Addressing the Speech Language Pathologist Shortage in Virginia

Picture from: ("How to Become a Speech-Language Pathologist," 2021)

Ashley Leonard

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UVA | FRANK BATTEN SCHOOL of LEADERSHIP and PUBLIC POLICY

SHAV Speech-Language-Hearing Association of Virginia

Table of Contents

Executive Summary

The Speech-Language-Hearing Association of Virginia (SHAV) is an advocacy organization and a provider of continuing education services for renewing licenses for their members. They are interested in ways to address the shortage of speech language pathologists (SLPs) in Virginia. SHAV has advocated with regulatory bodies and state legislators previously to increase the quality of care for individuals while addressing concerns raised by SLPs. In the following report, I describe the basic background of the SLP shortage and then the specific demographics in Virginia. The main findings regarding SLPs in Virginia were that a majority of SLPs under 40 have substantial student debt and the distribution of SLPs in Virginia is concentrated in the Northern, Central, and Hampton Roads region (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021).

The SLP shortage is not a new phenomenon and states have been trying to mitigate the negative consequences associated with it for over 15 years. The COVID-19 pandemic also increased the use of virtual strategies that may provide a path to addressing the shortage. The evidence from the literature suggests that the use of support staff and increasing telepractice can have a quick effect on the SLP shortage while having minimal negatives. Focusing on improving job satisfaction and increasing quality access to SLP services will have the most immediate effects on the shortage in Virginia.

From the evidence, I proposed the following alternatives:

1. Develop standardized guidelines and expand the use of Speech Language Pathologists Assistants (SLPAs) in Virginia
2. Expansion of SLP telepractice in public schools and private practice for rural areas
3. Pilot program to expand online learning

These options were all assessed based on how they performed on three evaluative criteria, their cost-effectiveness, feasibility, and equity. The alternatives were evaluated on a scale of low (1) to high (3) and the criteria were all equally weighted. After evaluation developing standardized guidelines and expanding the use of SLPAs in Virginia was ranked highest and is the recommended alternative for SHAV to pursue. This was the most feasible option for SHAV, and it is the best way to address the shortage quickly in the short-term while also being a sustainable option for shortages in the future.

SHAV should focus on structuring guidelines that prioritize quality and sustainability. So, they should work with the Board of Audiology and Speech Language Pathology to develop guidelines for SLPA licensure then distribute educational materials about SLPA roles and best supervision guidance to SLPs in Virginia. After creating this coalition that supports SLPAs licenses, SHAV and BASLP should bring forth this recommendation to the Virginia General Assembly for their approval.

Acknowledgements

I would first like to thank Amy Barnett and everyone at the Speech-Language-Hearing Association of Virginia (SHAV) for their assistance throughout this process and for the amazing work they do on behalf of speech language pathologists and audiologists in Virginia. It has been an incredible learning experience and I sincerely hope that this project meets their expectations.

I would like to thank Professor Craig Volden and Professor Kirsten Gelsdorf for their feedback and guidance at each step of this project. I would also like to thank my parents, Chris and Stacie Leonard, as well as my sisters Abby and Megan for their support and patience throughout this past year.

Disclaimer

The author conducted this study as part of the program of professional education at the Frank Batten School of Leadership and Public Policy, University of Virginia. This paper is submitted in partial fulfillment of the course requirements for the Master of Public Policy degree. The judgments and conclusions are solely those of the author, and are not necessarily endorsed by the Batten School, by the University of Virginia, or by any other agency.

Honor

On my honor as a student, I have neither given nor received unauthorized aid on this assignment.

--Ashley Jean Leonard

Commonly used Abbreviations

ASHA----American Speech-Language-Hearing Association

BASLP----Board of Audiology and Speech Language Pathology in Virginia

SHAV----Speech-Language-Hearing Association of Virginia

SLPs----Speech Language Pathologists

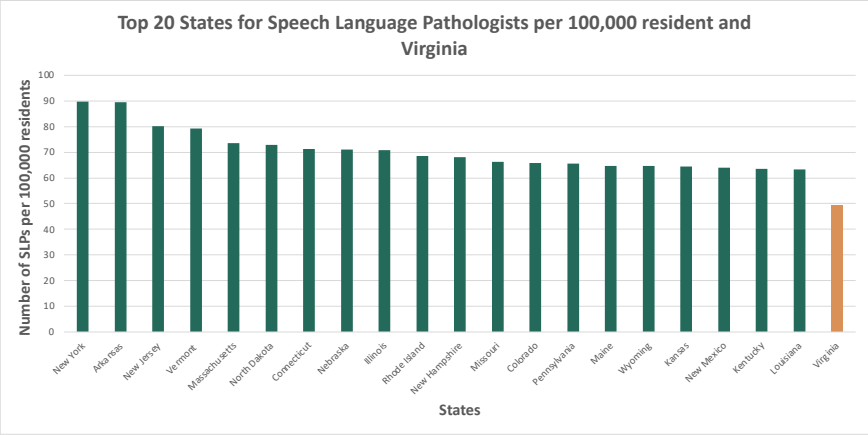
SLPAs----Speech Language Pathologist Assistants

VDOE----Virginia Department of Education

Introduction

Shortages in healthcare are not a new phenomenon, but the COVID-19 pandemic highlighted the issues that can occur if labor shortages in essential businesses are not mitigated. Speech-language pathologists (SLPs) are vital in the healthcare industry and a shortage of their vital services could negatively affect individuals' health, social skills, and educational development. Research has shown that speech and communicative disorder can have many short- and long-term consequences including difficulty understanding people, poor self-esteem, leaving school early, and a higher chance of interaction with the juvenile justice system (Verdon & Crowe, 2021). These negative consequences can be mitigated by consistent therapy services provided by licensed SLPs.

This report attempts to explain the reasons for the current shortage of SLPs in Virginia and the current demographic trends relevant to the shortage. The report will investigate some possible ways to address the shortage and identify key takeaways from existing literature. Given the existing shortage and the services that SLPs provide for development, the solutions will focus on ways to make the largest effect in the short-term.



Data Source: American Speech-Language-Hearing Association (Brook, 2020)

The graph above shows the number of SLPs per 100,000 residents for the top 20 states compared to Virginia which is highlighted. As you can see Virginia is well below the top 20 states and is currently ranked 39th in the country in this metric (Brook, 2020). There is no reason to believe that any state has a larger need for SLPs than others, so this shows that Virginia is not doing as well as other states in attracting and retaining SLPs.

Problem Statement

Speech language pathologists (SLPs) assess, diagnose, treat, and help to prevent communication and swallowing disorders in children and adults. The number of SLP jobs nationwide is expected to grow 29% by 2030 and 27% of the current SLP workforce in Virginia is expected to retire in the next 15 years (*Speech-Language Pathologists*, n.d.; *Virginia's Speech-Language Pathology Workforce: 2021*, 2021). There are not enough new SLP graduates to address the projected shortage caused by increased demand and retirement, so there will be a gap that will need to be addressed (*Communication-Sciences-and-Disorders-Education-Trend-Data.Pdf*, n.d.).

Background

Client Overview

The Speech-Language-Hearing Association of Virginia (SHAV) focuses on increasing awareness and advocating for the interests of audiologists and speech pathologists in Virginia. They wish to help members practice at a high standard, and they hold educational events for members to aid in accomplishing their overarching goal (*Home*, n.d.).

Certification, Training, and Licensing Required

Virginia's Board of Audiology and Speech Pathology and the American Speech Language Hearing Association (ASHA) play vital roles in the certification and licensing process for SLPs in Virginia. Virginia requires that all SLPs have a certification from ASHA and pass an examination to qualify for a license. In order to obtain the certification the applicant must have graduated from a master's, doctorate, or other approved post-baccalaureate program (*2020 Certification Standards in Speech-Language Pathology*, n.d.). The licensing requirements for in-person and telehealth therapy are the same and any SLP wishing to practice in Virginia using telehealth options must be fully registered and licensed in Virginia (*COVID-19: Tracking of State Laws and Regulations for Telepractice and Licensure Policy*, 2021). In 2021, 98% of SLPs in Virginia had masters degrees with the other 2% holding doctorate degrees (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021).

Student Debt

Since SLPs must have graduate degrees to be licensed, they often take on a significant amount of debt related to educational expenses; over one-third are debt burdened (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021). A higher percentage of SLPs who are under 40 have student debt in part due to the rising cost of college education; over 52% of SLPs working in Virginia under the age of 40 have education debt (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021). This debt can be daunting to many since this could be an accumulation from both undergraduate and graduate degrees; the high cost of a master's degree in SLP could be a potential barrier to individuals attempting to gain work in Virginia.

Demographics of SLPs and Increasing Shortage

In the United States approximately 10,000 total masters in SLP were conferred in 2020 (*Communication-Sciences-and-Disorders-Education-Trend-Data*, n.d.). The median size of a program in the United States in 2020 was 32 (*Communication-Sciences-and-Disorders-Education-Trend-Data.Pdf*, n.d.). Individuals pursuing these masters have become more diverse as time progresses with approximately 23.3% of student in 2020 identifying as a minority population (*Communication-Sciences-and-Disorders-Education-Trend-Data.Pdf*, n.d.).

The Bureau of Labor Statistics states that from 2020 to 2030 the SLP industry will grow by 29% which is much higher than the projected growth of average industry during this time (*Speech-Language Pathologists*, n.d.). This growth is due in part to an aging population and the growing need for swallowing specialists after medical incidents such as strokes. Virginia has 14% of SLPs working primarily in skilled nursing facilities or involved in home health care; these are both typically for the elderly (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021). 24% of the SLP workforce also has a self-reported specialty in swallowing disorders (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021).

Another factor affecting the growth of demand in SLPs is the increasing prevalence of children diagnosed with autism spectrum disorder each year (CDC, 2020). SLPs can often play a vital role in helping children with different communicative disorders; autism spectrum disorder can present certain communication issues in children that are often addressed with speech therapy performed by an SLP (*What's Driving the Demand for Speech-Language Pathologists?*, 2017). 21% of SLPs in Virginia self-reported having a specialty in speech therapy for autism spectrum disorder (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021).

SLPs in Schools

41% of SLPs in Virginia are primarily employed in a school and another 9% of SLPs designated it as a secondary place they do work (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021). Schools must provide students with accommodations, and they provide SLPs services to all students that qualify. In 1990, the federal government passed the Individuals with Disabilities Education Act (IDEA) which ensured that all children in the U.S. received special education services if they need it (*What Is the Individuals with Disabilities Education Act? | DO-IT*, n.d.). This act was reauthorized but amended slightly in 2004 to further promote educational achievement. Under the updated act children and youth receive special education services from their public school from the age of 3 to 21 ("About IDEA," n.d.).

Geographic Locations of SLPs in Virginia

"75% of SLPs in Virginia work primarily in the Northern, Central, and Hampton Roads Regions"

(*Virginia's Speech-Language Pathology Workforce: 2021*, 2021)

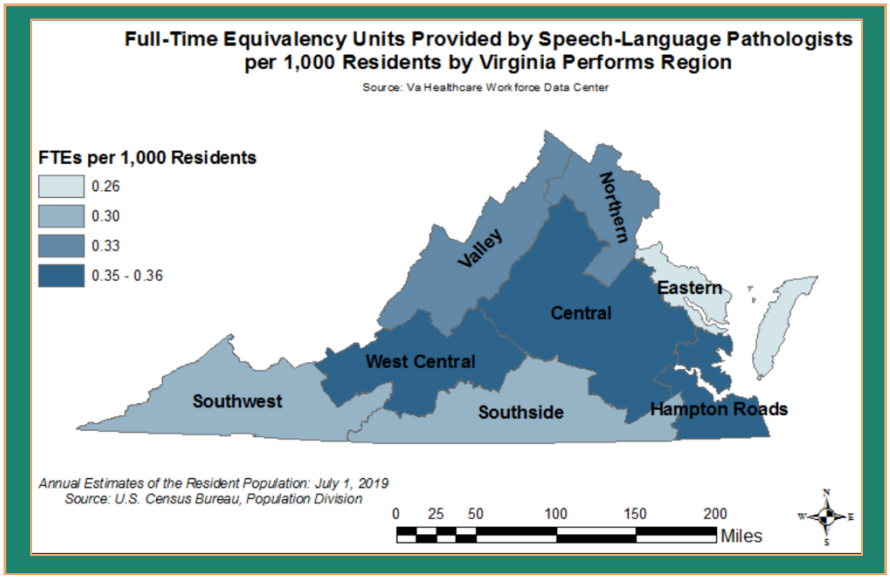
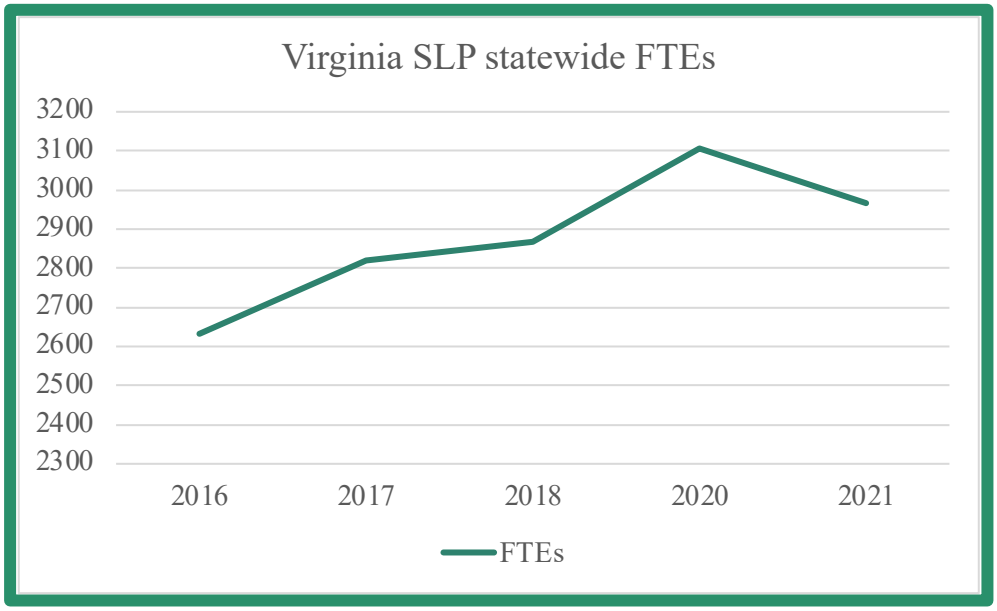


Image: (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021)

The distribution of SLPs in Virginia varies widely with many SLPs listing more than one region as an area in which they offer services. 75% of SLPs work in the Northern Virginia region, Central Virginia region, or the Hampton Roads region (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021). Central Virginia, Hampton Roads, and West Central planning districts had higher FTE rates, whereas planning districts in Southern Virginia and on the Eastern Shore had considerably lower FTE rates as shown in the image on the previous page (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021).

All in all, the United States is on the verge of a severe shortage of trained speech language pathologists. There are not enough graduate programs open to fill that shortage and Virginia is especially at risk due to its current standing in SLPs per 100,000 residents and their aging speech language pathologist workforce. Virginia has made some progress on total SLP FTEs in the past six years; they have increased the SLP statewide FTEs by 13% since 2016 which can be seen in the graph below (*Virginia Healthcare Workforce Data Center - ASLP Reports*, n.d.).



Data Source: (*Virginia Healthcare Workforce Data Center - ASLP Reports*, n.d.)

FTEs peaked in 2020 which is most likely due to the increased prevalence of telepractice and the number of individuals performing services across states (*Virginia Healthcare Workforce Data Center - ASLP Reports*, n.d.). The growing number of elderly patients and children diagnosed with communicative disorders is further increasing the demand for SLPs' highly trained skills in Virginia and elsewhere. So, Virginia is making progress on this issue, but it will not be enough to address the shortages caused by increased demand and expected retirements.

Evidence on Potential Solutions

The shortage of SLPs is not unique to Virginia nor to the United States, with growing demand due to aging populations and higher prevalence of communicative disorders in children in recent decades. Other countries and states have employed various strategies to deal with shortages in their systems including telepractice, telesupervision, additional support personnel, and scholarships. The COVID-19 pandemic caused many SLPs to begin utilizing technology in the delivery of their services and the training of new SLPs. These untraditional modes of speech and language therapy each have positives and negatives associated with them.

Speech Language Pathologist Assistants (SLPAs)

Currently, many policymakers and scholars are investigating the possibility of using SLPAs to lower the work and stress burden on SLPs. SLPAs have less formal training and do not require a graduate degree in Virginia to work; they typically receive on the job training to become a SLPA (*Virginia Support Personnel Requirements*, n.d.). They can assist with some of the administrative work and some specific tasks regarding client interactions and sessions. There is mixed research on the effects of utilizing SLPAs to address SLP shortages (Aguilar & Ostergren, 2016; Betts, 2015; O'Brien, 2018; Ross & Harding, 2010; *Virginia Support Personnel Requirements*, n.d.). Australia is also experiencing a massive SLP shortage and began introducing SLPAs in schools and clinical settings nationwide more recently than the United States. SLPs realize they are being overworked in the current system and crave intervention aimed at reducing caseload which is much higher than historic average (O'Brien, 2018). SLPs also feel that the introduction of SLPAs is somewhat degrading as it dilutes their professional role and introduces a secondary pathway into their profession that is less costly (O'Brien, 2018). The introduction of SLPAs have reduced the workload on SLPs considerably in school settings which SLPs recognize and welcome.

There are no direct requirements for SLPAs since they are not licensed in Virginia (*Virginia Support Personnel Requirements*, n.d.). There are some concerns with employing SLPAs since there are potential liabilities associated with having unlicensed professionals in healthcare and school settings. Another issue that exists with Virginia SLPAs is that not all insurances cover services performed by SLPAs since they are unlicensed so private practices and hospitals can be more hesitant to employ them. This lack of clarity and direct resources have been a major issue when SLPAs have been introduced in school and clinical settings (Aguilar & Ostergren, 2016; Betts, 2015). Since there are not standards, some SLPAs have reported not receiving training they felt necessary before starting the job including not knowing how to handle certain disorders and not having access to necessary information quickly (Betts, 2015). These issues introduce a bottleneck in the process because SLPAs must seek out information from supervising SLPs or internet resources. All in all, the use of SLPAs to reduce the workload on SLPs has been effective in that main goal, but it has introduced many issues with its implementation including lack of standard requirements, inefficient training, and negative psychological effects in SLPs.

Lessons from other healthcare shortages

Another critical healthcare field which is experiencing shortages nationally and in Virginia is the nursing industry. There has been research and policy trials implemented to address the nursing shortages in various states. One study of five midwestern states investigated efforts made to lessen the shortage from 1999 to 2003 found that many individuals identified increasing number

of newly licensed nurses as key, but the states did not have educational support necessary for expansion of nursing programs needed (Cooksey et al., 2004). Expanding education through scholarships or additional funding for larger class sizes was not feasible due to other state priorities and limited funding (Cooksey et al., 2004). Another issue regarding expanding the number of new graduates is that there are a limited number of faculty available for teaching and the hours of clinical supervisions that all graduates must receive (Bartels, 2007). An extensive research study was carried out in Saudi Arabia regarding the nursing shortage in that country which found that using short-term solutions focused solely on reducing nurses' workload were most beneficial to patient care and job satisfaction of nurses (Muabbar & Alsharqi, 2020). Increasing job satisfaction of existing workforce is paramount when addressing shortages because people are more likely to quit, take early retirement, and not recommend it to others when they are run down by the workload.

The nursing shortage has been lessened by the expansion of licensed practical nurses (LPN) and certified nursing assistants (CNA); these individuals do not receive the same amount of training as individuals who are registered nurses and therefore cannot provide the same services (Keenan, 2003). The introduction of other levels of nurses allows registered nurses (RN) to focus solely on main tasks and not as much on administrative work. Overall, the nursing shortage highlights that increasing educational funding for graduates in specialized fields is difficult and that retaining job satisfaction during short-term trial period is key. Also, it shows that introducing support staff that require less time to train can decrease workload of registered nurses and allow them to better care for more individuals.

Telepractice

Many SLPs have moved their services online in the last 18-months; few reported utilizing telepractice before the pandemic. There are conflicting reports of effectiveness of telepractice especially during COVID-19 (Akamoglu et al., 2018; Campbell & Goldstein, 2021; Cherney et al., 2011; Cybele Wu, 2019; Fairweather et al., 2016; Fong et al., 2020; Kollia & Tsiamtsiouris, 2021; Lowman & Kleinert, 2017; Overby, 2018; Short et al., 2016; Tucker, 2012). There was a consensus among SLPs that they were unprepared for the abrupt switch to telepractice (Beiting & Nicolet, 2020). After initial hesitation, SLPs saw the benefits of telepractice during the pandemic with many planning to continue this mode of therapy in some capacity after concerns about the pandemic have abated (Kollia & Tsiamtsiouris, 2021; Santayana et al., 2021). Initial research into the use of telepractice during the pandemic has shown promise of the practice, but there have also been notable issues present during the use of virtual therapy. A main concern that SLPs, parents, and caregivers identified was that clients, especially children, had issues making progress in the virtual format without first having or building a rapport with their therapist (Akamoglu et al., 2018; Freckmann et al., 2017; Hines et al., 2015; Lam et al., 2020). Another issue SLPs ran into during their time utilizing telepractice during the pandemic was lack of technological knowledge of best practices with few SLPs receiving any formal training on proper pedagogy (Kraljević et al., 2020). While many individuals have had positive experiences with telepractice there has not been an universally accepted standard way to evaluate the practice yet (Mansuri et al., 2021). Overall, telepractice has expanded massively during the past year with varying degrees of success and many SLPs are planning to continue the practice in some capacity in the future. This could be used to address shortages in rural areas that do not have a high capacity of SLPs in their geographic region.

Oklahoma Case Study

While telepractice has grown substantially in the last two years to deal with the consequences of the COVID-19 pandemic, states have attempted to use telepractice to address isolated shortages for the past two decades. One example of this was in Oklahoma where it was used to expand options for rural area schools specifically. They set up a central hub site where they had five SLPs conducting therapy to 99 individuals in rural schools in Oklahoma that could not consistently keep a SLP on their staff (Forducey, 2006). The funding comes from the school systems themselves who are billed from the SLP contractual service and the SLPs met the children and their parents on-site before starting therapy services to build a good relationship (Forducey, 2006). SLPs involved with the telepractice program have expressed that students react well to the virtual format and consistently exceed goals set for their sessions (Forducey, 2006). Overall, this program was successful with students, parents, SLPs, and administrators expressing satisfaction with it through a yearly feedback survey aimed at assessing the program to address any concerns (Forducey, 2006).

"SLPs involved with the program express that students react well to the virtual format and exceed goals" (Forducey, 2006)

Electronic Educational Supervision and Online Education

Much scholarly attention has been devoted to using technology to fill gaps in the system where there is not enough human capital to complete tasks (Carlin et al., 2012; Conn et al., 2009; Rock et al., 2013; Rousmaniere & Frederickson, 2013; Voniati et al., 2021). One major bottleneck in the system is the training and supervision of graduate students and those attempting to get licensed. SLPs are already overworked with their own caseload so taking time off to supervise and train others is just more work for the SLPs. This technology takes the form of having a camera stream real time to a second location where they are observed and a supervisor rates then provides feedback to the student on their skills and classroom management. This has been used for both SLPs graduate students and other special education teachers-in-training (Rock et al., 2013). Multiple real-world studies have found that trainees in this scenario enjoyed the online model (Carlin et al., 2012; Rock et al., 2013). Notably, a student who had received both online and in-person supervision noted that they did not feel like the feedback or supervision they received differed between the two modes of supervision (Conn et al., 2009). They found that a significant amount of student trainees prefer the online model and reported less anxiety surrounding their supervision than in-person supervision (Carlin et al., 2012). This could lessen the stress levels of SLPs students during training in Virginia.

This telesupervision expanded immensely during COVID-19 as many SLP sessions were moved to a virtual format or they introduced telesupervision during in-person sessions out of an abundance of caution. The United States was not the only country to introduce online models for SLP training and other professions that require training for licensing. Cyprus introduced a massive program of telepractice, telesupervision and distance learning during the pandemic

(Voniati et al., 2021). This program provided clinical services for students in Cyprus and the initial reviews of these practices suggest that they can help reach students who had less access to these services in the pre-pandemic world (Voniati et al., 2021). This highlights that students do not suffer when their SLP graduate trainees complete their work online during their initial supervision and training. By expanding online options, states can train individuals no matter where they are located geographically which opens opportunities for more rural or harder to serve areas by having more SLP trainees in their area.

Texas Women's University (TWU) Case Study

The Texas Education Agency (TEA) foresaw the shortage of SLPs in their public schools and partnered with Texas Women's University (TWU) to develop a hybrid teaching option that allows students to take part in a hybrid learning program and gain a master degree in Speech Language Pathology (*Distance Education SLP Degree & Admission Details - Texas Woman's University*, n.d.). This program allows students to take majority of classes online and only meet at a regional site once a week; these sites are located in various areas around the state (Gill et al., 2018). In a program review published in 2011, researchers found that there was no significant difference in outcomes between the in-person and distance learning cohorts pre- or post-matriculation factors, but there was higher racial diversity in student body in the distance learning group (Gill et al., 2018). Before the program public university programs in Texas could on average produce 16 masters per university; in 2011 the TWU distance program was on pace to graduate 100 every two years (Gill et al., 2018). This program also required individuals to work in Texas for at least two years after graduation; they usually work in the school district where they completed their clinical hours (Gill et al., 2018). The distance nature of this program allows students to take classes and complete clinical practicums in areas of the state that they would otherwise not be able to due to the extended distance from the districts to any SLP masters program.

> "Researchers found that there was no significant difference in outcomes between the in-person and distance learning cohorts"
> (Gill et al., 2018)

Limitations

One major limitation of this review was the lack of a standardized definition or measure of speech therapy effectiveness because without one it is hard to make a clear decision about the credibility of academic conclusions regarding these approaches. Another issue is that a majority of SLPs only began using telepractice and telesupervision during the COVID-19 pandemic so the results from those methods have not been investigated fully.

Key Takeaways

Virginia is on the verge of a severe shortage of trained speech language pathologists. There are not enough graduate programs open to fill that shortage and Virginia is especially at risk due to the more arduous licensing procedure and their aging speech language pathologist workforce.

The growing number of elderly patients and children diagnosed with communicative disorders that will need speech therapy is further increasing the demand for SLPs' highly trained skills.

The COVID-19 pandemic allowed SLPs in Virginia to test out the various approaches to address shortages in the field. The main findings are that most approaches are just as effective for most types of disorders, but there are some issues that emerged in these approaches. The evidence from the literature suggests that the use of support staff and telepractice will most likely have the quickest effect on the SLP shortage while having the least negative consequences. However, it is important to note that rapport with clients is vitally important for telepractice to be effective and prioritizing decreasing SLPs workload will increase job satisfaction. Increasing job satisfaction and access to SLP services will have the most immediate effects on the shortage in Virginia and are the ones that SHAV can more readily address, but in the longer-term Virginia will need to look at options that focus on systemic issues.

Alternatives

Option 1: Develop standardized guidelines and expand the use of Speech Language Pathologists Assistants (SLPAs) in Virginia

Currently over 30 states require SLPAs to be licensed, certified, or registered with their respective state's board responsible for speech language pathology (*NCSB Annual Conference, Oct 13-15, 2022, Santa Fe, NM*, n.d.). Virginia does not require this step and as such SLPAs do not have to meet minimum qualifications to practice as support personnel, but most SLPAs in Virginia do have some experience or education with speech language pathology. There are some concerns with employing SLPAs since there are potential liabilities associated with having unlicensed professionals in healthcare and school settings.

For this alternative SHAV would work in conjunction with the Board of Audiology and Speech Language Pathology (BASLP) to develop the license guidelines. Then the BASLP would present these new guidelines to the Virginia General Assembly for their approval. The guidelines would not be mandatory until the calendar year following the regulatory change. The costs associated with this development would be split between SHAV and BASLP. This license requirement would be mandated for everyone who works as a SLPA in the state, but there would be a clause that would offer exemptions for individuals who have worked as SLPAs in Virginia for the past five years as of the date of enactment. Those that fit that exemption could apply for this exemption and be allowed to continue working unlicensed in the state. Many states have licensure guidelines that Virginia could model their own guidelines off.

One state that has SLPA licenses and is similar in demographics and geography is Maryland. Maryland is 22nd in the nation for SLPs per 100,000 so they supplement the areas with SLP shortages with SLPAs (Brook, 2020). Virginia is also not highly ranked in SLPs per 100,000 residents so they could follow Maryland's model to mitigate areas that are suffering shortages more quickly. If Virginia modeled Maryland, then it would require the individual wishing to obtain a license either have an Associate's degree or Bachelor's degree in speech language or communication disorders with credit in certain classes deemed essential to the field (*Maryland Support Personnel Requirements*, n.d.). Maryland requires 100 clinical hours (25 hours for observation and 75 hours in clinical assistance with accredited an educational program). They also mandate continuing education for SLPAs; they must complete 10 units every two years to renew their license (*Maryland Support Personnel Requirements*, n.d.). Maryland offers limited licenses and waiver programs which Virginia could consider adding. Standardized guidelines would provide employers with assurances of the SLPAs qualifications and protection from liability and concerns related to having unlicensed individuals performing healthcare services.

Option 2: Expansion of SLP telepractice in public schools and private practice for rural areas

Telepractice was introduced on a large scale during the COVID-19 pandemic when all non-essential contact between individuals in different households was discouraged and all possible interactions were moved online. This required schools and private practice to develop necessary infrastructure to complete therapy sessions online; most have continued this practice in some capacity for those specific cases where individuals do not feel comfortable conducting therapy in-person.

Telepractice is currently allowed in Virginia for speech-language therapy if the practitioner holds a Virginia license so implementation on a broad scale will rely on school systems and private practice expanding and adjusting how they conduct therapy. This option would not affect much on the private practice side other than continuing to allow telepractice to be used for therapy services if the SLP is licensed in Virginia. SHAV could try to promote SLPs providing services to those in areas with low access, but the option would not mandate anything on the private side.

Telepractice for schools would work by first having one central site that employs five part-time licensed SLPs thus allowing SLPs in more metropolitan areas of the state to use video conference software to conduct therapy for individuals in areas that are experiencing shortages. The Department of Education would fund the central site for public schools; school systems that have shortages could inform the VDOE in the summer and then the VDOE could place students into the site calendar. It would be a versatile program that could provide services to school aged children in various school districts and regions. The school systems would pay the VDOE for their minimal administrative costs associated with scheduling, but the VDOE would pay the salaries of the SLPs. The school systems who need this would be inclined to opt-in since it would not cost them nearly as much as if they were paying to find and hire a new SLP. SHAV and the VDOE should focus first on the counties in Southern Virginia and the Eastern Shore; SHAV should mobilize members who work in those school systems to advocate for this expansion to their respective school boards. SHAV can provide necessary studies about effectiveness and cost to those members to use in their efforts at telepractice expansion.

Currently, in public schools, SLPs work at various schools with the SLP traveling in between schools during the day and working at various schools throughout the week. This travel time in both rural and suburban areas can become quite extensive since SLPs can be asked to cover schools that are not near each other. There have been concerns about poor rapport with SLPs hindering the quality of therapy services in telepractice (Akamoglu et al., 2018; Freckmann et al., 2017; Hines et al., 2015; Lam et al., 2020). So, this program should be primarily utilized by older children who have been through speech therapy beforehand and know what to expect. Therefore, the telepractice site system would allow SLPs to increase the amount of time that they spend with each child and some group sessions could be moved to one-on-one sessions.

Option 3: Pilot program to expand online learning

Prospective SLPs complete a certain number of educational courses and supervised training before being granted their degree and license to practice in Virginia. The COVID-19 pandemic increased the use of online forms of education and many schools invested in licenses and equipment necessary to livestream their educational content to students located elsewhere. This instruction was shown to be effective and other universities already have online master's programs available for SLP. Building upon the success of the virtual classes post-pandemic and the various successes shown in other states such as Texas, this option would involve supplementing an online master's program in Virginia so that the price for students in the program is the same as the price per credit for the Texas Women's University (TWU) online program that has had considerable success in increasing the number of new SLPs working in the state of Texas (Gill et al., 2018).

The overall program would consist of the VDOE using money allocated from the state's General Assembly to pay for tuition for individuals that enroll in the school's online SLP program. This program would be a pilot where 50 students are enrolled in a three year online master course where they must pay $284 per credit hour and complete the minimum number of credits needed for the specific university's program. The cost over that amount would be funded by the VDOE; the credit cost would stay consistent for all three years so the state funding would already be set for the program. After completion of the graduate program the students would have to agree to work as a SLP in Virginia for at least three years or pay back the tuition supplement for their degree with interest. Also, since the state would be supplementing this program, they would be able to designate where students get placed in their clinical and practicums. So, the state could place SLP students in areas with low access to speech therapy to support existing SLPs.

The quickest way for SHAV to implement this option would be to partner with an existing online masters program since they already have the infrastructure and the necessary accreditation. Currently there are six ASHA accredited speech pathology master programs in Virginia (*Best Virginia Speech Pathology Degrees for 2022, Online SLP Included*, n.d.). These programs are all in-person except for James Madison University's (JMU) online degree which involves individuals taking virtual classes for three years while also completing 375 hours of clinical experience under supervision of SLPs (*Communication Sciences and Disorders | JMU*, n.d.-a). In their model the clinical hours are completed in-person and six weeks of these clinicals must be completed in Harrisonburg, VA; the other clinicals can be completed with clinics or in school systems that have a contract with JMU and the locations are coordinated with JMU administration and students (*Communication Sciences and Disorders | JMU*, n.d.-a). The overall cost of attendance for this program in-state is $22,572 and the preplanned course of study on their website lists 15 credits a year; the cost per credit is $501.60 (*Communication Sciences and Disorders | JMU*, n.d.-b; *Graduate Hours and Tuition Estimates*, n.d.). So, the easiest way for SHAV to expand the online model to increase SLPs in Virginia is to partner with the Department of Education and JMU. The distance program currently graduates between 15-25 students every other year (*Communication Sciences and Disorders | JMU*, n.d.-c).

Therefore, this option would follow the TWU model and only charge student $284 per credit and the state government would cover the remaining $217.60 per credit for the cost of attendance at JMU. If this pilot is successful and the students graduate and remain working in Virginia for the following three years, then it could be scaled up to include more students or be spread out to the other accredited masters' programs in Virginia.

Criteria

My client's overarching goal is to reduce the existing heavy workload of SLPs in Virginia while ensuring that all adults and children have access to a high quality of care. They want to ensure that all individuals are provided the therapy they need to thrive and that shortages do not cause poor or rushed care by practitioners, so the following criteria were crafted based on SHAV's main goals.

Cost-Effectiveness

For this criterion each alternative will be judged on its cost effectiveness and the full analysis is included in Appendix A. The outcome of interest will be how much each alternative increases the number of full-time equivalency units. FTE is standard in Virginia to measure SLP supply and is measured on a range from 0 - 1; one unit is 40 hours a week for 50 weeks (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021).

Feasibility

This criterion will encompass the feasibility of each alternative and rank them from low (1) to high (3). My client is an advocacy membership organization where most of the executive team also have full-time jobs, so they do not have the resources to spend on alternatives that are unlikely to be feasible and they will want to know if they spend political capital and time advocating for something that the option won't be hard to implement.

Equity

This will address the extent to which each alternative promotes equity in the state regarding SLPs. Certain areas of Virginia are more likely to experience shortages in SLPs due to their smaller budgets so increases of FTEs in those regions would make a larger impact. This relates to my client's goals of ensuring every individual no matter where they are in Virginia receives all necessary care for their unique needs. I will score this criterion on a scale of low (1) to high (3) based on how well each option expands SLPs to underserved regions.

Alternatives Evaluated

Option 1: Develop standardized guidelines and expand the use of Speech Language Pathologists Assistants (SLPAs) in Virginia

SLPAs have proven beneficial in reducing the administrative workload of SLPs which allows them to spend more time in therapy sessions and increase their number of clients. To properly address the impending shortage, this alternative would involve adopting guidelines that standardize the SLPA training process which would allow them to gain a state license.

Cost-Effectiveness:

This option ranked medium in cost-effectiveness. A survey study from California that looked at SLPAs in practice found that majority of SLPAs reported less than 2 hours of their time being supervised by SLPs (Ostergren & Aguilar, 2012). When you assume the SLPA is working 40 hours a week the additional time a SLP gains from each SLPA is 38 hours a week which equals an additional 0.95 FTEs (=1900/2000). If you assume each school district in Virginia hires a SLPA to alleviate some of the workload, then the cost for five years would be around $55 million when accounting for 2% inflation in the average SLP salary in Virginia and discounting to the present value. Therefore, over five years the cost to increase one FTE is about $51,000 which is not too much when one considers how much healthcare or educational intervention typically cost, so it receives a rating of medium (2) on this criteria and this analysis is explained in more detail in Appendix A.

Feasibility:

This alternative ranks high (3) for feasibility. In more than 30 states SLPAs must be registered, certified, or licensed to work in support roles (*NCSB Annual Conference, Oct 13-15, 2022, Santa Fe, NM*, n.d.). SLPAs became a policy option considered by Virginia during the last decade. The 2014 Virginia General Assembly passed a bill amending the code to allow individuals to practice as SLPAs; this bill was passed unanimously by both chambers (*HB 764 Speech-Language Pathologists, Assistant; Practice of Duties under Licensed Pathologist*, 2014). The level of bipartisan support for SLPAs stayed strong when they overwhelmingly passed another bill in 2016 which further outlined the role of SLPA in Virginia and ordered the Board of Audiology and Speech Language Pathology (BASLP) to conduct a review of possible licensure of SLPAs (*HB 252 Assistant Speech-Language Pathologists; Duties, Report*, 2016). This review proved inconclusive, and they planned to continue reviewing the possibility of licensing SLPAs in Virginia in the future (*Need for and Impact of Licensure or Certification of Assistant Speech-Language Pathologists*, 2016). There wasn't much other discussion on SLPAs until the 2022 legislative session when HB 547 was proposed. This bill would mandate that the Department of Education develop a statewide strategic plan to mitigate the SLP shortage in Virginia (*HB 547 Speech-Language Pathologists; Department of Education to Develop/Maintain Statewide Strategic Plan*, 2022).

The COVID-19 pandemic increased the strain for SLPs in both school and private settings, and legislators are actively looking to help address the SLP shortage in Virginia. The legislative history of Virginia in the last decade shows that there is strong bipartisan support of SLPA use in Virginia and that right now there is a window of opportunity to make changes to the speech language pathology industry since there are ongoing discussions about trying different tactics.

Equity:
This option is ranked medium on this equity criterion. This will allow school districts and private healthcare settings to lessen the initial workload of SLPs by allowing SLPAs to assist with administrative and other supporting tasks. They could use the time gained from hiring SLPA's to take on more cases or be able to provide longer sessions to existing clientele. SLPAs do not need to have graduate degrees so SLPAs can be trained quicker and can be employed for less cost than SLPs. This training would allow them to be more quickly employed to mitigate shortages in the eastern shore and southern Virginia where there are less SLPs per 100,000 residents than the rest of the state (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021). The license would provide employers the assurance of minimum standards and allow them to employ SLPAs without concerns. Since SLPAs can be more quickly trained and put in therapy settings to support SLPs it is likely that the regions which are currently experiencing the worse shortages would be the ones to most benefit from this option.

Option 2: Expansion of SLP telepractice in public schools and private practice for rural areas
Telepractice would work by allowing SLPs in more metropolitan areas of the state to use video conference software to conduct therapy to clients in rural areas on the private practice side. In public schools telepractice would be implemented by the SLPs stationed at a singular site and virtually conducting therapy sessions with children who are located at different schools.

Cost-Effectiveness:
Rural Oklahoma counties implemented a telepractice model that involved a specialized computer system meant for speech and communication therapies and had the therapist deliver their services to schoolchildren from a centralized site. The study outlined the major costs associated with this program including the resources and equipment needed for the centralized therapy site (Forducey, 2006). Each site employs five SLPs on a part-time basis and if you assume that these services would not be provided to those patients without this suite then that would be an increase of 12.5 FTEs over five years since each year one suite would increase FTEs by 2.5. The cost for five years would be about $1.06 million so the cost to increase one FTE using this program is approximately $85,000. Therefore, this alternative is ranked low (1) on this criterion and this analysis is shown in more depth in Appendix A.

Feasibility:
This alternative is not really feasible and is rated as low on a scale from low (1) to high (3). The pandemic lockdowns and mask mandates prompted many therapy sessions to be moved online for over a year. Many SLPs completed trainings related to telepractice best practices since graduate programs did not typically teach students about online therapy (Beiting & Nicolet, 2020). It is more feasible to implement for private settings than in school systems since many private practices already invested in video software other infrastructure needed to perform speech therapy during the COVID-19 pandemic. Since they already have the infrastructure, it would be easy for SLPs in healthcare settings to offer online services to not only those within their region, but they also could provide services to those regions most at risk to SLP shortages. The benefits and costs of telepractice in private practice settings are highly concentrated; SLPs who offer online services are more likely to have a competitive advantage compared to those who don't since some clients thrived with this option during the COVID-19 pandemic.

The school system's adoption of telepractice from a central site would be more difficult to establish since it would involve school board's implementing a new system to deliver SLP services. Most school systems implemented video software during the COVID-19 pandemic, but this hub-site system would require a more secure and quicker software than what they were using during the pandemic since the rural regions are less likely to have reliable fast internet. This would require public outlay of funds by the state legislature. It would also require school system to get the public to support them in this change. This would allow children to get more time with their SLPs since it cuts down on travel time between schools. The benefits of this program are concentrated to those students in rural school systems that receive the speech language therapy, and the costs are widely distributed to all taxpayers. Another hurdle to this option's feasibility is that it would involve approval and funding from the Department of Education. While the Department of Education is looking into the best strategies to address the SLP shortage, it is unlikely that they will focus on this technique since it would require a large outlay of funds and continuing administration costs. They have other priorities, especially after COVID-19, so they would be unlikely to want to take on this project for schools.

Equity:
This option ranks high in the equity criterion due to the broad increase in accessibility of SLP services derived from telepractice. Patients have expressed support for telepractice in the past with them saying they did not see any large difference in quality of care (Mansuri et al., 2021). There are concerns about building rapport with young clients before therapy to ensure the client feels comfortable with the SLP (Akamoglu et al., 2018; Freckmann et al., 2017; Hines et al., 2015; Lam et al., 2020). This could be mitigated by having a few sessions meant to make the client feel comfortable and get to know their therapist. The use of telepractice in private settings would allow any SLPs who hold licenses in Virginia to provide their services in areas experiencing shortages which would help fill the gap and ensure every individual gets the services they need. The telepractice system in a school setting would allow rural counties in the regions with the lowest SLP per 100,000 resident ratio to utilize this system to cut down on travel and shortages in these schools to provide better services for those individuals. Since this alternative would primarily help those individuals who live in areas with the least access to SLPs it is a highly equitable option.

Option 3: Pilot program to expand online learning
Telesupervision and online school models were introduced in the COVID-19 pandemic with different states introducing various forms of electronic monitoring, most of them performed virtual monitoring because they were conducting the therapy online. For this to work, a graduate SLP program would have to agree to the constant credit tuition over three years and be able to accommodate the increase in students enrolled in their program. If the school does not already offer an online degree, then they would have to start a new program for this option.

Cost-Effectiveness:
Texas has a hybrid school and supervision model that they've used for over 10 years (Gill et al., 2018). The 2021 average current cost per credit for this graduate program is $284 and the only current online degree in Virginia is about $501.60 per credit (*Graduate Hours and Tuition Estimates*, n.d.; *Tuition & Fees - Texas Woman's University*, n.d.). So, the cost of the proposed

pilot program would be $217.60 per credit hour to account for the difference. The present value cost of this pilot program is approximately $475,000 when you use a 3% discount rate. When you assume that the 50 students work clinical hours until they finish their degree and work full-time in Virginia for the following two years then the FTEs added from this program are 109.375. So, the cost per each unit increase of FTE is about $4,350. So, this option is evaluated as high-cost effectiveness.

Feasibility:
This option would require that multiple stakeholders agree so the feasibility is rated as low due to its complexity. One major stakeholder that would have to support this would be the potential SLP graduate students who would be the ones using the online model. While individuals have said they felt like the model was just as beneficial to their learning as a solely in-person system, it is likely that there will be some pushback to this change from students (Gill et al., 2018). These potential concerns could be addressed by informational campaigns, and it would be a voluntary opt-in pilot since in-person options would still be available in Virginia. Also, you would have to gain buy-in from a university program and administrators. Lastly, for this alternative to work it will need support from the BASLP and legislators. These groups are likely to promote online schooling, but they have other priorities so getting them to agree on funding an educational scholarship program is doubtful. Since the stakeholders each have their own specific interests, this alternative has low feasibility.

Equity:
Lastly, the alternative is rated medium on equity. This would be a way to increase the number of SLPs graduating each year since it would allow more individuals to complete courses to study and become SLPs. It would also increase access for individuals to complete their clinical hours in rural settings and allow SLPs to monitor students that are practicing in various regions.

Outcome Matrix

	Cost-Effectiveness	**Feasibility**	**Equity**	**Total Score**
License for SLPAs	**Medium (2)**	**High (3)**	**Medium (2)**	**2.33**
Expand Rural Telepractice	Low (1)	Low (1)	High (3)	1.67
Pilot Online Learning Program	High (3)	Low (1)	Medium (2)	2

Recommendation

I recommend that SHAV advocate and implement *Option 1: Develop standardized guidelines and expand the use of Speech Language Pathologists Assistants (SLPAs) in Virginia*. This option addresses the long-term needs of Virginia since the number of SLPAs can more easily expand; they can also immediately be used to lessen the workload of SLPs and offer support in the short-term. This option also is highly feasible since majority of states already have a structure to license or certify these positions and the Virginia General Assembly has a long history of bipartisan support of adopting guidelines expanding SLPAs. This option will potentially increase access to speech therapy services since SLPAs support SLPs and allow them to spend more time on cases and with patients. There is a tradeoff with this option in terms of equity because it doesn't provide specific assurances that therapy service providers in rural counties will employ more SLPAs, but since the cost is lower to employ SLPAs it is likely that counties with lower access to SLPs will benefit from this recommendation.

Implementation

SHAV should take the role of implementation manager when trying to advance legislation and regulatory changes that would allow SLPAs to be licensed by the Board of Audiology and Speech Language Pathology (BASLP). They have the necessary contacts with state legislators, staff within BASLP, and licensed SLPs in Virginia who are their members. SHAV is motivated to address the shortage issue since their membership is composed of licensed SLPs who have struggled with extra work related to moving therapy delivery from in-person to online during the COVID-19 pandemic. SHAV's goal is to ensure all individuals in Virginia have access to the quality care that they need, so they are incentivized to work with all stakeholders to achieve the licensing change for SLPAs. SHAV does not have the authority to make decisions about state license unilaterally so they will have to work alongside BASLP and the state general assembly. SHAV works with BASLP regarding providing necessary continuing education hours for SLP license renewal and online best practices trainings, so SHAV has a good working relationship with this board.

There are a few concerns related to the implementation of this recommendation. One worry is that legislation or BASLP will water down the standards or opt for a registration or certification system instead. To ensure that this does not occur SHAV should first work with BASLP to guarantee that they have their full support since in the last decade the state general assembly has voted almost unanimously to support regulatory changes related to SLPs if they were supported by the board. So, SHAV should work with BASLP to finalize minimum qualifications related to SLPAs like what other states have already adopted. The state legislature is currently looking into strategies to best address the shortages, so this is the ideal time for BASLP to review its current policies on SLPAs (*HB 547 Speech-Language Pathologists; Department of Education to Develop/Maintain Statewide Strategic Plan*, 2022).

Also, some SLPs may have apprehensions about using SLPAs in their practices or in school systems. When Australia rolled out SLPAs for their healthcare system, researchers found that SLPs felt that their role was diminished somewhat and had apprehensions about largescale use of SLPAs to address shortages (O'Brien, 2018). To mitigate these concerns SHAV should launch an educational campaign and emphasize how the rollout of SLPAs will decrease workload of SLPs and that SLPAs will have specific job responsibilities that do not go into diagnosing or

planning treatment for patients. SLPs often spend a lot of time completing administrative work related to their patients which decreases the amount of time that they can spend diagnosing or treating individuals, so it is likely that their members will be open to SHAV's work promoting SLPAs if SHAV presents it with an emphasis on decreased administrative workload. SHAV should also develop workshops about how best to supervise and work with SLPA supporting personnel to help members best know how to utilize SLPAs in their practices or schools.

Since the 2022 General Assembly has just been looking into different strategies for dealing with SLP shortages in Virginia, SHAV should work with BASLP to finalize proposed qualifications needed for SLPAs in the next six months. Once those are established SHAV should work on gaining support from SLPs in their membership. The ideal way to do that is to run a workshop during their Fall 2022 membership meeting which would highlight the new proposed license for SLPAs and how it will affect SLPs' workload in the future. After the initial informational workshop, SHAV can upload optional best practices for supervision workshops to mitigate any additional potential concerns from SLPs. Finally, SHAV should help facilitate BASLP in proposing this regulatory change during the 2023 legislative session while the General Assembly is still concerned with healthcare shortages. Overall, SHAV should focus on achieving consensus with BASLP and SLPs then attempt to gain approval from the General Assembly for licensure of SLPAs in Virginia.

There are many educational programs in Virginia that grant individuals associates or bachelor's degrees in Communication Sciences. Other states allow those with these degrees to get a SLPA license if they meet the state's clinical hours. These programs produce many graduates each year that either go on to obtain graduate degrees or pursue other paths that aren't necessarily related to this field. The best way to ensure that individuals are aware of the new licensed profession is to have their education institutions inform them of the benefits of the SLPA pathway. Becoming a SLPA will allow recent graduate to have a good-paying job right out of undergrad while increasing their experience in the field which will aid them in getting accepted to SLP graduate schools which can be highly competitive.

Conclusion

All in all, the growing demand of SLPs in conjunction with the expected retirements and lack of new graduates will make the existing shortage of SLPs worse. This shortage is likely to affect Southern Virginia and the Eastern shore more than other areas since those areas already have fewer SLPs per capita than others in Virginia (*Virginia's Speech-Language Pathology Workforce: 2021*, 2021). This would negatively affect the quality of services provided to recipients since they would have less individualized therapy services and shorter sessions. This would hurt their communication skills which can have long-lasting consequences on social and educational development.

Therefore, SHAV should advocate for the creation of guidelines for a license for SLPAs which would allow SLPAs to be used more broadly in Virginia. The SLPAs would be quicker to train and deploy into areas that are suffering from shortages rather than attempting to simply increase the number of SLPs in Virginia. This recommendation should occur with an educational campaign focused on best practices for supervision/training and guidelines about role responsibilities of SLPAs compared to SLPs.

Appendix A: COST-EFFECTIVENESS ANALYSIS

Option 1: SLPA Licensure

Hours SLPAs work per week	40
Hours that SLPs Supervise SLPA	2[I]
Hours SLP gets back from one SLPA	38[II]
FTE Increase for one SLPA	0.95[III]
Average Salary of SLPA in VA	$49,531[IV]
Number of School Districts in VA	227[V]
Increase in SLP Time in School Districts	192.95[VI]
Present Value of SLPA salary over 5 Years	$55,136,626.23[VII]
Increase in SLP Time over 5 Years	1078.25
Cost-Effectiveness for 5 Years	**$51,135.29**

Assumptions:

I. California study shows that majority of SLPAs respondent report that SLPs supervise them for 2 or less of their total hours (Ostergren & Aguilar, 2012).
II. Assume that the screenings and administrative work done by SLPAs would still need to be done in the absence of employing SLPAs and would otherwise be completed by SLPs. So, by employing SLPAs to do some of the administrative work it frees up SLPs to diagnose and treat other patients.
III. Full Time Equivalency Units is a range from 0 – 1. An increase of 34 hours for 50 weeks would be 1,700 hours. A SLP working full time works 40 hours for 50 weeks or 2,000 hours. This would increase available FTEs of SLPs by 0.85 (=1700/2000).
IV. (*SLPA Assistant Annual Salary in Virginia*, 2022)
V. Assume that each school district will employ one. Also, for the purposes of this CEA we will assume that after the legislation is passed those who are already essentially working as SLPAs in VA without licenses will be able to obtain them and be employed by the school districts relatively immediately. There are individuals who could feasibly be employed as SLPAs right now that match the proposed qualifications, but school systems and private practices do not want to risk employing them without a formal license.
VI. Statewide the increase of 227 SLPAs would increase the statewide SLP's FTE by 192.95.
VII. The PV over 5 years of SLPA salary using a standard 3% discount rate and salary increase of 2% for inflation each year

Also, this only estimates cost of SLPAs in school systems because private sector employers will make their decisions themselves and adding them into it would be too complex for this analysis.

Option 2: Expansion of telepractice suites

Telemedicine Suite	$7,000[I]
Median SLP salary in VA	$85,868[II]
Part-Time Salary of SLP	$42,934[III]
Increase in SLP FTEs in rural sites	2.5[IV]
Number of SLPs per Telemedicine Suite	5
Present Value of 1 Suite Cost for 5 Years	$1,059,709.62
Increase in SLP FTEs over 5 Years	12.5[VI]
Cost-Effectiveness over 5 Years	**84,776.77[VII]**

Assumptions:

I. This estimate is from the Oklahoma rural site study, and it would require more than just existing Zoom software since these rural areas have slower and less reliable internet access. (Forducey, 2006)
II. (*Speech and Language Pathologist Salary in Virginia | Salary.Com*, n.d.).
III. Assume that part-time SLPs work 20 hours instead of 40 hours so their average pay is half the full-time salary
IV. Assume that the rural site would not get the 100 hours of therapy from SLPs in metro areas without the telemedicine suite. Since each of the five part-time SLP are contributing 0.5 FTEs, the total increase in FTEs in 2.5 (=0.5 x 5).
V. Found the present value of the cost of running a telemedicine suite for five years while employing 5 part-time SLPs; includes salary and 7,000 start-up costs. Used a standard 3% discount rate and 2% inflation increase in salaries for this calculation.
VI. Calculated by adding up the FTEs gained each year (=2.5 x 5)
VII. This means that to increase one FTE in rural sites it would cost $84,776.77

Option 3: Pilot Program of Distancing Learning and Electronic Educational Supervision

Students Enrolled	50
Costs per year	$163,200[I]
SLP Student Hours per year	6250[II]
Grad school length in years	3
FTEs added in 1st three years	9.375[III]
FTEs by graduates in YR 4-5	100[IV]
Present Value of costs through year 5	$475,478.25[V]
FTEs added in five years	109.375
Cost-Effectiveness over 5 Years	**$4,347.23**

Assumptions:

I. Cost of education for one credit for one student is $217.60; data from (Gill et al., 2018). Used JMU's cost per credit (501.60-284 = 217.60).
II. Students must complete 375 clinical hours to get the degree at JMU
III. The clinical hours help add FTEs
IV. Assume all 50 graduates of this program must work in Virginia for two years
V. Found this by discounting the three years using discount rate of 3%. Cost of employing SLPs in years 4-5 is not paid by VDOE but by their individual employers

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