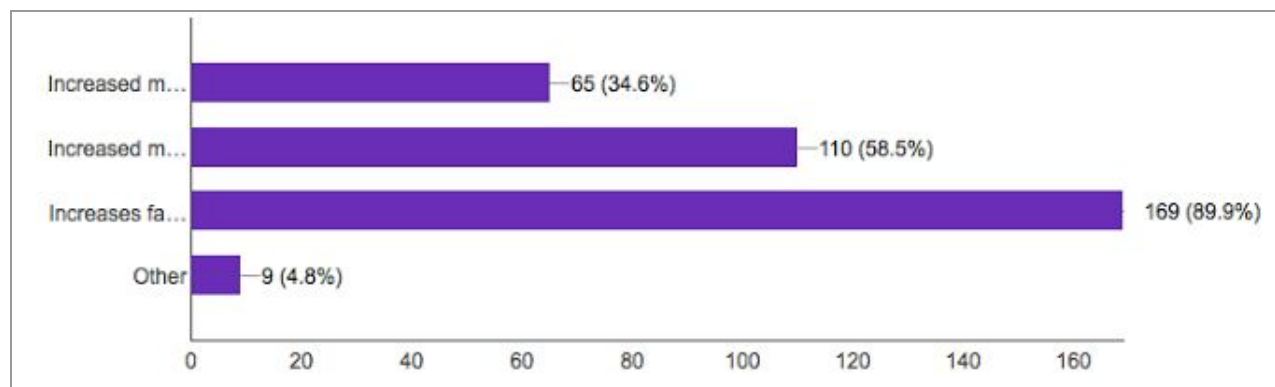


Figure 7. Reasons given for why a patient may benefit from the presence of a loved one during therapy.

Structure of Program

Because there are no program modifications available and the treatment is administered in the exact same way for every patient, setting, and severity of symptoms, clinicians were asked, “Have you had patients succeed well enough with treatment that you feel the length or intensity could have been lessened?” Clinicians could answer “yes,” “no,” or write in an answer for “other.” The majority of respondents (57.7%) answered “no,” while 35.3% answered “yes” (shown in Figure 8). Of the other responses written by 7% of responding clinicians, generally, their answers fell into one of two categories: they feel that no modifications should be made due to research proving its current effectiveness, or they seldom feel it would be appropriate to slightly shorten or lengthen the treatment (but no reports of anyone having done so).

Clinicians were asked, “Do you feel the treatment program as a whole could be modified without affecting success rate?” Clinicians were allowed to select one or more of the following: “Yes, treatment may not need to be clinician-led all 4 days of the week,” “Yes, treatment should be fewer times a week, but over a longer period of time,” “Yes, treatment success can be met

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before the end of four weeks,” “Yes, treatment should be extended longer than 4 weeks,” “No,” and an “other” option for clinicians to write in an answer. The most frequently selected answers were “no” (36.4%), “Yes, treatment may not need to be clinician-led all 4 days of the week” (25.8%), and “Yes, treatment should be fewer times a week, but over a longer period of time” (21.2%). Other answers received less than 20% clinician response. Clinicians stated that administering the treatment fewer times a week over a longer period of time could benefit patients with cognitive deficits, assist in generalization, and allow patients to more easily attend therapy due to the decreased frequency. Considering the distribution of responses, if modifications are ever allowed in the future of this treatment, it would be highly dependent on the patient’s status.

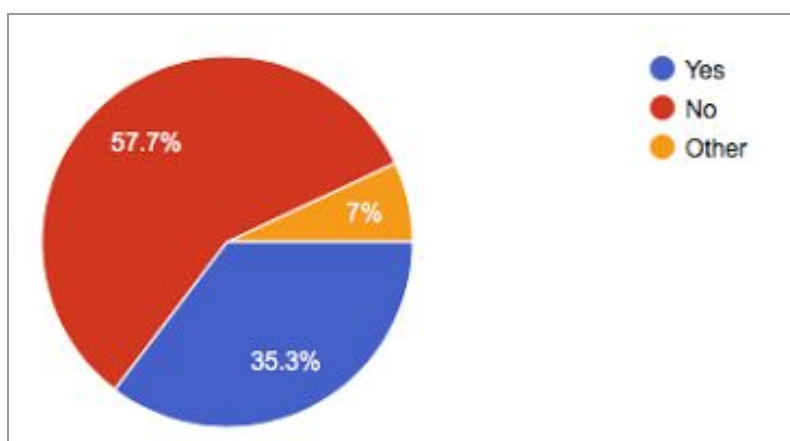


Figure 8. Graphical representation on clinician’s responses on if they’ve had patients succeed well enough to feel that the length or intensity of the program could have been lessened.

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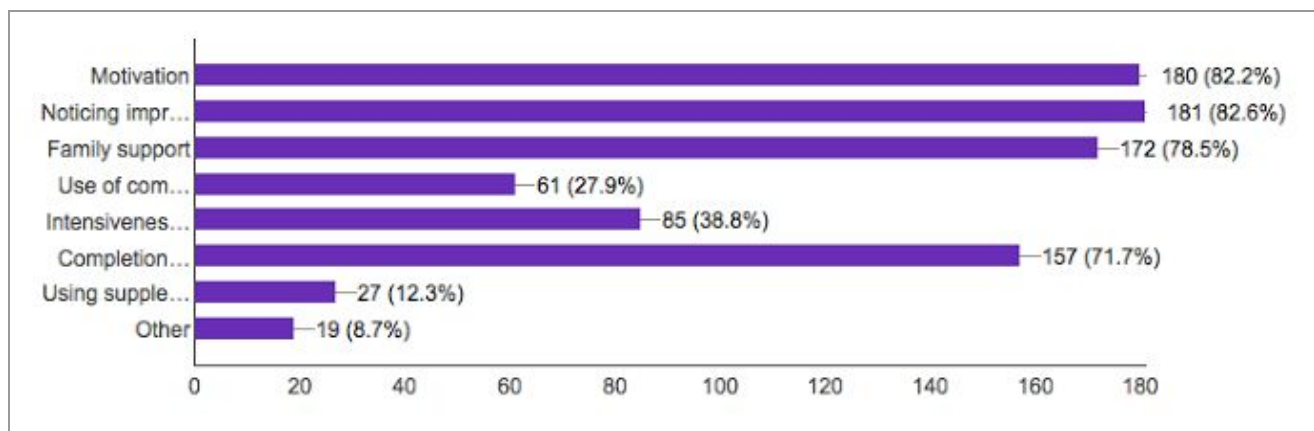


Figure 9. Distribution of clinician responses when asked which factors lead to good carryover/generalization of treatment.

Carryover/Generalization of Treatment

The sole purpose for the LSVT LOUD program is to improve the loudness and quality of voice in such a way that it carries over to the person's daily communication. To assess the clinician's opinion of patients having met this goal, they were asked "Do you feel there is good carryover/generalization of treatment when it comes to their speech outside of the clinic?" Nearly half (46.3%) of respondents answered "yes," while 17.1% selected "no," and 36.6% wrote in information for "other." Of the 79 written in "other" responses, approximately 80% stated they were unable to make a generalized statement, due to the variability from patient to patient concerning cognitive status, family support, lifestyle, motivation, and homework completion, for example.

Next, clinicians were asked to select factors they feel "lead to good carryover or generalization of treatment." Options included: "Motivation," "Noticing improvement in speech/voice," "Family support," "Use of commonly used phrases," "Intensiveness of

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treatment,” “Completion of homework exercises,” “Using supplemental materials,” and “other,” where clinicians could write in a response. Distributions of answers can be seen in Figure 9. The answers with the most responses were “noticing improvement in their speech/voice” (82.5%), “motivation” (82.2%), “family support” (78.5%), and “completion of homework exercises” (78.5%). Other responses were selected by less than 40% of clinicians.

Accessibility of Treatment

Research has proven that LSVT is an extremely effective treatment program in long term improvement of voice, but studies suggest less than 5% of individuals with Parkinson's disease receive speech therapy (Trail et al., 2005). Clinicians were asked, “Do you feel the cost of treatment is the top factor prohibiting those that would benefit from treatment from receiving it?” Clinicians responded: “No” (69.6%), “Yes” (21.2%), and 9.2% wrote a response in “other.” Of the written answers, clinicians generally mentioned that the cost depends on the type of insurance the patient has and its cap on therapy, especially when the patient is recommended for both LSVT LOUD and BIG programs.

Next, clinicians were asked “If not, what do you feel is the greatest factor prohibiting people from receiving treatment?” Of the 134 responses (many of which contained more than one factor listed), 55.9% stated that a lack of awareness (28% specifically mentioned a lack of awareness among referring physicians while the other 78% mentioned a general lack of awareness). Other factors mentioned by at least 20% of those 134 clinicians included: time commitment for treatment, issues with transportation, and the availability of clinicians. Some mentioned that all of these factors tie in together, such as an individual not having a way to get to a clinic several times a week that's located over an hour away. In addition, clinicians reported

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patient frustration due to a requirement of an ENT assessment prior to therapy, or long wait times for an appointment with an ENT.

Additional Clinician Opinions Given

Clinicians were given an option at the end of the survey to “list or discuss any additional opinions on the treatment.” Many responses were received in which clinicians talked about their experience with patient success, additional opinions on the structure of the program, and additional tools available to patients that have been successful.

Supplemental options for treatment. One clinician remarked that they always recommend that a patient obtains a dB monitor during and after treatment to ensure they're staying on target in vocal loudness. This can be especially useful if they live alone and aren't able to readily obtain feedback from family members and to ensure their loudness doesn't decrease over time. The LSVT Homework Helper DVD was mentioned several times as being reported as extremely helpful in optimizing strength and loudness and motivating patients to complete homework exercises. A couple of clinicians mentioned that there are weekly support group meetings available for patients and their families after they complete the LOUD program that have proven to positively influence the continuation of homework and better generalization into daily communication.

Optimal time for treatment. As a neurodegenerative disease progresses, many individuals become increasingly impaired in cognitive functioning. There were several reports of clinicians describing a higher success rate (short- and long-term) among patients who seek treatment in the early stages of the disease. Clinicians stated that this may be because those individuals may become unknowingly used to their softer voice, increasing the difficulty of

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calibrating the new, loud voice and maintaining it over a long period of time. In addition, patients treated at an advanced stage of the disease may suffer from more cognitive impairments that can impede progress.

Discussion

After reviewing the results of the survey, we can conclude that, according to clinician's reports, there is a correlation between treatment success and the patient's motivation, support system, overall health, intact cognitive functioning, and willingness to complete the homework exercises. Apathy and/or the progression of Parkinson's disease can negatively impact many of these factors, so it is important that a patient is receiving services from other physicians if necessary. The purpose of the intensive and frequent treatment is to develop a habitual skill that will continue to be used after the treatment program. Because of the frequency and intensity, we can hypothesize on why these factors could impact the potential success of treatment for some individuals, such as fatigue, distance from clinic, or a busy schedule.

Overall, it has been proven to be a highly effective program for patients suffering from voice and speech disorders due to Parkinson's disease. This survey reports that the largest preventative factor from an individual receiving treatment is a lack of awareness. This could possibly be due to the scarcity of clinicians in some areas, shortfall of physician referrals due to their unawareness, or because the patient and their family are unaware that it can be treated, for example.

Although many insurance plans cover some of the costs for speech therapy, many individuals have plans that require a copay at the time of each service. A couple of respondents commented that those copays add up over the course of those 16 treatments. Due to the average

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age of patients at the time of diagnosis of Parkinson's disease coinciding with the typical age of retirement, the cost could prevent the patient from completing all treatment sessions (Trail, et al., 2005).

Other external factors that appear to have the greatest influence on a patient's access to this therapy program include: lack of physician and patient awareness of program, time commitment, transportation, and the distance from a certified clinician. Distance and transportation to and from the clinic can have significant impacts on treatment success according to the availability of clinicians and the physical status of the patient. While some states such as Virginia have 93 certified clinicians, some rural but larger states like Wyoming may only have 8 clinicians (LSVT Global, 2015). This puts patients living in rural areas at a significant disadvantage even before accounting for physical or cognitive deficits that may prevent them from independently driving to the clinic. Poor overall health may also indicate the patient is unable to complete treatment due to hospitalization, inadequate respiratory functioning, having an advanced stage of Parkinson's, or added dementia.

Lastly, cooperation and a positive attitude during therapy is of utmost importance in terms of successful sessions and long-term carryover. As some clinicians expressed, patients who are only attending therapy as a result of their family's urges are unlikely to have perceived a change in their vocal functioning and therefore do not feel that they need treatment, which affects participation levels and progress. This reported lack of insight could possibly support the theory that there is a deficit in cortical sensory processing of self-produced vocal effort in Parkinson's disease. However, it was reported that patients who sought treatment independently are typically the most motivated and proactive during their treatment, and some clinicians

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reported never having a patient that displayed unwillingness to participate. Clinicians also found that hosting a local support group for individuals who have completed the program to meet on a regular basis has been useful in reminding and motivating the patient to continue with exercises.

Conclusion

There are many internal and external factors that can play a role in the success of a patient's LSVT program. According to this study, a patient's motivation, cognitive status, completion of home exercises, and family support system are among the most influential factors that can either impede or promote success of treatment. Externally, insurance/cost, availability of certified clinicians, time commitment needed, and transportation are among the factors that may prohibit a patient from seeking or receiving this therapy program. The speech-language pathologist plays a vital role in informing the patient and their family the importance of every factor that can play a part in success. In terms of post-treatment strategies, ensuring there is adequate communication at the home environment, or wherever the patient is, can promote continued speech loudness efforts. Some apathetic patients need external support when it comes to continued efforts, as well. Overall, this treatment program has proven to be very effective in short- and long-term improvement of voice and speech disorders in Parkinson's disease, even with the varied population of patients.

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Appendix A